60000520

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-414
AUTHOR	C. Ballew; R. Lisle, R. Vance; K. Allen; S. King; G. Langstaff; V. Reid; M. Jex; M. Pentz; J. Welch
DATE OF DOC(S)	1997-1998
MULTI_DIST Y / (N?) Additional Dist_Nos:	
QUAD_NAME	Sulphur 7.5'
P_M_C_NAME (mine, claim & company names)	Rosebud Mine; Newmont Gold Co; Hecla Mining Co.; Rosebud Mining Co Newmont Exploration, Ltd
COMMODITY If not obvious	gold; silver
NOTES	drill logs; geology; assay; geochemistry photographs; total depth 850'; invoices 125p

Keep docs at about 250 pages if no oversized maps attached
(for every 1 oversized page (>11x17) with text reduce
the amount of pages by ~25)

SS: DD 3/18/08
Initials Date

DB:
Initials Date

SCANNED:
Initials Date

Revised: 1/22/08

RS-414

60000520
4010

66000520

NEWMONT EXPLORATION LIMITED — DRILL HOLE SUMMARY

Project: Rosebud Location: Hecla's East Zone Drill Hole No.: RS-414

State: NV Co.: Pershing T.: R.: S.:

Purpose: Mine Geology Infill Results:

Date Started: 10/15/97 - 10/15/97 rc Date Finished: 11/17/97 - 11/20/97 core

Grid System: Northing: Easting: Elevation:

Collar Az/Inc.: / -90 Drill Site: Total Depth: 850

Geologist(s): Log Date(s): Laboratory:

HOLE CONSTRUCTION AND HISTORY CASING (INTERVAL):

From	To	Hole Type/Size	Started	Completed	Contractor
0	550	rc /			Eklund
550	850	core / HQ			Boart-Longyear
		/			
		/			

LITHOLOGIC SUMMARY				ALTERATION/ MINERALIZATION	SIGNIFICANT ASSAYS				
From	To	Formation	Rock Type		From	To	Width	Au oz/st	Cutoff

DOWNHOLE SURVEYS		
Directional		Date:
Other		
Depth (ft)	Azimuth	Inclination
850	31' @ 334°	-87.3
Water Table Depth:		
Water Flow Rate:		

COMMENTS

see Welnav Survey

Project: ROSEBUD JV	State: Nevada	Northing:	Inclination:	Total Depth:	Hole No. RS-414	Page 1 of 11
Log'd by: G. Langstaff Date: 10/29/97	County: Pershing	Easting:	Azimuth:	Elevation:	Core/Chips(Intervals): Chips 0-550'	

Depth (ft.)	GRAPHIC Rock	GRAPHIC Alt/Vn	ROCK Color	ROCK Rock Type	ROCK Grain Size	ROCK Structure (Sed.,Vol.)	PHENOS/LAPILLI/CLASTS %	PHENOS/LAPILLI/CLASTS Size	PHENOS/LAPILLI/CLASTS Shape	PHENOS/LAPILLI/CLASTS Color	PHENOS/LAPILLI/CLASTS Mineral/ Type	ALTERATION Int.	ALTERATION Distrib.	ALTERATION Type	ALTERATION Minerals	VEINS Thick.	VEINS Abund.	VEINS Selvedge	VEINS Minerals	INTERPRETATION Rock Name/ Composition	INTERPRETATION Formation	Comments	Recovery	Assay
5																				colluvium?		calcareous dirt to 20'		
10																								
15																								
20																								
25			10YR6/4 yellow brown	Volc	aph to fine	massive, breccia, & granular		only/less hard chips from above?				w w	patchy local dissem	lim arg	orange-tan FeOx white clay	<2mm <2mm	rare rare	? none	qtz hard white clay?		brecciated TcFG	clay and some reddish brown chips from above (?)		
30			10YR5/6 yellow orange+ 5Y8/1				<1	<1mm	irreg	green	?→chl?											several 5R2/2 (red-black and grey?) chips of aphanitic massive volc w/black specks chip of brown breccia w/white clasts <1mm		
35			pale yellow grey		vf-f	only rare breccia	<1 <1	2mm <1mm	irreg round	green green	?→chl? feld→chl?										TcFG	whiter, granular chips may have mod. argillic alteration and weak silicifi.		
40						generally massive, granular	<1	<1mm	round	green	feld→chl?													
45							<1	<1mm	specks	green	?→chl?													
50							<1 <1 <1	3mm <1mm <1mm	ang round irreg	white grey green	clast? feldspar? ?→chl?					<1mm	rare	?	qtz			less yellow, some chips with green tint		

Project: ROSEBUD JV	State: Nevada	Northing:	Inclination:	Total Depth:	Hole No. RS-414	Page 2 of 4
Log'd by: G. Langstaff Date: 10/30/97	County: Pershing	Easting:	Azimuth:	Elevation:	Core/Chips(Intervals): Chips 0-550'	

Depth (ft.)	GRAPHIC Rock	GRAPHIC Alt/Vn	ROCK Color	ROCK Rock Type	ROCK Grain Size	ROCK Structure (Sed.,Vol.)	PHENOS/LAPILLI/CLASTS %	Size	Shape	Color	Mineral/ Type	ALTERATION Int.	Distrib.	Type	Minerals	VEINS Thick.	Abund.	Selvedge	Minerals	INTERPRETATION Rock Name/ Composition	Formation	Comments	Recovery	Assay
55			5GY 7/1 pale grey + 10YR 6/6	Volc	vf	massive	<1	<1mm	irreg	green	hbl→chl?	W	dissem	arg	white clay	hair-line	rare	none	qtz		Tr Fg	some red chips, or staining brownish-black Fe/Mn ox on brown and yellow chips throughout		
							<1	1mm	long	green	hbl→chl?		possibly moderate alteration in white chips											
60			10YR 7/6 yellow-orange less				4	1mm	round	pale green	feld?													
							<1	1mm	long	pale green	hbl→?													
							<1	<1mm	oblong chunk	wht-grey	feld?													
							<1	.5mm	irreg	green	hbl→chl?													
65			5YR 3/6 brown				<1	.5mm	irreg	green	hbl→chl?											some white chips w/dissem. black specks (Mn ox?)		
							<1	1mm	long	pale green	hbl?													
70							<1	<1mm	irreg	green	hbl→chl?											rare red grains (hematitic?) chips w/ black specks		
							<1	2mm	oblong	pale green	?													
75			5Y 7/1 - less green				<1	<1mm	irreg	green	hbl→chl?					<2mm	rare	?	qtz± white clay					
80			more yellow than above			rare granular textures	<1	<1mm	irreg	green	hbl→chl?											black Fe/Mn ox even on white chips trace dissem pyrite cubes		
85							<1	<1mm	irreg	green	hbl→chl?													
90			back to				<1	1mm	oblong	green	hbl→chl?													
95			5G 6/1 greenish grey still with				<1	<2mm	oblong irreg	green	hbl→chl?											still some black Fe/Mox on brown and white chips trace pyrite local brown mottling on white & grn chips		
100			lots of yellow orange				<1	<1mm	irreg	green	hbl→chl?													

Project: ROSEBUD JV	State: Nevada	Northing:	Inclination:	Total Depth:	Hole No. RS-414	Page 3 of 11
Log'd by: G. Langstaff Date: 10/31/97	County: Pershing	Easting:	Azimuth:	Elevation:	Core/Chips(Intervals): Chips 0-550'	

Depth (ft.)	GRAPHIC Rock	GRAPHIC Alt/Vn	ROCK Color	ROCK Rock Type	ROCK Grain Size	ROCK Structure (Sed.,Vol.)	PHENOS/LAPILLI/CLASTS %	Size	Shape	Color	Mineral/ Type	ALTERATION Int.	Distrib.	Type	Minerals	VEINS Thick.	Abund.	Selvedge	Minerals	INTERPRETATION Rock Name/ Composition	Formation	Comments	Recovery	Assay
105			greenish grey & brown as ~~above~~	Vol.	vf	massive locally granular or	1? <1	<.5mm <1mm	round angular irreg.	vitr. grey green	qtz? hbl→chl?	w w	dissem dissem	arg py	white clay pyrite	<2mm	rare	?	qtz		TeFG	trace scattered pyrite rare chips w/strong arg alteration		
110			5G6/1 greenish grey			microporphy.	<1 1?	<1mm <.5m	chunks irreg. long irreg	green vitr. grey	hbl→chl? qtz/fell?					<4mm	pres	?	py ± qtz			rare yellow or brown chips below 110'		
115			5GY7/1 paler greenish grey				<1 <1	<.5mm <1mm	chunks irreg irreg chunky	vitr. grey green	qtz/fell? hbl→chl?											dark specks in some chips		36
120							<1	<.5mm	irreg	vitr. grey	qtz?		moderate argillic?											80
125						generally granular	<1	1mm	oblong	green	hbl→chl?											green chips and white chips of clay		70
130							<1 <1	<.5mm 2mm	irreg. irreg	vitr. grey green	qtz/fell? hbl→chl?													78
135			more darker				<1 <1	<1mm <.5mm	irreg irreg	green vitr. grey	hbl→chl? qtz/fell?					<1mm	rare	green or none?	white clay			chip of barite (?) from vein		70 88
140			5G 6/1 greenish grey chips				<1 <1	<1mm <.5mm	irreg chunks irreg	green vitr. grey	hbl→chl? qtz/fell?													36
145							<1 <1	<2mm <.5mm	long irreg irreg	green vitr. grey	hbl→chl? qtz/fell?													
150							<1 <1	2mm <1mm	long irreg	white green	amygd? hbl→chl?											more green grains than above, in both greener and paler chips		

Project: ROSEBUD JV	State: Nevada	Northing:	Inclination:	Total Depth:	Hole No. RS-414	Page 4 of 11
Log'd by: G. Langstaff Date: 10/31/97	County: Pershing	Easting:	Azimuth:	Elevation:	Core/Chips(Intervals): Chips 0-550'	

Depth (ft.)	GRAPHIC Rock	GRAPHIC Alt/Vn	ROCK Color	ROCK Rock Type	ROCK Grain Size	ROCK Structure (Sed.,Vol.)	PHENOS/LAPILLI/CLASTS %	Size	Shape	Color	Mineral/ Type	ALTERATION Int.	Distrib.	Type	Minerals	VEINS Thick.	Abund.	Selvedge	Minerals	INTERPRETATION Rock Name/ Composition	Formation	Comments	Recovery	Assay
155			5G8/1	Volc	vf	massive	<1	1mm	irreg round	green	hbl→chl?	m?	pervasive	arg	whiteclay	<3mm	rare	?	calcite		TcFG	samples weakly calcareous to 200'		
			pale			locally	<1	1mm	round	vitr.grey	qtz/feld?	W	dissem	py	pyrite	<4mm	pres	none	pyrite			metalliz mineral - massive (no distinct		
			greenish			granular	<1	1.5mm	long	white	amygd.?											grains) and <yellow than pyrite; likely		
			grey				<1	<.5mm	irreg	vitrgrey	qtz/feld?													
160																						slightly calcareous to 170'		
			5G4/6/1-	Volc	vf	massive	<1	<1mm	round specks	green	hbl→chl?	W	dissem	arg	white clay									
			5G4/5/1				<1	1mm	chunks	white	feld?													
165			greenish grey																					
170							<1	1mm	irreg	pale green	feld→chl?											rare, scattered chunks of pyrite		
							<1	1mm	round	green	hbl→ch?													
							<1	<.3mm	specks	green	?													
175			10R4/2-	Volc	aph	massive	~1?	<.3mm	needles specks	red-black	hbl?										unaltered TcFG (hbl only)	weakly calcareous		
			10R3/2				<1	1.5mm	long?	grey-white	amygd?													
			red with a little grey																					
180			5RP5/2-																			slightly calcareous to 185'		
			5RP4/2																					
			mottled																					
			red & gray																					
185			which																					
			looks																					
			purple;																					
			varies																					
190			with more													3mm	rare	Fox	cat py			weakly calcareous to 200'		
			and less																					
			red																					
195																								
200																								

Project: ROSEBUD JV	State: Nevada	Northing:	Inclination:	Total Depth:	Hole No. RS-414	Page 5 of 11
Log'd by: G. Langstaff Date: 10/31/97	County: Pershing	Easting:	Azimuth:	Elevation:	Core/Chips(Intervals): Chips 0-550'	

Depth (ft.)	GRAPHIC Rock	GRAPHIC Alt/Vn	ROCK Color	ROCK Rock Type	ROCK Grain Size	ROCK Structure (Sed.,Vol.)	PHENOS/LAPILLI/CLASTS %	PHENOS/LAPILLI/CLASTS Size	PHENOS/LAPILLI/CLASTS Shape	PHENOS/LAPILLI/CLASTS Color	PHENOS/LAPILLI/CLASTS Mineral/ Type	ALTERATION Int.	ALTERATION Distrib.	ALTERATION Type	ALTERATION Minerals	VEINS Thick.	VEINS Abund.	VEINS Selvedge	VEINS Minerals	INTERPRETATION Rock Name/ Composition	INTERPRETATION Formation	Comments	Recovery	Assay
205			5RP5/2 purple look but	Volc	aph	massive	1-2 <1	<.3mm 2mm	needles specks irreg	black vitr.grey	hbl? ca amygd?										unaltered TcFG (hbl only)	Samples weakly calcareous to 240'		
210			actually mottled red & grey																					
215																								
220																1mm	rare	none	calcite					
225			5Y6/1-5GY6/1 olivegrey	Volc	vf	massive	<1	<.5mm	irreg	green	hbl->chl?	W	dissem	arg	whiteclay	<2mm	rare	none	pyrite		TcFG	trace widely dissem pyrite chips slightly pink locally		
230			to pale grey				<1	<1mm	long irreg	green	hbl->chl?													
235							<1	<1mm	round long	red	?											white clay chip		
240												W	dissem	py	pyrite	<3mm	rare	none	py+qtz					<.5
245			some darker grey blue to qtz	Bx Volc?	vfaph vf	matrix supported breccia massive	? <1	<5mm <1mm	ang-round irreg round	white green	wall rock clast hbl->chl?	m W	pervasive dissem	sil py	massive qtz pyrite	<5mm	com.	silic.	qtz+py ± white clay		fault? breccia TcFG	possibly some chalcopyrite (yellower) bladed pyrite in silicified breccia		28
250			10YR4/2 5Y6/1 brown to dive grey			granular	<1	1mm	long	white	amyg	W W W	pervasive dissem dissem	sil arg py	massqtz whiteclay pyrite										24

Project: ROSEBUD JV	State: Nevada	Northing:	Inclination:	Total Depth:	Hole No. RS-414	Page 6 of 11
Log'd by: G. Longstaff Date: 10/31/97	County: Pershing	Easting:	Azimuth:	Elevation:	Core/Chips(Intervals): Chips 0-550'	

Depth (ft.)	GRAPHIC Rock	GRAPHIC Alt/Vn	ROCK Color	ROCK Rock Type	ROCK Grain Size	ROCK Structure (Sed.,Vol.)	PHENOS/LAPILLI/CLASTS %	PHENOS/LAPILLI/CLASTS Size	PHENOS/LAPILLI/CLASTS Shape	PHENOS/LAPILLI/CLASTS Color	PHENOS/LAPILLI/CLASTS Mineral/ Type	ALTERATION Int.	ALTERATION Distrib.	ALTERATION Type	ALTERATION Minerals	VEINS Thick.	VEINS Abund.	VEINS Selvedge	VEINS Minerals	INTERPRETATION Rock Name/ Composition	INTERPRETATION Formation	Comments	Recovery	Assay
255	Δ?	X □ – X – X □ X	N6-N7 grey	Volc	vf	massive granular	<1	<1mm	round long	green	hbl→chl?	m w-m	pervasive dissem	sil arg	mass.qtz whiteclay	<1cm	com	none	py±qtz		TcFG	minor brown-stained veins are rare chips of silica breccia a lot of yellow pyrite		72
260	A	X □ – X – X □ X –	10R6/4-	Volc	vf	breccia?	<1	<.5mm	round	green	hbl→chl?	m	patchy	sil	mass.qtz						TcLLT	contact, if there is one, may be		34
265	Δ?	X □ X – X – X □ X	10R5/4 reddish brown with various			locally granular (due to silicif.?)	<1	<1mm	chunky round	green	hbl→chl?	w-m [w	dissem dissem	arg py	whiteclay pyrite]		weakly calcareous					obscured by varying degrees alteration brown may be breccia matrix/vein as elsewhere but clasts within chips necessarily <5mm and ang-subround		6
270	Δ?	X – X □ X – X	proportions 5GY 8/1- N6 greenish				<1 <1	3mm 1mm	long prism	green green	hbl→chl? hbl→chl?											mire white clay adheres to sample		<5
275	Δ?	X – X □ X – X	grey to grey				<1	1mm	prism	green	hbl→chl?													14
280	Δ?	X – X □ X – X □ X														<1cm	pres	none	qtz+py			bleded py/more in qtz		86
285	Δ?	X – X □ X – X □ X																				some vf drusy qtz		62
290	Δ?	X □ – X – X □ X					<1	<1mm	oblong	green	hbl→chl?													48
295	Δ?	X □ – X – X □ X	more paler grey below				<1	1mm	long	green	hbl→chl?											rare dissem pyrite		24
300	Δ?	X – X □ X	290'				<1	<1mm	oblong round	green	hbl→chl?	w w-m	patchy dissem	sil arg	mass.qtz whiteclay							slightly calcareous		18

Project: ROSEBUD JV	State: Nevada	Northing:	Inclination:	Total Depth:	Hole No. RS-414	Page 7 of 11
Log'd by: G. Langstaff Date: 10/31/97	County: Pershing	Easting:	Azimuth:	Elevation:	Core/Chips(Intervals): Chips 0-550'	

Depth (ft.)	GRAPHIC Rock	GRAPHIC Alt/Vn	ROCK Color	ROCK Rock Type	ROCK Grain Size	ROCK Structure (Sed.,Vol.)	PHENOS/LAPILLI/CLASTS %	Size	Shape	Color	Mineral/ Type	ALTERATION Int.	Distrib.	Type	Minerals	VEINS Thick.	Abund.	Selvedge	Minerals	INTERPRETATION Rock Name/ Composition	Formation	Comments	Recovery	Assay
305	Δ?	□	N8 pale grey & 10YR6/2-10YR5/2	Volc	vf	breccia or massive granular	<1	1.5mm	prism	green	hbl->chl?	W	dissem	arg	white clay	<3mm	pres	none	pyrite±qtz		JLLLJ	pyrite commonly in core of qtz vein rare disseminated pyrite samples to 325' only slightly calcareous rare white clay chips		150
							<1	<1mm	irreg	green	hbl->chl?					<2mm	rare	?	calcite					
310	Δ	□	brown				<1	<1mm	irreg	green	hbl->chl?											at least 1 chip with breccia texture but matrix quartz and not brown		12 16
315	Δ Δ	□	more pale brown chips				<1	1mm	prism	pale green	hbl->chl?											definite breccia textures - matrix supported with white irreg/ang/sub-round clasts in siliceous grey to brown matrix		
320	Δ	□	generally paler				<1	<1mm	irreg	green	hbl->chl?											rare dissem pyrite		
							<1	2mm	prism	green	hbl->chl?													
325	Δ	□					<1	<1mm	irreg	green	hbl->chl?													
330	Δ Δ						<1	<1mm	oblong irreg	green	hbl->chl?											trace pyrite weakly calcareous to 350' hair-line qtz veins		
335	Δ Δ						<1	1.5mm	chunk	green	hbl->chl?											trace dissem. pyrite		
340	Δ						<1	<1mm	round	vitr grey	qtz/feld?											trace dissem pyrite		
345	Δ Δ						<1	1mm	chunk	green	hbl->chl?					<2mm	rare	?	calcite			hair-line qtz vein in clay pyrite chip from above (?)		
							<1	<1mm	round	grey	qtz/feld?													
350	Δ Δ						<1	1mm	chunk	green	hbl->chl?													

Project: ROSEBUD JV	State: Nevada	Northing:	Inclination:	Total Depth:	Hole No. RS-414	Page 8 of 11
Log'd by: G. Langstaff Date: 10/31/97	County: Pershing	Easting:	Azimuth:	Elevation:	Core/Chips(Intervals): Chips 0-550'	

Depth (ft.)	GRAPHIC Rock	GRAPHIC Alt/Vn	ROCK Color	ROCK Rock Type	ROCK Grain Size	ROCK Structure (Sed.,Vol.)	PHENOS/LAPILLI/CLASTS %	PHENOS/LAPILLI/CLASTS Size	PHENOS/LAPILLI/CLASTS Shape	PHENOS/LAPILLI/CLASTS Color	PHENOS/LAPILLI/CLASTS Mineral/ Type	ALTERATION Int.	ALTERATION Distrib.	ALTERATION Type	ALTERATION Minerals	VEINS Thick.	VEINS Abund.	VEINS Selvedge	VEINS Minerals	INTERPRETATION Rock Name/ Composition	INTERPRETATION Formation	Comments	Recovery	Assay
355	Δ Δ Δ		5GY6/1-5GY5/1 pale grey 10.5YR5/2	Volc	vf	breccia monomict	<1	<1mm	irreg	green	hbl→chl?	w	dissem	arg	whiteclay						TcLLT	trace dissem pyrite weakly calcareous to 400'		
360	Δ Δ		5YR4/2 brown				<1	<1mm	oblong irreg	green	hbl→chl?											trace pyrite		
365	Δ Δ Δ	□					<1	1mm	oblong	green	hbl→chl?					<2mm	rare	none	pyrqtz			calcite chip (vein?)		
370	Δ Δ Δ	— □ —					<1	<1mm	prism irreg	green	hbl→chl?	m	patchy	arg	whiteclay							lumps of white clay commonly have sparse embedded green grains		
375	Δ Δ Δ	— □ —					<1	<1mm	round irreg	green	hbl→chl?													
380	Δ Δ Δ	— — —	more brown chips				<1	<1mm	oblong irreg	green	hbl→chl?											trace pyrite		
385	Δ Δ Δ	— — —					<1	<1mm	round irreg	green	hbl→chl?													
390	Δ Δ	— — —					<1 <1	1.5mm <1mm	irreg prism	green pale green	hbl→chl? hbl→chl?											trace pyrite		
395	Δ Δ	□					<1 <1	1.5mm <1mm	tabular chunk irreg	black green	hbl? hbl→chl?	w	dissem	arg	whiteclay	<2mm	rare	?	pyrqtz			rare aphanitic chips		
400	Δ Δ	□					<1	<1mm	needle irreg	green	hbl→chl?											some aphanitic chips with pyrite and green grains		

Project: ROSEBUD JV	State: Nevada	Northing:	Inclination:	Total Depth:	Hole No. RS-414	Page 9 of 11
Log'd by: G. Langstaff Date: 11/1/97	County: Pershing	Easting:	Azimuth:	Elevation:	Core/Chips(Intervals): Chips 0-550'	

Depth (ft.)	GRAPHIC Rock	GRAPHIC Alt/Vn	ROCK Color	ROCK Rock Type	ROCK Grain Size	ROCK Structure (Sed.,Vol.)	PHENOS/LAPILLI/CLASTS %	Size	Shape	Color	Mineral/ Type	ALTERATION Int.	Distrib.	Type	Minerals	VEINS Thick.	Abund.	Selvedge	Minerals	INTERPRETATION Rock Name/ Composition	Formation	Comments	Recovery	Assay
405	Δ Δ	□	generally 5Y6/1 olive grey with some	Volc	vf some aph chips	mostly breccia, some aph massive	<1	<2mm	long irreg	green	hbl→chl?	W	dissem	arg	white clay	<3mm <2mm	pres rare	none ?	qtz+py calcite		TeLLT	weakly calcareous to 495' and more so at 495-450' trace dissem. pyrite		
410	Δ Δ Δ	□	browner (10R4/2-5YR5/1) chips & "veins"			some vf granular (i.e. poly-mict breccia)	<1 <1	1mm <1mm	chunk prism chunk irreg	pale grey green	feld? hbl→chl?					<1mm	rare	?	pale green clay			many breccia chips with paler ang-subround clasts in greysiliceous or pink matrix trace dissem pyrite		
415	Δ Δ						<1	<2mm	irreg, long chunk	green	hbl→chl?											green things in breccia matrix as well as "clasts" trace dissem py		
420	Δ Δ Δ	□					<1	<3mm	long irreg	green	hbl→chl?	W	dissem	py	pyrite	<3mm	pres	none	py±qtz			more green things than usual		
425	Δ Δ Δ	□					<1	<2mm	irreg	green	hbl→chl?													
430	Δ Δ Δ	□					<1	<3mm	irreg	green	hbl→chl?											chip with white clay, py, green things lots more vein qtz than above		
435	Δ Δ	— □ —	[greener w/white clay]				<1	<3mm	irreg	green	hbl→chl?	m	patchy	arg	white clay							w dissem py in pink aph clasts		
440	Δ Δ	— □ —					<1	<2mm	long irreg	green	hbl→chl?	W	dissem	py	pyrite									
445	Δ Δ Δ	□					<1	<3mm	needles irreg	green	hbl→chl?	W W	dissem dissem	arg py	white clay pyrite							green needles in white clay and qtz+py		
450	Δ Δ Δ	□					<1	<2mm	chunk irreg	green	hbl→chl?													

Project: ROSEBUD JV	State: Nevada	Northing:	Inclination:	Total Depth:	Hole No. RS-414	Page 10 of 11
Log'd by: G. Langstaff Date: 11/1/97	County: Pershing	Easting:	Azimuth:	Elevation:	Core/Chips(Intervals): Chips 0-550'	

Depth (ft.)	GRAPHIC Rock	GRAPHIC Alt/Vn	ROCK Color	ROCK Rock Type	ROCK Grain Size	ROCK Structure (Sed.,Vol.)	PHENOS/LAPILLI/CLASTS %	Size	Shape	Color	Mineral/ Type	ALTERATION Int.	Distrib.	Type	Minerals	VEINS Thick.	Abund.	Selvedge	Minerals	INTERPRETATION Rock Name/ Composition	Formation	Comments	Recovery	Assay
455	Δ Δ Δ Δ	□	5YR7/2 to 5R4/2 verious shades of	Volc	vf-aph	mostly breccia	<1	<2mm	irreg	green	hbl→chl?	W	patchy mostly in clasts	arg	whiteclay	<2mm	pres	none	py±qtz		TcLLT	still polymict breccia with clasts of massive aphanitic volc, white altered volc. and massive granular volc. weakly calcareous to 460'		8
460	Δ Δ Δ Δ	□	grey to brown in and between chips				<1	<2mm	long irreg	green	hbl→chl?	W	dissem (commonly prismatic)	py	pyrite									176
465	Δ Δ Δ Δ	□					<1	<3mm	long irreg	green	hbl→chl?													102
470	Δ Δ Δ Δ	□					<1	<1mm	irreg	green	hbl→chl?											greenish black radiating needles up to 1mm long in vesicles (?) qtz		36
475	Δ Δ Δ Δ	□					<1	<2mm	long irreg	green	hbl→chl?													
480	Δ Δ Δ	□	[greener than above and below]				<1	<2mm	long irreg	green	hbl→chl?													
485	Δ Δ Δ Δ	□					<1	<2mm	tabular irreg	green	hbl→chl?											pocket of intercrystalline magnetite in breccia matrix at one chip		
490	Δ Δ Δ Δ	□					<1	<1mm	irreg	green	hbl→chl?											bladed py/marc in qtz matrix/vein		
495	Δ Δ Δ Δ	□																						
500	Δ Δ Δ Δ	□					<1	<1mm	chunk	green	hbl→chl?													

Project: ROSEBUD JV	State: Nevada	Northing:	Inclination:	Total Depth:	Hole No. RS-414	Page 11 of 11
Log'd by: G. Langstaff Date: 11/1/97	County: Pershing	Easting:	Azimuth:	Elevation:	Core/Chips(Intervals): Chips 0-550'	

Depth (ft.)	GRAPHIC Rock	GRAPHIC Alt/Vn	ROCK Color	ROCK Rock Type	ROCK Grain Size	ROCK Structure (Sed.,Vol.)	PHENOS/LAPILLI/CLASTS %	Size	Shape	Color	Mineral/ Type	ALTERATION Int.	Distrib.	Type	Minerals	VEINS Thick.	Abund.	Selvedge	Minerals	INTERPRETATION Rock Name/ Composition	Formation	Comments	Recovery	Assay
505	△	x □ x?	5YR 8/1 10R 6/2 pale gray to pale	Volc	vf	mostly granular, some breccia chips						w w u	dissem dissem patchy	arg py sil?	white clay py cubes qtz	<3mm	pres	none	py ± qtz		TcLLT	bladed py/marc in vein qtz		16
	△	□	reddish brown			more breccia																laminated gray qtz vein frag(?) with microcrystalline pyrite specks		
510	△	□		Volc	vf to aph	mostly massive, but some monomict breccia in upper part		pinkish chips could be with pink porphyry	aphyric, aphanitic	contact		w tr	dissem dissem	arg py	white clay py cubes						brecciated aphyric	this appears to be new, homogeneous, aphyric unit with local brecciation		42
515	△	□																			TcMpp	this unit could be weakly silicified if some qtz chips are replacement rather than vein		164
520	△	□																						180
525	△	□					<1	1-2mm	rect long	white	feldspar					<4mm	pres	none	qtz ± py					72
530	△	□																						74
535	△	□																						54
540	△	□	more N7-N8 pale gray qtz																					132
545		□																						96
550		□																				bladed py/marc in vein qtz		94

xAMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP046863

American Assay Laboratories

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

NEWMONT GOLD COMPANY

COPIES TO : RANDY VANCE

: KURT ALLEN

:

:

CLIENT REFERENCE No: RS-414 RECEIVED : 21 OCT 1997

No. SAMPLES : 113 REPORTED : 6 NOV 1997

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	FA30	15%	ppb	5
Au(R)	FA30	15%	ppb	5
Au(OZ)	FA30	15%	OPT	0.001
Au(RZ)	FA30	15%	OPT	0.001
Ag	D210	10%	ppm	0.5
Ag(OZ)	D210	10%	OPT	0.02

SIGNATORY : Susan King M.S.

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP046863

American Assay Laboratories

CLIENT : NEWMONT GOLD COMPANY
PROJECT : ROSEBUD
REFERENCE : RS-414

REPORTED : 6 NOV 1997

SAMPLES	Au FA30 ppb	Au(R) FA30 ppb	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	Ag D210 ppm	Ag(OZ) D210 OPT
RS-414 00-05	<5		<0.001		<0.5	<0.02
RS-414 05-10	<5		<0.001		<0.5	<0.02
RS-414 10-15	<5		<0.001		<0.5	<0.02
RS-414 15-20	10		<0.001		<0.5	<0.02
RS-414 20-25	18		<0.001		<0.5	<0.02
RS-414 25-30	17		<0.001		<0.5	<0.02
RS-414 30-35	15		<0.001		<0.5	<0.02
RS-414 35-40	17		<0.001		<0.5	<0.02
RS-414 40-45	29		<0.001		<0.5	<0.02
RS-414 45-50	21		<0.001		<0.5	<0.02
RS-414 50-55	50		0.001		0.9	0.03
RS-414 55-60	44		0.001		<0.5	<0.02
RS-414 60-65	36		0.001		<0.5	<0.02
RS-414 65-70	42		0.001		<0.5	<0.02
RS-414 70-75	28		<0.001		<0.5	<0.02
RS-414 75-80A	14		<0.001		1.3	0.04
RS-414 75-80B	140		0.004		<0.5	<0.02
RS-414 80-85	12		<0.001		0.7	0.02
RS-414 85-90	8		<0.001		<0.5	<0.02
RS-414 90-95	<5		<0.001		0.8	0.02
RS-414 95-100	<5		<0.001		<0.5	<0.02
RS-414 100-105	<5		<0.001		<0.5	<0.02
RS-414 105-110	<5		<0.001		<0.5	<0.02
RS-414 110-115	36		0.001		<0.5	<0.02
RS-414 115-120	80		0.002		<0.5	<0.02

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP046863

American Assay Laboratories

CLIENT : NEWMONT GOLD COMPANY
PROJECT : ROSEBUD
REFERENCE : RS-414

REPORTED : 6 NOV 1997

SAMPLES	Au FA30 ppb	Au(R) FA30 ppb	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	Ag D210 ppm	Ag(OZ) D210 OPT
RS-414 120-125	70		0.002		1.8	0.05
RS-414 125-130	78		0.002		2.3	0.07
RS-414 130-135	88	70	0.003	0.002	2.1	0.06
RS-414 135-140	36		0.001		1.7	0.05
RS-414 140-145	12		<0.001		1.0	0.03
RS-414 145-150	12		<0.001		0.6	<0.02
RS-414 150-155	36		0.001		0.6	<0.02
RS-414 155-160	<5		<0.001		<0.5	<0.02
RS-414 160-165	<5		<0.001		<0.5	<0.02
RS-414 165-170	<5		<0.001		<0.5	<0.02
RS-414 170-175	<5		<0.001		<0.5	<0.02
RS-414 175-180	<5		<0.001		<0.5	<0.02
RS-414 180-185	<5		<0.001		0.8	0.02
RS-414 185-190	<5		<0.001		<0.5	<0.02
RS-414 190-195	<5		<0.001		<0.5	<0.02
RS-414 195-200	<5	<5	<0.001	<0.001	<0.5	<0.02
RS-414 200-205A	<5		<0.001		<0.5	<0.02
RS-414 200-205B	1046		0.031		<0.5	<0.02
RS-414 205-210	<5		<0.001		<0.5	<0.02
RS-414 210-215	<5		<0.001		<0.5	<0.02
RS-414 215-220	<5		<0.001		<0.5	<0.02
RS-414 220-225	<5	<5	<0.001	<0.001	<0.5	<0.02
RS-414 225-230	<5		<0.001		<0.5	<0.02
RS-414 230-235	<5		<0.001		<0.5	<0.02
RS-414 235-240	<5		<0.001		<0.5	<0.02

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP046863

American Assay Laboratories

CLIENT : NEWMONT GOLD COMPANY
PROJECT : ROSEBUD
REFERENCE : RS-414

REPORTED : 6 NOV 1997

SAMPLES	Au FA30 ppb	Au(R) FA30 ppb	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	Ag D210 ppm	Ag(OZ) D210 OPT
RS-414 240-245	28		<0.001		1.6	0.05
RS-414 245-250	24		<0.001		1.7	0.05
RS-414 250-255	72		0.002		2.6	0.08
RS-414 255-260	34		<0.001		1.6	0.05
RS-414 260-265	6		<0.001		0.7	0.02
RS-414 265-270	<5		<0.001		0.7	0.02
RS-414 270-275	14		<0.001		1.1	0.03
RS-414 275-280	86		0.003		3.7	0.11
RS-414 280-285	62		0.002		3.7	0.11
RS-414 285-290	48		0.001		2.8	0.08
RS-414 290-295	24		<0.001		1.8	0.05
RS-414 295-300	18		<0.001		1.0	0.03
RS-414 300-305	150		0.004		3.3	0.10
RS-414 305-310	16	12	<0.001	<0.001	1.6	0.05
RS-414 310-315	8		<0.001		1.0	0.03
RS-414 315-320	56		0.002		1.8	0.05
RS-414 320-325	<5		<0.001		0.8	0.02
RS-414 325-330	<5		<0.001		<0.5	<0.02
RS-414 330-335	<5		<0.001		<0.5	<0.02
RS-414 335-340	<5		<0.001		<0.5	<0.02
RS-414 340-345	<5		<0.001		<0.5	<0.02
RS-414 345-350	<5		<0.001		<0.5	<0.02
RS-414 350-355	<5		<0.001		0.6	<0.02
RS-414 355-360	<5		<0.001		<0.5	<0.02
RS-414 360-365	<5		<0.001		0.8	0.02

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP046863

American Assay Laboratories

CLIENT : NEWMONT GOLD COMPANY
PROJECT : ROSEBUD
REFERENCE : RS-414

REPORTED : 6 NOV 1997

SAMPLES	Au FA30 ppb	Au(R) FA30 ppb	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	Ag D210 ppm	Ag(OZ) D210 OPT
RS-414 365-370	<5	<5	<0.001	<0.001	<0.5	<0.02
RS-414 370-375	<5		<0.001		<0.5	<0.02
RS-414 375-380	<5		<0.001		<0.5	<0.02
RS-414 380-385	<5		<0.001		<0.5	<0.02
RS-414 385-390	<5		<0.001		<0.5	<0.02
RS-414 390-395	<5		<0.001		<0.5	<0.02
RS-414 395-400	<5		<0.001		<0.5	<0.02
RS-414 400-405	<5	<5	<0.001	<0.001	<0.5	<0.02
RS-414 405-410	<5		<0.001		<0.5	<0.02
RS-414 410-415	<5		<0.001		<0.5	<0.02
RS-414 415-420	<5		<0.001		0.8	0.02
RS-414 420-425	18		<0.001		1.7	0.05
RS-414 425-430	82		0.002		2.5	0.07
RS-414 430-435	84		0.002		2.4	0.07
RS-414 435-440	36		0.001		1.1	0.03
RS-414 440-445	<5		<0.001		<0.5	<0.02
RS-414 445-450	36		0.001		1.2	0.04
RS-414 450-455	8		<0.001		1.7	0.05
RS-414 455-460	176		0.005		85.5	2.49
RS-414 460-465	102		0.003		7.0	0.20
RS-414 465-470	36		0.001		3.2	0.09
RS-414 470-475	54		0.002		2.8	0.08
RS-414 475-480	40		0.001		1.9	0.06
RS-414 480-485	40		0.001		1.8	0.05
RS-414 485-490	54		0.002		3.1	0.09

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP046863

American Assay Laboratories

CLIENT : NEWMONT GOLD COMPANY
PROJECT : ROSEBUD
REFERENCE : RS-414

REPORTED : 6 NOV 1997

SAMPLES	Au FA30 ppb	Au(R) FA30 ppb	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	Ag D210 ppm	Ag(OZ) D210 OPT
RS-414 490-495	48		0.001		2.3	0.07
RS-414 495-500	26		<0.001		0.9	0.03
RS-414 500-505	16		<0.001		1.0	0.03
RS-414 505-510A	42		0.001		1.5	0.04
RS-414 505-510B	148		0.004		0.6	<0.02
RS-414 510-515	164		0.005		2.4	0.07
RS-414 515-520	180		0.005		3.0	0.09
RS-414 520-525	72		0.002		3.3	0.10
RS-414 525-530	74		0.002		3.5	0.10
RS-414 530-535	54		0.002		1.9	0.06
RS-414 535-540	132		0.004		2.7	0.08
RS-414 540-545	96		0.003		2.8	0.08
RS-414 545-550	94		0.003		2.4	0.07

SP

SUBMITTAL FORM

American Assay Laboratories

Geochemical • Environmental • Metallurgical

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Telephone/Fax
011-52-69-170035

Other Offices
Lima, Peru
Santiago, Chile
Mendoza, Argentina

Company: Newmont Exploration - Rosebud Mine

Address: P.O. Box 2610

City Winnemucca State NV Zip 89446

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

Project Name: Rosebud Exploration Purchase Order Number:

Date Submitted: 10/20/97 Number of Samples: 113

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

SAMPLE IDENTIFICATION	TYPE	ELEMENTS REQUIRED
RS-414	RC	Au/Ag FA/AA each sample (5')
0-550' T.D. (110 samples)		
+80B, 205B, 510B		
80B MS-2 MS-2		
205B MS-3 MS-3		
510B MS-2 MS-2		

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:

Bob Kastelic / Randy Vance
Rosebud Mine

Results to:

Rick Lisle - Newmont Exploration
Winnemucca
Randy Vance } Rosebud Mine
Kurt Allen

Comments:

CLIENT FILE COPY

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

****
* NEWMONT EXPLORATION LTD. *
****

JOB NUMBER: 29-0521-311

WELL NAME: RS-414

LOCATION: ROSEBUD MINE

SURVEY DATE: 11/20/97

SURVEY ENGINEER: VERN REID

GYRO REFERENCE BEARING: 270.00

WELNAV

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

COMMENTS: ** BOART LONGYEAR **
***** MIKE JEX *****
**** MIKE PENTZ ****
PROJECTED F/826' T/850'.

****
****
*** 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: 29-0521-311 WELL NAME: RS-414

INRUN SURVEY
BY MINIMUM CURVATURE

MEAS. DEPTH	VERT. DEPTH	VERT. SECT.	L/R CLOS.	INCL HORZ	BEARING AZIMUTH	COORDINATES LATITUDE	COORDINATES DEPARTURE	D-LEG /100	D-LEG /CL	STATION DISP.	DISPLACEMENT DIRECTION	TEMP. DEG. F.
50.0	50.00	0.23	-0.019	-89.46	329.73	0.20 N	0.12 W	1.08	0.54	0.24	AT 329.73	053.78
100.0	100.00	0.69	-0.026	-89.50	337.73	0.61 N	0.32 W	0.17	0.08	0.69	AT 332.26	054.00
150.0	149.99	1.34	0.193	-88.89	359.52	1.30 N	0.41 W	1.34	0.67	1.36	AT 342.56	054.14
200.0	199.98	2.41	0.341	-88.56	329.18	2.32 N	0.73 W	1.48	0.74	2.43	AT 342.46	054.35
250.0	249.96	3.77	0.136	-88.28	323.07	3.46 N	1.51 W	0.65	0.33	3.77	AT 336.47	054.21
300.0	299.94	5.36	0.093	-88.03	341.38	4.87 N	2.23 W	1.27	0.64	5.36	AT 335.40	054.28
350.0	349.90	7.28	0.212	-87.56	335.15	6.65 N	2.95 W	1.05	0.53	7.28	AT 336.07	054.07
400.0	399.84	9.64	0.356	-87.01	340.13	8.85 N	3.84 W	1.20	0.60	9.64	AT 336.52	050.55
450.0	449.78	12.20	0.552	-87.09	337.37	11.24 N	4.77 W	0.33	0.16	12.21	AT 336.99	050.84
500.0	499.71	14.77	0.617	-87.01	334.38	13.59 N	5.83 W	0.35	0.17	14.79	AT 336.79	051.13
550.0	549.65	17.29	0.662	-87.22	336.52	15.88 N	6.87 W	0.47	0.24	17.30	AT 336.59	052.35
600.0	599.60	19.55	0.657	-87.59	331.70	17.92 N	7.86 W	0.86	0.43	19.56	AT 336.32	053.92
650.0	649.55	21.73	0.481	-87.39	328.02	19.81 N	8.96 W	0.51	0.26	21.74	AT 335.67	054.71
700.0	699.49	24.09	0.388	-87.18	335.95	21.90 N	10.06 W	0.86	0.43	24.10	AT 335.32	057.37
750.0	749.43	26.48	0.285	-87.33	327.70	24.00 N	11.18 W	0.84	0.42	26.48	AT 335.02	058.88
800.0	799.38	28.71	0.094	-87.53	331.48	25.93 N	12.32 W	0.52	0.26	28.71	AT 334.59	059.60
826.0	825.36	29.90	0.041	-87.24	332.10	26.98 N	12.88 W	1.12	0.29	29.90	AT 334.48	060.10
850.0	849.33	31.04	0.001	-87.28	332.78	28.00 N	13.41 W	0.22	0.05	31.04	AT 334.40	060.17

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*************************************************************
*                          ********                         *
*      THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF          *
*                          ********                         *
*   850.0 FEET EQUALS    31.04   FEET AT  334.40             *
*                          ********                         *
*************************************************************
```

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

****
* NEWMONT EXPLORATION LTD. *
****

JOB NUMBER: 29-0521-311

WELL NAME: RS-414 / VS 305.00

LOCATION: ROSEBUD MINE

SURVEY DATE: 11/20/97

SURVEY ENGINEER: VERN REID

GYRO REFERENCE BEARING: 270.00

VERTICAL SECTION CALCULATED IN A
PROPOSAL DIRECTION OF: 035.00

WELNAV

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

COMMENTS: ** BOART LONGYEAR **
***** MIKE JEX *****
**** MIKE PENTZ ****
PROJECTED F/826' T/850'.

****
****
*** 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: 29-0521-311 WELL NAME: RS-414 / 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	0.10	-0.214	-89.46	329.73	0.20 N	0.12 W	1.08	0.54	0.24	AT 329.73	053.78
100.0	100.00	0.32	-0.612	-89.50	337.73	0.61 N	0.32 W	0.17	0.08	0.69	AT 332.26	054.00
150.0	149.99	0.83	-1.076	-88.89	359.52	1.30 N	0.41 W	1.34	0.67	1.36	AT 342.56	054.14
200.0	199.98	1.48	-1.930	-88.56	329.18	2.32 N	0.73 W	1.48	0.74	2.43	AT 342.46	054.35
250.0	249.96	1.97	-3.217	-88.28	323.07	3.46 N	1.51 W	0.65	0.33	3.77	AT 336.47	054.21
300.0	299.94	2.71	-4.622	-88.03	341.38	4.87 N	2.23 W	1.27	0.64	5.36	AT 335.40	054.28
350.0	349.90	3.76	-6.234	-87.56	335.15	6.65 N	2.95 W	1.05	0.53	7.28	AT 336.07	054.07
400.0	399.84	5.04	-8.221	-87.01	340.13	8.85 N	3.84 W	1.20	0.60	9.64	AT 336.52	050.55
450.0	449.78	6.47	-10.360	-87.09	337.37	11.24 N	4.77 W	0.33	0.16	12.21	AT 336.99	050.84
500.0	499.71	7.79	-12.568	-87.01	334.38	13.59 N	5.83 W	0.35	0.17	14.79	AT 336.79	051.13
550.0	549.65	9.06	-14.738	-87.22	336.52	15.88 N	6.87 W	0.47	0.24	17.30	AT 336.59	052.35
600.0	599.60	10.17	-16.711	-87.59	331.70	17.92 N	7.86 W	0.86	0.43	19.56	AT 336.32	053.92
650.0	649.55	11.09	-18.698	-87.39	328.02	19.81 N	8.96 W	0.51	0.26	21.74	AT 335.67	054.71
700.0	699.49	12.17	-20.800	-87.18	335.95	21.90 N	10.06 W	0.86	0.43	24.10	AT 335.32	057.37
750.0	749.43	13.25	-22.930	-87.33	327.70	24.00 N	11.18 W	0.84	0.42	26.48	AT 335.02	058.88
800.0	799.38	14.18	-24.968	-87.53	331.48	25.93 N	12.32 W	0.52	0.26	28.71	AT 334.59	059.60
826.0	825.36	14.71	-26.027	-87.24	332.10	26.98 N	12.88 W	1.12	0.29	29.90	AT 334.48	060.10
850.0	849.33	15.24	-27.045	-87.28	332.78	28.00 N	13.41 W	0.22	0.05	31.04	AT 334.40	060.17

```
*************************************************************
*                          ********                         *
*      THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF          *
*                          ********                         *
*   850.0 FEET EQUALS    31.04   FEET AT   334.40           *
*                          ********                         *
*************************************************************
```

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

****
* NEWMONT EXPLORATION LTD. *
****

JOB NUMBER: 29-0521-311

WELL NAME: RS-414 / VS 035.00

LOCATION: ROSEBUD MINE

SURVEY DATE: 11/20/97

SURVEY ENGINEER: VERN REID

GYRO REFERENCE BEARING: 270.00

VERTICAL SECTION CALCULATED IN A
PROPOSAL DIRECTION OF: 125.00

WELNAV

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

COMMENTS: ** BOART LONGYEAR **
***** MIKE JEX *****
**** MIKE PENTZ ****
PROJECTED F/826' T/850'.

****
****
*** 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: 29-0521-311 WELL NAME: RS-414 / VS 035.00

INRUN SURVEY
BY MINIMUM CURVATURE

MEAS. DEPTH	VERT. DEPTH	VERT. SECT.	L/R PROP.	INCL HORZ	BEARING AZIMUTH	COORDINATES LATITUDE	COORDINATES DEPARTURE	D-LEG /100	D-LEG /CL	STATION DISP.	DISPLACEMENT DIRECTION	TEMP. DEG. F.
50.0	50.00	-0.21	-0.099	-89.46	329.73	0.20 N	0.12 W	1.08	0.54	0.24	AT 329.73	053.78
100.0	100.00	-0.61	-0.315	-89.50	337.73	0.61 N	0.32 W	0.17	0.08	0.69	AT 332.26	054.00
150.0	149.99	-1.08	-0.827	-88.89	359.52	1.30 N	0.41 W	1.34	0.67	1.36	AT 342.56	054.14
200.0	199.98	-1.93	-1.479	-88.56	329.18	2.32 N	0.73 W	1.48	0.74	2.43	AT 342.46	054.35
250.0	249.96	-3.22	-1.969	-88.28	323.07	3.46 N	1.51 W	0.65	0.33	3.77	AT 336.47	054.21
300.0	299.94	-4.62	-2.712	-88.03	341.38	4.87 N	2.23 W	1.27	0.64	5.36	AT 335.40	054.28
350.0	349.90	-6.23	-3.756	-87.56	335.15	6.65 N	2.95 W	1.05	0.53	7.28	AT 336.07	054.07
400.0	399.84	-8.22	-5.041	-87.01	340.13	8.85 N	3.84 W	1.20	0.60	9.64	AT 336.52	050.55
450.0	449.78	-10.36	-6.471	-87.09	337.37	11.24 N	4.77 W	0.33	0.16	12.21	AT 336.99	050.84
500.0	499.71	-12.57	-7.790	-87.01	334.38	13.59 N	5.83 W	0.35	0.17	14.79	AT 336.79	051.13
550.0	549.65	-14.74	-9.064	-87.22	336.52	15.88 N	6.87 W	0.47	0.24	17.30	AT 336.59	052.35
600.0	599.60	-16.71	-10.170	-87.59	331.70	17.92 N	7.86 W	0.86	0.43	19.56	AT 336.32	053.92
650.0	649.55	-18.70	-11.088	-87.39	328.02	19.81 N	8.96 W	0.51	0.26	21.74	AT 335.67	054.71
700.0	699.49	-20.80	-12.165	-87.18	335.95	21.90 N	10.06 W	0.86	0.43	24.10	AT 335.32	057.37
750.0	749.43	-22.93	-13.247	-87.33	327.70	24.00 N	11.18 W	0.84	0.42	26.48	AT 335.02	058.88
800.0	799.38	-24.97	-14.177	-87.53	331.48	25.93 N	12.32 W	0.52	0.26	28.71	AT 334.59	059.60
826.0	825.36	-26.03	-14.712	-87.24	332.10	26.98 N	12.88 W	1.12	0.29	29.90	AT 334.48	060.10
850.0	849.33	-27.05	-15.241	-87.28	332.78	28.00 N	13.41 W	0.22	0.05	31.04	AT 334.40	060.17

```
*************************************************************
*                         ********                          *
*     THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF           *
*                         ********                          *
*   850.0 FEET EQUALS     31.04    FEET AT   334.40         *
*                         ********                          *
*************************************************************
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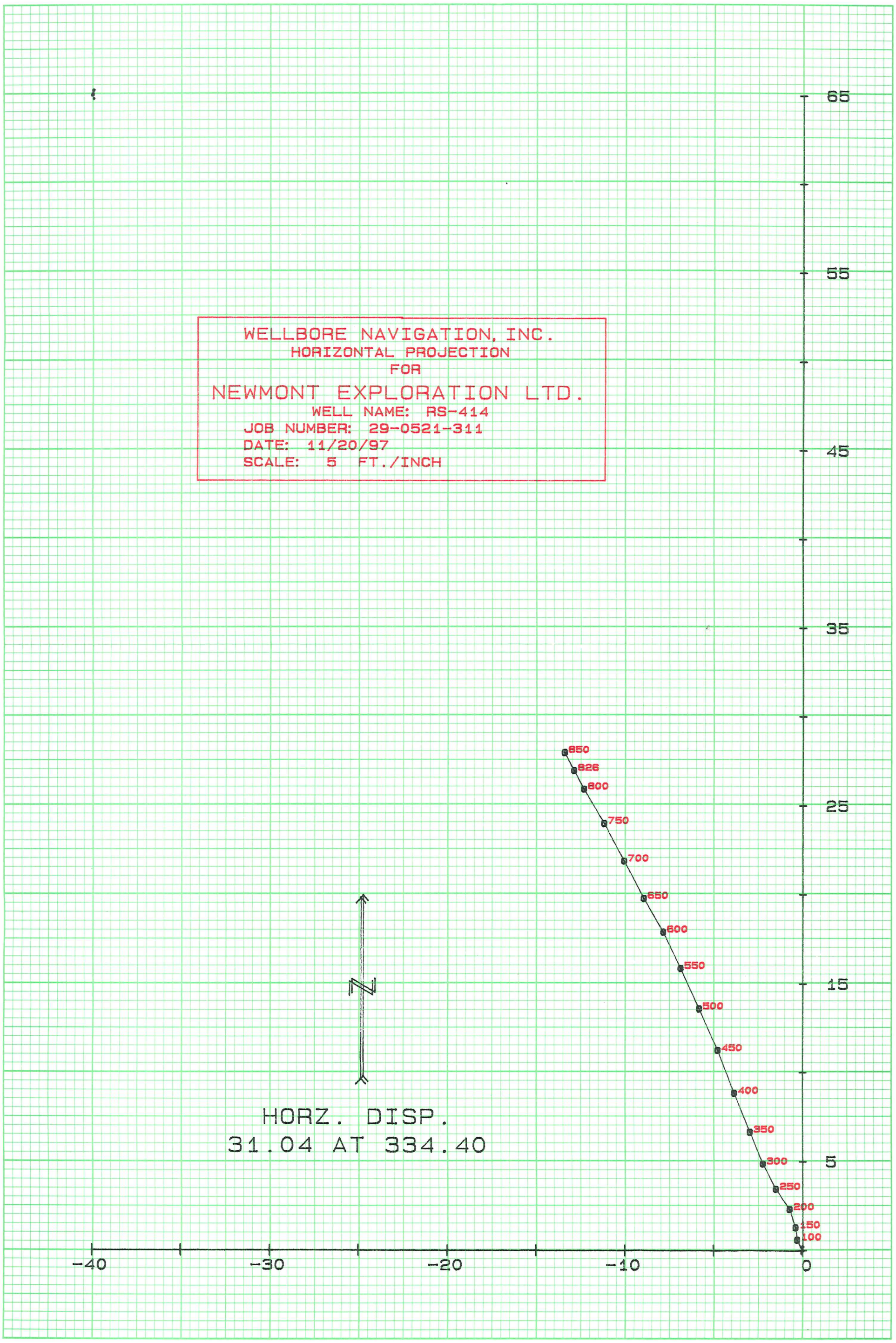
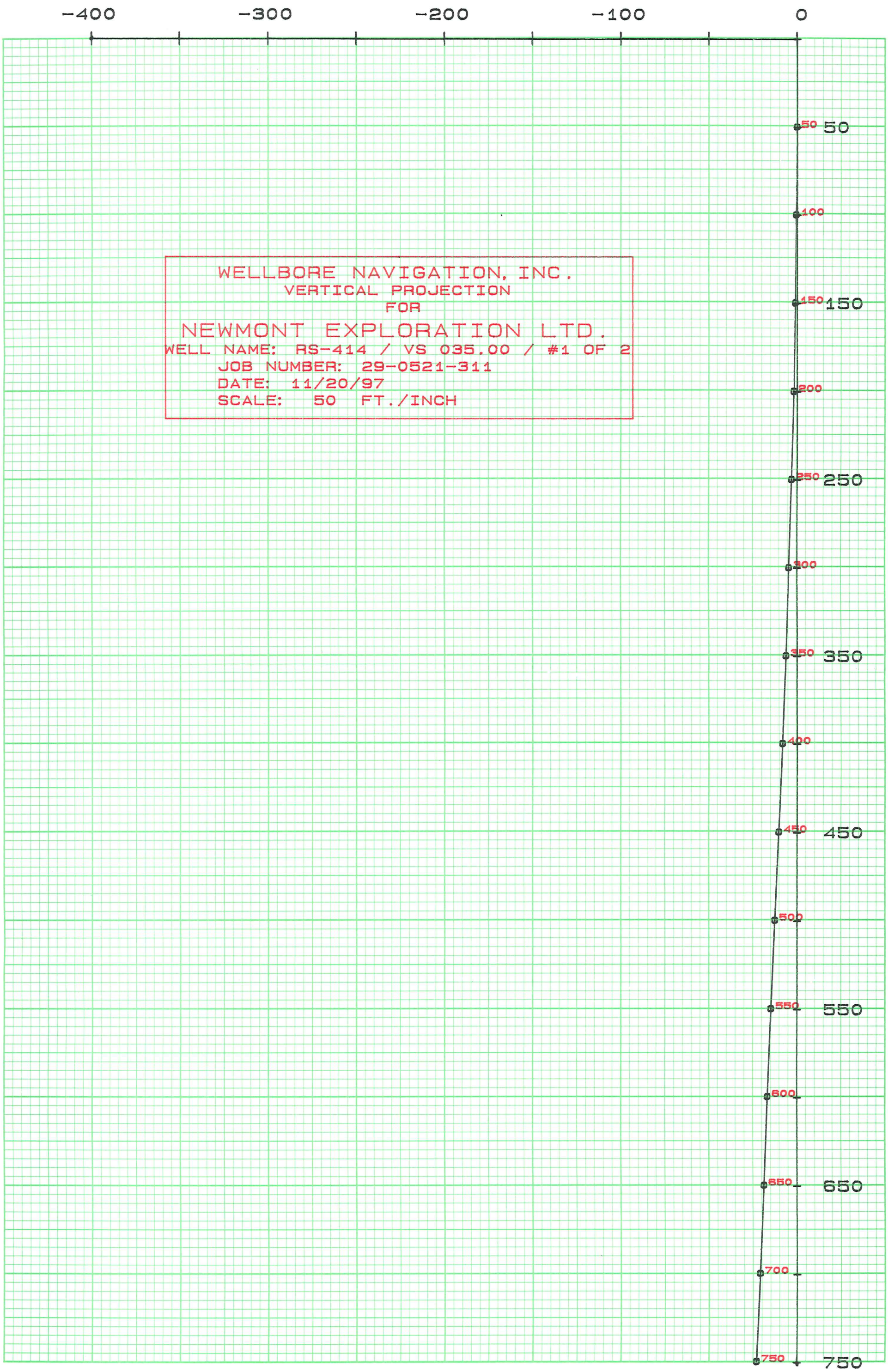
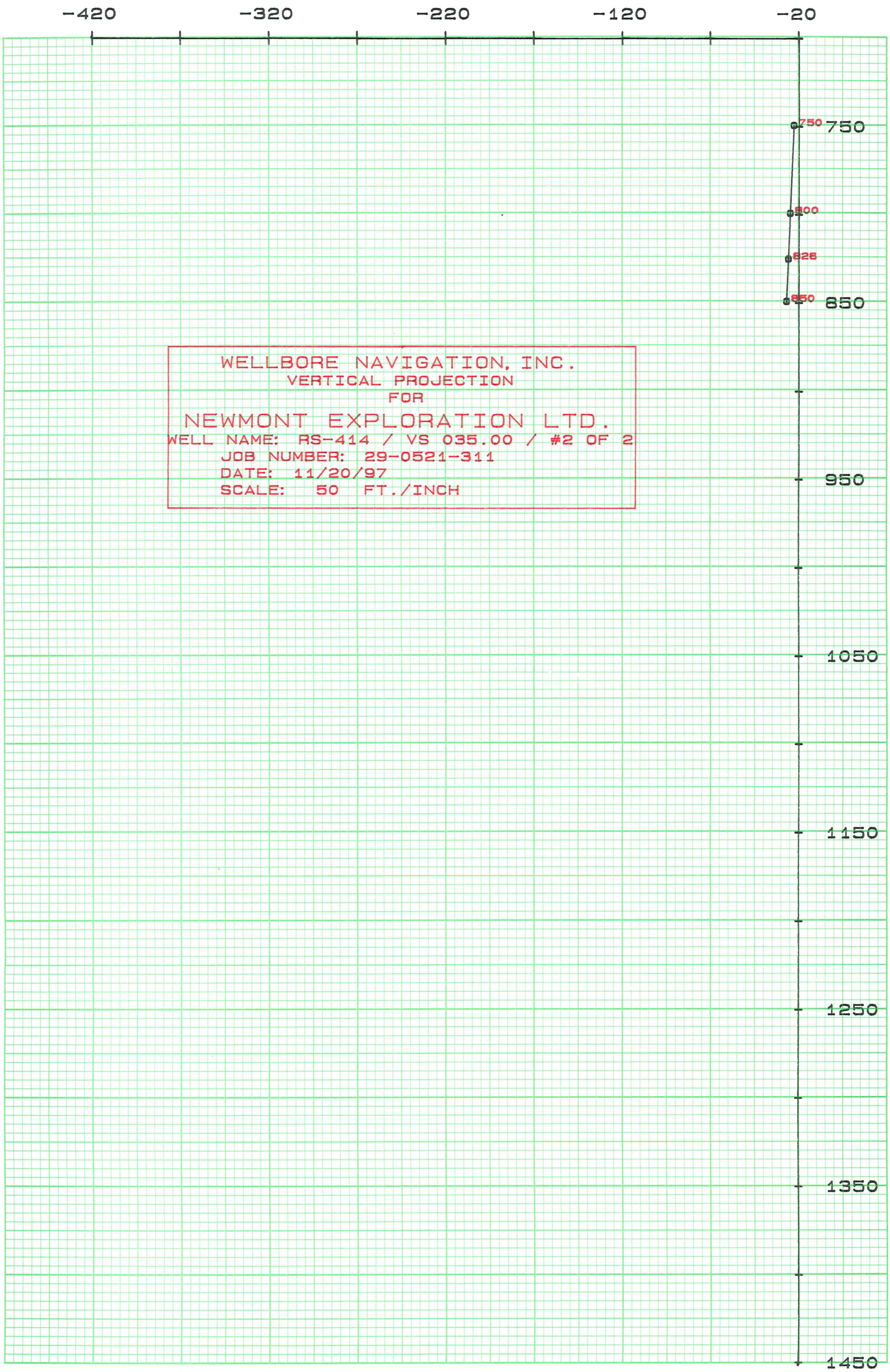


STARLIGHT PRINTING (801) 467-2841



STARLIGHT PRINTING (801) 467-2841



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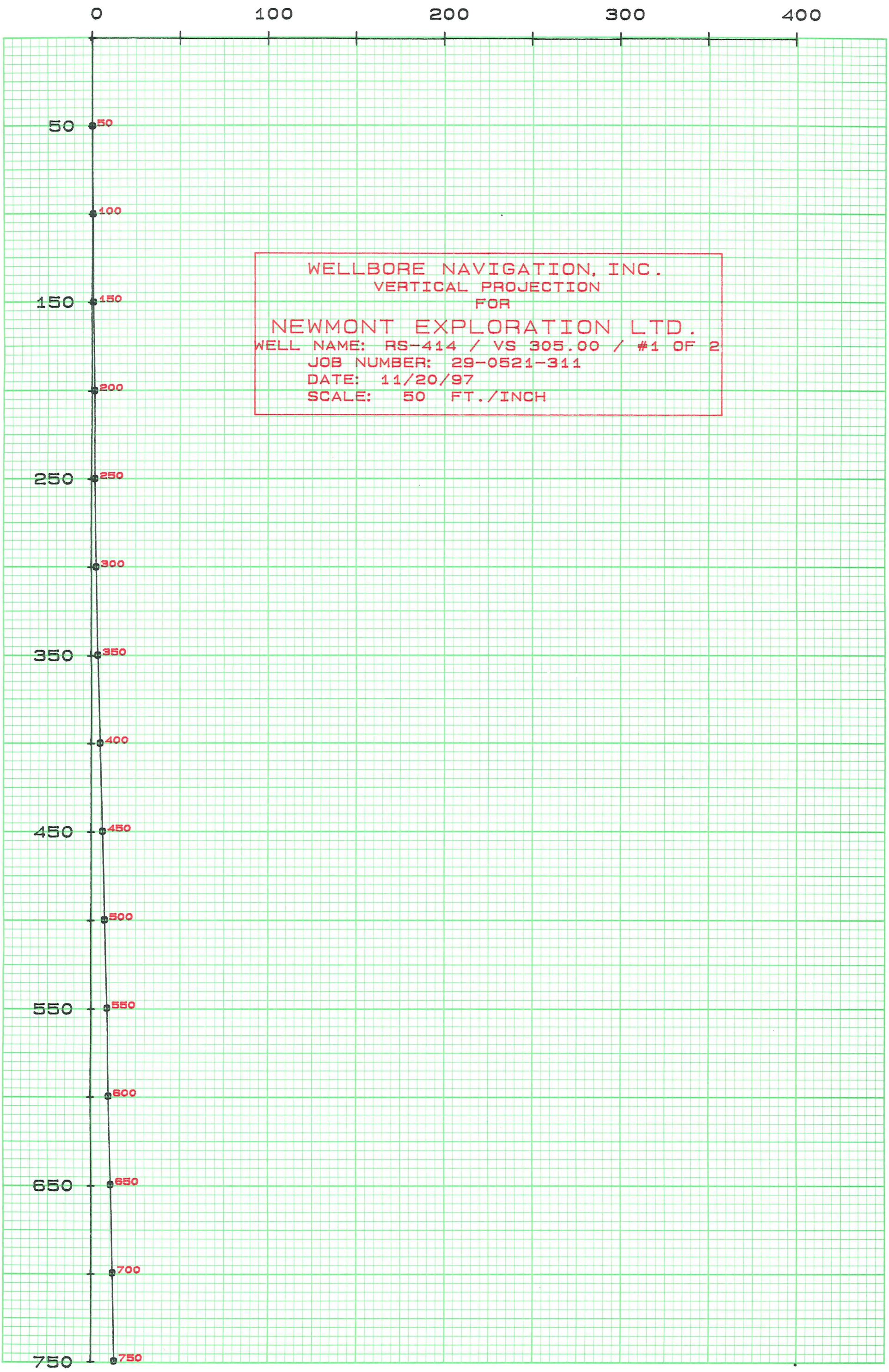

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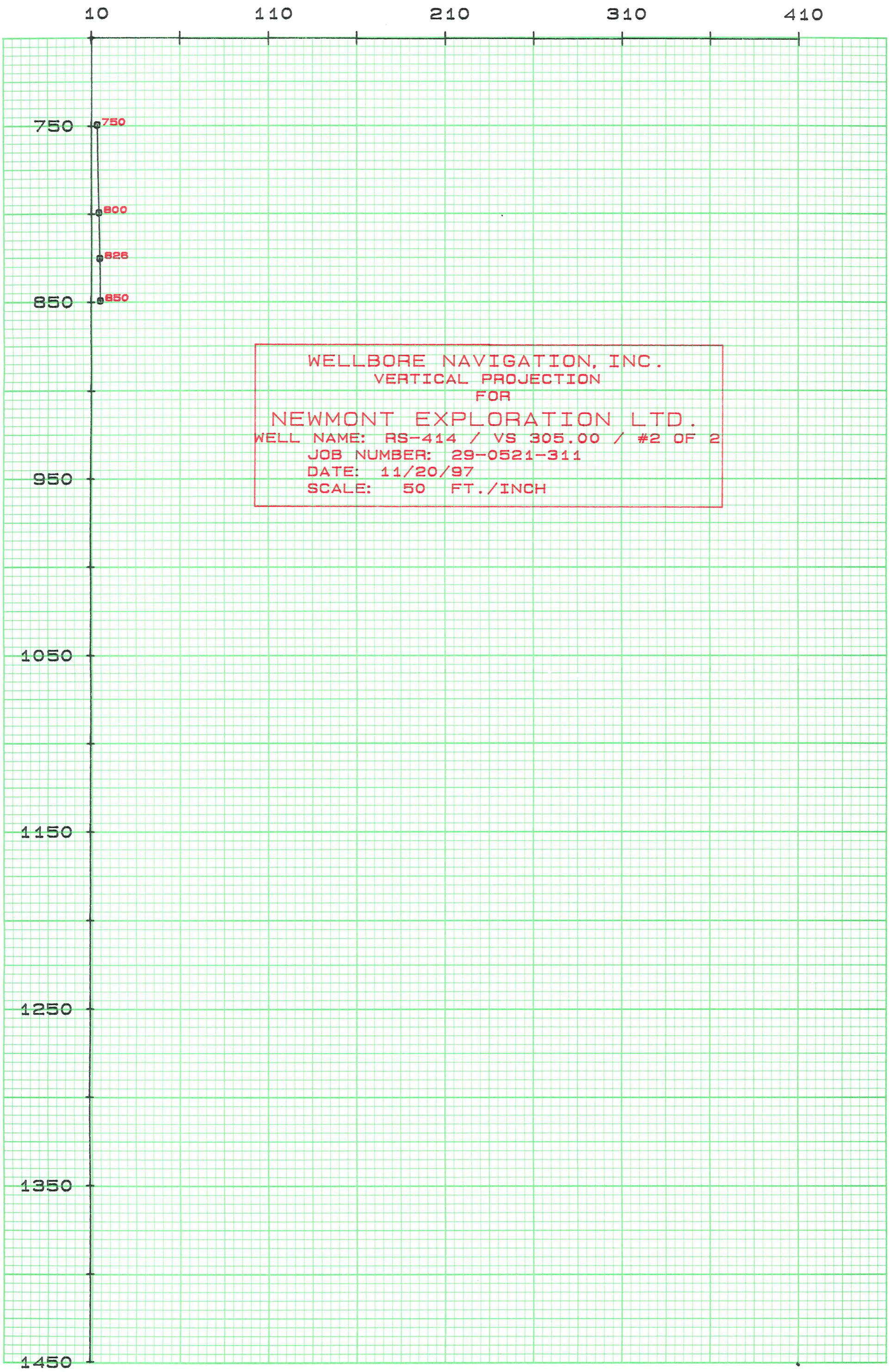

xAMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP046863

American Assay Laboratories

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

NEWMONT GOLD COMPANY

COPIES TO : RANDY VANCE

: KURT ALLEN

:

:

CLIENT REFERENCE No: RS-414 RECEIVED : 21 OCT 1997

No. SAMPLES : 113 REPORTED : 6 NOV 1997

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	FA30	15%	ppb	5
Au(R)	FA30	15%	ppb	5
Au(OZ)	FA30	15%	OPT	0.001
Au(RZ)	FA30	15%	OPT	0.001
Ag	D210	10%	ppm	0.5
Ag(OZ)	D210	10%	OPT	0.02

SIGNATORY : Susan King M.S.

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP046863

American Assay Laboratories

CLIENT : NEWMONT GOLD COMPANY
PROJECT : ROSEBUD
REFERENCE : RS-414

REPORTED : 6 NOV 1997

SAMPLES	Au FA30 ppb	Au(R) FA30 ppb	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	Ag D210 ppm	Ag(OZ) D210 OPT
RS-414 00-05	<5		<0.001		<0.5	<0.02
RS-414 05-10	<5		<0.001		<0.5	<0.02
RS-414 10-15	<5		<0.001		<0.5	<0.02
RS-414 15-20	10		<0.001		<0.5	<0.02
RS-414 20-25	18		<0.001		<0.5	<0.02
RS-414 25-30	17		<0.001		<0.5	<0.02
RS-414 30-35	15		<0.001		<0.5	<0.02
RS-414 35-40	17		<0.001		<0.5	<0.02
RS-414 40-45	29		<0.001		<0.5	<0.02
RS-414 45-50	21		<0.001		<0.5	<0.02
RS-414 50-55	50		0.001		0.9	0.03
RS-414 55-60	44		0.001		<0.5	<0.02
RS-414 60-65	36		0.001		<0.5	<0.02
RS-414 65-70	42		0.001		<0.5	<0.02
RS-414 70-75	28		<0.001		<0.5	<0.02
RS-414 75-80A	14		<0.001		1.3	0.04
RS-414 75-80B	140		0.004		<0.5	<0.02
RS-414 80-85	12		<0.001		0.7	0.02
RS-414 85-90	8		<0.001		<0.5	<0.02
RS-414 90-95	<5		<0.001		0.8	0.02
RS-414 95-100	<5		<0.001		<0.5	<0.02
RS-414 100-105	<5		<0.001		<0.5	<0.02
RS-414 105-110	<5		<0.001		<0.5	<0.02
RS-414 110-115	36		0.001		<0.5	<0.02
RS-414 115-120	80		0.002		<0.5	<0.02

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP046863

American Assay Laboratories

CLIENT : NEWMONT GOLD COMPANY
PROJECT : ROSEBUD
REFERENCE : RS-414

REPORTED : 6 NOV 1997

SAMPLES	Au FA30 ppb	Au(R) FA30 ppb	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	Ag D210 ppm	Ag(OZ) D210 OPT
RS-414 120-125	70		0.002		1.8	0.05
RS-414 125-130	78		0.002		2.3	0.07
RS-414 130-135	88	70	0.003	0.002	2.1	0.06
RS-414 135-140	36		0.001		1.7	0.05
RS-414 140-145	12		<0.001		1.0	0.03
RS-414 145-150	12		<0.001		0.6	<0.02
RS-414 150-155	36		0.001		0.6	<0.02
RS-414 155-160	<5		<0.001		<0.5	<0.02
RS-414 160-165	<5		<0.001		<0.5	<0.02
RS-414 165-170	<5		<0.001		<0.5	<0.02
RS-414 170-175	<5		<0.001		<0.5	<0.02
RS-414 175-180	<5		<0.001		<0.5	<0.02
RS-414 180-185	<5		<0.001		0.8	0.02
RS-414 185-190	<5		<0.001		<0.5	<0.02
RS-414 190-195	<5		<0.001		<0.5	<0.02
RS-414 195-200	<5	<5	<0.001	<0.001	<0.5	<0.02
RS-414 200-205A	<5		<0.001		<0.5	<0.02
RS-414 200-205B	1046		0.031		<0.5	<0.02
RS-414 205-210	<5		<0.001		<0.5	<0.02
RS-414 210-215	<5		<0.001		<0.5	<0.02
RS-414 215-220	<5		<0.001		<0.5	<0.02
RS-414 220-225	<5	<5	<0.001	<0.001	<0.5	<0.02
RS-414 225-230	<5		<0.001		<0.5	<0.02
RS-414 230-235	<5		<0.001		<0.5	<0.02
RS-414 235-240	<5		<0.001		<0.5	<0.02

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP046863

American Assay Laboratories

CLIENT : NEWMONT GOLD COMPANY
PROJECT : ROSEBUD
REFERENCE : RS-414

REPORTED : 6 NOV 1997

SAMPLES	Au FA30 ppb	Au(R) FA30 ppb	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	Ag D210 ppm	Ag(OZ) D210 OPT
RS-414 240-245	28		<0.001		1.6	0.05
RS-414 245-250	24		<0.001		1.7	0.05
RS-414 250-255	72		0.002		2.6	0.08
RS-414 255-260	34		<0.001		1.6	0.05
RS-414 260-265	6		<0.001		0.7	0.02
RS-414 265-270	<5		<0.001		0.7	0.02
RS-414 270-275	14		<0.001		1.1	0.03
RS-414 275-280	86		0.003		3.7	0.11
RS-414 280-285	62		0.002		3.7	0.11
RS-414 285-290	48		0.001		2.8	0.08
RS-414 290-295	24		<0.001		1.8	0.05
RS-414 295-300	18		<0.001		1.0	0.03
RS-414 300-305	150		0.004		3.3	0.10
RS-414 305-310	16	12	<0.001	<0.001	1.6	0.05
RS-414 310-315	8		<0.001		1.0	0.03
RS-414 315-320	56		0.002		1.8	0.05
RS-414 320-325	<5		<0.001		0.8	0.02
RS-414 325-330	<5		<0.001		<0.5	<0.02
RS-414 330-335	<5		<0.001		<0.5	<0.02
RS-414 335-340	<5		<0.001		<0.5	<0.02
RS-414 340-345	<5		<0.001		<0.5	<0.02
RS-414 345-350	<5		<0.001		<0.5	<0.02
RS-414 350-355	<5		<0.001		0.6	<0.02
RS-414 355-360	<5		<0.001		<0.5	<0.02
RS-414 360-365	<5		<0.001		0.8	0.02

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP046863

American Assay Laboratories

CLIENT : NEWMONT GOLD COMPANY
PROJECT : ROSEBUD
REFERENCE : RS-414

REPORTED : 6 NOV 1997

SAMPLES	Au FA30 ppb	Au(R) FA30 ppb	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	Ag D210 ppm	Ag(OZ) D210 OPT
RS-414 365-370	<5	<5	<0.001	<0.001	<0.5	<0.02
RS-414 370-375	<5		<0.001		<0.5	<0.02
RS-414 375-380	<5		<0.001		<0.5	<0.02
RS-414 380-385	<5		<0.001		<0.5	<0.02
RS-414 385-390	<5		<0.001		<0.5	<0.02
RS-414 390-395	<5		<0.001		<0.5	<0.02
RS-414 395-400	<5		<0.001		<0.5	<0.02
RS-414 400-405	<5	<5	<0.001	<0.001	<0.5	<0.02
RS-414 405-410	<5		<0.001		<0.5	<0.02
RS-414 410-415	<5		<0.001		<0.5	<0.02
RS-414 415-420	<5		<0.001		0.8	0.02
RS-414 420-425	18		<0.001		1.7	0.05
RS-414 425-430	82		0.002		2.5	0.07
RS-414 430-435	84		0.002		2.4	0.07
RS-414 435-440	36		0.001		1.1	0.03
RS-414 440-445	<5		<0.001		<0.5	<0.02
RS-414 445-450	36		0.001		1.2	0.04
RS-414 450-455	8		<0.001		1.7	0.05
RS-414 455-460	176		0.005		85.5	2.49
RS-414 460-465	102		0.003		7.0	0.20
RS-414 465-470	36		0.001		3.2	0.09
RS-414 470-475	54		0.002		2.8	0.08
RS-414 475-480	40		0.001		1.9	0.06
RS-414 480-485	40		0.001		1.8	0.05
RS-414 485-490	54		0.002		3.1	0.09

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP046863

American Assay Laboratories

CLIENT : NEWMONT GOLD COMPANY
PROJECT : ROSEBUD
REFERENCE : RS-414

REPORTED : 6 NOV 1997

SAMPLES	Au FA30 ppb	Au(R) FA30 ppb	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	Ag D210 ppm	Ag(OZ) D210 OPT
RS-414 490-495	48		0.001		2.3	0.07
RS-414 495-500	26		<0.001		0.9	0.03
RS-414 500-505	16		<0.001		1.0	0.03
RS-414 505-510A	42		0.001		1.5	0.04
RS-414 505-510B	148		0.004		0.6	<0.02
RS-414 510-515	164		0.005		2.4	0.07
RS-414 515-520	180		0.005		3.0	0.09
RS-414 520-525	72		0.002		3.3	0.10
RS-414 525-530	74		0.002		3.5	0.10
RS-414 530-535	54		0.002		1.9	0.06
RS-414 535-540	132		0.004		2.7	0.08
RS-414 540-545	96		0.003		2.8	0.08
RS-414 545-550	94		0.003		2.4	0.07

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ANALYSIS REPORT SP046863

American Assay Laboratories

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

NEWMONT GOLD COMPANY

COPIES TO : RANDY VANCE

: KURT ALLEN

:

:

CLIENT REFERENCE No: RS-414 RECEIVED : 21 OCT 1997

No. SAMPLES : 113 REPORTED : 6 NOV 1997

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	FA30	15%	ppb	5
Au(R)	FA30	15%	ppb	5
Au(OZ)	FA30	15%	OPT	0.001
Au(RZ)	FA30	15%	OPT	0.001
Ag	D210	10%	ppm	0.5
Ag(OZ)	D210	10%	OPT	0.02

SIGNATORY : Susan King M.S.

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP046863

American Assay Laboratories

CLIENT : NEWMONT GOLD COMPANY
PROJECT : ROSEBUD
REFERENCE : RS-414

REPORTED : 6 NOV 1997

SAMPLES	Au FA30 ppb	Au(R) FA30 ppb	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	Ag D210 ppm	Ag(OZ) D210 OPT
RS-414 00-05	<5		<0.001		<0.5	<0.02
RS-414 05-10	<5		<0.001		<0.5	<0.02
RS-414 10-15	<5		<0.001		<0.5	<0.02
RS-414 15-20	10		<0.001		<0.5	<0.02
RS-414 20-25	18		<0.001		<0.5	<0.02
RS-414 25-30	17		<0.001		<0.5	<0.02
RS-414 30-35	15		<0.001		<0.5	<0.02
RS-414 35-40	17		<0.001		<0.5	<0.02
RS-414 40-45	29		<0.001		<0.5	<0.02
RS-414 45-50	21		<0.001		<0.5	<0.02
RS-414 50-55	50		0.001		0.9	0.03
RS-414 55-60	44		0.001		<0.5	<0.02
RS-414 60-65	36		0.001		<0.5	<0.02
RS-414 65-70	42		0.001		<0.5	<0.02
RS-414 70-75	28		<0.001		<0.5	<0.02
RS-414 75-80A	14		<0.001		1.3	0.04
RS-414 75-80B	140		0.004		<0.5	<0.02
RS-414 80-85	12		<0.001		0.7	0.02
RS-414 85-90	8		<0.001		<0.5	<0.02
RS-414 90-95	<5		<0.001		0.8	0.02
RS-414 95-100	<5		<0.001		<0.5	<0.02
RS-414 100-105	<5		<0.001		<0.5	<0.02
RS-414 105-110	<5		<0.001		<0.5	<0.02
RS-414 110-115	36		0.001		<0.5	<0.02
RS-414 115-120	80		0.002		<0.5	<0.02

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP046863

American Assay Laboratories

CLIENT : NEWMONT GOLD COMPANY
PROJECT : ROSEBUD
REFERENCE : RS-414

REPORTED : 6 NOV 1997

SAMPLES	Au FA30 ppb	Au(R) FA30 ppb	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	Ag D210 ppm	Ag(OZ) D210 OPT
RS-414 120-125	70		0.002		1.8	0.05
RS-414 125-130	78		0.002		2.3	0.07
RS-414 130-135	88	70	0.003	0.002	2.1	0.06
RS-414 135-140	36		0.001		1.7	0.05
RS-414 140-145	12		<0.001		1.0	0.03
RS-414 145-150	12		<0.001		0.6	<0.02
RS-414 150-155	36		0.001		0.6	<0.02
RS-414 155-160	<5		<0.001		<0.5	<0.02
RS-414 160-165	<5		<0.001		<0.5	<0.02
RS-414 165-170	<5		<0.001		<0.5	<0.02
RS-414 170-175	<5		<0.001		<0.5	<0.02
RS-414 175-180	<5		<0.001		<0.5	<0.02
RS-414 180-185	<5		<0.001		0.8	0.02
RS-414 185-190	<5		<0.001		<0.5	<0.02
RS-414 190-195	<5		<0.001		<0.5	<0.02
RS-414 195-200	<5	<5	<0.001	<0.001	<0.5	<0.02
RS-414 200-205A	<5		<0.001		<0.5	<0.02
RS-414 200-205B	1046		0.031		<0.5	<0.02
RS-414 205-210	<5		<0.001		<0.5	<0.02
RS-414 210-215	<5		<0.001		<0.5	<0.02
RS-414 215-220	<5		<0.001		<0.5	<0.02
RS-414 220-225	<5	<5	<0.001	<0.001	<0.5	<0.02
RS-414 225-230	<5		<0.001		<0.5	<0.02
RS-414 230-235	<5		<0.001		<0.5	<0.02
RS-414 235-240	<5		<0.001		<0.5	<0.02

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP046863

American Assay Laboratories

CLIENT : NEWMONT GOLD COMPANY
PROJECT : ROSEBUD
REFERENCE : RS-414

REPORTED : 6 NOV 1997

SAMPLES	Au FA30 ppb	Au(R) FA30 ppb	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	Ag D210 ppm	Ag(OZ) D210 OPT
RS-414 240-245	28		<0.001		1.6	0.05
RS-414 245-250	24		<0.001		1.7	0.05
RS-414 250-255	72		0.002		2.6	0.08
RS-414 255-260	34		<0.001		1.6	0.05
RS-414 260-265	6		<0.001		0.7	0.02
RS-414 265-270	<5		<0.001		0.7	0.02
RS-414 270-275	14		<0.001		1.1	0.03
RS-414 275-280	86		0.003		3.7	0.11
RS-414 280-285	62		0.002		3.7	0.11
RS-414 285-290	48		0.001		2.8	0.08
RS-414 290-295	24		<0.001		1.8	0.05
RS-414 295-300	18		<0.001		1.0	0.03
RS-414 300-305	150		0.004		3.3	0.10
RS-414 305-310	16	12	<0.001	<0.001	1.6	0.05
RS-414 310-315	8		<0.001		1.0	0.03
RS-414 315-320	56		0.002		1.8	0.05
RS-414 320-325	<5		<0.001		0.8	0.02
RS-414 325-330	<5		<0.001		<0.5	<0.02
RS-414 330-335	<5		<0.001		<0.5	<0.02
RS-414 335-340	<5		<0.001		<0.5	<0.02
RS-414 340-345	<5		<0.001		<0.5	<0.02
RS-414 345-350	<5		<0.001		<0.5	<0.02
RS-414 350-355	<5		<0.001		0.6	<0.02
RS-414 355-360	<5		<0.001		<0.5	<0.02
RS-414 360-365	<5		<0.001		0.8	0.02

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP046863

American Assay Laboratories

CLIENT : NEWMONT GOLD COMPANY
PROJECT : ROSEBUD
REFERENCE : RS-414

REPORTED : 6 NOV 1997

SAMPLES	Au FA30 ppb	Au(R) FA30 ppb	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	Ag D210 ppm	Ag(OZ) D210 OPT
RS-414 365-370	<5	<5	<0.001	<0.001	<0.5	<0.02
RS-414 370-375	<5		<0.001		<0.5	<0.02
RS-414 375-380	<5		<0.001		<0.5	<0.02
RS-414 380-385	<5		<0.001		<0.5	<0.02
RS-414 385-390	<5		<0.001		<0.5	<0.02
RS-414 390-395	<5		<0.001		<0.5	<0.02
RS-414 395-400	<5		<0.001		<0.5	<0.02
RS-414 400-405	<5	<5	<0.001	<0.001	<0.5	<0.02
RS-414 405-410	<5		<0.001		<0.5	<0.02
RS-414 410-415	<5		<0.001		<0.5	<0.02
RS-414 415-420	<5		<0.001		0.8	0.02
RS-414 420-425	18		<0.001		1.7	0.05
RS-414 425-430	82		0.002		2.5	0.07
RS-414 430-435	84		0.002		2.4	0.07
RS-414 435-440	36		0.001		1.1	0.03
RS-414 440-445	<5		<0.001		<0.5	<0.02
RS-414 445-450	36		0.001		1.2	0.04
RS-414 450-455	8		<0.001		1.7	0.05
RS-414 455-460	176		0.005		85.5	2.49
RS-414 460-465	102		0.003		7.0	0.20
RS-414 465-470	36		0.001		3.2	0.09
RS-414 470-475	54		0.002		2.8	0.08
RS-414 475-480	40		0.001		1.9	0.06
RS-414 480-485	40		0.001		1.8	0.05
RS-414 485-490	54		0.002		3.1	0.09

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP046863

American Assay Laboratories

CLIENT : NEWMONT GOLD COMPANY
PROJECT : ROSEBUD
REFERENCE : RS-414

REPORTED : 6 NOV 1997

SAMPLES	Au FA30 ppb	Au(R) FA30 ppb	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	Ag D210 ppm	Ag(OZ) D210 OPT
RS-414 490-495	48		0.001		2.3	0.07
RS-414 495-500	26		<0.001		0.9	0.03
RS-414 500-505	16		<0.001		1.0	0.03
RS-414 505-510A	42		0.001		1.5	0.04
RS-414 505-510B	148		0.004		0.6	<0.02
RS-414 510-515	164		0.005		2.4	0.07
RS-414 515-520	180		0.005		3.0	0.09
RS-414 520-525	72		0.002		3.3	0.10
RS-414 525-530	74		0.002		3.5	0.10
RS-414 530-535	54		0.002		1.9	0.06
RS-414 535-540	132		0.004		2.7	0.08
RS-414 540-545	96		0.003		2.8	0.08
RS-414 545-550	94		0.003		2.4	0.07

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 0047546-IN
INVOICE DATE: 12/24/97

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-414	KURT ALLEN	NET 30 - DUE IN U.S. DOLLARS

QUANTITY	DESCRIPTION	PRICE	AMOUNT
68	SAMPLES RECEIVED	.00	.00
68	DRYING	2.00	136.00
68	JAW CRUSHING CHARGE	2.60	176.80
68	COARSE MILLING CHARGE	9.00	612.00
68	SPLITTING CHARGE	2.40	163.20
68	RING MILLING CHARGE	2.00	136.00
68	Au (1 A.T. FIRE ASSAY)	8.00	544.00
17	Au ANALYSES/GRAVIMETRIC	8.75	148.75
68	HYDROCHLORIC/NITRIC DIGESTION	2.00	136.00
68	Ag ANALYSES	1.00	68.00
6	Ag (ore grade) ANALYSES	5.00	30.00

86-5210-477
KAA

NET INVOICE:	2,150.75
LESS DISCOUNT:	430.15
FREIGHT:	.00
INVOICE TOTAL:	1,720.60

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ANALYSIS REPORT SP047546

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-414 RECEIVED : 5 DEC 1997

No. SAMPLES : 68 REPORTED : 24 DEC 1997

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 SP047546

American Assay Laboratories

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-414

REPORTED : 24 DEC 1997

SAMPLES	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	AuGRAV GRAV OPT	Ag(OZ) D210 OPT
RS-414 550.0-554.7	<0.001			0.04
RS-414 554.7-560.0	0.002			0.05
RS-414 560.0-564.7	0.002			0.09
RS-414 564.7-570.0	0.003			0.05
RS-414 570-575	0.006			0.06
RS-414 575.0-580.2	0.012			0.08
RS-414 580.2-585.3	0.003			0.07
RS-414 585.3-589.4	0.007			0.09
RS-414 589.4-595.3	0.003			0.08
RS-414 595.3-600.3	0.002			0.07
RS-414 600.3-604.8	0.002			0.05
RS-414 604.8-609.4	0.004			3.50
RS-414 609.4-611.8	0.024			0.48
RS-414 611.8-614.7	0.011			0.65
RS-414 614.7-617.4	0.009			0.45
RS-414 617.4-621.2	0.004			0.56
RS-414 621.2-625.4	0.003			0.53
RS-414 625.4-627.5	0.013			11.34
RS-414 627.5-629.7	0.016			9.25
RS-414 629.7-634.6	0.029			9.98
RS-414 634.6-639.3	0.015			0.11
RS-414 639.3-643.4	0.370		0.400	0.11
RS-414 643.4-647.8	0.069		0.074	0.40
RS-414 647.8-652.3	0.114		0.120	1.05
RS-414 652.3-654.9	0.123		0.111	0.85

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP047546

American Assay Laboratories

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-414

REPORTED : 24 DEC 1997

SAMPLES	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	AuGRAV GRAV OPT	Ag(OZ) D210 OPT
RS-414 654.9-659.0	0.094		0.106	0.25
RS-414 659-664	0.022			0.16
RS-414 664.0-669.4	0.036			0.18
RS-414 669.4-673.7	0.097		0.095	0.53
RS-414 673.7-677.6	0.144		0.136	0.16
RS-414 677.6-681.3	0.094		0.114	0.50
RS-414 681.3-684.5	0.098		0.106	0.16
RS-414 684.5-688.2	0.050		0.054	0.33
RS-414 688.2-693.4	0.081		0.100	0.22
RS-414 693.4-698.1	0.041			0.09
RS-414 698.1-703.5	0.007			0.09
RS-414 703.5-708.4	0.002			0.08
RS-414 708.4-713.2	0.003			0.08
RS-414 713.2-718.0	0.088		0.073	5.09
RS-414 718.0-722.9	0.018			0.31
RS-414 722.9-728.3	0.037			0.12
RS-414 728.3-733.3	0.072		0.069	0.10
RS-414 733.3-738.1	0.007			0.26
RS-414 738.1-743.9	0.001			0.06
RS-414 743.9-748.2	0.002			0.05
RS-414 748.2-751.5	0.007			0.08
RS-414 751.5-755.7	0.141		0.130	0.10
RS-414 755.7-758.7	0.052		0.055	0.17
RS-414 758.7-763.4	0.035			0.07
RS-414 763.4-768.6	0.003			0.10

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP047546

American Assay Laboratories

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-414

REPORTED : 24 DEC 1997

SAMPLES	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	AuGRAV GRAV OPT	Ag(OZ) D210 OPT
RS-414 768.6-773.4	0.002			0.06
RS-414 773.4-778.4	<0.001			0.07
RS-414 778.4-781.4	0.002			0.50
RS-414 781.4-783.4	0.040			7.23
RS-414 783.4-788.6	0.050		0.050	0.18
RS-414 788.6-793.8	0.106		0.120	0.29
RS-414 793.8-798.4	0.022			0.10
RS-414 798.4-803.4	0.014			0.07
RS-414 803.4-808.3	0.035	0.041		0.08
RS-414 808.3-813.6	0.005			0.06
RS-414 813.6-818.6	0.020			0.08
RS-414 818.6-823.8	0.021			0.08
RS-414 823.8-828.5	0.035			0.12
RS-414 828.5-833.3	0.014			0.13
RS-414 833.3-838.4	0.009			0.04
RS-414 838.4-843.6	0.026			0.09
RS-414 843.6-846.6	0.013			0.06
RS-414 846.6-850.0	0.003			0.08

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ANALYSIS REPORT SP047546

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-414 RECEIVED : 5 DEC 1997

No. SAMPLES : 68 REPORTED : 24 DEC 1997

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 SP047546

American Assay Laboratories

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-414

REPORTED : 24 DEC 1997

SAMPLES	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	AuGRAV GRAV OPT	Ag(OZ) D210 OPT
RS-414 550.0-554.7	<0.001			0.04
RS-414 554.7-560.0	0.002			0.05
RS-414 560.0-564.7	0.002			0.09
RS-414 564.7-570.0	0.003			0.05
RS-414 570-575	0.006			0.06
RS-414 575.0-580.2	0.012			0.08
RS-414 580.2-585.3	0.003			0.07
RS-414 585.3-589.4	0.007			0.09
RS-414 589.4-595.3	0.003			0.08
RS-414 595.3-600.3	0.002			0.07
RS-414 600.3-604.8	0.002			0.05
RS-414 604.8-609.4	0.004			3.50
RS-414 609.4-611.8	0.024			0.48
RS-414 611.8-614.7	0.011			0.65
RS-414 614.7-617.4	0.009			0.45
RS-414 617.4-621.2	0.004			0.56
RS-414 621.2-625.4	0.003			0.53
RS-414 625.4-627.5	0.013			11.34
RS-414 627.5-629.7	0.016			9.25
RS-414 629.7-634.6	0.029			9.98
RS-414 634.6-639.3	0.015			0.11
RS-414 639.3-643.4	0.370		0.400	0.11
RS-414 643.4-647.8	0.069		0.074	0.40
RS-414 647.8-652.3	0.114		0.120	1.05
RS-414 652.3-654.9	0.123		0.111	0.85

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP047546

American Assay Laboratories

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-414

REPORTED : 24 DEC 1997

SAMPLES	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	AuGRAV GRAV OPT	Ag(OZ) D210 OPT
RS-414 654.9-659.0	0.094		0.106	0.25
RS-414 659-664	0.022			0.16
RS-414 664.0-669.4	0.036			0.18
RS-414 669.4-673.7	0.097		0.095	0.53
RS-414 673.7-677.6	0.144		0.136	0.16
RS-414 677.6-681.3	0.094		0.114	0.50
RS-414 681.3-684.5	0.098		0.106	0.16
RS-414 684.5-688.2	0.050		0.054	0.33
RS-414 688.2-693.4	0.081		0.100	0.22
RS-414 693.4-698.1	0.041			0.09
RS-414 698.1-703.5	0.007			0.09
RS-414 703.5-708.4	0.002			0.08
RS-414 708.4-713.2	0.003			0.08
RS-414 713.2-718.0	0.088		0.073	5.09
RS-414 718.0-722.9	0.018			0.31
RS-414 722.9-728.3	0.037			0.12
RS-414 728.3-733.3	0.072		0.069	0.10
RS-414 733.3-738.1	0.007			0.26
RS-414 738.1-743.9	0.001			0.06
RS-414 743.9-748.2	0.002			0.05
RS-414 748.2-751.5	0.007			0.08
RS-414 751.5-755.7	0.141		0.130	0.10
RS-414 755.7-758.7	0.052		0.055	0.17
RS-414 758.7-763.4	0.035			0.07
RS-414 763.4-768.6	0.003			0.10

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP047546

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REFERENCE : RS-414

REPORTED : 24 DEC 1997

SAMPLES	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	AuGRAV GRAV OPT	Ag(OZ) D210 OPT
RS-414 768.6-773.4	0.002			0.06
RS-414 773.4-778.4	<0.001			0.07
RS-414 778.4-781.4	0.002			0.50
RS-414 781.4-783.4	0.040			7.23
RS-414 783.4-788.6	0.050		0.050	0.18
RS-414 788.6-793.8	0.106		0.120	0.29
RS-414 793.8-798.4	0.022			0.10
RS-414 798.4-803.4	0.014			0.07
RS-414 803.4-808.3	0.035	0.041		0.08
RS-414 808.3-813.6	0.005			0.06
RS-414 813.6-818.6	0.020			0.08
RS-414 818.6-823.8	0.021			0.08
RS-414 823.8-828.5	0.035			0.12
RS-414 828.5-833.3	0.014			0.13
RS-414 833.3-838.4	0.009			0.04
RS-414 838.4-843.6	0.026			0.09
RS-414 843.6-846.6	0.013			0.06
RS-414 846.6-850.0	0.003			0.08

SP

SUBMITTAL FORM

PAGE 1

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: ~~HECLA~~ ROSEBUD MINE CO. LLT

Address: P.O. BOX 2610

City WINNEMUCCA State NV Zip ~~89820~~ 89446

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

Project Name: _____ Purchase Order Number: _____

Date Submitted: 12/2/97 Number of Samples: 68

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

SAMPLE IDENTIFICATION	TYPE	ELEMENTS REQUIRED
RS-414:	CORE	AU-AG FOLLOWING ROSEBUD
550.0-554.7 614.7-617.4 669.4-673.7		DEVELOPMENT CORE DRILLING
554.7-560.0 617.4-621.2 673.7-677.6		PROTOCOL
560.0-564.7 621.2-625.4 677.6-681.3		
564.7-570.0 625.4-627.5 681.3-684.5		
570.0-575.0 627.5-629.7 684.5-688.2		
575.0-580.2 629.7-634.6 688.2-693.4		
580.2-585.3 634.6-639.3 693.4-698.1		
585.3-589.4 639.3-643.4 698.1-703.5		
589.4-595.3 643.4-647.8 703.5-708.4		
595.3-600.3 647.8-652.3 708.4-713.2		
600.3-604.8 652.3-654.8 713.2-718.0		
604.8-609.4 654.9-659.0 718.0-722.9		
609.4-611.8 659.0-664.0 722.9-728.3		
611.8-614.7 664.0-669.4 728.3-733.3		

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 @ ROSEBUD

RANDY VANCE

Comments: 2 PAGES

CLIENT FILE COPY

SP

SUBMITTAL FORM

PAGE 2

American Assay Laboratories

Geochemical • Environmental • Metallurgical

Sparks Office
1500 Glendale Ave.
Nevada 89431
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Reno, NV 89510
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(702) 356-0606
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011-52-69-170035

Other Offices
Lima, Peru
Santiago, Chile
Mendoza, Argentina

Company: ROSEBUD MINE Co. LLC

Address: P.O. Box 2610

City WINNEMUCCA State NV Zip 89446

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

Project Name: _____ Purchase Order Number: _____

Date Submitted: 12/2/97 Number of Samples: 68

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

RS-414 SAMPLE IDENTIFICATION		TYPE	ELEMENTS REQUIRED
733.3-738.1	798.4-803.4	CORE	AU-AG FOLLOWING ROSEBUD
738.1-743.9	803.4-808.3		DEVELOPMENT CORE DRILLING
743.9-748.2	808.3-813.6		PROTOCOL
748.2-751.5	813.6-818.6		
751.5-755.7	818.6-823.8		
755.7-758.7	823.8-828.5		
758.7-763.4	828.5-833.3		
763.4-768.6	833.3-838.4		
768.6-773.4	838.4-843.6		
773.4-778.4	843.6-846.6		
778.4-781.4	846.6-850.0		
781.4-783.4			
783.4-788.6			
788.6-793.8			
793.8-798.4			

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
RANDY VANCE

Comments: 2 PAGES

CLIENT FILE COPY

AMERICAN ASSAY LABORATORIES

PROVISIONAL REPORT SP047546

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-414 RECEIVED : 5 DEC 1997

No. SAMPLES : 68 REPORTED : 24 DEC 1997

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

PROVISIONAL REPORT SP047546

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-414

REPORTED : 24 DEC 1997

SAMPLES	Au(OZ)	Au(RZ)	AuGRAV	Ag(OZ)
RS-414 550.0-554.7	<0.001			0.04
RS-414 554.7-560.0	0.002			0.05
RS-414 560.0-564.7	0.002			0.09
RS-414 564.7-570.0	0.003			0.05
RS-414 570-575	0.006			0.06
RS-414 575.0-580.2	0.012			0.08
RS-414 580.2-585.3	0.003			0.07
RS-414 585.3-589.4	0.007			0.09
RS-414 589.4-595.3	0.003			0.08
RS-414 595.3-600.3	0.002			0.07
RS-414 600.3-604.8	0.002			0.05
RS-414 604.8-609.4	0.004			3.50
RS-414 609.4-611.8	0.024			0.48
RS-414 611.8-614.7	0.011			0.65
RS-414 614.7-617.4	0.009			0.45
RS-414 617.4-621.2	0.004			0.56
RS-414 621.2-625.4	0.003			0.53
RS-414 625.4-627.5	0.013			11.34
RS-414 627.5-629.7	0.016			9.25
RS-414 629.7-634.6	0.029			9.98
RS-414 634.6-639.3	0.015			0.11
RS-414 639.3-643.4	0.370		0.400	0.11 4.1
RS-414 643.4-647.8	0.069		0.074	0.40
RS-414 647.8-652.3	0.114		0.120	1.05
RS-414 652.3-654.9	0.123		0.111	0.85

AMERICAN ASSAY LABORATORIES

PROVISIONAL REPORT SP047546

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-414

REPORTED : 24 DEC 1997

SAMPLES	Au(OZ)	Au(RZ)	AuGRAV	Ag(OZ)
RS-414 654.9-659.0	0.094		0.106	0.25
RS-414 659-664	0.022			0.16
RS-414 664.0-669.4	0.036			0.18
RS-414 669.4-673.7	0.097		0.095	0.53
RS-414 673.7-677.6	0.144		0.136	0.16 3.9'
RS-414 677.6-681.3	0.094		0.114	0.50
RS-414 681.3-684.5	0.098		0.106	0.16
RS-414 684.5-688.2	0.050		0.054	0.33
RS-414 688.2-693.4	0.081		0.100	0.22
RS-414 693.4-698.1	0.041			0.09
RS-414 698.1-703.5	0.007			0.09
RS-414 703.5-708.4	0.002			0.08
RS-414 708.4-713.2	0.003			0.08
RS-414 713.2-718.0	0.088		0.073	5.09
RS-414 718.0-722.9	0.018			0.31
RS-414 722.9-728.3	0.037			0.12
RS-414 728.3-733.3	0.072		0.069	0.10
RS-414 733.3-738.1	0.007			0.26
RS-414 738.1-743.9	0.001			0.06
RS-414 743.9-748.2	0.002			0.05
RS-414 748.2-751.5	0.007			0.08
RS-414 751.5-755.7	0.141		0.130	0.10
RS-414 755.7-758.7	0.052		0.055	0.17
RS-414 758.7-763.4	0.035			0.07
RS-414 763.4-768.6	0.003			0.10

AMERICAN ASSAY LABORATORIES

PROVISIONAL REPORT SP047546

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-414

REPORTED : 24 DEC 1997

SAMPLES	Au(OZ)	Au(RZ)	AuGRAV	Ag(OZ)
RS-414 768.6-773.4	0.002			0.06
RS-414 773.4-778.4	<0.001			0.07
RS-414 778.4-781.4	0.002			0.50
RS-414 781.4-783.4	0.040			7.23
RS-414 783.4-788.6	0.050		0.050	0.18
RS-414 788.6-793.8	0.106		0.120	0.29
RS-414 793.8-798.4	0.022			0.10
RS-414 798.4-803.4	0.014			0.07
RS-414 803.4-808.3	0.035	0.041		0.08
RS-414 808.3-813.6	0.005			0.06
RS-414 813.6-818.6	0.029			0.08
RS-414 818.6-823.8	0.021			0.08
RS-414 823.8-828.5	0.035			0.12
RS-414 828.5-833.3	0.014			0.13
RS-414 833.3-838.4	0.009			0.04
RS-414 838.4-843.6	0.026			0.09
RS-414 843.6-846.6	0.013			0.06
RS-414 846.6-850.0	0.003			0.08

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

****
* NEWMONT GOLD COMPANY *
****

JOB NUMBER: 29-0521-311

WELL NAME: ~~RS-413 / VERTICAL~~ RS-414

LOCATION: ROSEBUD MINE

SURVEY DATE: 10/15/97

SURVEY ENGINEER: VERN REID

GYRO REFERENCE BEARING: 341.00

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

COMMENTS: **** EKLUND ****
** JOHN WELCH **

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

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

JOB NUMBER: 29-0021-311

WELL NAME: RS-413 / VERTICAL

INRUN SURVEY
BY MINIMUM CURVATURE

MEAS. DEPTH	VERT. DEPTH	VERT. SECT.	L/R CLOS.	INCL HORZ	BEARING AZIMUTH	COORDINATES LATITUDE	COORDINATES DEPARTURE	D-LEG /100	D-LEG /CL	STATION DISP.	DISPLACEMENT DIRECTION	TEMP. DEG. F.
50.0	50.00	0.19	0.051	-89.57	352.15	0.19 N	0.03 W	0.86	0.43	0.19	AT 352.15	088.70
100.0	100.00	0.60	0.203	-89.41	359.20	0.63 N	0.05 W	0.34	0.17	0.63	AT 355.02	086.68
150.0	149.99	1.31	0.310	-88.91	337.18	1.32 N	0.24 W	1.17	0.59	1.35	AT 349.61	084.73
200.0	199.98	2.51	0.282	-88.33	333.50	2.42 N	0.75 W	1.17	0.59	2.53	AT 342.70	082.78
250.0	249.96	4.00	0.205	-88.26	333.18	3.74 N	1.42 W	0.14	0.07	4.00	AT 339.23	080.04
300.0	299.93	5.52	0.198	-88.24	338.83	5.14 N	2.04 W	0.35	0.17	5.53	AT 338.35	077.81
350.0	349.90	7.29	0.272	-87.72	338.65	6.78 N	2.68 W	1.04	0.52	7.29	AT 338.44	075.50
400.0	399.85	9.46	0.277	-87.30	334.52	8.77 N	3.55 W	0.91	0.46	9.46	AT 337.98	073.56
450.0	449.79	11.92	0.206	-87.06	334.78	10.99 N	4.60 W	0.48	0.24	11.92	AT 337.29	071.61
500.0	499.73	14.42	0.090	-87.20	332.45	13.24 N	5.71 W	0.36	0.18	14.42	AT 336.66	070.10
550.0	549.67	16.91	0.001	-87.08	336.00	15.48 N	6.79 W	0.43	0.21	16.91	AT 336.30	066.21

```
*************************************************************
*                         ********                          *
*      THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF          *
*                         ********                          *
*   550.0 FEET EQUALS      16.91    FEET AT  336.30         *
*                         ********                          *
*************************************************************
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WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

****
* NEWMONT GOLD COMPANY *
****

JOB NUMBER: 29-0521-311

WELL NAME: RS-413 / VS 305.00

LOCATION: ROSEBUD MINE

SURVEY DATE: 10/15/97

SURVEY ENGINEER: VERN REID

GYRO REFERENCE BEARING: 341.00

VERTICAL SECTION CALCULATED IN A
PROPOSAL DIRECTION OF: 035.00

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

COMMENTS: **** EKLUND ****
** JOHN WELCH **

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

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

JOB NUMBER: 29-0521-311 WELL NAME: RS-413 / VS 305.00

INRUN SURVEY
BY MINIMUM CURVATURE

MEAS. DEPTH	VERT. DEPTH	VERT. SECT.	L/R PROP.	INCL HORZ	BEARING AZIMUTH	COORDINATES LATITUDE	COORDINATES DEPARTURE	D-LEG /100	D-LEG /CL	STATION DISP.	DISPLACEMENT DIRECTION	TEMP. DEG. F.
50.0	50.00	0.14	-0.128	-89.57	352.15	0.19 N	0.03 W	0.86	0.43	0.19	AT 352.15	088.70
100.0	100.00	0.48	-0.406	-89.41	359.20	0.63 N	0.05 W	0.34	0.17	0.63	AT 355.02	086.68
150.0	149.99	0.95	-0.959	-88.91	337.18	1.32 N	0.24 W	1.17	0.59	1.35	AT 349.61	084.73
200.0	199.98	1.55	-2.002	-88.33	333.50	2.42 N	0.75 W	1.17	0.59	2.53	AT 342.70	082.78
250.0	249.96	2.25	-3.311	-88.26	333.18	3.74 N	1.42 W	0.14	0.07	4.00	AT 339.23	080.04
300.0	299.93	3.04	-4.618	-88.24	338.83	5.14 N	2.04 W	0.35	0.17	5.53	AT 338.35	077.81
350.0	349.90	4.02	-6.084	-87.72	338.65	6.78 N	2.68 W	1.04	0.52	7.29	AT 338.44	075.50
400.0	399.85	5.15	-7.936	-87.30	334.52	8.77 N	3.55 W	0.91	0.46	9.46	AT 337.98	073.56
450.0	449.79	6.37	-10.074	-87.06	334.78	10.99 N	4.60 W	0.48	0.24	11.92	AT 337.29	071.61
500.0	499.73	7.57	-12.271	-87.20	332.45	13.24 N	5.71 W	0.36	0.18	14.42	AT 336.66	070.10
550.0	549.67	8.78	-14.446	-87.08	336.00	15.48 N	6.79 W	0.43	0.21	16.91	AT 336.30	066.21

```
*************************************************************
*                          ********                         *
*      THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF          *
*                          ********                         *
*   550.0 FEET EQUALS     16.91    FEET AT   336.30         *
*                          ********                         *
*************************************************************
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WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

****
* NEWMONT GOLD COMPANY *
****

JOB NUMBER: 29-0521-311

WELL NAME: RS-413 / VS 035.00

LOCATION: ROSEBUD MINE

SURVEY DATE: 10/15/97

SURVEY ENGINEER: VERN REID

GYRO REFERENCE BEARING: 341.00

VERTICAL SECTION CALCULATED IN A
PROPOSAL DIRECTION OF: 125.00

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

COMMENTS: **** EKLUND ****
** JOHN WELCH **

****
****
*** THIS DIRECTIONAL SURVEY REPORT IS ****
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* AND IS SUPPORTED BY ACTUAL FIELD DATA! *
**
**
**
****
****

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

JOB NUMBER: 29-0521-311

WELL NAME: RS-413 / 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	-0.13	-0.138	-89.57	352.15	0.19 N	0.03 W	0.86	0.43	0.19	AT 352.15	088.70
100.0	100.00	-0.41	-0.484	-89.41	359.20	0.63 N	0.05 W	0.34	0.17	0.63	AT 355.02	086.68
150.0	149.99	-0.96	-0.946	-88.91	337.18	1.32 N	0.24 W	1.17	0.59	1.35	AT 349.61	084.73
200.0	199.98	-2.00	-1.547	-88.33	333.50	2.42 N	0.75 W	1.17	0.59	2.53	AT 342.70	082.78
250.0	249.96	-3.31	-2.253	-88.26	333.18	3.74 N	1.42 W	0.14	0.07	4.00	AT 339.23	080.04
300.0	299.93	-4.62	-3.039	-88.24	338.83	5.14 N	2.04 W	0.35	0.17	5.53	AT 338.35	077.81
350.0	349.90	-6.08	-4.018	-87.72	338.65	6.78 N	2.68 W	1.04	0.52	7.29	AT 338.44	075.50
400.0	399.85	-7.94	-5.149	-87.30	334.52	8.77 N	3.55 W	0.91	0.46	9.46	AT 337.98	073.56
450.0	449.79	-10.07	-6.366	-87.06	334.78	10.99 N	4.60 W	0.48	0.24	11.92	AT 337.29	071.61
500.0	499.73	-12.27	-7.566	-87.20	332.45	13.24 N	5.71 W	0.36	0.18	14.42	AT 336.66	070.10
550.0	549.67	-14.45	-8.785	-87.08	336.00	15.48 N	6.79 W	0.43	0.21	16.91	AT 336.30	066.21

```
*************************************************************
*                          ********                         *
*      THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF          *
*                          ********                         *
*   550.0 FEET EQUALS     16.91    FEET AT  336.30          *
*                          ********                         *
*************************************************************
```

CORRECTED
HOLE # F/RS-413
T/RS-414

Vern mislabeled RS-414
as RS-413 previously.

LBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

COPIC DIRECTIONAL SURVEY
Y MINIMUM CURVATURE

FOR

****
EWMONT GOLD COMPANY *
****

JOB NUMBER: 29-0521-311

WELL NAME: RS-414 / VERTICAL

LOCATION: ROSEBUD MINE

SURVEY DATE: 10/15/97

SURVEY ENGINEER: VERN REID

GYRO REFERENCE BEARING: 341.00

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

COMMENTS: **** EKLUND ****
** JOHN WELCH **

****
****
*** 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: 29-0521-311

WELL NAME: RS-414 / VERTICAL

INRUN SURVEY
BY MINIMUM CURVATURE

MEAS. DEPTH	VERT. DEPTH	VERT. SECT.	L/R CLOS.	INCL HORZ	BEARING AZIMUTH	COORDINATES LATITUDE	COORDINATES DEPARTURE	D-LEG /100	D-LEG /CL	STATION DISP.	DISPLACEMENT DIRECTION	TEMP. DEG. F.
50.0	50.00	0.18	0.051	-89.57	352.15	0.19 N	0.03 W	0.86	0.43	0.19	AT 352.15	088.70
100.0	100.00	0.60	0.203	-89.41	359.20	0.63 N	0.05 W	0.34	0.17	0.63	AT 355.02	086.68
150.0	149.99	1.31	0.310	-88.91	337.18	1.32 N	0.24 W	1.17	0.59	1.35	AT 349.61	084.73
200.0	199.98	2.51	0.282	-88.33	333.50	2.42 N	0.75 W	1.17	0.59	2.53	AT 342.70	082.78
250.0	249.96	4.00	0.205	-88.26	333.18	3.74 N	1.42 W	0.14	0.07	4.00	AT 339.23	080.04
300.0	299.93	5.52	0.198	-88.24	338.83	5.14 N	2.04 W	0.35	0.17	5.53	AT 338.35	077.81
350.0	349.90	7.29	0.272	-87.72	338.65	6.78 N	2.68 W	1.04	0.52	7.29	AT 338.44	075.50
400.0	399.85	9.46	0.277	-87.30	334.52	8.77 N	3.55 W	0.91	0.46	9.46	AT 337.98	073.56
450.0	449.79	11.92	0.206	-87.06	334.78	10.99 N	4.60 W	0.48	0.24	11.92	AT 337.29	071.61
500.0	499.73	14.42	0.090	-87.20	332.45	13.24 N	5.71 W	0.36	0.18	14.42	AT 336.66	070.10
550.0	549.67	16.91	0.001	-87.08	336.00	15.48 N	6.79 W	0.43	0.21	16.91	AT 336.30	066.21

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*************************************************************
*                          ********                         *
*      THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF          *
*                          ********                         *
*   550.0 FEET EQUALS     16.91    FEET AT  336.30          *
*                          ********                         *
*************************************************************
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WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

JOB NUMBER: 29-0521-311

WELL NAME: RS-414 / VS 305.00

INRUN SURVEY
BY MINIMUM CURVATURE

MEAS. DEPTH	VERT. DEPTH	VERT. SECT.	L/R PROP.	INCL HORZ	BEARING AZIMUTH	COORDINATES LATITUDE	COORDINATES DEPARTURE	D-LEG /100	D-LEG /CL	STATION DISP.	DISPLACEMENT DIRECTION	TEMP. DEG. F.
50.0	50.00	0.14	-0.128	-89.57	352.15	0.19 N	0.03 W	0.86	0.43	0.19	AT 352.15	088.70
100.0	100.00	0.48	-0.406	-89.41	359.20	0.63 N	0.05 W	0.34	0.17	0.63	AT 355.02	086.68
150.0	149.99	0.95	-0.959	-88.91	337.18	1.32 N	0.24 W	1.17	0.59	1.35	AT 349.61	084.73
200.0	199.98	1.55	-2.002	-88.33	333.50	2.42 N	0.75 W	1.17	0.59	2.53	AT 342.70	082.78
250.0	249.96	2.25	-3.311	-88.26	333.18	3.74 N	1.42 W	0.14	0.07	4.00	AT 339.23	080.04
300.0	299.93	3.04	-4.618	-88.24	338.83	5.14 N	2.04 W	0.35	0.17	5.53	AT 338.35	077.81
350.0	349.90	4.02	-6.084	-87.72	338.65	6.78 N	2.68 W	1.04	0.52	7.29	AT 338.44	075.50
400.0	399.85	5.15	-7.936	-87.30	334.52	8.77 N	3.55 W	0.91	0.46	9.46	AT 337.98	073.56
450.0	449.79	6.37	-10.074	-87.06	334.78	10.99 N	4.60 W	0.48	0.24	11.92	AT 337.29	071.61
500.0	499.73	7.57	-12.271	-87.20	332.45	13.24 N	5.71 W	0.36	0.18	14.42	AT 336.66	070.10
550.0	549.67	8.78	-14.446	-87.08	336.00	15.48 N	6.79 W	0.43	0.21	16.91	AT 336.30	066.21

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*************************************************************
*                          ********                         *
*      THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF          *
*                          ********                         *
*   550.0 FEET EQUALS     16.91    FEET AT  336.30          *
*                          ********                         *
*************************************************************
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WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

JOB NUMBER: 29-0521-311

WELL NAME: RS-414 / 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	-0.13	-0.138	-89.57	352.15	0.19 N	0.03 W	0.86	0.43	0.19	AT 352.15	088.70
100.0	100.00	-0.41	-0.484	-89.41	359.20	0.63 N	0.05 W	0.34	0.17	0.63	AT 355.02	086.68
150.0	149.99	-0.96	-0.946	-88.91	337.18	1.32 N	0.24 W	1.17	0.59	1.35	AT 349.61	084.73
200.0	199.98	-2.00	-1.547	-88.33	333.50	2.42 N	0.75 W	1.17	0.59	2.53	AT 342.70	082.78
250.0	249.96	-3.31	-2.253	-88.26	333.18	3.74 N	1.42 W	0.14	0.07	4.00	AT 339.23	080.04
300.0	299.93	-4.62	-3.039	-88.24	338.83	5.14 N	2.04 W	0.35	0.17	5.53	AT 338.35	077.81
350.0	349.90	-6.08	-4.018	-87.72	338.65	6.78 N	2.68 W	1.04	0.52	7.29	AT 338.44	075.50
400.0	399.85	-7.94	-5.149	-87.30	334.52	8.77 N	3.55 W	0.91	0.46	9.46	AT 337.98	073.56
450.0	449.79	-10.07	-6.366	-87.06	334.78	10.99 N	4.60 W	0.48	0.24	11.92	AT 337.29	071.61
500.0	499.73	-12.27	-7.566	-87.20	332.45	13.24 N	5.71 W	0.36	0.18	14.42	AT 336.66	070.10
550.0	549.67	-14.45	-8.785	-87.08	336.00	15.48 N	6.79 W	0.43	0.21	16.91	AT 336.30	066.21

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*************************************************************
*                         ********                          *
*     THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF           *
*                         ********                          *
*   550.0 FEET EQUALS     16.91    FEET AT  336.30          *
*                         ********                          *
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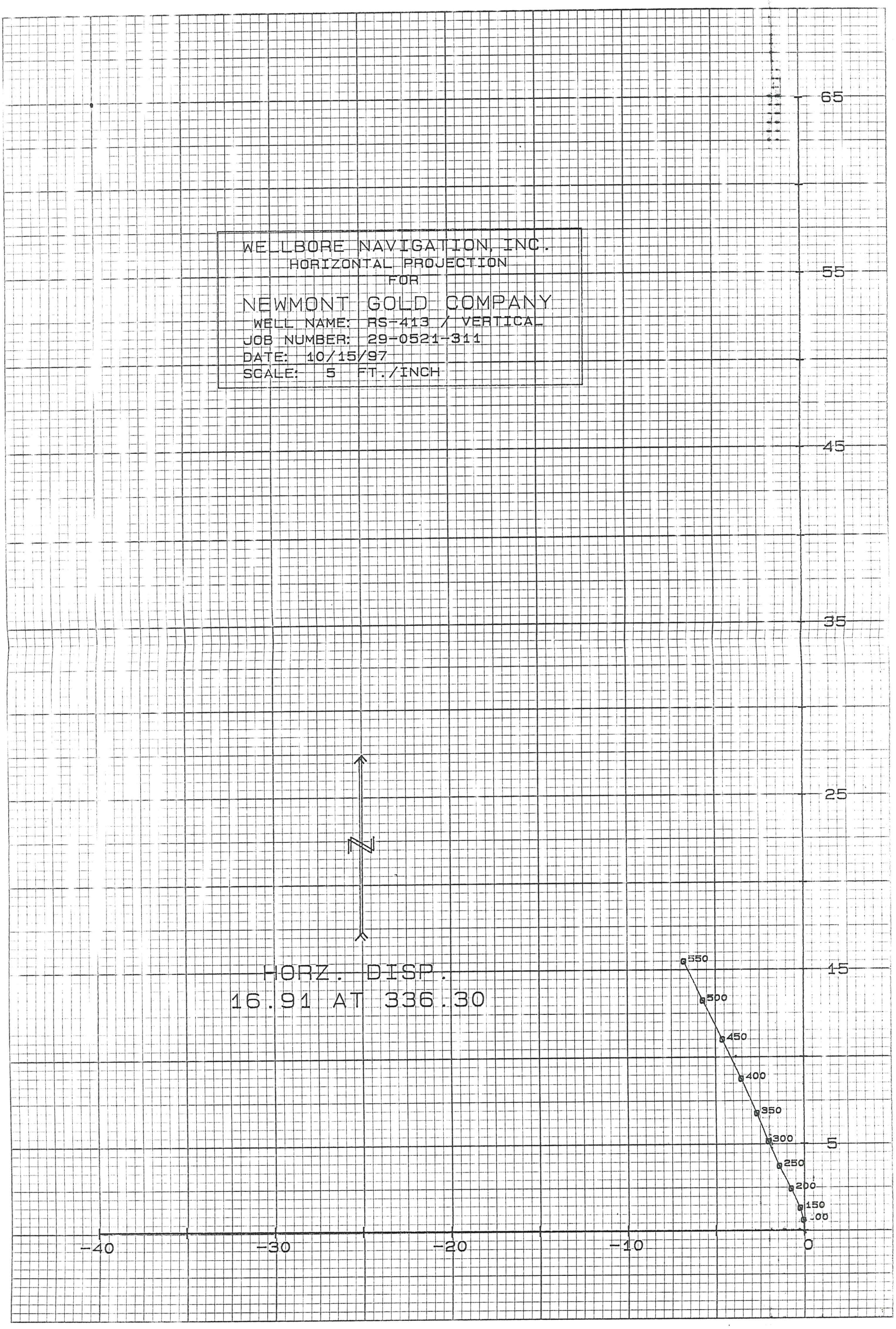

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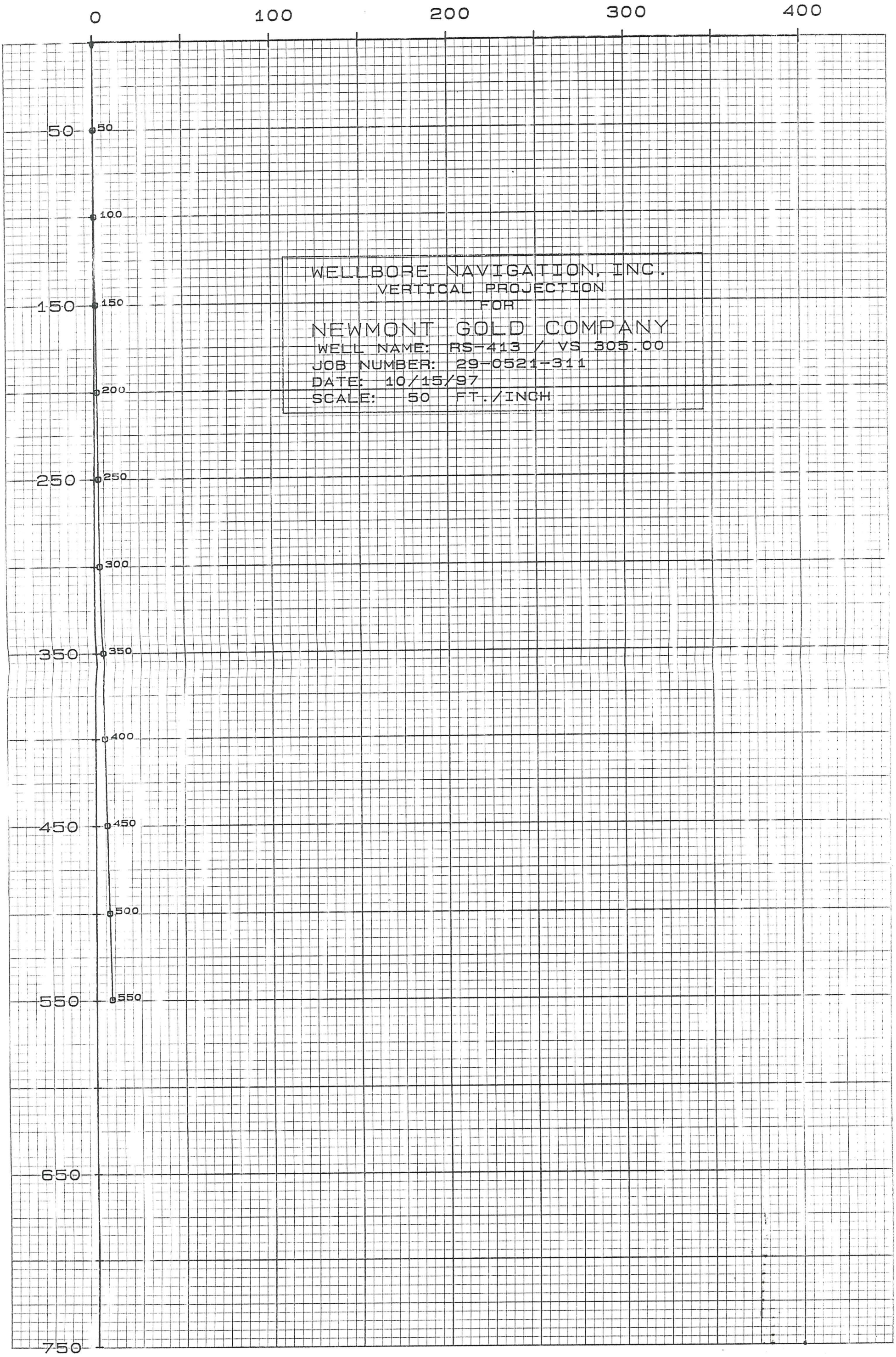

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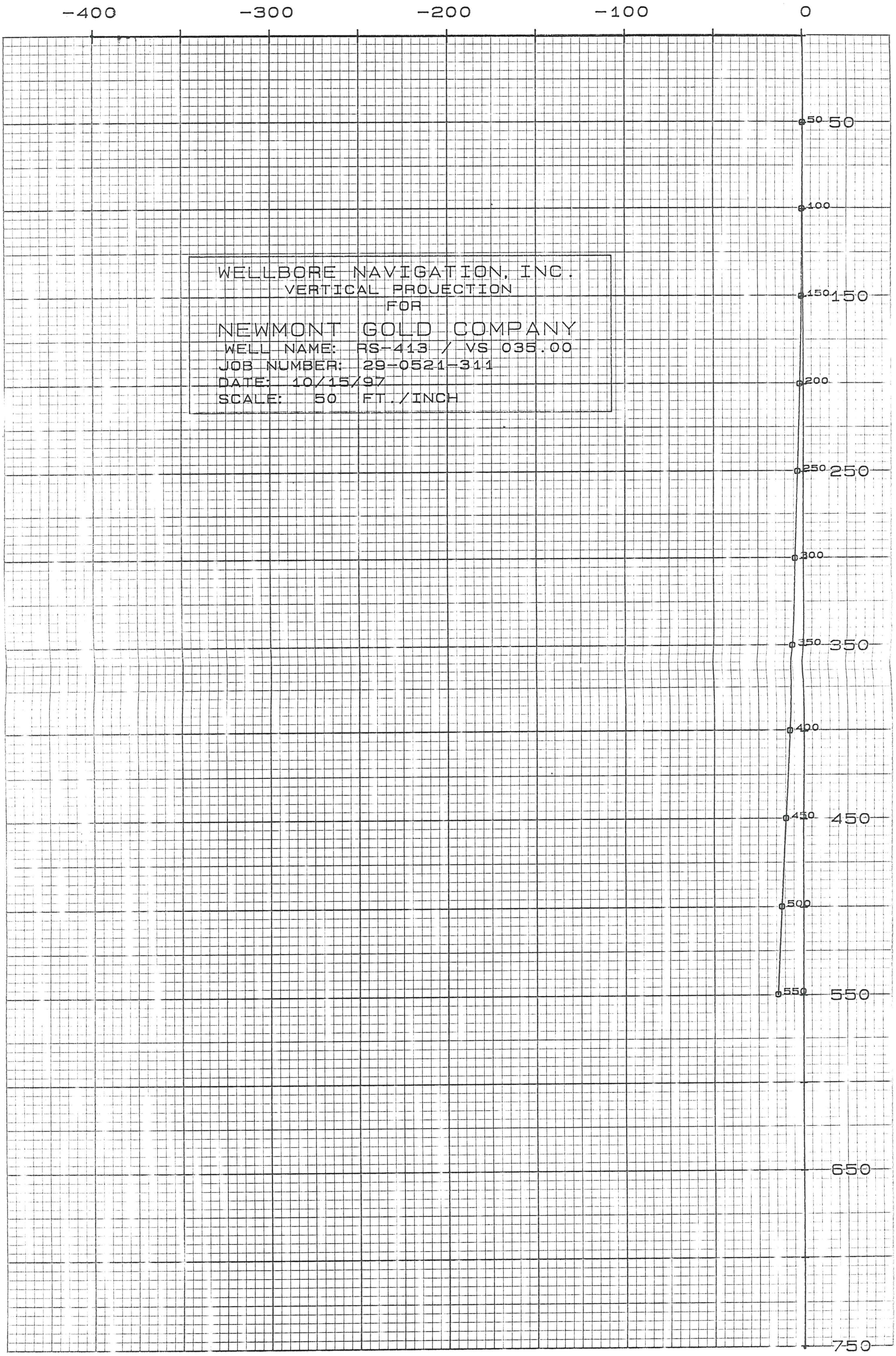

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

****
* NEWMONT EXPLORATION LTD. *
****

JOB NUMBER: 29-0521-311

WELL NAME: RS-414

LOCATION: ROSEBUD MINE

SURVEY DATE: 11/20/97

SURVEY ENGINEER: VERN REID

GYRO REFERENCE BEARING: 270.00

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

COMMENTS: ** BOART LONGYEAR **
***** MIKE JEX *****
**** MIKE PENTZ ****
PROJECTED F/826' T/850'.

****
****
*** 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: 29-0521-311 WELL NAME: RS-414

INRUN SURVEY
BY MINIMUM CURVATURE

MEAS. DEPTH	VERT. DEPTH	VERT. SECT.	L/R CLOS.	INCL HORZ	BEARING AZIMUTH	COORDINATES LATITUDE	COORDINATES DEPARTURE	D-LEG /100	D-LEG /CL	STATION DISP.	DISPLACEMENT DIRECTION	TEMP. DEG. F.
50.0	50.00	0.23	-0.019	-89.46	329.73	0.20 N	0.12 W	1.08	0.54	0.24	AT 329.73	053.78
100.0	100.00	0.69	-0.026	-89.50	337.73	0.61 N	0.32 W	0.17	0.08	0.69	AT 332.26	054.00
150.0	149.99	1.34	0.193	-88.89	359.52	1.30 N	0.41 W	1.34	0.67	1.36	AT 342.56	054.14
200.0	199.98	2.41	0.341	-88.56	329.18	2.32 N	0.73 W	1.48	0.74	2.43	AT 342.46	054.35
250.0	249.96	3.77	0.136	-88.28	323.07	3.46 N	1.51 W	0.65	0.33	3.77	AT 336.47	054.21
300.0	299.94	5.36	0.093	-88.03	341.38	4.87 N	2.23 W	1.27	0.64	5.36	AT 335.40	054.28
350.0	349.90	7.28	0.212	-87.56	335.15	6.65 N	2.95 W	1.05	0.53	7.28	AT 336.07	054.07
400.0	399.84	9.64	0.356	-87.01	340.13	8.85 N	3.84 W	1.20	0.60	9.64	AT 336.52	050.55
450.0	449.78	12.20	0.552	-87.09	337.37	11.24 N	4.77 W	0.33	0.16	12.21	AT 336.99	050.84
500.0	499.71	14.77	0.617	-87.01	334.38	13.59 N	5.83 W	0.35	0.17	14.79	AT 336.79	051.13
550.0	549.65	17.29	0.662	-87.22	336.52	15.88 N	6.87 W	0.47	0.24	17.30	AT 336.59	052.35
600.0	599.60	19.55	0.657	-87.59	331.70	17.92 N	7.86 W	0.86	0.43	19.56	AT 336.32	053.92
650.0	649.55	21.73	0.481	-87.39	328.02	19.81 N	8.96 W	0.51	0.26	21.74	AT 335.67	054.71
700.0	699.49	24.09	0.388	-87.18	335.95	21.90 N	10.06 W	0.86	0.43	24.10	AT 335.32	057.37
750.0	749.43	26.48	0.285	-87.33	327.70	24.00 N	11.18 W	0.84	0.42	26.48	AT 335.02	058.88
800.0	799.38	28.71	0.094	-87.53	331.48	25.93 N	12.32 W	0.52	0.26	28.71	AT 334.59	059.60
826.0	825.36	29.90	0.041	-87.24	332.10	26.98 N	12.88 W	1.12	0.29	29.90	AT 334.48	060.10
850.0	849.33	31.04	0.001	-87.28	332.78	28.00 N	13.41 W	0.22	0.05	31.04	AT 334.40	060.17

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*************************************************************
*                          ********                         *
*     THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF           *
*                          ********                         *
*  850.0 FEET EQUALS    31.04   FEET AT   334.40            *
*                          ********                         *
*************************************************************
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WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

****
* NEWMONT EXPLORATION LTD. *
****

JOB NUMBER: 29-0521-311

WELL NAME: RS-414 / VS 305.00

LOCATION: ROSEBUD MINE

SURVEY DATE: 11/20/97

SURVEY ENGINEER: VERN REID

GYRO REFERENCE BEARING: 270.00

VERTICAL SECTION CALCULATED IN A
PROPOSAL DIRECTION OF: 035.00

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

COMMENTS: ** BOART LONGYEAR **
***** MIKE JEX *****
**** MIKE PENTZ ****
PROJECTED F/826' T/850'.

****
****
*** 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: 29-0521-311 WELL NAME: RS-414 / 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	0.10	-0.214	-89.46	329.73	0.20 N	0.12 W	1.08	0.54	0.24	AT 329.73	053.78
100.0	100.00	0.32	-0.612	-89.50	337.73	0.61 N	0.32 W	0.17	0.08	0.69	AT 332.26	054.00
150.0	149.99	0.83	-1.076	-88.89	359.52	1.30 N	0.41 W	1.34	0.67	1.36	AT 342.56	054.14
200.0	199.98	1.48	-1.930	-88.56	329.18	2.32 N	0.73 W	1.48	0.74	2.43	AT 342.46	054.35
250.0	249.96	1.97	-3.217	-88.28	323.07	3.46 N	1.51 W	0.65	0.33	3.77	AT 336.47	054.21
300.0	299.94	2.71	-4.622	-88.03	341.38	4.87 N	2.23 W	1.27	0.64	5.36	AT 335.40	054.28
350.0	349.90	3.76	-6.234	-87.56	335.15	6.65 N	2.95 W	1.05	0.53	7.28	AT 336.07	054.07
400.0	399.84	5.04	-8.221	-87.01	340.13	8.85 N	3.84 W	1.20	0.60	9.64	AT 336.52	050.55
450.0	449.78	6.47	-10.360	-87.09	337.37	11.24 N	4.77 W	0.33	0.16	12.21	AT 336.99	050.84
500.0	499.71	7.79	-12.568	-87.01	334.38	13.59 N	5.83 W	0.35	0.17	14.79	AT 336.79	051.13
550.0	549.65	9.06	-14.738	-87.22	336.52	15.88 N	6.87 W	0.47	0.24	17.30	AT 336.59	052.35
600.0	599.60	10.17	-16.711	-87.59	331.70	17.92 N	7.86 W	0.86	0.43	19.56	AT 336.32	053.92
650.0	649.55	11.09	-18.698	-87.39	328.02	19.81 N	8.96 W	0.51	0.26	21.74	AT 335.67	054.71
700.0	699.49	12.17	-20.800	-87.18	335.95	21.90 N	10.06 W	0.86	0.43	24.10	AT 335.32	057.37
750.0	749.43	13.25	-22.930	-87.33	327.70	24.00 N	11.18 W	0.84	0.42	26.48	AT 335.02	058.88
800.0	799.38	14.18	-24.968	-87.53	331.48	25.93 N	12.32 W	0.52	0.26	28.71	AT 334.59	059.60
826.0	825.36	14.71	-26.027	-87.24	332.10	26.98 N	12.88 W	1.12	0.29	29.90	AT 334.48	060.10
850.0	849.33	15.24	-27.045	-87.28	332.78	28.00 N	13.41 W	0.22	0.05	31.04	AT 334.40	060.17

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*************************************************************
*                         ********                          *
*     THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF           *
*                         ********                          *
*  850.0 FEET EQUALS    31.04    FEET AT   334.40           *
*                         ********                          *
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WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

****
* NEWMONT EXPLORATION LTD. *
****

JOB NUMBER: 29-0521-311

WELL NAME: RS-414 / VS 035.00

LOCATION: ROSEBUD MINE

SURVEY DATE: 11/20/97

SURVEY ENGINEER: VERN REID

GYRO REFERENCE BEARING: 270.00

VERTICAL SECTION CALCULATED IN A
PROPOSAL DIRECTION OF: 125.00

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

COMMENTS: ** BOART LONGYEAR **
***** MIKE JEX *****
**** MIKE PENTZ ****
PROJECTED F/826' T/850'.

****
****
*** 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: 29-0521-311 WELL NAME: RS-414 / VS 035.00

INRUN SURVEY
BY MINIMUM CURVATURE

MEAS. DEPTH	VERT. DEPTH	VERT. SECT.	L/R PROP.	INCL HORZ	BEARING AZIMUTH	COORDINATES LATITUDE	COORDINATES DEPARTURE	D-LEG /100	D-LEG /CL	STATION DISP.	DISPLACEMENT DIRECTION	TEMP. DEG. F.
50.0	50.00	-0.21	-0.099	-89.46	329.73	0.20 N	0.12 W	1.08	0.54	0.24	AT 329.73	053.78
100.0	100.00	-0.61	-0.315	-89.50	337.73	0.61 N	0.32 W	0.17	0.08	0.69	AT 332.26	054.00
150.0	149.99	-1.08	-0.827	-88.89	359.52	1.30 N	0.41 W	1.34	0.67	1.36	AT 342.56	054.14
200.0	199.98	-1.93	-1.479	-88.56	329.18	2.32 N	0.73 W	1.48	0.74	2.43	AT 342.46	054.35
250.0	249.96	-3.22	-1.969	-88.28	323.07	3.46 N	1.51 W	0.65	0.33	3.77	AT 336.47	054.21
300.0	299.94	-4.62	-2.712	-88.03	341.38	4.87 N	2.23 W	1.27	0.64	5.36	AT 335.40	054.28
350.0	349.90	-6.23	-3.756	-87.56	335.15	6.65 N	2.95 W	1.05	0.53	7.28	AT 336.07	054.07
400.0	399.84	-8.22	-5.041	-87.01	340.13	8.85 N	3.84 W	1.20	0.60	9.64	AT 336.52	050.55
450.0	449.78	-10.36	-6.471	-87.09	337.37	11.24 N	4.77 W	0.33	0.16	12.21	AT 336.99	050.84
500.0	499.71	-12.57	-7.790	-87.01	334.38	13.59 N	5.83 W	0.35	0.17	14.79	AT 336.79	051.13
550.0	549.65	-14.74	-9.064	-87.22	336.52	15.88 N	6.87 W	0.47	0.24	17.30	AT 336.59	052.35
600.0	599.60	-16.71	-10.170	-87.59	331.70	17.92 N	7.86 W	0.86	0.43	19.56	AT 336.32	053.92
650.0	649.55	-18.70	-11.088	-87.39	328.02	19.81 N	8.96 W	0.51	0.26	21.74	AT 335.67	054.71
700.0	699.49	-20.80	-12.165	-87.18	335.95	21.90 N	10.06 W	0.86	0.43	24.10	AT 335.32	057.37
750.0	749.43	-22.93	-13.247	-87.33	327.70	24.00 N	11.18 W	0.84	0.42	26.48	AT 335.02	058.88
800.0	799.38	-24.97	-14.177	-87.53	331.48	25.93 N	12.32 W	0.52	0.26	28.71	AT 334.59	059.60
826.0	825.36	-26.03	-14.712	-87.24	332.10	26.98 N	12.88 W	1.12	0.29	29.90	AT 334.48	060.10
850.0	849.33	-27.05	-15.241	-87.28	332.78	28.00 N	13.41 W	0.22	0.05	31.04	AT 334.40	060.17

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*************************************************************
*                         ********                          *
*      THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF          *
*                         ********                          *
*   850.0 FEET EQUALS     31.04    FEET AT   334.40         *
*                         ********                          *
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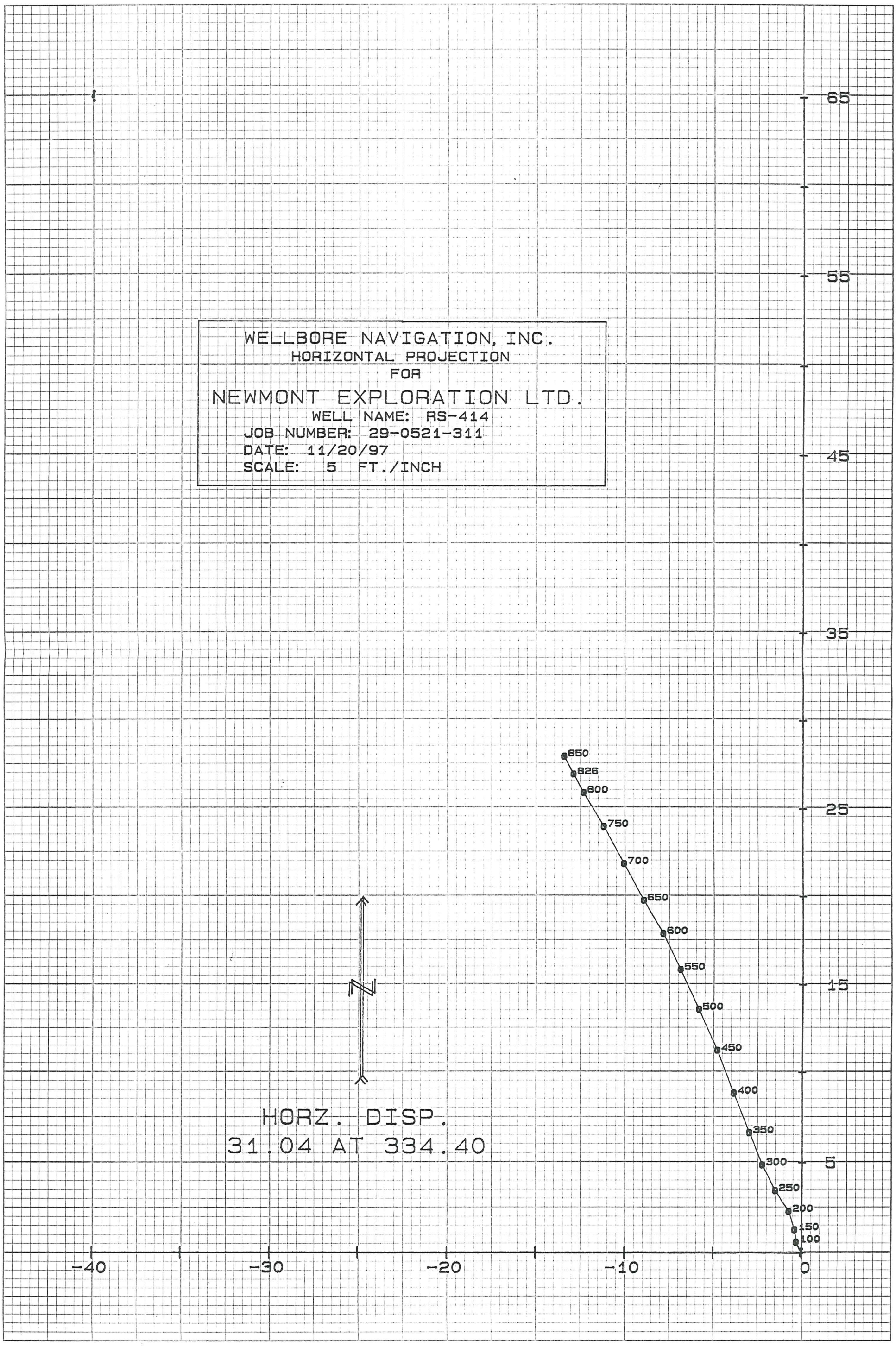
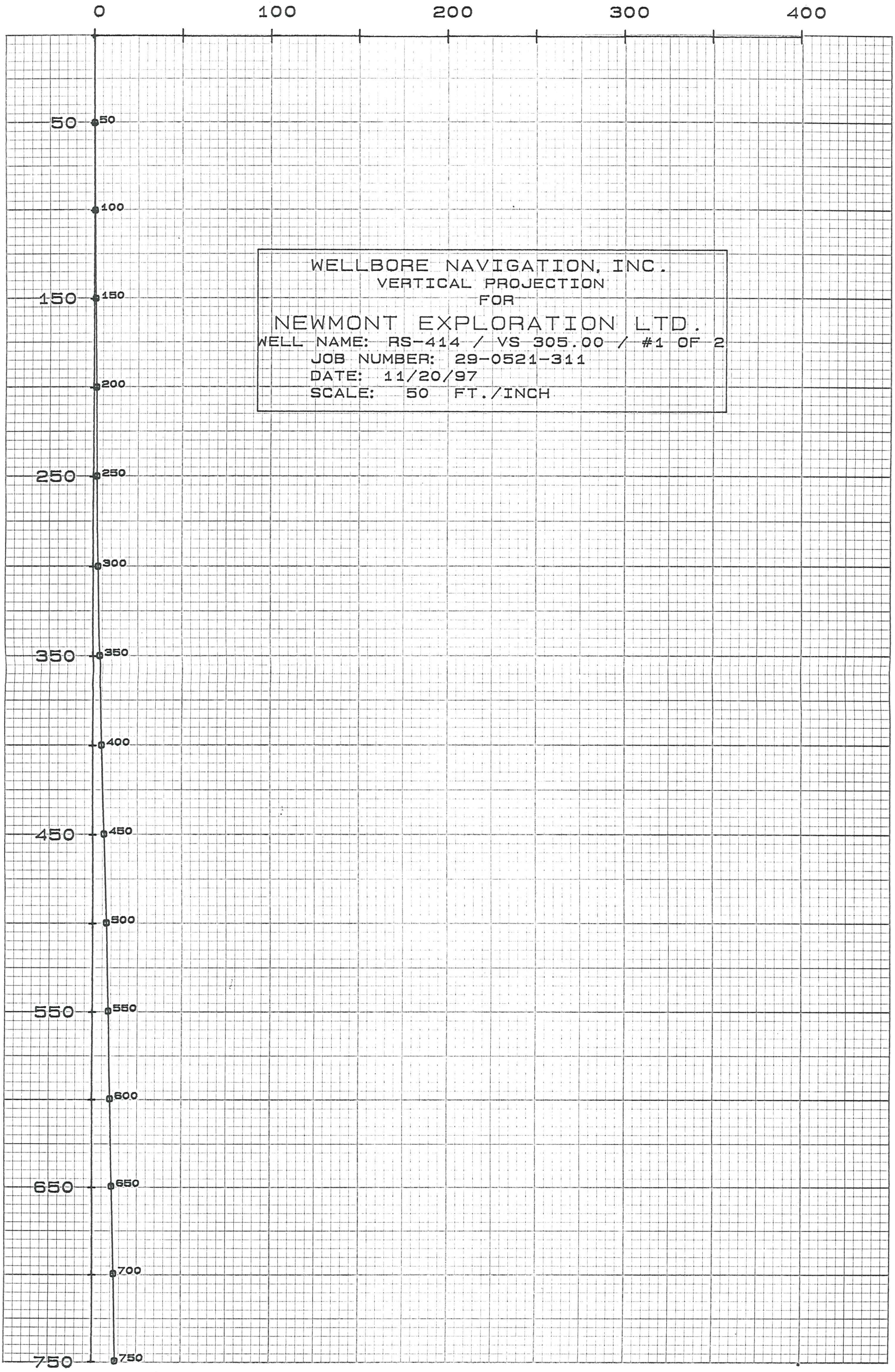
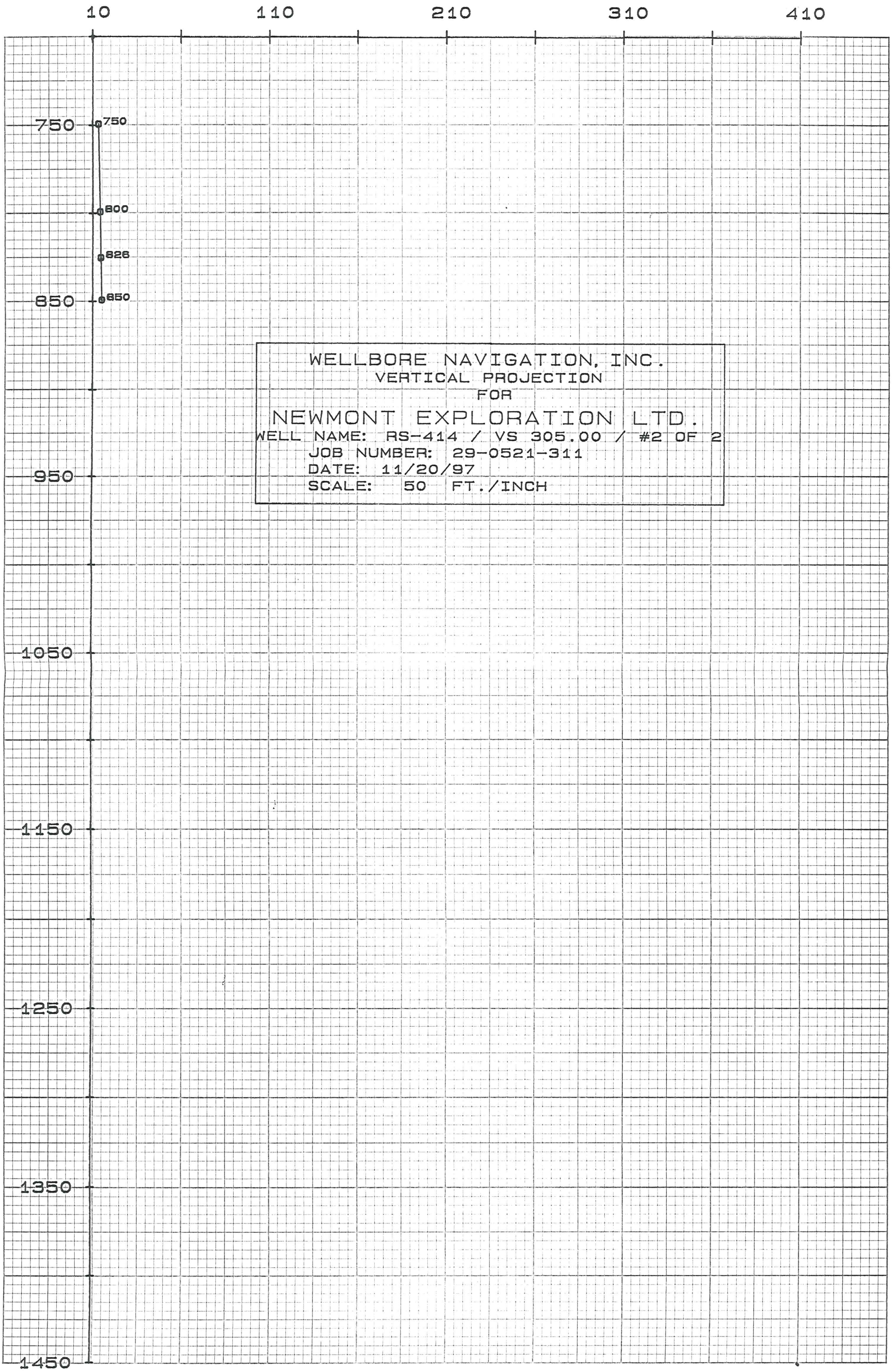
STRAIGHT PRINTING (801) 467-2841



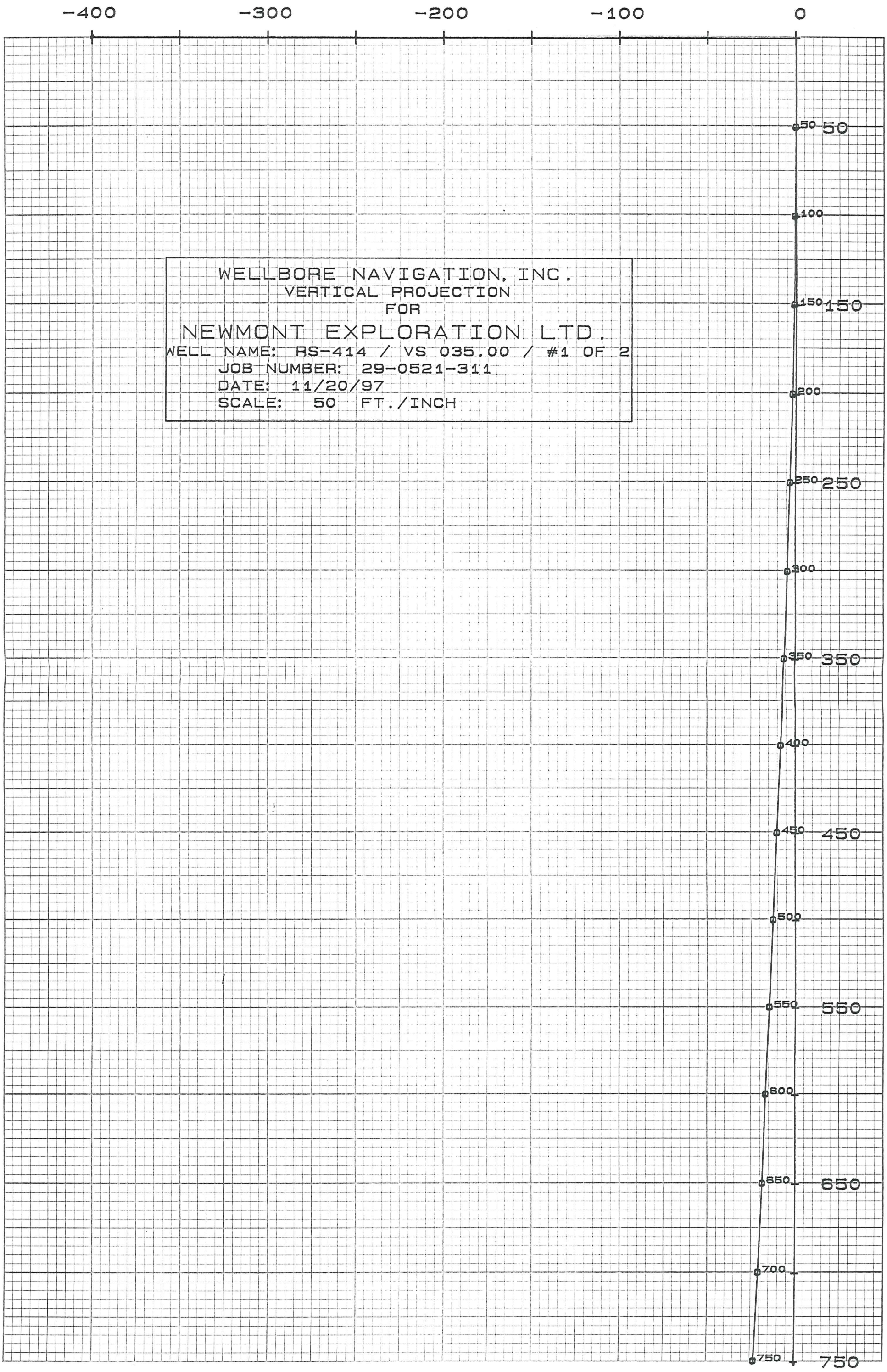
STANDARD PRINTING (801) 467-2841



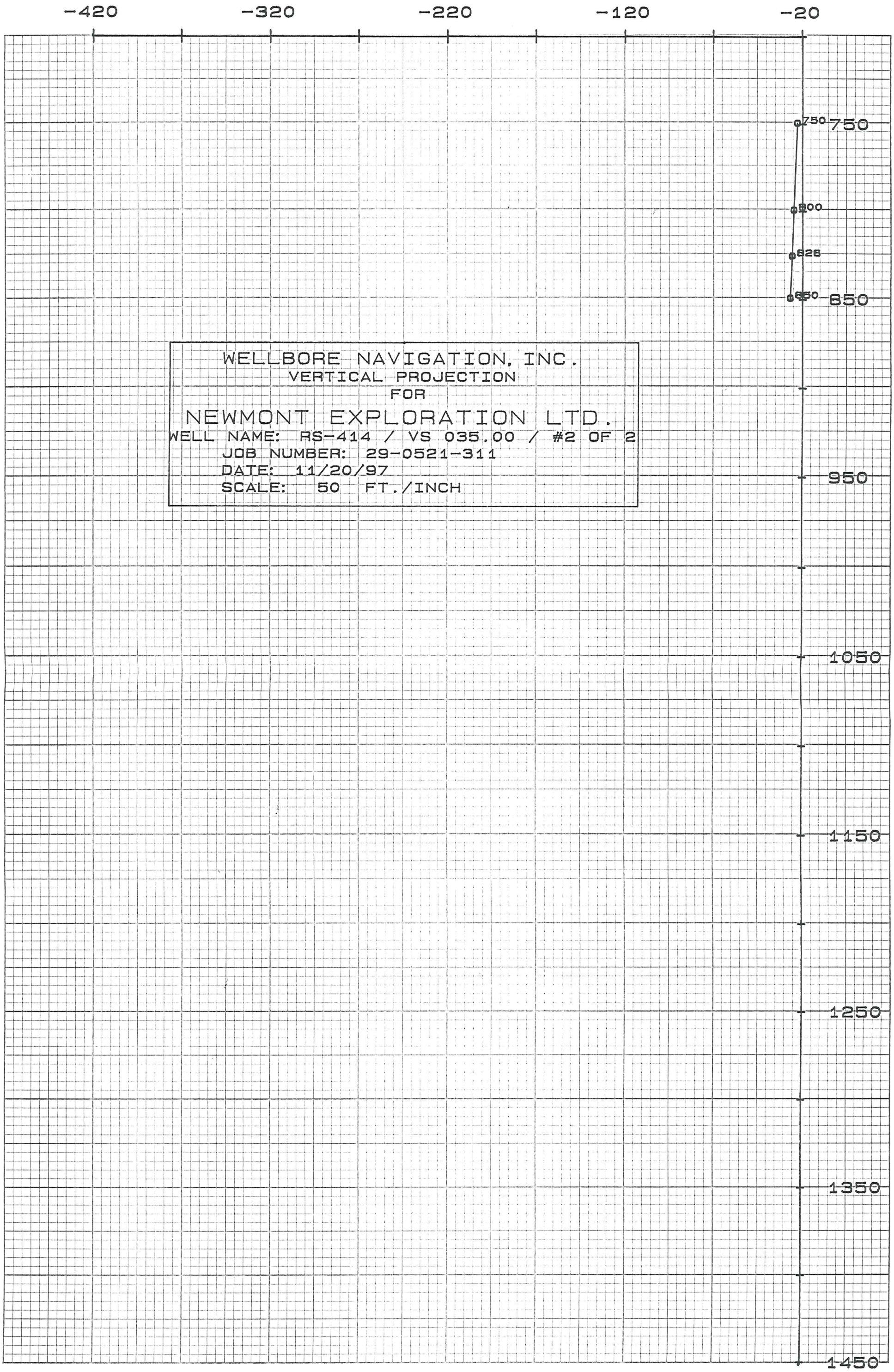
CARLSON PRINTING (801) 467-2841



STARLIGHT PRINTING (801) 467-2841



STAR DRILLING (801) 467-2841



Hecla MINING COMPANY

ROSEBUD PROJECT DRILL LOG

HOLE NUMBER RS-414
PAGE 1 OF 3
DATE 6-29-98
LOGGED BY BLC
TOTAL DEPTH 550'

LOCATION
NORTHING
EASTING
ELEVATION
AZIMUTH
INCLINATION

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

FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE	ALTERATION: SILICIFICATION 5%	SILICIFICATION 15%	SILICIFICATION +25%	SILICIFICATION MATRIX %	SILICIFICATION CLASTS %	ARGILLIC 5%	ARGILLIC 15%	ARGILLIC +25%	ARGILLIC TYPE	PROPYLITIC % CHLORITE	PROPYLITIC % CALCITE	POTASSIC % K-SPAR	POTASSIC % ALUNITE	OXIDATION 5%	OXIDATION 15%	OXIDATION +25%	VIENING %	VIENING TYPE	MINERALIZATION: SULFIDES 5%	SULFIDES 15%	SULFIDES +25%	PY %	CPY %	MAR %	K-SUL %	SLEBNITE %	BARITE %	METALLURGY: OXIDE	SULF	CARBON	MOISTURE	ANALYTICAL DATA: FROM	TO	W	Au	Ag
		Coll	Colluvium																		X																				
																					X																				
20																					X																				
		T.C.F.G	Chocolate Fm. - fine grained																		X																				
																					X																				
40																					X																				
																					X																				
60																					X																				
																					X																				
80																					X																				
																					X																				
100																					X																				
																					X																				
120																			X																						
																			X																						
140																																									
160																			X																						
																				X																				
																					X																				
180																					X																				
																					X																				

Hecla MINING COMPANY

ROSEBUD PROJECT
DRILL LOG

HOLE NUMBER RS-414
PAGE 2 OF 3
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 % COLORE	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-SUL %	SULFATE %	BARITE %	METALLURGY: OXIDE	SULF	CARBON	MOISTURE	ANALYTICAL DATA: FROM	TO	W	Au	Ag
		TCFG																			X																				
																					X																				
220																				X																					
																			X																						
240																																									
																			X																						
260																																									
		TCLLT	Chocolate Fm Bxa																	X																					
																					X																				
280																				X																					
																			X																						
300																				X																					
																				X																					
320																				X																					
																				X																					
340			Bxa gets more prevalent here--this may be contact																	X																					
																				X																					
360																				X																					
																				X																					
380																				X																					

Hecla MINING COMPANY

ROSEBUD PROJECT
DRILL LOG

HOLE NUMBER RS-414
PAGE 3 OF 3
DATE
LOGGED BY
TOTAL DEPTH

LOCATION
NORTHING
EASTING
ELEVATION
AZIMUTH
INCLINATION

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

FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE	ALTERATION																		MINERALIZATION									METALLURGY				ANALYTICAL DATA				
						SILICIFICATION					ARGILLIC				PROPYLITIC %		POTASSIC %		OXIDATION			VIENING		SULFIDES			PY	CPY	MAR	AS-SUL	STIBNITE	BARITE	OXIDE	SULF	CARBON	MOISTURE	FROM	TO	W	AU	AG
						5%	15%	+25%	MATRIX %	CLASTS %	5%	15%	+25%	TYPE	CHLORITE	CALCITE	K-SPAR	ALUNITE	5%	15%	+25%	%	TYPE	5%	15%	+25%	%	%	%	%	%	%										
		TCLLT																		X																						
																				X																						
120																				X																						
																				X																						
140																				X																						
																				X																						
160																					X																					
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180																					X																					
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																					X																					
220																					X																					
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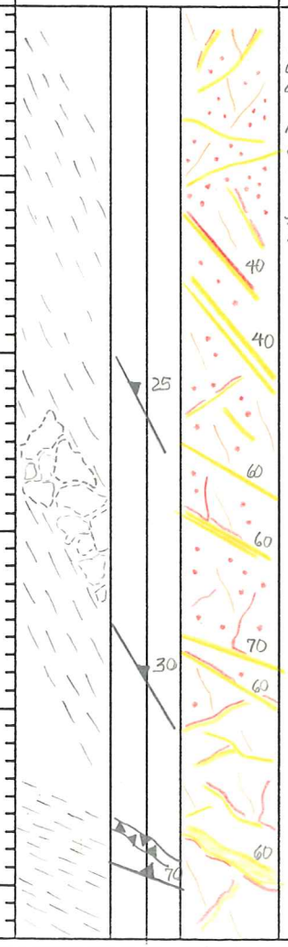
240																					X																					
																					X																					
260																																										

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

Hecla MINING COMPANY

ROSEBUD PROJECT
DIAMOND DRILL LOG

HOLE NUMBER	RS-414	LOCATION		REMARKS	
PAGE	1 OF 5	NORTHING			
DATE	11/25/97	EASTING			
LOGGED BY	HBM	ELEVATION			
SCALE	1" = 10'	AZIMUTH			
TOTAL DEPTH	850'	INCLINATION			

REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
550.0-609.6? FG PINK PORPHYRY (BRADY ANDESITE EQUIVALENT)		550.0-609.6': FINE-GRAINED PALE GRAY-PINK 'PORPHYRY.' STRONG FLOW BANDING COMMON, BUT NOT CONTINUOUS AND QUITE VARIABLE IN ATTITUDE. FLOW BANDING TENDS TO BE ABSENT IN AUTOBRECCIA'D ZONES. 576-580': PSEUDOBRECCIA TEXTURE IN WALLROCK.	550.0 560 570 580 590 600		SPARSE JOINTS COMMONLY OCCUR WITH LATE, WHT, OPAQUE QUARTZ VEINS. THIS EPISODE OF QUARTZ IS VUGGY/LEACHED, OPAQUE, & WHT & IS LESS ASSOC'D WITH SULFIDE DEPOSITION. 560-~590': 'FLOW' FOLIATN AT LO ∠ TO CA.	FROM 550': MODERATE TO STR. IRREGULAR QUARTZ VEINING COMMONLY WITH MARCASITE. LATE WHITE CLAY IN VUGS, & LINING OPEN VEINS. PERVASIVE ALTERATION IN THE FG PINK PORPHYRY: WK TO MODERATE BLEACHING, OTHERWISE ABSENT. THE PALE FLESHY PINK GROUNDMASS IS LACED W/ RED-BRN WISPY VNLTS. THESE STOCKWK VEINS ARE XCUT BY LATER SILICA MARCASITE. DISSEMINATED BRASSY PYRITE & MEDALLIONS OF DENSER BRASSY PYRITE ARE COMMON IN THIS WALLROCK & OVERPRINT HmOx STKWK. ~595': SILICA-MARCASITE VEIN DENSITY DECREASES FROM MOD/STR TO WK/MOD.

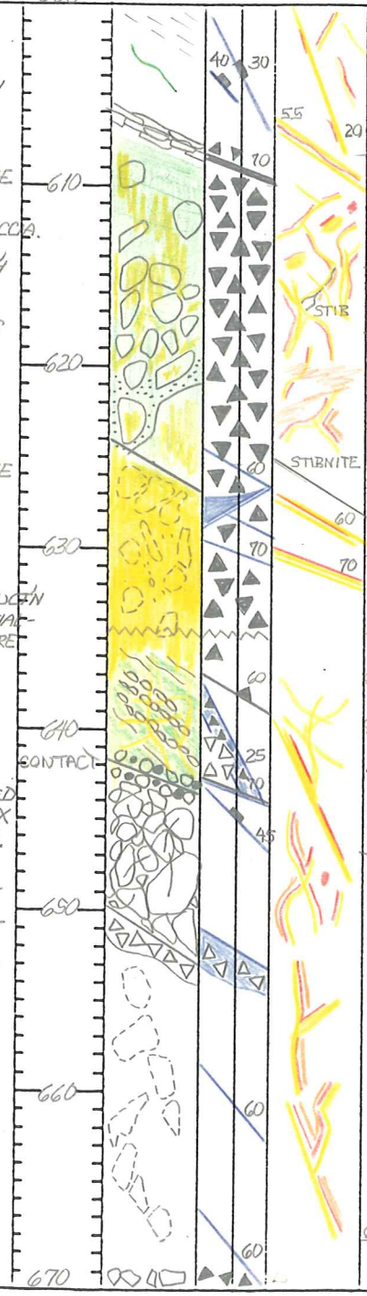
ANALYTICAL DATA

FROM	TO	W	Au	Ag	Au2	Ag2
550.0	554.7		<	.004		
554.7	560.0		.002	.05		
560.0	564.7		.002	.09		
564.7	570.0		.003	.05		
570.0	575.0		.006	.06		
575.0	580.2		.012	.08		
580.2	585.3		.003	.07		
585.3	589.4		.007	.09		
589.4	595.3		.003	.08		
595.3	600.3		.002	.07		

HOLE NUMBER RS-44 PAGE 2 OF 5

SEC	RQD	LITHOLOGY
FROM 550.0 FG PINK PORPHYRY TO 609.4'		608.7-609.4: TIGHTLY PACKED CRACKLE BRECCIA IN FG PINK PORPHYRY WITH A FABRIC AT HIGH ANGLE TO CORE AXIS, // FAULT ZONE CONTACT.
609.4'-634.6' SOUTH RIDGE FAULT UNCERTAIN PROTOLITH		609.4': BEGINNING OF DISRUPTED ROCK IN/NEAR SOUTH RIDGE FAULT ZONE. 609.4-625.4': MILLED LOCALLY, IRREGULAR, GREEN FAULT BRECCIA. THIS APPEARS TO BE PRIMARILY COMMINUTED FG PINK PORPHYRY WHICH HAS BEEN OVERPRINTED BY: 1ST, GREEN CLAY +/- CHLORITE AND THEN BY 2ND, VERY LOCALIZED SPOTTY SILICA +/- MARCASITE. THE ORIGINAL ROCK TEXTURE IS OBSCURED BY THE ALTERATION, BUT LARGER FRAGMENTS FROM 622.8'-625.4' RETAIN THE APPEARANCE OF FG PINK PORPHYRY. 625.4'-629.7: STRONGLY SILICIFIED TEXTURE-DESTROYED FAULT ZONE. SILICA COMPLETELY FLODDS & OVERPRINTS THE GREEN CLAY ALTERED BRECCIA ABOVE. 629.7-634.6: CONTINUE STRONG/INTENSE SILICA FLODDING BUT WITH LESS SULFIDE DISSEMINATION AND TEXTURE DESTROYED. THE ORIGINAL BRECCIA TEXTURE IS RETAINED, AT LEAST PARTIALLY. SMALL 1-2" DIA. HIGHLY CRACKLED DOZER FRAGMENTS ARE VISIBLE IN SILICA FROM ~628.5' & FORM A MOSAIC/RUBBLE BXA IN SILICIFIED RK FLOUR MATRIX FROM 629.7'.
634.6'-643.4' Tos		634.6-643.4': GREEN Tos SLIVER. HIGHLY SHEARED & DISRUPTED TO 636.5'. SURGE TUFF TEXTURE IS ONLY CLEAR FROM 636.5'-638.5'. PARTIALLY OBSCURED BY SILICA.
643.4'- TD	DOZER	643.4': FAULTED Tos-DOZER CONTACT AT 70° TO C/A. UNHEALED RUBBLE BELOW SILICA-HEALED, WEAKLY MILLED DOZER BX AT 643.0', CONTAINING PY-SHOT PEBBLE-SIZED FRAGMENTS. 643.4-652.3': PALE BUFF COMPLETELY UNSILICIFIED DOZER. WELL-DEVELOPED PERLITIC DEVITRIFICATION CREATES AN INITIAL PSEUDOBXA. OVERPRINTED BY MODERATE SILICA-PYRITE VEINING. 652.3-654.8': 2NDARY SPLAY? BUFF-GRY GOUGE ZONE W/IN DOZER 654.8'- : LESS PERLITIC BUFF-GRY DOZER.

FT



STRUCTURE
609.4-643.4: SOUTH RIDGE FAULT ZONE. 609.4-625.4': TEXTURE-DESTROYED, ALTERED FLT BRECCIA. PROBABLY CATACLASTIZED & LOCALLY MYLONITIZED & THEN RE-BRECCIATED. FROM ~615': CLAY ALTERED SHEARED FRAGMENTS FORM MOSAIC BRECCIA CEMENTED WITH SILICA. OPEN SPACE IS FILLED WITH LATER OPAQUE WHT QZ WHT CLAY & STIBNITE. TO ~620'. FROM 620': RED-BRN RK FLOUR MATRIX & LARGE 4-18", FG PORPHYRY, SUB-ROUNDED FRAGMENTS. 625.4'-634.6: SILICA-FLOODED FAULT BX. 625.9': MINOR GOUGE 634.6-643.4': SHEAR FABRIC +/- BEDDING(?) // TO SOUTH RIDGE FAULT. 643.0-643.4': ABRUPT TRANSITION FROM SILICA HEALED TO COMPLETELY UNHEALED TO RUBBLE. 652.3-654.8': FAULT GOUGE 669.3-673.4' CRACKLE BXA IN DOZER

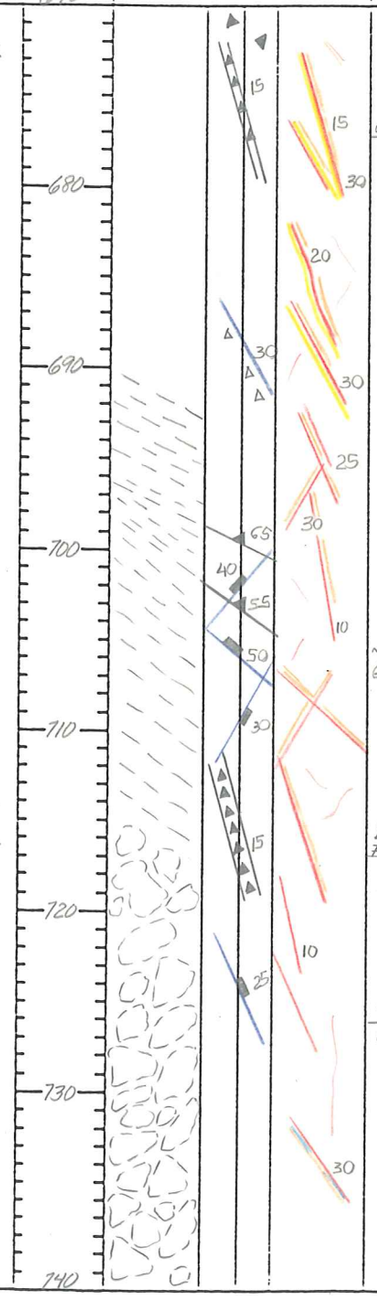
ALTERATION AND MINERALIZATION
609.4'-625.4': BRECCIA STR'LY ALTERED TO WAXY GREEN CLAY +/- CHLORITE. SILICIFICATION IS SPOTTY, BLEBBY & VEIN-CONTROLLED. IN FACT SILICA +/- MARCASITE IS PRESENT PRIMARILY AS GRAYISH TRANSLUSCENT VNS X-CUTTING CLAYSHOT BRECCIA 612.0'-613.5'; DK GRY SULFOSALT? 617.4-619.8': NEEDLE-LIKE SPRAYS OF STIBNITE IN OPEN-SPACE IN DRUSY QZ CEMENTED BX. 625.4'-629.7: INTENSE SILICA FLODDING; ASSOCIATD VFG DK GRY SULFIDE DARKENS THE SILICA HERE. GRN CLAY COLOR GONE BY ~627'. 629.7-634.6': STR/INTENSE PERVASIVE SILICIFICATION/BUFF DOZER FRAGMTS LESS SILICIFIED THAN FLOODED ROCK FLOUR MATRIX. VNLT & MATRIX BLADED MARCASITE 634.6-643.4': SILICIFICATION OVERPRINT ON GRN/WHT CLAY DECREASES DOWNHOLE, GRAD'L FROM PERVASIVE TO VEIN-LIKE. 643.4'-652.3': WKLY BLCH'D? MOD. SILICA-MARCASITE VNS, MOD/WK SPOTTING OF FINELY DISSEMINATED BRASSY PYRITE 654.8'- : CONTINUED MOD-WK SILICA-MARCASITE VNING.

ANALYTICAL DATA

FROM	TO	W	Au	Ag	Au2	Ag2
600.3	604.8		.002	.05		
604.8	609.4		.004	3.50		
609.4	611.8		.024	.48		
611.8	614.7		.011	.65		
614.7	617.4		.009	.45		
617.4	621.2		.004	.56		
621.2	625.4		.003	.53		
625.4	627.5		.013	11.34		
627.5	629.7		.016	9.25		
629.7	634.6		.029	9.98		
634.6	639.3		.015	.11		
639.3	643.4		.370	.11	.400	
643.4	647.8		.069	.40	.074	
647.8	652.3		.114	1.05	.120	
654.8	654.8		.123	.85	.111	
654.9	659.0		.094	.25	.106	
659.0	664.0		.022	.16		
664.0	669.4		.036	.18		

HOLE NUMBER RS-4A PAGE 3 OF 5

REC	RQD	LITHOLOGY	STRUCTURE	ALTERATION AND MINERALIZATION
693.3'	T_D	654.8'- : BUFF-GRY DECREASINGLY DISRUPTED DOZER. 669.4'- ~674': CRACKLE BXA IN DOZER WITH MARCASITE + QZ + LATE WHITE CLAY MATRIX. 676'- 689.5': DECREASING CRACKLE BRECCIA OVERPRINT A/O AUTOBRECCIA FROM 689.5': FAIRLY UNDISTURBED BUFF-GRY DOZER WITH CONSISTENT FLOW BANDING, BELOW A WEAKLY SHEARED CLAY-MARCASITE VNLT. SILICA CONTENT OF THESE VEINS HAS BEEN DECREASING FROM ~685'. 715': ~2' WIDE MONOLITHIC DOZER MOSAIC BRECCIA VEIN CORED WITH A HAIRLINE MARCASITE (PY?) VNLT. DOZER IS DOMINANTLY AUTOBRECCIATED BELOW 715'. IT CONTINUES TO BE PALE BUFF-GRY. ~730-740': WK AUTOBXAT'N. LITTLE DISRUPTION. SOME FLOW BANDING.	672': TRACE CALCITE W/ WHT CLAY ~700': STRAIGHT FRAX (JNTS) GO FROM ABSENT → MOD. DOMINANTLY AUTO BXA BELOW BXA VN AT 715'. LOSE FOLIA 726': CALCITE W/ WHT CLAY +/- ESPECIALLY THE LARGER ONES	657.8'- : MODERATELY VNED & LOCALLY BRECCIATED BY QUARTZ + BLADED MARCASITE + LATER WHT CLAY. SOME OF THIS CLAY INFILL OF VUGS & VEIN OPEN SPACE IS RATHER HARD, & PROBABLY ∴ SILICEOUS. VEINLETS RANGE FROM STRAIGHT-WALLED TO VERY DIFFUSE OR IRREGULAR. MODERATE DISS'D L. Py ~685': DECREASING VEIN SILICA. 700': THIN PYRITE COATING ON FRAX & JNTS. WHT CLAY + MARCASITE VEINLETS DECREASE TO WK/SPARSE. 715': 2" WIDE MONOLITHIC DOZER CRACKLE BRECCIA VNLT CORED WITH A HAIRLINE MARCASITE VNLT. MARCASITE IN VNLTS,



ANALYTICAL DATA

FROM	TO	W	Au	Ag	Au2	Ag2
669.4	673.7		.097	.53	.095	
673.7	677.6		.144	.16	.136	
677.6	681.3		.094	.50	.114	
681.3	684.5		.098	.16	.106	
684.5	688.2		.050	.33	.054	
688.2	693.4		.081	.22	.100	
693.4	698.1		.041	.09		
698.1	703.5		.007	.09		
703.5	708.4		.002	.08		
708.4	713.2		.003	.08		
713.2	718.0		.088	5.09	.073	
718.0	722.9		.018	.31		
722.9	728.3		.037	.12		
728.3	733.3		.072	.10	.069	
733.3	738.1		.007	.08		

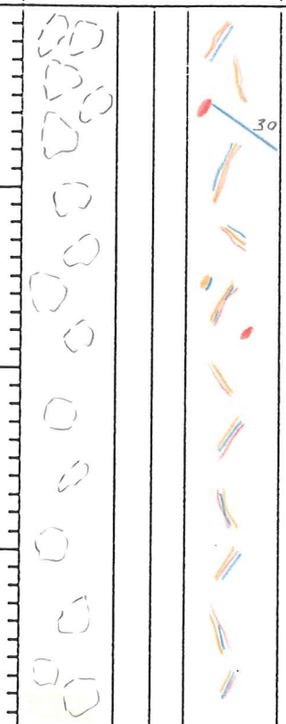
HOLE NUMBER RS-414 PAGE 4 OF 5

EC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
643.4'-850 TD		AUTOBRECCIATED FROM 715'. FROM ~744': DOZER AUTOBRECCIA IS WELL-DEVELOPED 755.7-759.7: WKLY CLAY ALTERED ZONE OF STRONGLY DEVELOPED AUTOBRECCIA. MATRIX IS RUDDY TAN ALTHOUGH FRAGMENTS ARE STILL BUFF-GRY-WHT. ROCK IS SLIGHTLY FRIABLE. 765.7-765.9': MINOR WKLY FRIABLE ALTERATION ZONE. AS DESCRIBED ABOVE. 781.4-783.8': WK SILICIFICATION(?) OF RK FLOUR AUTOBXA MATRIX IN & NEAR X-CUTTING JNTS. ~796.5-799.5': SHEARED ZONE WITH MYLONITIC FABRIC IN AUTOBRECCIATED DOZER. BELOW THIS ZONE DOZER AUTOBRECCIA TEXTURE CONTINUES AS DESCRIBED ABOVE. BRECCIA IS SOMEWHAT MORE COMMINUTED ~~AND~~ TO ABOUT 802' & IS MOSAIC TO CRACKLE BRECCIA W/O ANY MILLING BELOW 802'. FROM ~800-~810': POSSIBLY SHEAR RELATED FOLIATION FABRIC IN DOZER. CUT BY AUTOBRECCIA ∴ MAY BE OLDER, TRUE FLOW BANDING.	740 750 760 770 780 790 800 810	10 30 55 60 40 30 NOT IN PLACE 40 20 60 45	744': WELL-DEVELOPED AUTOBXA CRACKLE BXA. 755.0': WK MYLONITE VNLT ~ 1" WIDE. POSSIBLE SHEAR FABRIC.	FROM 740': CLAY + MARCASITE VEINLETS ARE SPARSE & THIN. SPARSE TO MODERATE ZONES & BLEBS OF DISSEMINATED Py 755.7-758.7 & 765.7-765.9: WK PERVASIVE CLAY ALT'N. TRACE GREEN CLAY PRIMARILY AS VEINLETS.

ANALYTICAL DATA

FROM	TO	W	Au	Ag	Au2	Ag2
738.1	743.9		.001	.06		
743.9	748.2		.002	.05		
748.2	751.5		.007	.08		
751.5	755.7		.141	.10	.130	
755.7	758.7		.052	.17	.055	
758.7	763.4		.035	.07		
763.4	768.6		.003	.10		
768.6	773.4		.002	.06		
773.4	778.4		<	.07		
778.4	781.4		.002	.50		
781.4	783.4		.040	7.23		
783.4	788.6		.050	.18	.050	
788.6	793.8		.106	.29	.120	
793.8	798.4		.022	.10		
798.4	803.4		.014	.07		
803.4	808.3		.035	.08	.041	

HOLE NUMBER RS-414 PAGE 5 OF 5

EC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
643.4 - 850' To		HARD MONOTONOUS STICK ROCK. DOZER CONTINUES AUTO-BRECCIATED TO T.D. PALEST BUFF TO GRN-GRY. AS DESCRIBED ON PREVIOUS PAGES. 839.5 - 840.5': HARD PINK MATRIXED BRECCIA. TEXTURALLY INDISTINGUISHABLE FROM THE MOSAIC AUTOBRECCIA SURROUNDING IT BUT RK FLOUR MATRIX IS BRIEFLY PINK.	810 820 830 840 850			CONTINUED WK TO MOD. WHT CLAY + MARCASITE +/- CALCITE VEINLETS, EVENLY DISPERSED W/O ANY PREFERED ORIENTATN. 815.7 - 816.0': VFG DULL BRASSY PYRITE IN AUTOBRECCIA MATRIX. BRECCIA MATRIX IS LARGELY FREE OF SULFIDE, EXCEPT WHERE OVERPRINTED BY FG ANHEDRAL BLEB THAT APPEAR JUST AS READILY IN FRAGMENTS. CALCITE IS V. CLOSELY ASSOCIATED WITH CHALKY WHT CLAY, & IS EXCLUSIVELY VEIN-CONTROLLED. PERVASIVE ARGILLIZATION = TRACE TO ABSENT.
		TD. 850'				

ANALYTICAL DATA

FROM	TO	W	Au	Ag	Au2	Ag2
808.3	813.6		.005	.06		
813.6	818.6		.020	.08		
818.6	823.8		.021	.08		
823.8	828.5		.035	.12		
828.5	833.3		.014	.13		
833.3	838.4		.009	.04		
838.4	843.6		.026	.09		
843.6	846.6		.013	.06		
846.6	850.0		.003	.08		

HECLA MINING COMPANY – ROSEBUD PROJECT
GEOTECHNICAL DRILL LOG

HOLE # RS-414 DATE: 11/25/97 LOGGED BY: RDM PAGE 1 OF

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)
550.	554.0	92.5	100	67.5										
554.0	560.0		116.7	86.7										
560.0	570.0	98.0	98.0	56.0										
570.0	576.5	92.3	92.3	60.0										
576.5	586.8	97.1	97.1	70.9										
586.8	597.0	93.1	96.1	49.0										
597.0	607.2	96.1	96.1	60.8										
607.2	617.4	98.0	98.0	49.0										
617.4	627.5	94.1	94.1	56.4										
627.5	636.5	77.8	100.0	53.3										
636.5	646.5	87.0	97.0	49.0										

HECLA MINING COMPANY – ROSEBUD PROJECT
GEOTECHNICAL DRILL LOG

HOLE # RS-414 DATE: 11/25/97 LOGGED BY: A&M PAGE 2 OF 3

DRILL RUN FROM	DRILL RUN TO	SOLID CORE RECOVERY (%)	TOTAL CORE RECOVERY (%)	RQD	ROCK STRENGTH DOWNHOLE DEPTH	ROCK STRENGTH POINT LOAD INDEX (psi)	FRACTURE DATA FRACTURE DENSITY/FT.	FRACTURE DATA AVG. ANGLE TO C.A.	FRACTURE DATA ROUGHNESS	FRACTURE DATA INFILL	DENSITY DATA DOWNHOLE DEPTH	DENSITY DATA SAMPLE WEIGHT (g)	DENSITY DATA DISPLACEMENT (cc)	DENSITY DATA DENSITY (g/cc)
646.5	655.0	75.3	100.0	56.5										
655.0	656.0	50.0	50.0	0										
656.0	666.0	99.0	99.0	87.0										
666.0	676.0	101.0	101.0	92.0										
676.0	686.0	96.5	96.5	94.1										
686.0	694.5	99.0	100.0	95.0										
694.5	704.8	94.2	94.2	74.8										
704.8	715.0	98.0	98.0	84.3										
715.0	724.7	100.0	100.0	80.4										
724.7	735.0	97.1	97.1	85.4										
735.0	745.2	97.1	97.1	97.1										

HECLA MINING COMPANY – ROSEBUD PROJECT
GEOTECHNICAL DRILL LOG

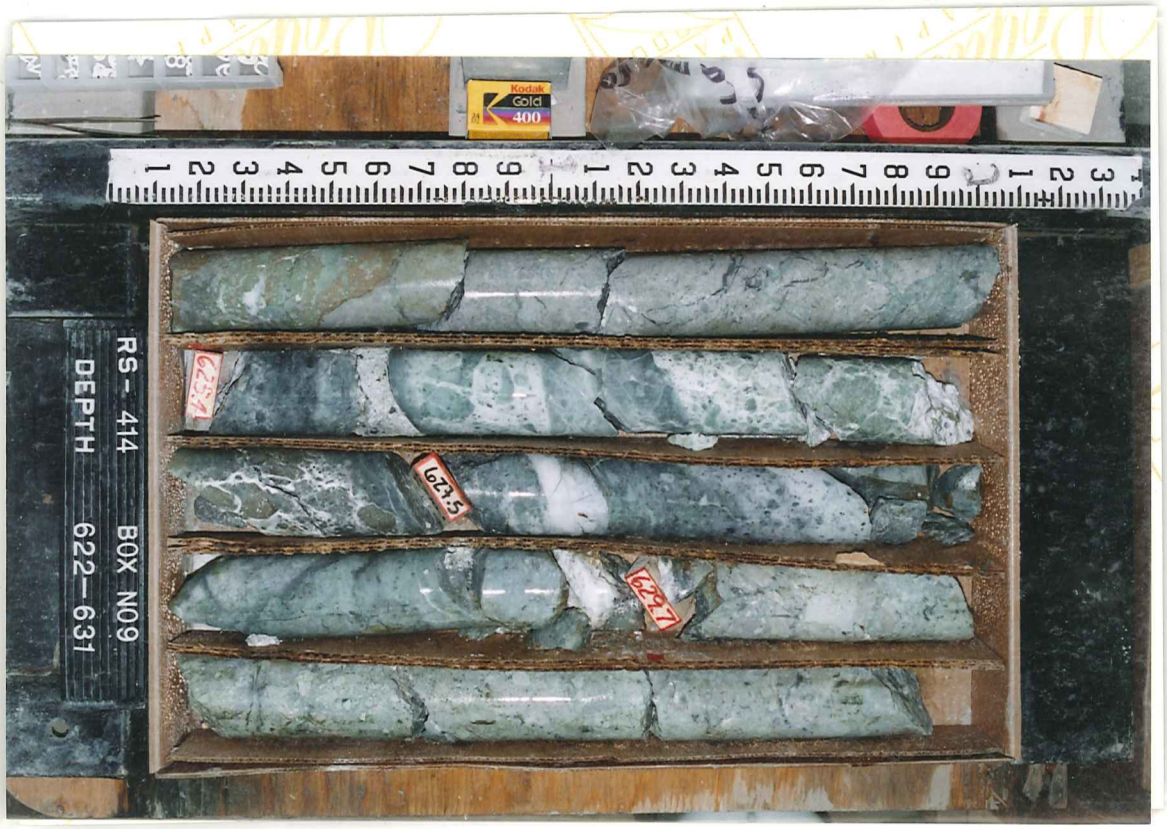
HOLE # RS-414 DATE: 12/1/97 LOGGED BY: [illegible] PAGE 3 OF 3

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)
745.2	755.5	99.0	99.0	96.1										
755.5	765.7	94.1	96.1	87.3										
765.7	776.0	96.1	96.1	91.3										
776.0	786.0	97.5	99.0	86.0										
786.0	796.0	100.0	100.0	100.0										
796.0	806.0	97.5	99.0	96.0										
806.0	816.0	99.0	99.0	99.0										
816.0	826.0	101.0	101.0	86.0										
826.0	836.0	99.0	99.0	93.0										
836.0	846.0	103.0	103.0	95.0										
846.0	850.0	95.0	95.0	95.0										

RS- 414 BOX NO 06
DEPTH 595-604

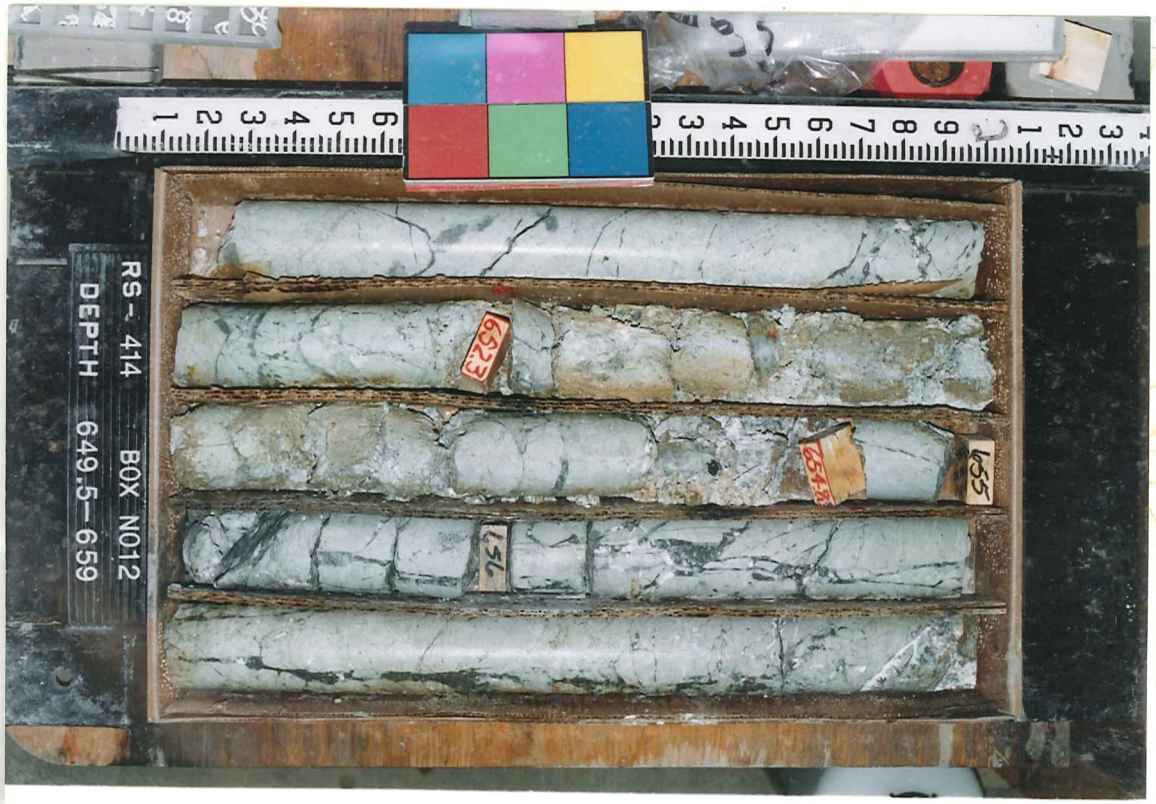
RS - 414 BOX NO 07
DEPTH 604-613
604.9
607.2
609.4
611.8

RS - 414 BOX NO 08
DEPTH 613-622
614.7
617.4
621.2


RS - 414 BOX NO9
DEPTH 622-631
622.4
623.5
627.7
Kodak
Gold
400

634.6
639.3
RS- 414 BOX N010
DEPTH 631-640

643.4
646.5
647.8
RS- 414 BOX N011
DEPTH 640-649.5


652.3
654.8
655
656
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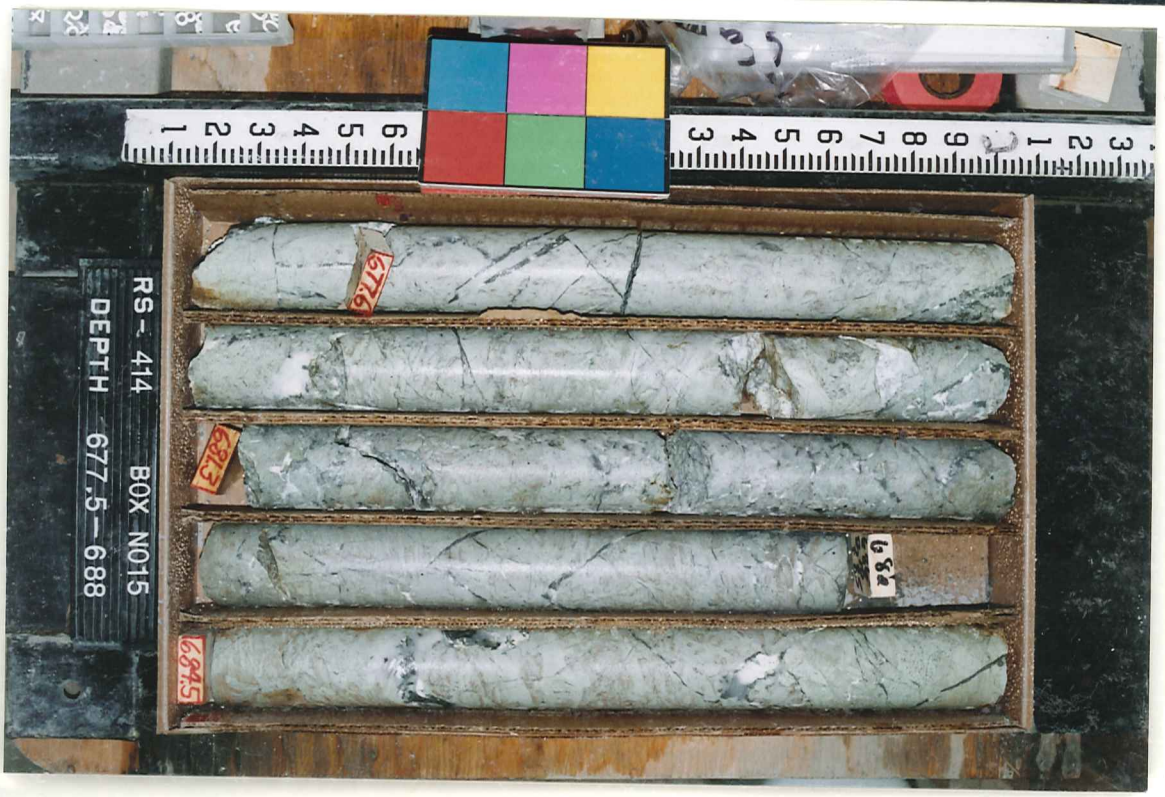
DEPTH 649.5-659

RS- 414 BOX N013
DEPTH 659-668.5

RS- 414 BOX N014
DEPTH 668.5-677.5

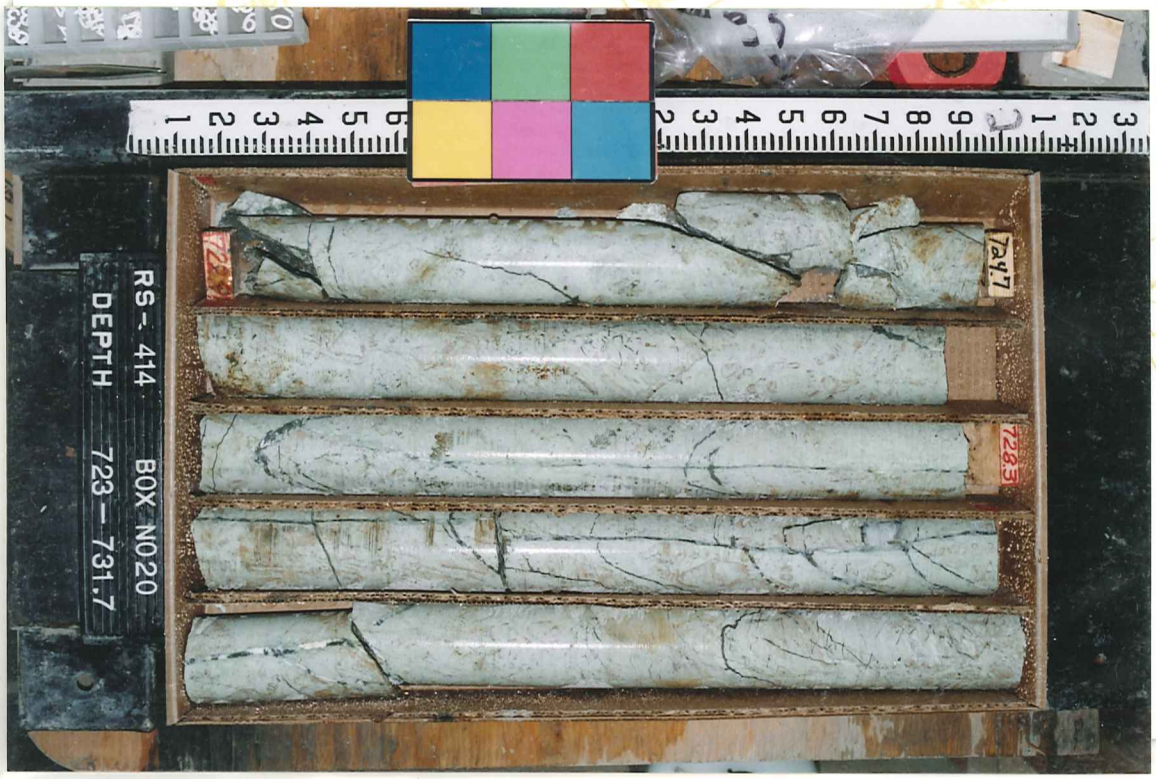

RS- 414 BOX N015
DEPTH 677.5-688

688.2
693.4
694.5
RS- 414 BOX N016
DEPTH 688-695.5

698.1
703.5
RS- 414 BOX N017
DEPTH 695.5-704.8

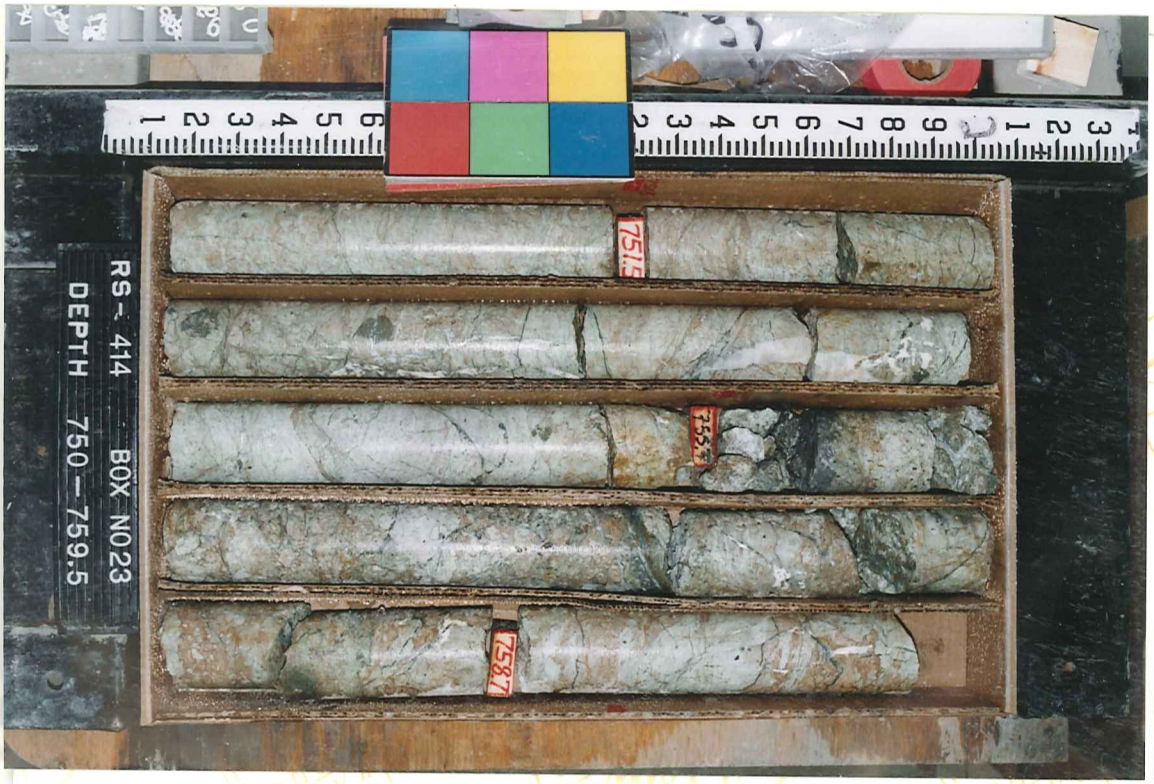
RS- 414 BOX N018
DEPTH 704.8- 713

RS- 414 BOX N019
DEPTH 712.5- 723


RS- 414 BOX N020
DEPTH 723- 731.7

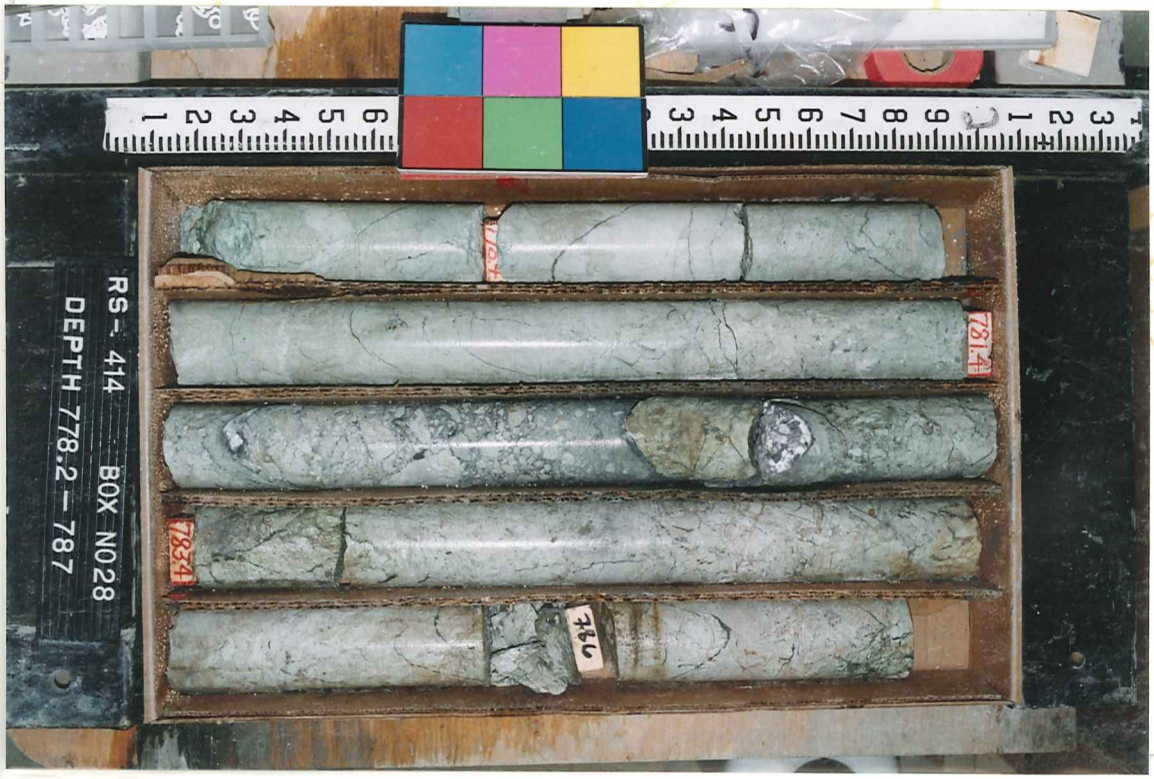
733.3
735
738.1
RS- 414 BOX NO21
DEPTH 731.7- 741

743.1
745.2
RS- 414 BOX NO22
DEPTH 741- 750


751.5
755.3
758.7
RS- 414 BOX NO23
DEPTH 750- 759.5

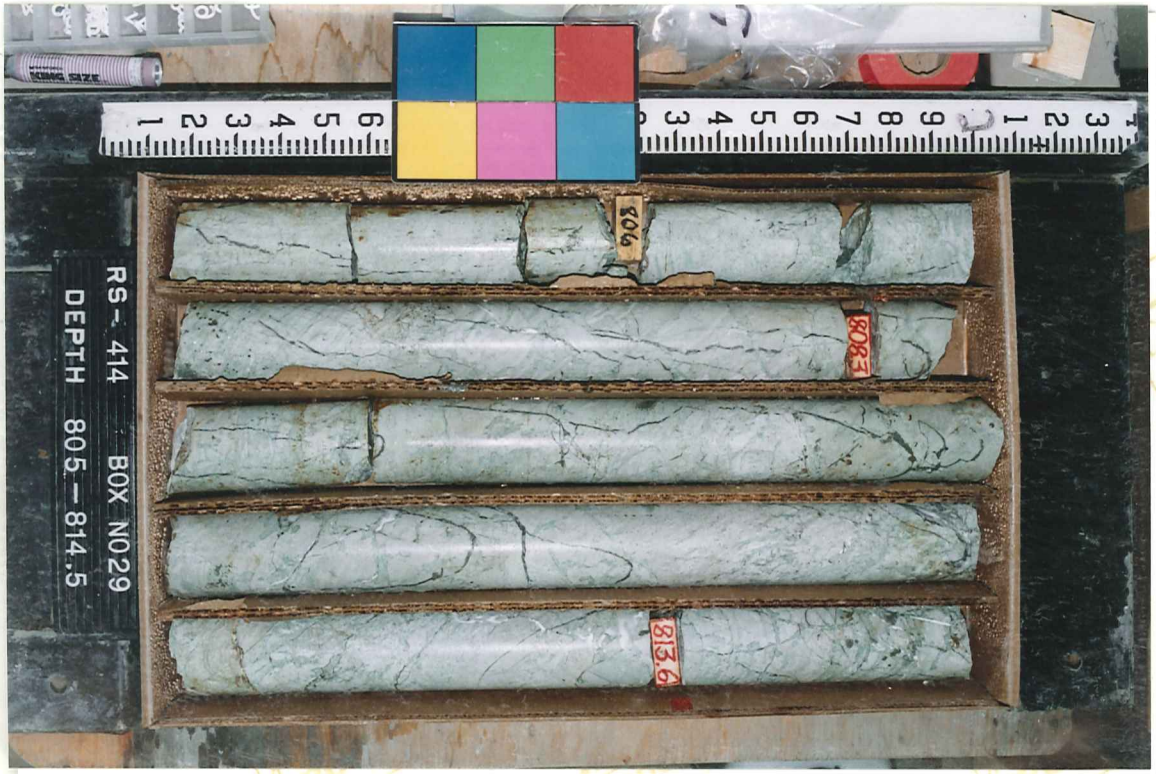
7634
7636
RS- 414 BOX N025
DEPTH 759.5 — 769

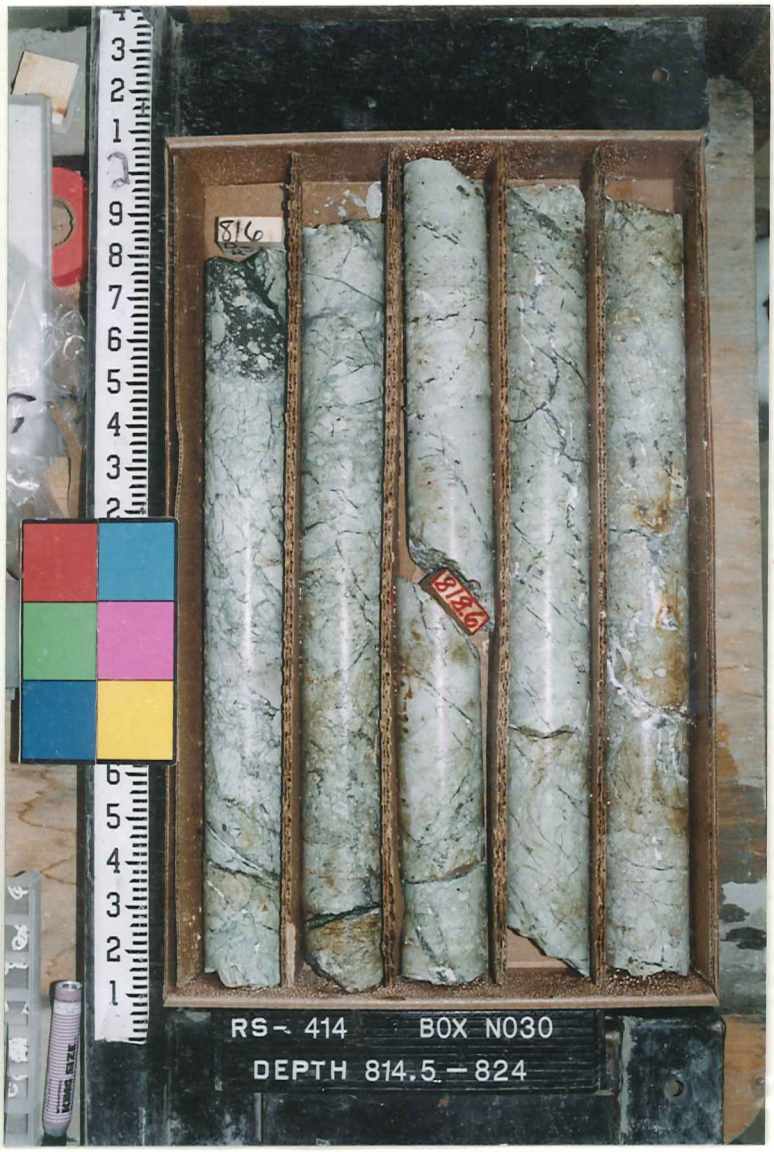
776
RS- 414 BOX N025
DEPTH 769 — 778.2


RS- 414 BOX N028
DEPTH 778.2 — 787
7834
786

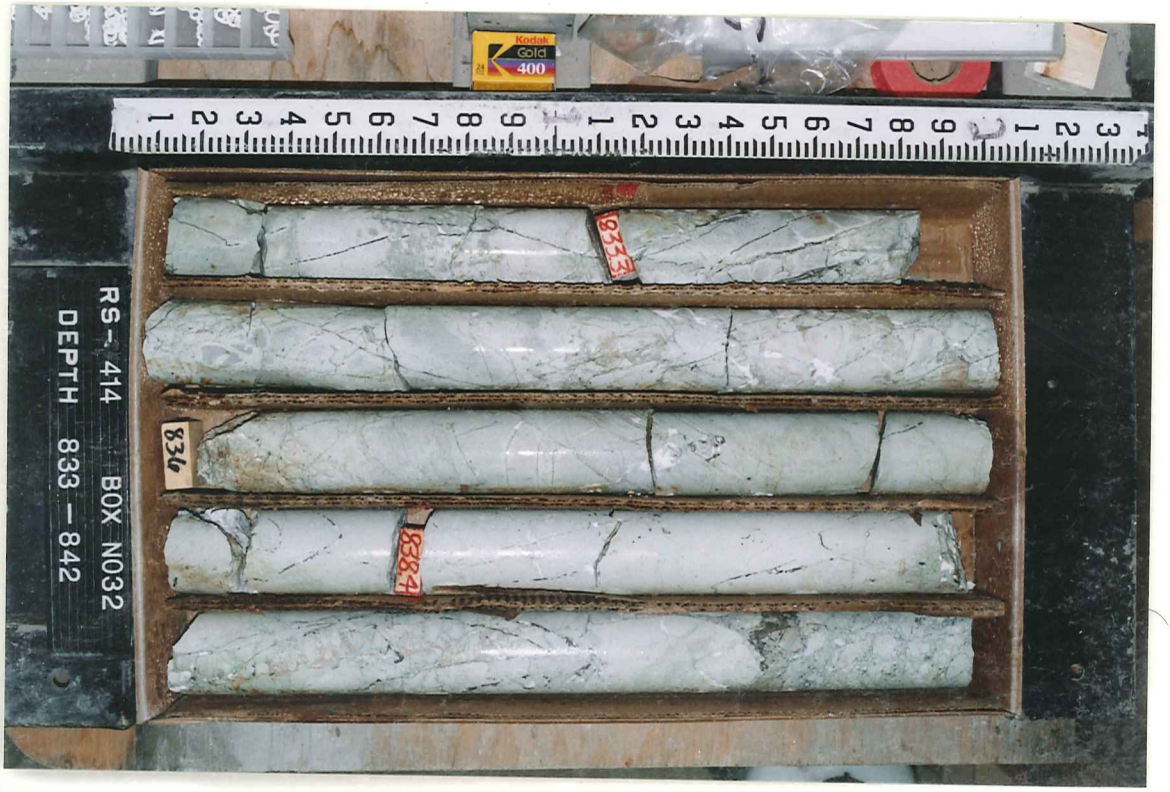
787.6
793.8
RS-414 BOX N028
DEPTH 787-796

796
798.4
803.4
RS-414 BOX N028
DEPTH 796-805


806
808.3
813.6
RS-414 BOX N029
DEPTH 805-814.5


816
818
RS- 414 BOX N030
DEPTH 814.5 – 824

826
823
RS- 414 BOX N031
DEPTH 824 – 833

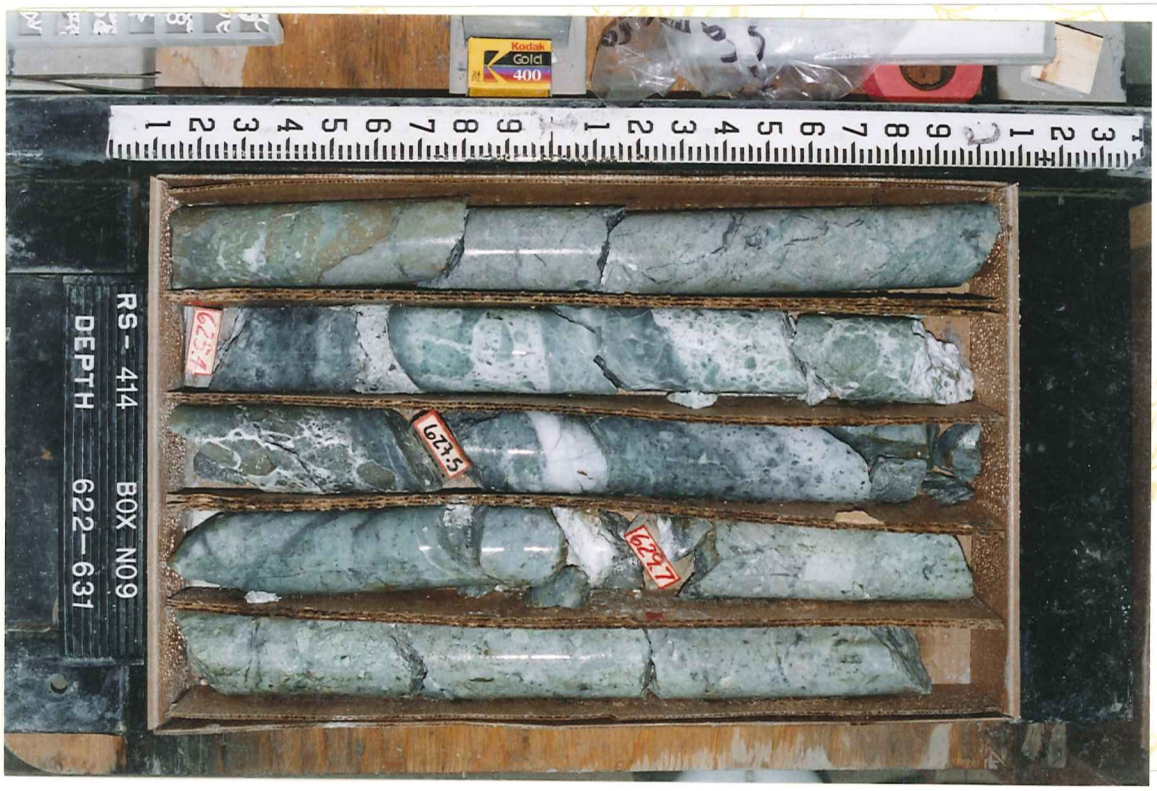

833
834
834
RS- 414 BOX N032
DEPTH 833 – 842

850
846
843.5
RS- 414 BOX N033
DEPTH 842 -850

RS- 414 BOX NO 06
DEPTH 595-604

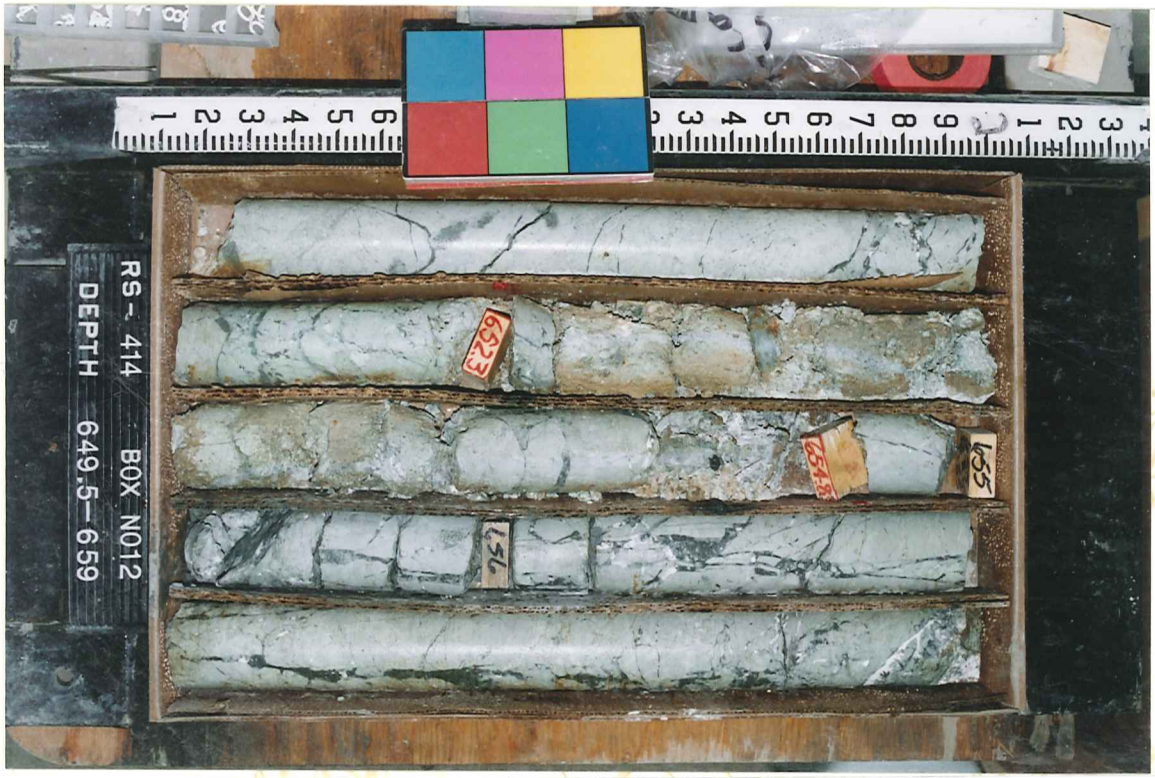
RS - 414 BOX NO 07
DEPTH 604-613
604.8
607.2
609.4
611.8

RS - 414 BOX NO 08
DEPTH 613-622
614.7
617.4
621.2


RS - 414 BOX NO9
DEPTH 622-631
623.4
625.5
629.7
Kodak
Gold
400

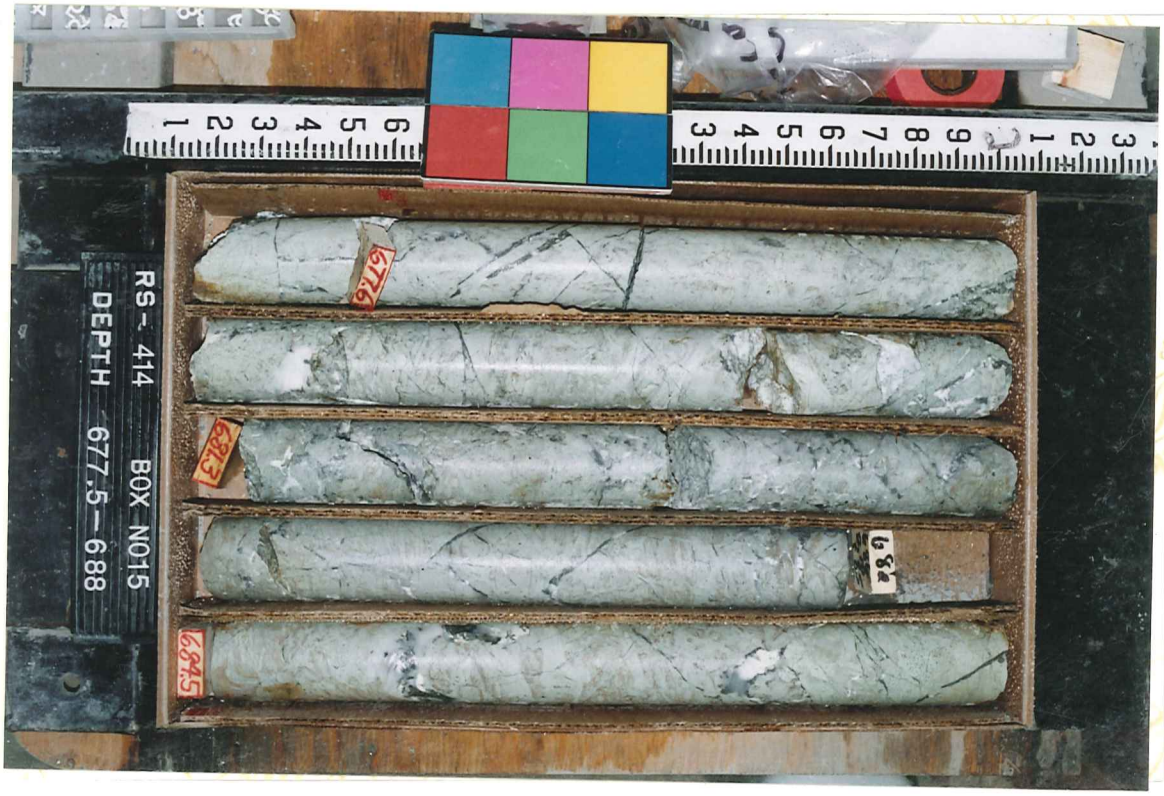
634.6
636.5
639.3
RS- 414 BOX N010
DEPTH 631-640

643.4
646.5
647.8
RS- 414 BOX N011
DEPTH 640-649.5


652.3
654.8
655
657
RS- 414 BOX N012
DEPTH 649.5-659

RS- 414 BOX N013
DEPTH 659-668.5
659.0
664.0
668.0

RS- 414 BOX N014
DEPTH 668.5-677.5
669.4
673.7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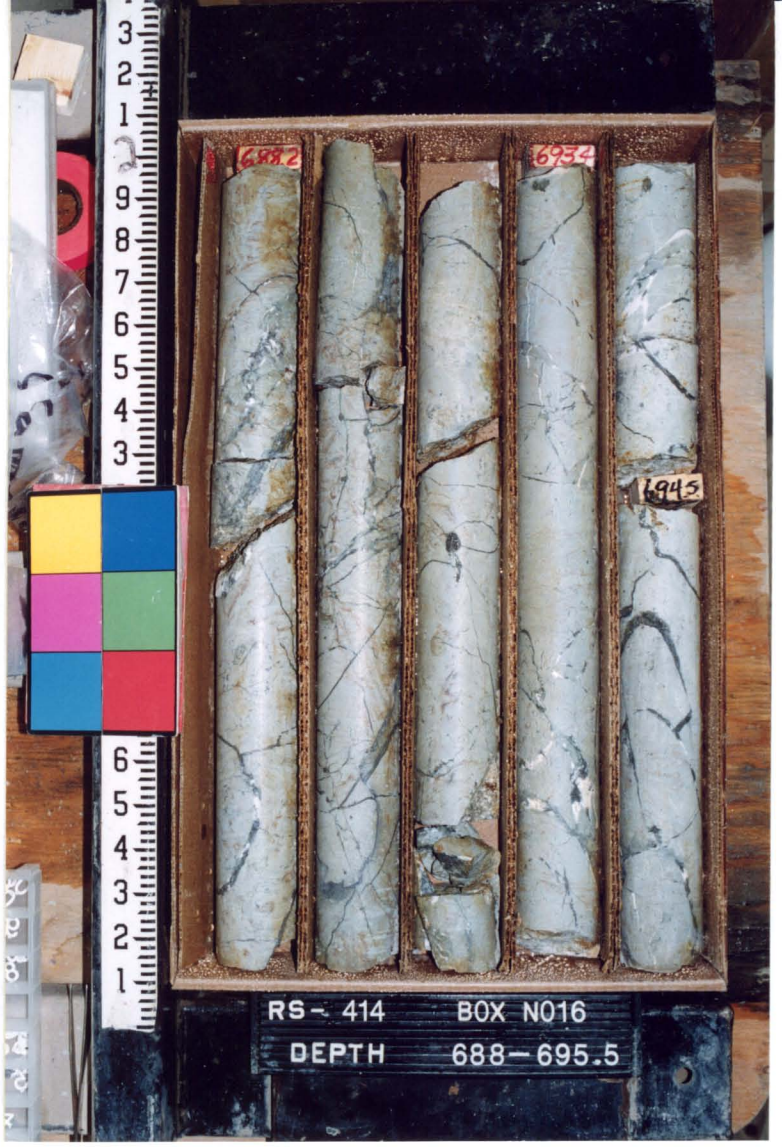
DEPTH 677.5-688
677.6
678.3
682
684.5

RS- 414 BOX N017
DEPTH 695.5-704.8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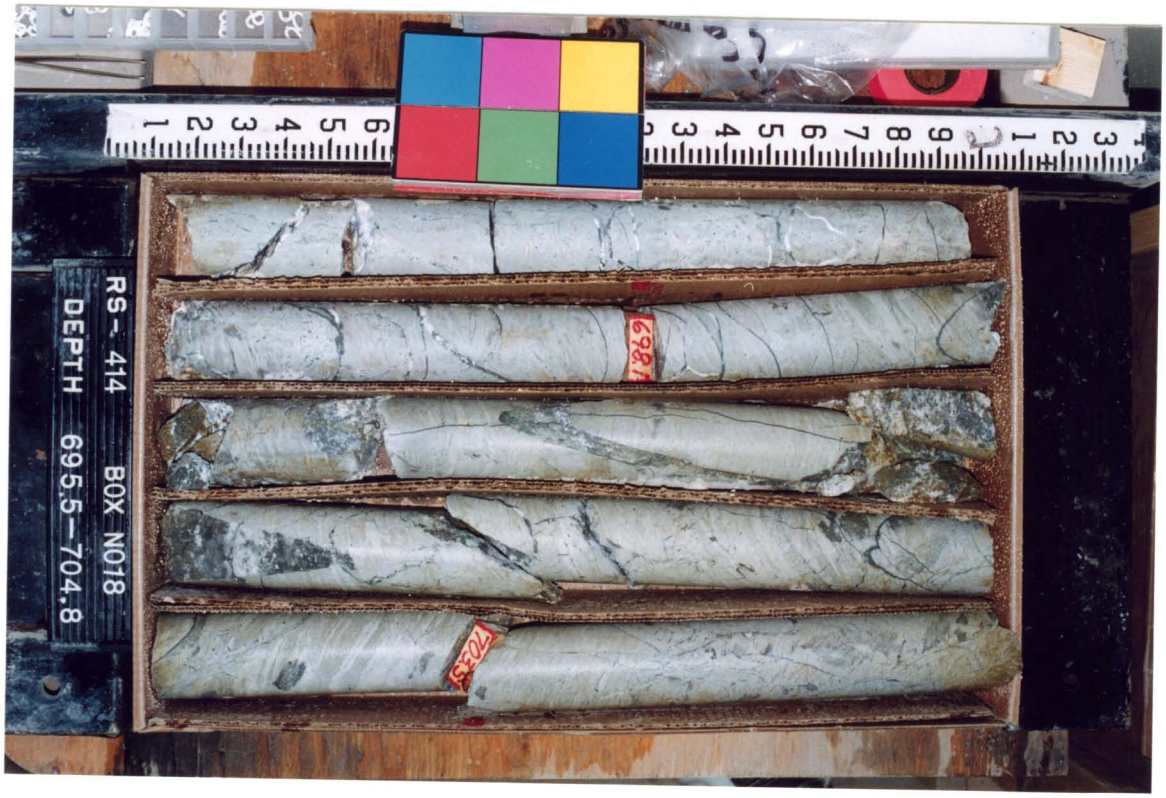
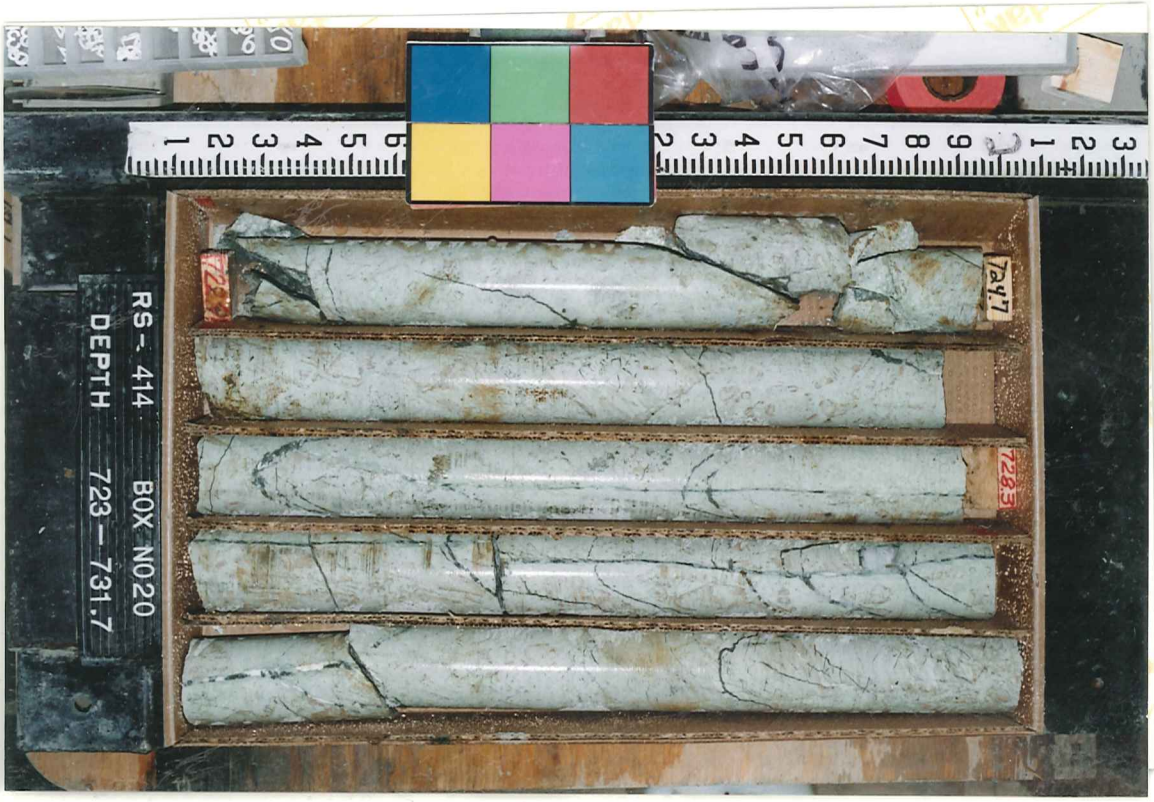
DEPTH 688-695.5

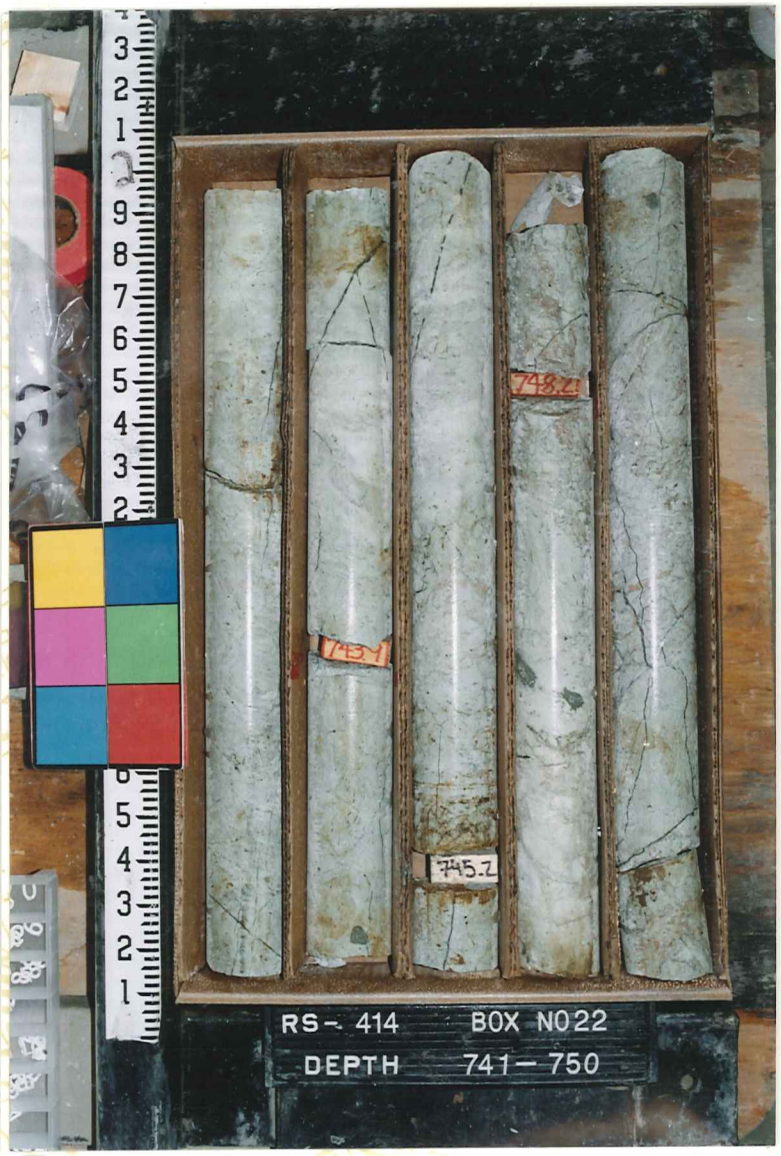

RS- 414 BOX N018
DEPTH 695.5-704.8

RS- 414 BOX N018
DEPTH 704.8- 713

RS- 414 BOX N019
DEPTH 712.5- 723


RS- 414 BOX N020
DEPTH 723- 731.7

733.3
735
738.1
RS- 414 BOX NO21
DEPTH 731.7- 741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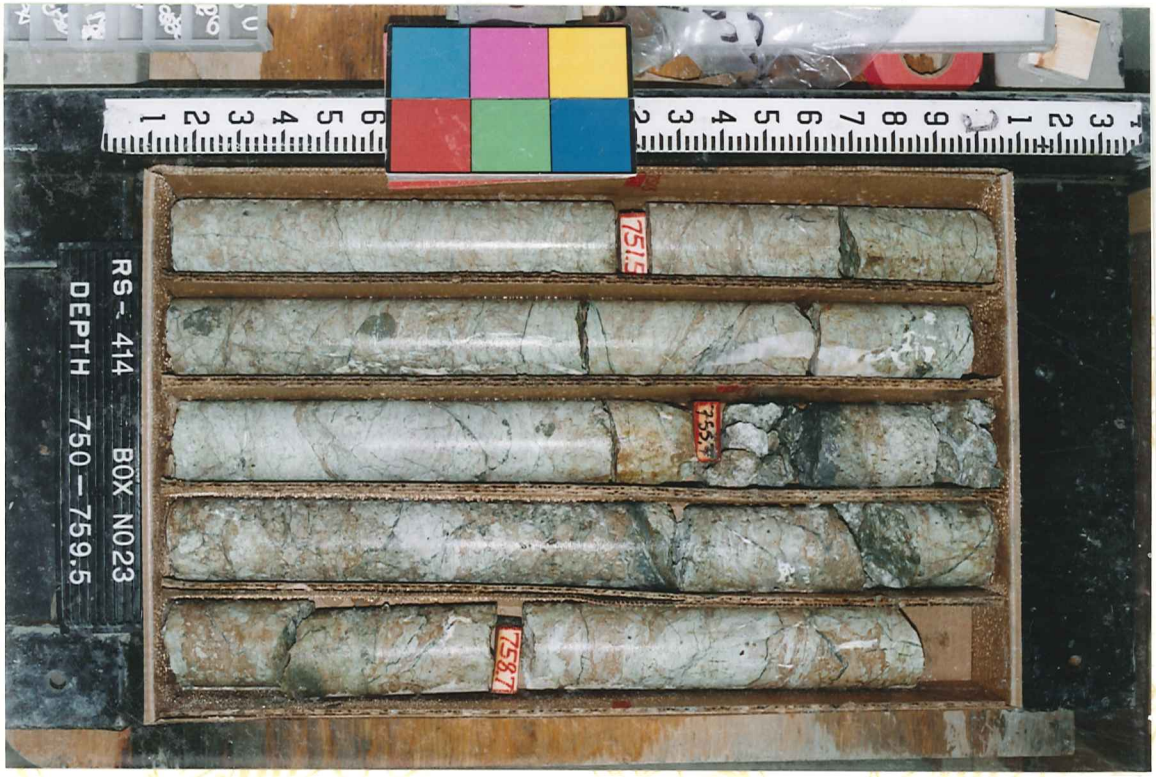
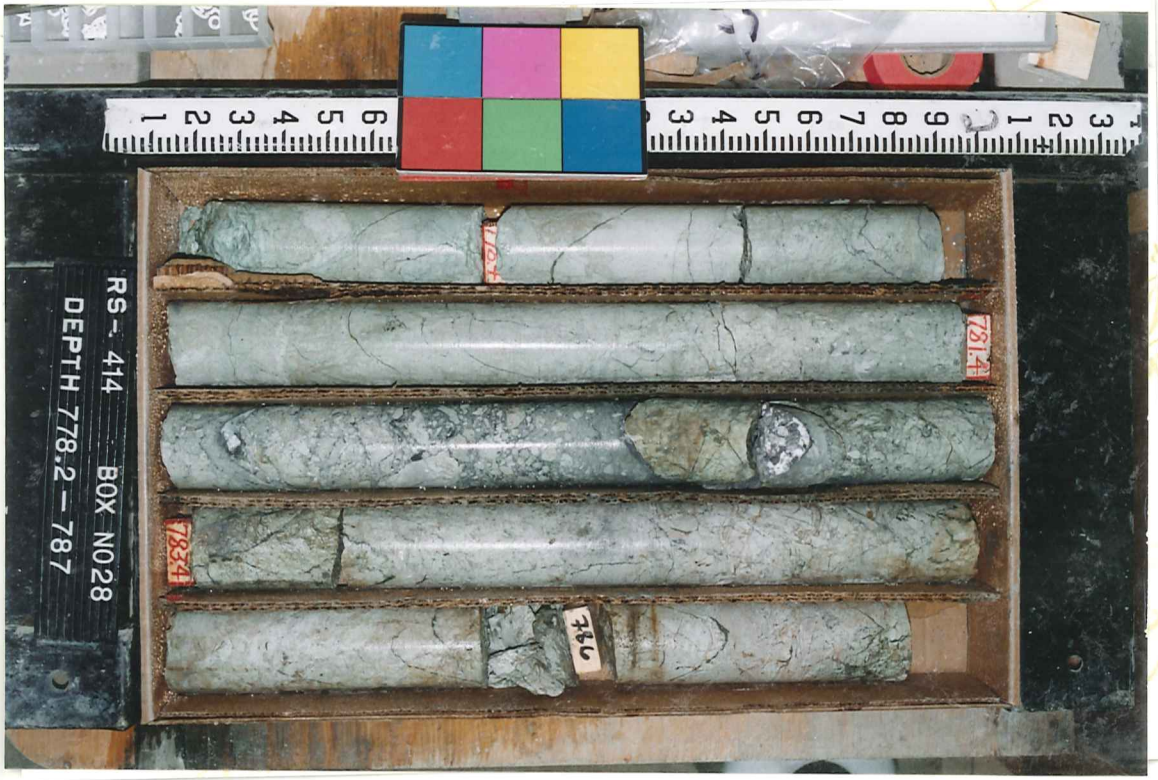
743.1
745.2
RS- 414 BOX NO22
DEPTH 741- 750


751.5
755.7
758.7
RS- 414 BOX NO23
DEPTH 750- 759.5

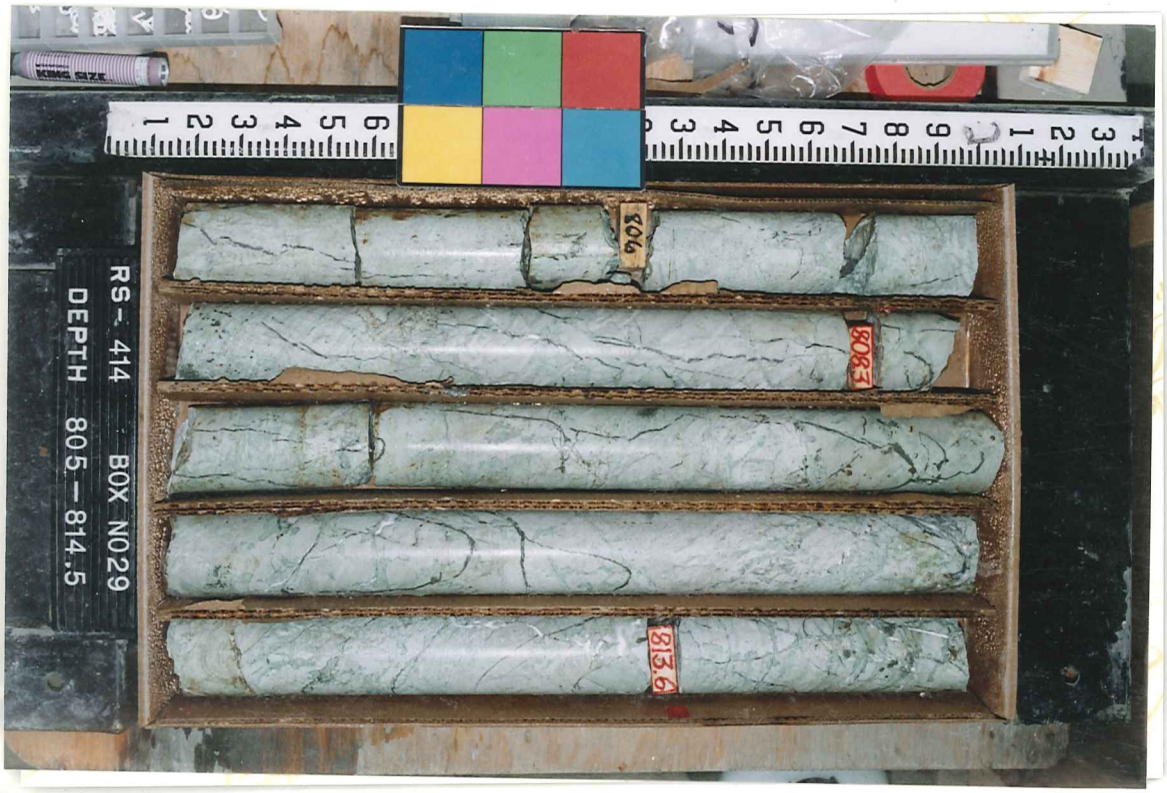
763.4
768.6
RS- 414 BOX N025
DEPTH 759.5 — 769

776
RS- 414 BOX N025
DEPTH 769 — 778.2


RS- 414 BOX N028
DEPTH 778.2 — 787

798.6
793.8
RS-414 BOX N028
DEPTH 787-796

798.4
803.4
796
RS-414 BOX N028
DEPTH 796-805


809
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813.6
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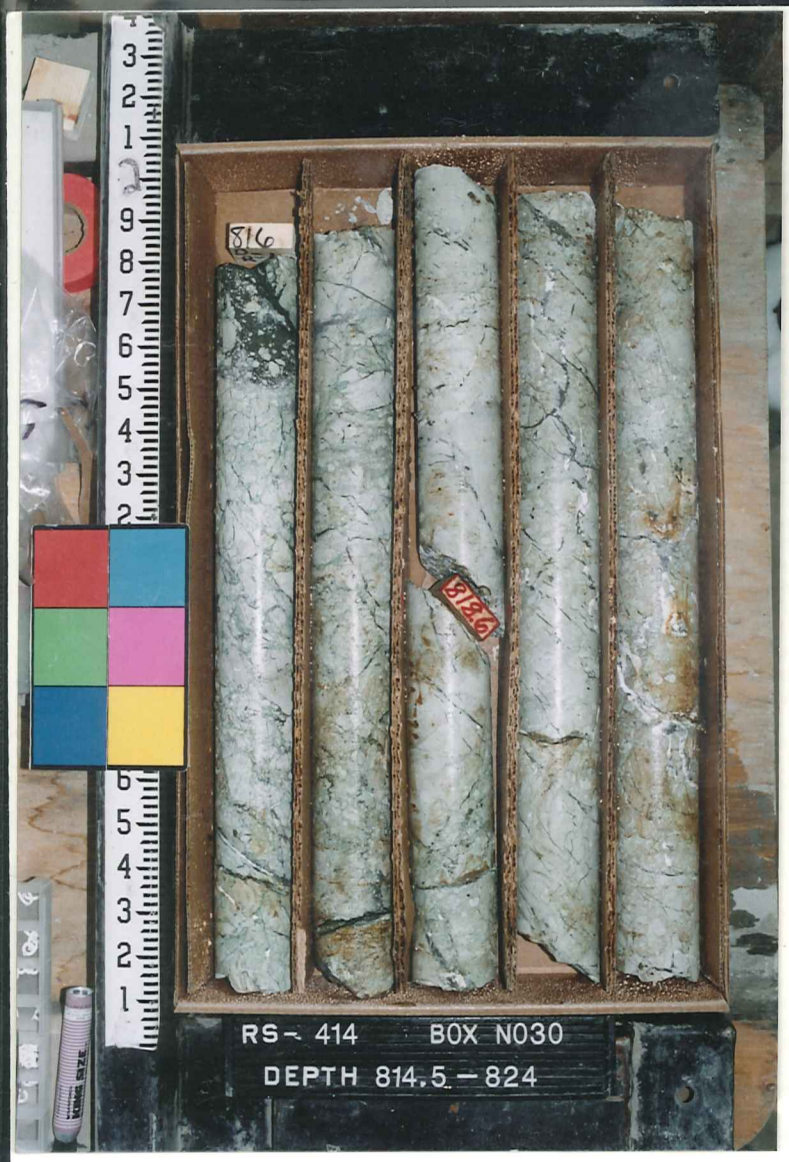
DEPTH 805-814.5


816
818
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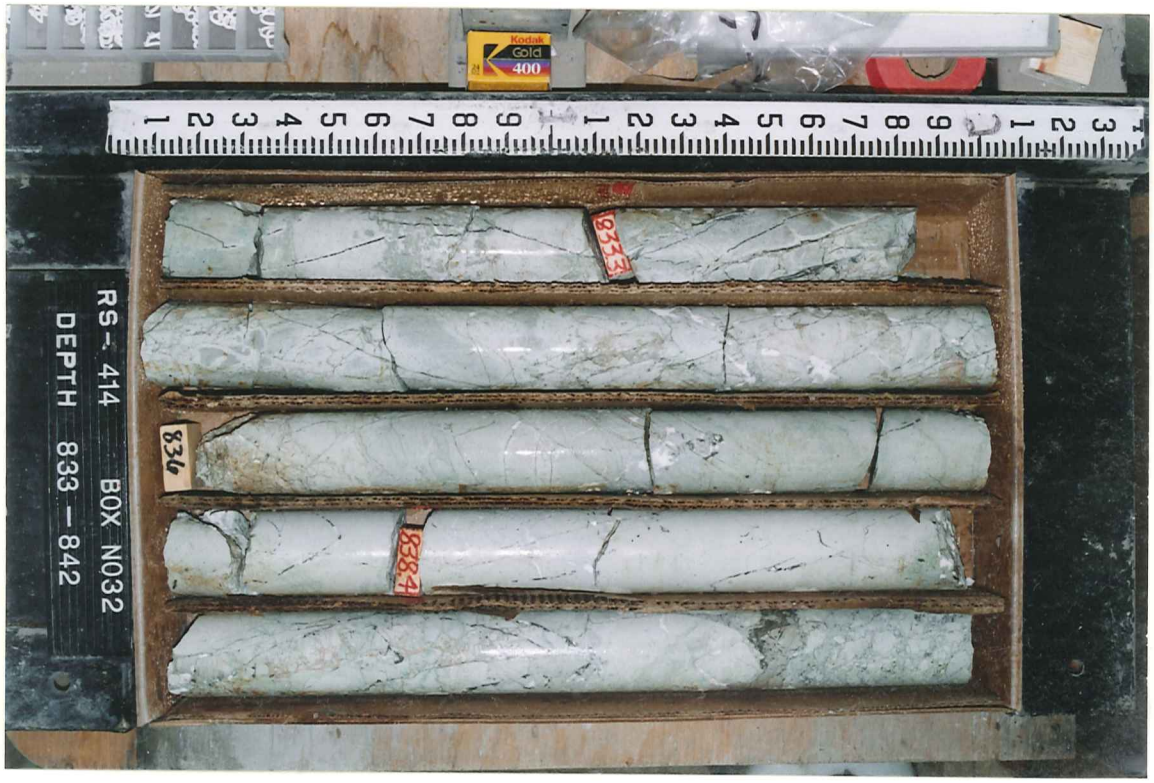
DEPTH 814.5 – 824

826
8238
8285
RS- 414 BOX N031
DEPTH 824 – 833


Kodak Gold 400
8333
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8384
RS- 414 BOX N032
DEPTH 833 – 842

850
846
843
RS- 414 BOX N033
DEPTH 842 -850