DRILL LOGS RL-161
Rosebud

4010 0039

1908-2 c10-
1908-3

****
JOB NUMBER
029-0313-12CCGY

WELL NAME*
RL-161

MINIMUM CUR.
****

DEPTH:	0.00
TVD:	0.00
SECT:	0.00
C.D.:	0.00
INCL:	-45.00
AZI:	136.00
LAT:	0.00N
DEP:	0.00E
DOG-LEG:	0.00

DEPTH:	50.00
TVD:	35.48
SECT:	35.21
C.D.:	35.25
INCL:	-45.37
AZI:	141.18
LAT:	26.41S
DEP:	23.30E
DOG-LEG:	7.34

DEPTH:	100.00
TVD:	71.58
SECT:	69.79
C.D.:	34.59
INCL:	-47.08
AZI:	141.04
LAT:	53.33S
DEP:	45.01E
DOG-LEG:	3.44

DEPTH:	150.00
TVD:	108.66
SECT:	103.33
C.D.:	33.54
INCL:	-48.65
AZI:	138.72
LAT:	78.99S
DEP:	66.62E
DOG-LEG:	4.41

DEPTH:	200.00
TVD:	146.67
SECT:	135.81
C.D.:	32.49
INCL:	-50.30
AZI:	138.75
LAT:	103.41S
DEP:	88.04E
DOG-LEG:	3.30

DEPTH:	250.00
TVD:	185.35
SECT:	167.49
C.D.:	31.69
INCL:	-51.08
AZI:	138.32
LAT:	127.15S
DEP:	109.02E
DOG-LEG:	1.72

DEPTH:	300.00
TVD:	224.66
SECT:	198.37
C.D.:	30.89
INCL:	-52.62
AZI:	140.01
LAT:	150.51S
DEP:	129.22E
DOG-LEG:	3.72

DEPTH:	350.00
TVD:	264.83
SECT:	228.15
C.D.:	29.78
INCL:	-54.28
AZI:	140.17
LAT:	173.35S
DEP:	148.32E
DOG-LEG:	3.34

DEPTH:	400.00
TVD:	305.72
SECT:	256.92
C.D.:	28.77
INCL:	-55.45
AZI:	140.09
LAT:	195.44S
DEP:	166.77E
DOG-LEG:	2.34

****
256.92 FEET
AT 139.53 DEG.

LAC MINERALS (U.S.A.) INC.

DRILL LOG SUMMARY SHEET

PROJECT Rosebud

HOLE NUMBER RL-161 TOTAL DEPTH 405' LOGGED BY Dan

Date started 11-7-90

Date completed 11-8-90

Initial bearing S45E

Initial inclination -45

Elevation 5251.8

Collar coordinates:

N 2,202,883

E 480,654.9

Contractor: Eklund

Drill Type: MPD-1000

Hole Size: 4 3/4"

Drilling Conditions: Good Hard Rock

Footage: Wet / Dry Dry to 405'

Comments:

DOWN HOLE SURVEY INFORMATION

FROM	TO	SURVEY POINT	INCLI-NATION	BEARING	X (Northing)	Y (Easting)	Z (Elevation)
0	25		-45	S 44 E			
25	75		-45.4	S 39.8 E			
75	125		-47.1	S 39 E			
125	175		-48.7	S 41.3 E			
175	225		-50.3	S 41.2 E			
225	275		-50.3	S 41.7 E			
275	325		-52.6	S 40 E			
325	375		-54.3	S 39.9 E			
375	405		-55.5				

LAC MINERALS (U.S.A.) INC.
ROSEBUD PROJECT

FINE-GRAINED TUFF
LITHIC LAPILLI TUFF
DT. DOZER TUFF

ARGILLIC
XX SILICIFICATION
OX OXIDIZED
XXXXXX DRUZY QUARTZ
XC CHALCEDONIC QUARTZ
XK STOCKWORK QUARTZ
P P P PROPYLITIZATION
Ca CALCITE

DRILL HOLE RL-161

Page 1 of 4

LOGGED BY DAM

	LITH.	ALT.	% ARG. ALT. W	M	S	% SIL'N W	M	S	COLOR	% FeOx W	M	S	% SULF.	COMMENTS	Au	Ag	CHECK	% WASH RECOV.
	DT	OX							SAGE GRN +					0-405' SAGE GREEN FINE GRAIN TUFF — DOZER TUFF	.001	.15		
05									BRN					LOCALLY Fe STAINED & OXIDIZED	.002	.12		
10														0-160 MOD. OXIDIZED	.007	<		
15															<	.13		
20															.001	<		
25															<	<		
30															<	<		
35															.001	.15		
40															<	.10		
45															<	<		
50															.002	<		
55															<	<		
60															<	.13		
65															.002	<		
70															<	.12		
75															<	.18		
80									OLIVE GRN						<	<		
85															<	.11		
90															<	<		
95															.005	<		
100									GRY + BRN									

LAC MINERALS (U.S.A.) INC.
ROSEBUD PROJECT

FINE-GRAINED TUFF
LITHIC LAPILLI TUFF

ARGILLIC
XX SILICIFICATION
OX OXIDIZED
XXXXXX DRUZY QUARTZ
XC CHALCEDONIC QUARTZ
XK STOCKWORK QUARTZ
P P P PROPYLITIZATION
Ca CALCITE

DRILL HOLE RL-161

Page 2 of 4

LOGGED BY DAM

	LITH.	ALT.	% ARG. ALT. W	M	S	% SIL'N W	M	S	COLOR	% FeOx W	M	S	% SULF.	COMMENTS	Au	Ag	CHECK	% WASH RECOV.
	D.T	OX							BRN + GREY					DOZER TUFF	.006	<		
105															.023	.15		
110															.175	.19		
115									OLIVE GRN						.009	<		
120															.016	<		
125															.004	.12		
130															.013	.08		
135															.030	.11		
140															.010	<		
145															.008			
150															.003			
155															.002			
160									LT SAGE GRN						<			
165															<			
170															<			
175															<			
180															.001			
185															.001			
190															<	.14		
195															<	<		
200																		

LAC MINERALS (U.S.A.) INC.
ROSEBUD PROJECT

CHOCOLATE TUFF
BUD BRECCIA
BUD TUFF
BUD EPICLASTIC
BUD TUFF BRECCIA
DT DOZER WELDED TUFF

ARGILLIC
XX SILICIFICATION
OX OXIDIZED
DRUZY QUARTZ
XC CHALCEDONIC QUARTZ
XK STOCKWORK QUARTZ
P P P PROPYLITIZATION
Ca CALCITE

DRILL HOLE RL-161

Page 3 of 4

LOGGED BY DAM

	LITH.	ALT.	% ARG. ALT. W	M	S	% SIL'N W	M	S	COLOR	% FeOx W	M	S	% SULF.	COMMENTS	Au	Ag	CHECK	
	DT								SAGE GRN					DOZER TUFF	<	<		
205																.13		
210																<		
215																.16		
220																.16		
225																<		
230															.001	.17		
235															<	.14		
240															<	<		
245															<	.16		
250															<	.10		
255															<	<		
260															.001	<		
265															<	.12		
270															<	<		
275															.001	.14		
280															.002	.16		
285															.001	.12		
290															<	<		
295															<	<		
300																		

LAC MINERALS (U.S.A.) INC.
ROSEBUD PROJECT

CHOCOLATE TUFF
BUD BRECCIA
BUD TUFF
BUD EPICLASTIC
BUD TUFF BRECCIA
DT DOZER WELDED TUFF

ARGILLIC
XX SILICIFICATION
OX OXIDIZED
DRUZY QUARTZ
XC CHALCEDONIC QUARTZ
XK STOCKWORK QUARTZ
P P P PROPYLITIZATION
Ca CALCITE

DRILL HOLE RL-161

Page 4 of 4

LOGGED BY DAM

	LITH.	ALT.	% ARG. ALT. W	M	S	% SIL'N W	M	S	COLOR	% FeOx W	M	S	% SULF.	COMMENTS	Au	Ag	CHECK	
	DT								SAGE GRN					DOZER TUFF	<	<		
305																		
310																		
315																		
320																		
325																		
330																		
335																		
340																		
345																		
350																		
355																		
360																		
365															.001			
370															<	.12		
375															<	<		
380															.001	.14		
385															.002	.16		
390															.001	.12		
395									DK GRN						.001	.18		
400														DK GREEN GREY (MORE MAFICS?) TUFF, WK OX'd.	<	<		
405														T.D = 405' DRY TO DEPTH.	<	.11		

C

NOV 29 1990

NEVADA GSI, INC.

GEOCHEMICAL ANALYSIS REPORT

Client: Mr. Nate Brewer

LAC Minerals USA, Inc.
1395 Greg St. #107
Sparks, NV 89431 tel:702/356-8058

Job #: LOA8789C
Samples: 162
Project: URBD
Product: FA2/AA
P.O. #:

This report has been reviewed and approved by:

Jerry Gaige, Production Manager

11-21-90
Date

1498 Kleppe Lane • Sparks, Nevada 89431 • (702)359-6600 • FAX: (702)359-6605

NEVADA GSI, INC.

GEOCHEMICAL ANALYSIS REPORT

Job No.: loa8789c

No.	Sample Id			Au opt	Ag opt
1	RL-161	0	5	0.0010	0.1500
2	R-44			~~0.0340~~	~~0.1500~~
3	RL-161	5	10	0.0020	0.1200
4	RL-161	10	15	0.0070	-0.1000
5	RL-161	15	20	-0.0010	0.1300
6	RL-161	20	25	0.0010	-0.1000
7	RL-161	25	30	-0.0010	-0.1000
8	RL-161	30	35	-0.0010	-0.1000
9	RL-161	35	40	0.0010	0.1500
10	RL-161	40	45	-0.0010	0.1000
11	RL-161	45	50	-0.0010	-0.1000
12	RL-161	50	55	0.0020	-0.1000
13	RL-161	55	60	-0.0010	-0.1000
14	RL-161	60	65	-0.0010	0.1300
15	RL-161	65	70	0.0020	-0.1000
16	RL-161	70	75	-0.0010	0.1200
17	RL-161	75	80	-0.0010	0.1800
18	RL-161	80	85	-0.0010	-0.1000
19	RL-161	85	90	-0.0010	0.1100
20	RL-161	90	95	-0.0010	-0.1000
21	RL-161	95	100	0.0050	-0.1000
22	R-45			~~0.0520~~	~~0.1300~~
23	RL-161	100	105	0.0060	-0.1000
24	RL-161	105	110	0.0230	0.1500
25	RL-161	110	115	0.1750	0.1900
26	RL-161	115	120	0.0090	-0.1000
27	RL-161	120	125	0.0160	-0.1000
28	RL-161	125	130	0.0040	0.1200
29	RL-161	130	135	0.0130	0.1800
30	RL-161	135	140	0.0300	0.1100
31	RL-161	140	145	0.0100	-0.1000
32	RL-161	145	150	0.0080	-0.1000
33	RL-161	150	155	0.0030	-0.1000
34	RL-161	155	160	0.0020	-0.1000
35	RL-161	160	165	-0.0010	-0.1000
36	RL-161	165	170	-0.0010	-0.1000
37	RL-161	170	175	-0.0010	-0.1000
38	RL-161	175	180	-0.0010	-0.1000
39	RL-161	180	185	0.0010	-0.1000
40	RL-161	185	190	0.0010	-0.1000
41	RL-161	190	195	-0.0010	0.1400
42	R-46			~~0.0340~~	~~0.1400~~
43	RL-161	195	200	-0.0010	-0.1000
44	RL-161	200	205	-0.0010	-0.1000
45	RL-161	205	210	-0.0010	0.1300
46	RL-161	210	215	-0.0010	-0.1000
47	RL-161	215	220	-0.0010	0.1600
48	RL-161	220	225	-0.0010	0.1600
49	RL-161	225	230	-0.0010	-0.1000
50	RL-161	230	235	0.0010	0.1700

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NEVADA GSI, INC.

GEOCHEMICAL ANALYSIS REPORT

Job No.: loa8789c

No.	Sample Id			Au opt	Ag opt
51	RL-161	235	240	-0.0010	0.1400
52	RL-161	240	245	-0.0010	-0.1000
53	RL-161	245	250	-0.0010	0.1600
54	RL-161	250	255	-0.0010	0.1000
55	RL-161	255	260	-0.0010	-0.1000
56	RL-161	260	265	0.0010	0.1000
57	RL-161	265	270	-0.0010	0.1800
58	RL-161	270	275	-0.0010	-0.1000
59	RL-161	275	280	-0.0010	-0.1000
60	RL-161	280	285	-0.0010	-0.1000
61	RL-161	285	290	-0.0010	-0.1000
62	R-47			~~0.0770~~	~~-0.1000~~
63	RL-161	290	295	-0.0010	-0.1000
64	RL-161	295	300	-0.0010	-0.1000
65	RL-161	300	305	-0.0010	-0.1000
66	RL-161	305	310	-0.0010	-0.1000
67	RL-161	310	315	-0.0010	-0.1000
68	RL-161	315	320	-0.0010	-0.1000
69	RL-161	320	325	-0.0010	-0.1000
70	RL-161	325	330	-0.0010	-0.1000
71	RL-161	330	335	-0.0010	-0.1000
72	RL-161	335	340	-0.0010	-0.1000
73	RL-161	340	345	-0.0010	-0.1000
74	RL-161	345	350	-0.0010	-0.1000
75	RL-161	350	355	-0.0010	-0.1000
76	RL-161	355	360	-0.0010	-0.1000
77	RL-161	360	365	0.0010	-0.1000
78	RL-161	365	370	-0.0010	0.1200
79	RL-161	370	375	-0.0010	-0.1000
80	RL-161	375	380	0.0010	0.1400
81	RL-161	380	385	0.0020	0.1600
82	R-48			~~0.0370~~	~~-0.1000~~
83	RL-161	385	390	0.0010	0.1200
84	RL-161	390	395	0.0010	0.1800
85	RL-161	395	400	-0.0010	-0.1000
86	RL-161	400	405	-0.0010	0.1100
87	RL-162	0	5	0.0020	-0.1000
88	RL-162	5	10	0.0030	0.1000
89	RL-162	10	15	0.0110	0.2300
90	RL-162	15	20	0.0060	0.1600
91	RL-162	20	25	0.0040	0.3100
92	RL-162	25	30	0.0050	0.2700
93	RL-162	35	40	0.0030	-0.1000
94	RL-162	40	45	0.0040	0.1700
95	RL-162	45	50	0.0050	-0.1000
96	RL-162	50	55	0.0030	-0.1000
97	RL-162	55	60	0.0070	-0.1000
98	RL-162	60	65	0.0040	-0.1000
99	RL-162	65	70	0.0030	-0.1000
100	RL-162	70	75	0.0030	-0.1000

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NOV 29 1990

NEVADA GSI, INC.

GEOCHEMICAL ANALYSIS REPORT

RL-161
0-405
RL-162
0-365

Client: Mr. Nate Brewer

LAC Minerals USA, Inc.
1395 Greg St. #107
Sparks, NV 89431 tel:702/356-8058

Job #: LOA8789C
Samples: 162
Project: URBD
Product: FA2/AA
P.O. #:

This report has been reviewed and approved by:

Jerry Gaige, Production Manager

11-21-90
Date

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NEVADA GSI, INC.

GEOCHEMICAL ANALYSIS REPORT

Job No.: loa8789c

No.	Sample Id			Au opt	Ag opt
1	RL-161	0	5	0.0010	0.1500
2	R-44			0.0340	0.1500
3	RL-161	5	10	0.0020	0.1200
4	RL-161	10	15	0.0070	-0.1000
5	RL-161	15	20	-0.0010	0.1300
6	RL-161	20	25	0.0010	-0.1000
7	RL-161	25	30	-0.0010	-0.1000
8	RL-161	30	35	-0.0010	-0.1000
9	RL-161	35	40	0.0010	0.1500
10	RL-161	40	45	-0.0010	0.1000
11	RL-161	45	50	-0.0010	-0.1000
12	RL-161	50	55	0.0020	-0.1000
13	RL-161	55	60	-0.0010	-0.1000
14	RL-161	60	65	-0.0010	0.1300
15	RL-161	65	70	0.0020	-0.1000
16	RL-161	70	75	-0.0010	0.1200
17	RL-161	75	80	-0.0010	0.1800
18	RL-161	80	85	-0.0010	-0.1000
19	RL-161	85	90	-0.0010	0.1100
20	RL-161	90	95	-0.0010	-0.1000
21	RL-161	95	100	0.0050	-0.1000
22	R-45			0.0520	0.1300
23	RL-161	100	105	0.0060	-0.1000
24	RL-161	105	110	0.0230	0.1500
25	RL-161	110	115	0.1750	0.1900
26	RL-161	115	120	0.0090	-0.1000
27	RL-161	120	125	0.0160	-0.1000
28	RL-161	125	130	0.0040	0.1200
29	RL-161	130	135	0.0130	0.1800
30	RL-161	135	140	0.0300	0.1100
31	RL-161	140	145	0.0100	-0.1000
32	RL-161	145	150	0.0080	-0.1000
33	RL-161	150	155	0.0030	-0.1000
34	RL-161	155	160	0.0020	-0.1000
35	RL-161	160	165	-0.0010	-0.1000
36	RL-161	165	170	-0.0010	-0.1000
37	RL-161	170	175	-0.0010	-0.1000
38	RL-161	175	180	-0.0010	-0.1000
39	RL-161	180	185	0.0010	-0.1000
40	RL-161	185	190	0.0010	-0.1000
41	RL-161	190	195	-0.0010	0.1400
42	R-46			0.0340	0.1400
43	RL-161	195	200	-0.0010	-0.1000
44	RL-161	200	205	-0.0010	-0.1000
45	RL-161	205	210	-0.0010	0.1300
46	RL-161	210	215	-0.0010	-0.1000
47	RL-161	215	220	-0.0010	0.1600
48	RL-161	220	225	-0.0010	0.1600
49	RL-161	225	230	-0.0010	-0.1000
50	RL-161	230	235	0.0010	0.1700

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NEVADA GSI, INC.

GEOCHEMICAL ANALYSIS REPORT

Job No.: loa8789c

No.	Sample Id			Au opt	Ag opt
51	RL-161	235	240	-0.0010	0.1400
52	RL-161	240	245	-0.0010	-0.1000
53	RL-161	245	250	-0.0010	0.1600
54	RL-161	250	255	-0.0010	0.1000
55	RL-161	255	260	-0.0010	-0.1000
56	RL-161	260	265	0.0010	0.1000
57	RL-161	265	270	-0.0010	0.1800
58	RL-161	270	275	-0.0010	-0.1000
59	RL-161	275	280	-0.0010	-0.1000
60	RL-161	280	285	-0.0010	-0.1000
61	RL-161	285	290	-0.0010	-0.1000
62	R-47			0.0770	-0.1000
63	RL-161	290	295	-0.0010	-0.1000
64	RL-161	295	300	-0.0010	-0.1000
65	RL-161	300	305	-0.0010	-0.1000
66	RL-161	305	310	-0.0010	-0.1000
67	RL-161	310	315	-0.0010	-0.1000
68	RL-161	315	320	-0.0010	-0.1000
69	RL-161	320	325	-0.0010	-0.1000
70	RL-161	325	330	-0.0010	-0.1000
71	RL-161	330	335	-0.0010	-0.1000
72	RL-161	335	340	-0.0010	-0.1000
73	RL-161	340	345	-0.0010	-0.1000
74	RL-161	345	350	-0.0010	-0.1000
75	RL-161	350	355	-0.0010	-0.1000
76	RL-161	355	360	-0.0010	-0.1000
77	RL-161	360	365	0.0010	-0.1000
78	RL-161	365	370	-0.0010	0.1200
79	RL-161	370	375	-0.0010	-0.1000
80	RL-161	375	380	0.0010	0.1400
81	RL-161	380	385	0.0020	0.1600
82	R-48			0.0370	-0.1000
83	RL-161	385	390	0.0010	0.1200
84	RL-161	390	395	0.0010	0.1800
85	RL-161	395	400	-0.0010	-0.1000
86	RL-161	400	405	-0.0010	0.1100
87	RL-162	0	5	0.0020	-0.1000
88	RL-162	5	10	0.0030	0.1000
89	RL-162	10	15	0.0110 ✓	0.2300
90	RL-162	15	20	0.0060	0.1600
91	RL-162	20	25	0.0040	0.3100
92	RL-162	25	30	0.0050	0.2700
93	RL-162	35	40	0.0030	-0.1000
94	RL-162	40	45	0.0040	0.1700
95	RL-162	45	50	0.0050	-0.1000
96	RL-162	50	55	0.0030	-0.1000
97	RL-162	55	60	0.0070	-0.1000
98	RL-162	60	65	0.0040	-0.1000
99	RL-162	65	70	0.0030	-0.1000
100	RL-162	70	75	0.0030	-0.1000

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NEVADA GSI, INC.

GEOCHEMICAL ANALYSIS REPORT

Job No.: loa8789c

No.	Sample Id				Au opt	Ag opt
101	R-49				0.0330	0.1100
102	RL-162	75	80		0.0040	-0.1000
103	RL-162	80	85		0.0040	-0.1000
104	RL-162	85	90		0.0030	-0.1000
105	RL-162	90	95		0.0270	-0.1000
106	RL-162	95	100		0.0040	-0.1000
107	RL-162	100	105		0.0020	-0.1000
108	RL-162	105	110		0.0290	-0.1000
109	RL-162	110	115		0.0050	-0.1000
110	RL-162	115	120		0.0130	-0.1000
111	RL-162	120	125		0.0580	-0.1000
112	RL-162	125	130		0.0060	0.3800
113	RL-162	130	135		0.0030	-0.1000
114	RL-162	135	140		0.0030	0.1700
115	RL-162	140	145		0.0040	-0.0010
116	RL-162	145	150		0.0040	-0.0010
117	RL-162	150	155		0.0030	-0.0010
118	RL-162	155	160		0.0040	-0.0010
119	RL-162	160	165		0.0050	-0.0010
120	RL-162	165	170		0.0030	-0.0010
121	R-50			.049	0.0510	0.1100
122	RL-162	170	175		0.0030	0.1500
123	RL-162	175	180		0.0030	-0.0010
124	RL-162	180	185		0.0050	-0.0010
125	RL-162	185	190		0.0060	-0.0010
126	RL-162	190	195		0.0560	0.1100
127	RL-162	195	200		0.0150	-0.0010
128	RL-162	200	205		0.0040	0.1300
129	RL-162	205	210		0.0030	-0.0010
130	RL-162	210	215		0.0030	-0.0010
131	RL-162	215	220		0.0040	-0.0010
132	RL-162	220	225		0.0030	-0.0010
133	RL-162	225	230		0.0030	0.1100
134	RL-162	230	235		0.0040	-0.1000
135	RL-162	235	240		0.0090	-0.1000
136	RL-162	240	245		0.0030	0.1400
137	RL-162	245	250		0.0030	-0.1000
138	RL-162	250	255		0.0030	-0.1000
139	RL-162	255	260		0.0020	0.1200
140	RL-162	260	265		0.0030	-0.1000
141	R-51			.075	0.0800	-0.1000
142	RL-162	265	270		0.0030	-0.1000
143	RL-162	270	275		0.0030	-0.1000
144	RL-162	275	280		0.0030	-0.1000
145	RL-162	280	285		0.0020	0.1000
146	RL-162	285	290		0.0030	-0.1000
147	RL-162	290	295		0.0040	0.1900
148	RL-162	295	300		0.0050	0.1700
149	RL-162	300	305		0.0040	0.2500
150	RL-162	305	310		0.0040	0.2100

1498 Kleppe Lane • Sparks, Nevada 89431 • (702)359-6600 • FAX: (702)359-6605

NEVADA GSI, INC.

GEOCHEMICAL ANALYSIS REPORT

Job No.: loa8789c

No.	Sample Id				Au opt	Ag opt
151	RL-162	310	315		0.0040	0.1700
152	RL-162	315	320		0.0040	0.1400
153	RL-162	320	325		0.0020	-0.1000
154	RL-162	325	330		0.0070	-0.1000
155	RL-162	330	335		0.0020	-0.1000
156	RL-162	335	340		0.0030	-0.1000
157	RL-162	340	345		0.0240	-0.1000
158	RL-162	345	350		0.0020	-0.1000
159	RL-162	350	355		0.0010	-0.1000
160	RL-162	355	360		0.0030	-0.1000
161	R-52			.049	0.0500	-0.1000
162	RL-162	360	365		0.0180	-0.1000

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BOYLES-WELNAV
RENO, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

****
* LAC MINERALS USA INC. *
****

JOB NUMBER: 029-0313-12CCGY

WELL NAME: RL-161

LOCATION: ROSEBUD

SURVEY DATE: 11-14-90

SURVEY ENGINEER: PHIL GRAFFT

GYRO REFERENCE BEARING: S44.00E

TIE-IN COORDINATES AT: 0 M.D.
TAKEN FROM: SURFACE

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

COMMENTS:

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

BOYLES-WELNAV
RENO, NEVADA

JOB NUMBER: 029-0313-12CCGY

WELL NAME: RL-161

INRUN SURVEY
BY

THE MINIMUM CURVATURE

MEAS. DEPTH	VERT. DEPTH	VERT. SECT.	COURSE DEV.	INCL	BEARING AZIMUTH	COORDINATES LATITUDE	COORDINATES DEPARTURE	D-LEG PER 50	STATION DISP.	DISPLACEMENT DIRECTION
0.0	0.00	0.00	0.00	-45.00	136.00	0.00 N	0.00 E	0.00	0.00 AT	0.00 DEG
50.0	35.48	35.21	35.25	-45.37	141.18	26.41 S	23.30 E	3.67	35.22 AT	138.58 DEG
100.0	71.58	69.79	34.59	-47.08	141.05	53.34 S	45.01 E	1.72	69.79 AT	139.84 DEG
150.0	108.66	103.33	33.54	-48.65	138.72	78.99 S	66.61 E	2.21	103.33 AT	139.86 DEG
200.0	146.67	135.81	32.49	-50.30	138.75	103.41 S	88.04 E	1.65	135.81 AT	139.59 DEG
250.0	185.13	167.76	31.95	-50.27	138.32	127.35 S	109.20 E	0.28	167.76 AT	139.39 DEG
300.0	224.23	198.92	31.16	-52.62	140.02	150.92 S	129.58 E	2.58	198.92 AT	139.35 DEG
350.0	264.39	228.69	29.78	-54.28	140.17	173.76 S	148.68 E	1.67	228.69 AT	139.45 DEG
400.0	305.28	257.46	28.77	-55.45	140.08	195.84 S	167.13 E	1.17	257.46 AT	139.52 DEG

```
*************************************************************
*                         ********                          *
*     THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF           *
*                         ********                          *
*  400.0 FEET EQUALS   257.46   FEET AT   139.52 DEG.       *
*                         ********                          *
*************************************************************
```

Hecla MINING COMPANY

ROSEBUD PROJECT DRILL LOG

HOLE NUMBER: RL-161
PAGE 1 OF 4
DATE:
LOGGED BY: M.W. Brady
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 QUARTS %	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-SUL %	SLEMIE %	BARITE %	METALLURGY: OXIDE	SULF	DIPSOM	MOISTURE	ANALYTICAL DATA: FROM	TO	W	Au	Ag
0			Qal																																						
			wtc v fine equigranular tuff w/ min orange brn feoxicoats			?					–				–				100			–					–														
10			Dozer																																						
20																																									
30																																									
40																																									
50																																									
60																																									
70																																									
80			tan-orange brn v fine grained tuff w/min feoxicoats			–					–				–				100			–					–														
			Dozer																																						
90																																									
100																																									

Hecla MINING COMPANY

ROSEBUD PROJECT
DRILL LOG

HOLE NUMBER RL-161
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 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 %	K-SUL %	SUBLIME %	BARITE %	METALLURGY: OXIDE	SULF	CARBON	MOCURE	ANALYTICAL DATA: FROM	TO	W	Au	Ag
			wt+lt green+tan fine equigranular tuff w/ tr diss py (wtk) & orang brn feox coats (rest)			–					–				✓				50			–					<1														
110															✓																										
120			tan fine equigranular tuff w/ MnO2 in fracs no sulf			–					–				–				–								–														
130																																									
140																																									
150																																									
160			Lt green–wt fine equigranular tuff w/ Tr diss py			–					–				✓				–								<1														
170			Pozes												✓																										
180															✓																										
190															✓																										
200															✓																										

Hecla MINING COMPANY

ROSEBUD PROJECT
DRILL LOG

HOLE NUMBER RL-161
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 % SILORE	PROPYLITIC % CALCITE	POTASSIC % K-SPAR	POTASSIC % ALUNITE	OXIDATION 5%	OXIDATION 15%	OXIDATION +25%	VEINING %	VEINING TYPE	MINERALIZATION: SULFIDES 5%	SULFIDES 15%	SULFIDES +25%	PY %	CPY %	MAR %	K-SLF %	STIBNITE %	BARITE %	METALLURGY: OXIDE	SULF	OXIDSULF	MIXTURE	ANALYTICAL DATA: FROM	TO	W	Au	Ag
			wte-Lt green vfine equigranular tuff w/tr diss py			–					–				✓				–			–					<1														
			Dozer												✓																										
210															✓																										
															✓																										
220															✓																										
															✓																										
230															✓																										
															✓																										
240															✓																										
															✓																										
250															✓																										
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260															✓																										
															✓																										
270															✓																										
															✓																										
280															✓																										
															✓																										
290															✓																										
															✓																										
300															✓																										

Hecla MINING COMPANY

ROSEBUD PROJECT
DRILL LOG

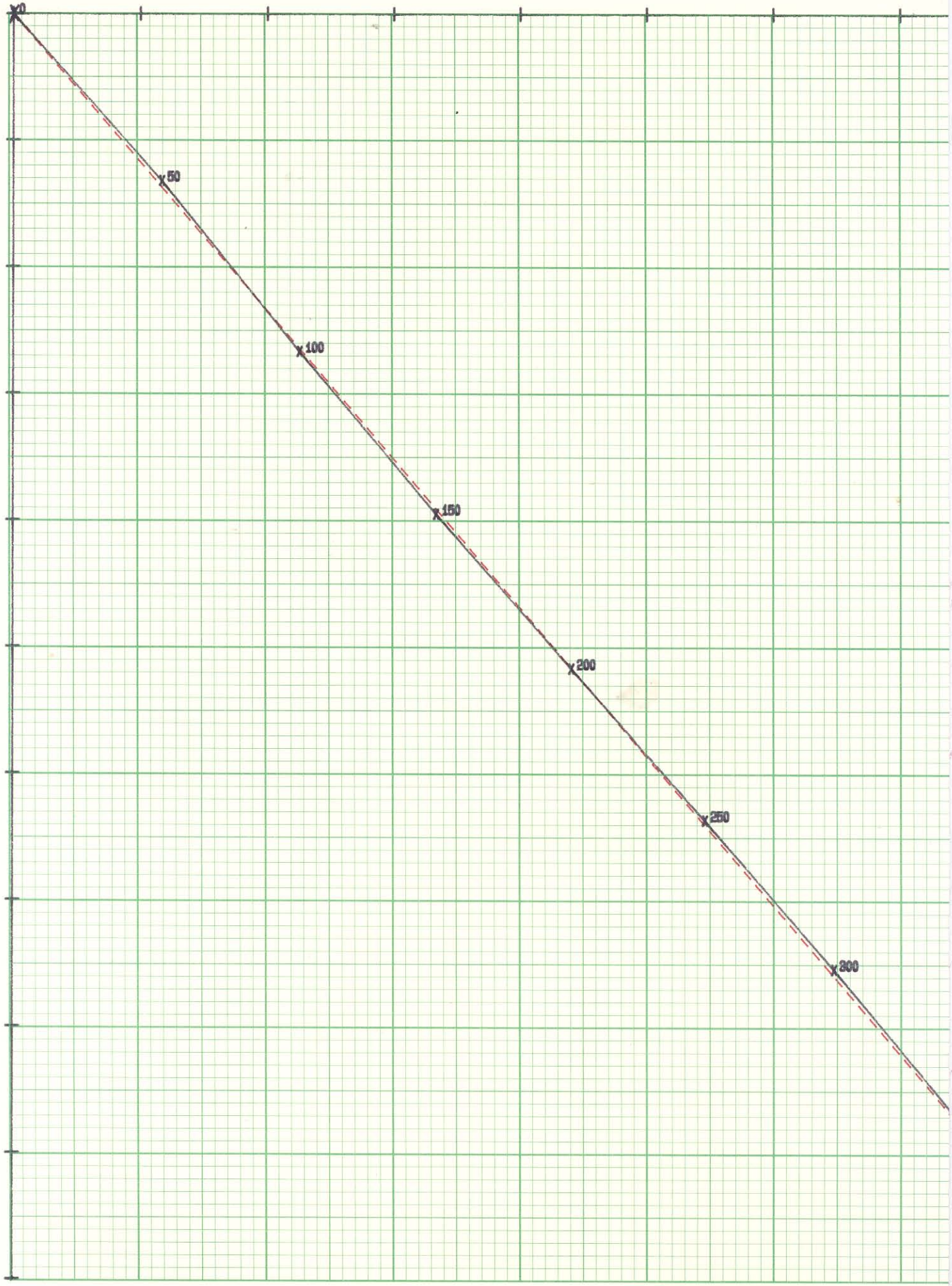
HOLE NUMBER RL-161
PAGE 4 OF 4
DATE
LOGGED BY
TOTAL DEPTH

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: SILICIFICATION 5%	SILICIFICATION 15%	SILICIFICATION +25%	SILICIFICATION MAT'RL %	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 %	K-SUL %	STIBNITE %	BARITE %	METALLURGY: OXIDE	SULF	CARBON	MOLYBDENITE	ANALYTICAL DATA: FROM	TO	W	Au	Ag
			Lt green v fine equigranular tuff w/ tr diss py			–					–				✓				–			–					4														
			Dozer												✓																										
310															✓																										
															✓																										
320															✓																										
															✓																										
330															✓																										
															✓																										
340															✓																										
															✓																										
350															✓																										
															✓																										
360															✓																										
															✓																										
370															✓																										
															✓																										
380															✓																										
			Lt green-gray v fine equigranular tuff w/ tr diss py			–					–				✓				–			–																			
390															✓																										
			Dozer												✓																										
400																																									

TD 405



HEWLETT-PACKARD 9270-1004

BOYLES-WELNAV

RENO, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY

FOR

LAC MINERALS USA INC.

WELL NAME: RL-161

JOB NUMBER: 029-0313-12CCGY

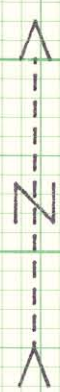
DATE: 11-14-90

INRUN SURVEY BY MINIMUM CURVATURE

HORIZONTAL DISPLACEMENT (* --- *) AT 400.0 FEET

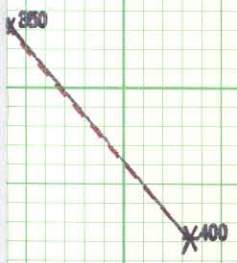
EQUALS 257.46 FEET AT S 40.48 E

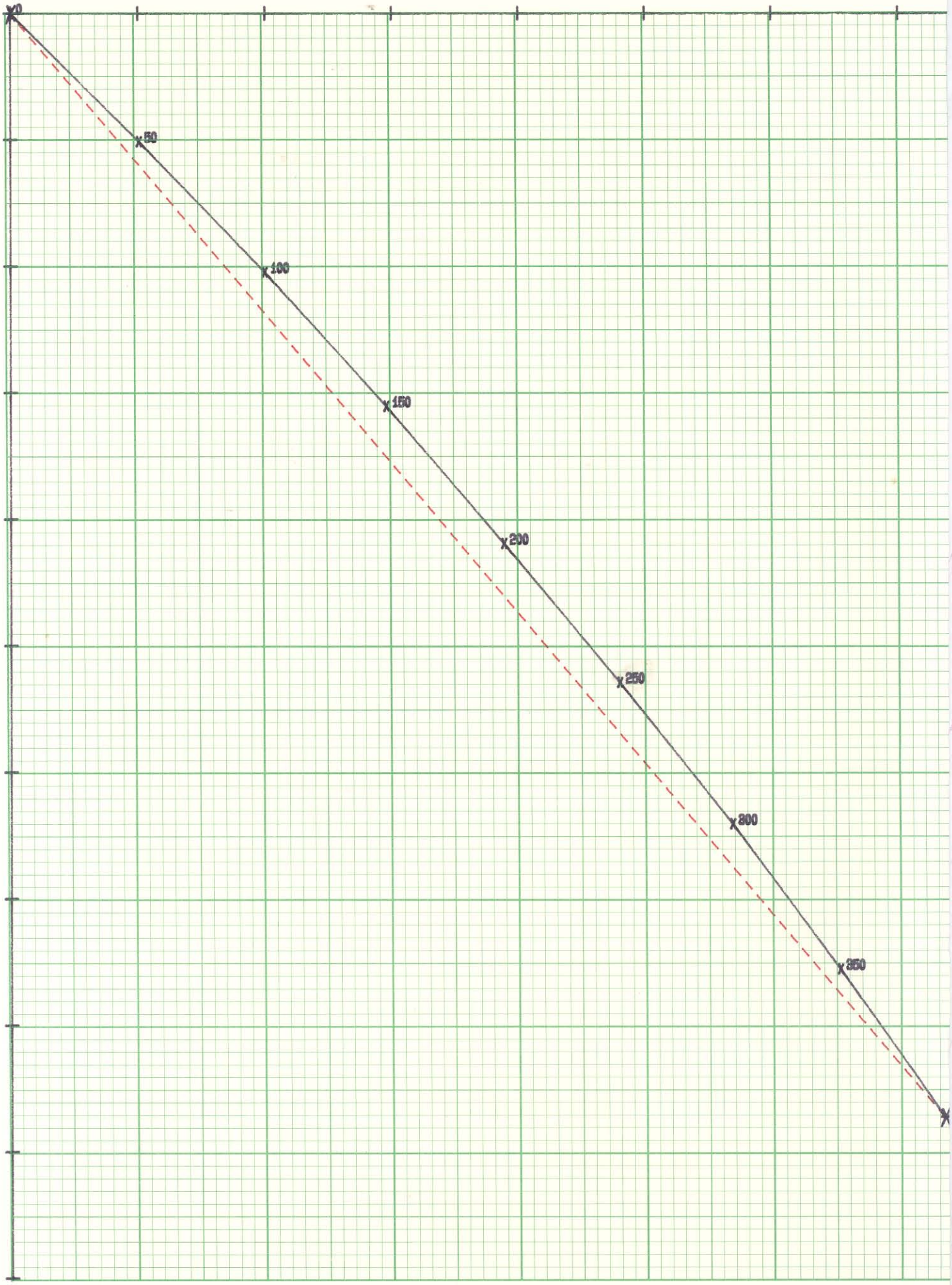
X DENOTES EVERY 1 STATION(S)



PLAN VIEW

SCALE = 20 FEET/INCH





HEWLETT-PACKARD 9270-1004

BOYLES-WELNAV

RENO, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY

FOR

LAC MINERALS USA INC.

WELL NAME: RL-161

JOB NUMBER: 029-0313-12CCGY

DATE: 11-14-90

INRUN SURVEY BY MINIMUM CURVATURE

VERTICAL PROJECTION (* --- *) AT 305.28 FEET

EQUALS 399.35 FEET AT 40.14

X DENOTES EVERY 1 STATION(S)

HORIZONTAL SCALE = 35 FEET/INCH

VERTICAL SCALE = 35 FEET/INCH

VERTICAL SECTION

PERPENDICULAR TO CLOSURE

400