COMPANY: Pacific-Nevada
PROJECT: North Butler
HOLE NUMBER: NB 003

Commenced:	12 Dec 99
Completed:	09 Jan 00
Logged By:	L.A.Newnham
Drilled By:	DDT

Purpose of Hole

to test a coincident IP and geochem anomaly along strike to the east of NB 001;

Comments on Completion

hole intersected a sequence of mafic volcanics overlying (?) a sequence of sediments including several substantial black shale beds; there was strong carbonate-quartz-pyrite alteration of the sediments; the only mineralisation of significance was from 166.0-172.0 m., (6 m) 0.14 g/t Au;

Collar Details

Grid	Northing	Easting	Elevation	Dip	Bearing
AMG	5307670	364180	2105	-50	52

Length (m)
310.7

Hole Size

To (m)	Size
4	HW
97	HQ
310.7	NQ

Significant Core Loss Zones

From	To	%Rec.
significant	losses in	
	sediments	see log

Hole Condition on Completion

all casing removed from hole except for 3 m.HW

Summary of Results:

Depth		Recovery	Description	Assays							
From	To	%		Length	ppm Au	Cu	Pb	Zn	%S		
166.0	172.0	98	calcareous shales and mudstone	6.0	0.14	106	68	13	13.8		

DOWN HOLE SURVEY DATA

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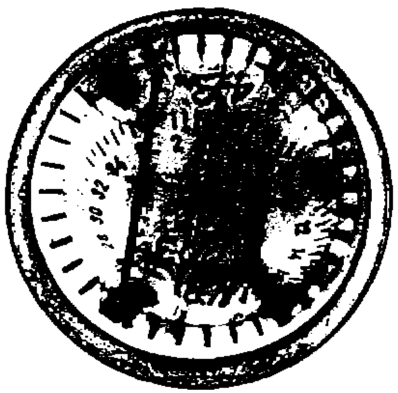
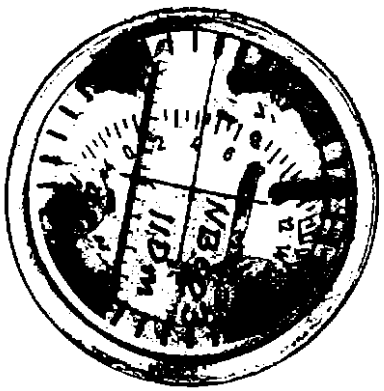
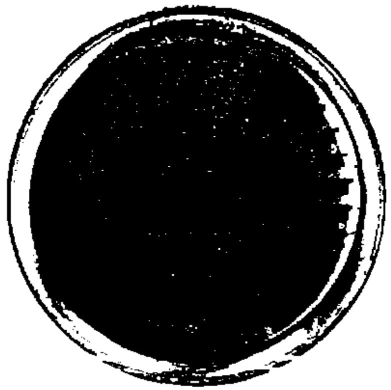
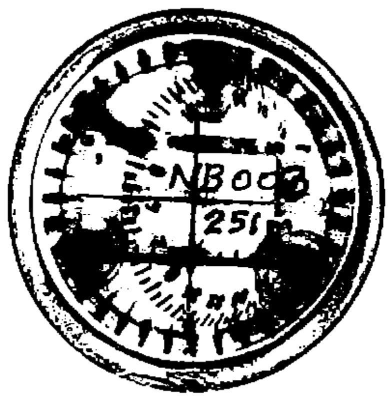
Depth	Dip	Bearing	Interval		Length	Vertical Distance		Horizontal Distance		Co-ordinates			
(m)		(AMG)	From	To	(D)	D.sin dip	R.L.	D. cos dip (HD)	Cumulative HD	N. distance HD. cos brg.	N. co-ordinate	E. distance HD. sin brg.	E. co-ordinate
COLLAR	-50	53					2105.00		0.00		5,307,670.0		364,180.0
0	-50	53	0	25	25	19.15	2085.85	16.07	16.07	9.67	5,307,679.7	12.83	364,192.8
50	-49	51	25	80	55	41.51	2044.34	36.08	52.15	22.71	5,307,702.4	28.04	364,220.9
110	-49	56	80	132.5	52.5	39.62	2004.72	34.44	86.60	19.26	5,307,721.6	28.55	364,249.4
155	-49	59	132.5	203	70.5	53.21	1951.51	46.25	132.85	23.82	5,307,745.5	39.65	364,289.1
251	-46	58	203	276.5	73.5	52.87	1898.64	51.06	183.91	27.06	5,307,772.5	43.30	364,332.4
302	-46	62	276.5	306.35	29.85	21.47	1877.17	20.74	204.64	9.73	5,307,782.3	18.31	364,350.7
310.7	-46	62	306.35	310.7	4.35	3.13	1874.04	3.02	207.66	1.42	5,307,783.7	2.67	364,353.4
310.7													









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Description			Core Recovery			RQD			Assays							
From	To		From	To	%	From	To	%	From	To	Au ppb	Cu ppm	Pb	Zn	As	% S
0.0	4.0	**HW tricone, no core;**	0.0	4.0	0											
4.0	30.6	**WEATHERED VOLCANICS;** orange-light brown clays and degraded rock; relict textures and iron rich spots after amphibole (?) suggest weathered volcanics; core recoveries good but ground has no strength; sharp contact with fresh rock below;	4.0	5.0	80				5.0	6.0	9	98	<20	188	<10	<0.1
			5.0	6.3	90											
			6.3	8.0	95				8.0	9.0	8	83	<20	224	<10	<0.1
			8.0	12.7	100											
			12.7	13.2	40				11.0	12.0	4	76	<20	233	<10	<0.1
			13.2	14.1	95											
			14.1	23.6	100				14.0	15.0	3	409	<20	191	<10	<0.1
			23.6	24.3	60											
30.6	59.5	**MIXED VOLCANIC BRECCIAS and LAVAS:** dark gray brecciated andesitic lava, interspersed with minor dioritic/doleritic units and minor medium grained volcaniclastic sedimentary beds; **below 35.5 m:** rocks are strongly calcareous with white carbonate as spots, and abundant veins and anastomosing masses replacing interstitial material in brecciate lavas; sections of volcaniclastic sediments are highly calcareous; carbonate alteration rapidly diminishes below 52.0 m; 0.5-1% pyrite associatd with carbonate replacement as small blebs and stringers within carbonate masses, and less commonly disseminated throughout volcanics; BCA in volcaniclastics 60°; core competent;	24.3	28.9	100				17.0	18.0	48	526	<20	184	<10	<0.1
			28.9	31.3	90											
									20.0	21.0	27	352	<20	616	28	<0.1
			31.3	59.5	100											
									21.0	24.0	3	76	<20	80	10	<0.1
									26.0	27.0	2	117	<20	77	13	<0.1
									29.0	30.0	5	39	<20	81	10	<0.1
									32.0	33.0	6	306	<20	92	<10	<0.1
									35.0	36.0	5	102	<20	50	13	0.1
									38.0	39.0	6	132	<20	138	11	0.1
									41.0	42.0	9	96	<20	165	15	0.1
59.5	68.2	**GABBRO/DOLERITE, minor volcaniclastic sediments:** dark gray-green medium grained gabbroic unit with light green-white mottled phenocrysts set in gark gray fine grained groundmass; thin volcaniclastic sedimentary beds near base (gradational?); minor 1-5 mm. carbonate veins; 0.5% pyrite as small grains and aggregates, normally associated with carbonate veins; core moderately broken along rough fractures, often at low angles to CA;	59.5	68.2	100											
									44.0	45.0	7	121	<20	92	15	<0.1
									47.0	48.0	6	35	<20	66	<10	<0.1
									50.0	51.0	8	111	<20	49	29	0.2
									51.0	52.0	12	1455	<20	63	77	0.2
									54.0	55.0	10	93	<20	49	41	0.3
									57.0	58.0	6	89	<20	95	<10	<0.1

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Description

From	To	Description
68.2	76.5	**SEDIMENTS, possibly volcaniclastic:** light-medium gray medium-coarse grained felspathic sandstone interbedded with light gray-light brown finer grained siltstone; BCA 55° near top increasing to 70° near base; graded bedding possibly suggests facing down hole? trace-minor pyrite; core moderately competent with several very broken zones; sharp contact with unit below 70° CA;
76.5	92.1	**GABBRO:** dark green-gray medium grained gabbro; upper margin very fine grained for first 400 mm.; chilled margin with unit above; lower margin bleached and altered but sharp contact with shales below; minor 1-5 mm. calcite and quartz-carbonate veining and calcite infilling of fine fractures; carbonate altered to soft greenish clay (talc?) in places; 0.5% pyrite, locally to 1-2%, as disseminated grains and aggregates, especially near lower contact and associated with carbonate and quartz-carbonate veining; ground conditions moderately good; most fracturing at 50-60° CA;
92.1	165.0	**CALCAREOUS SEDIMENTS interbedded with BLACK PYRITIC SHALES:** light gray-cream hine grained calcareous sediments(carbonates) interbedded with black carbonaceous shale; carbonate is extensively silicified and cut by white carbonate and quartz-carbonate veins; pyrite abundant in shales and common in carbonates, mainly associated with late stage veining; **92.1-97.8 m:** graphitic black shales, very broken and decomposed, reduced to recemented sandy rubble in places; strongly pyritic;

Core Recovery (RQD From / To / %: no entries)

From	To	%
68.2	68.6	100
68.6	69.0	75
69.0	70.8	100
70.8	71.6	50
71.6	76.5	100
76.5	92.1	100
92.1	93.0	100
93.0	93.8	35
93.8	95.2	0
95.2	96.4	10
96.4	97.3	30
97.3	97.9	80
97.9	98.0	100
98.0	99.4	85
99.4	101.5	100
101.5	103.7	85
103.7	105.5	15
105.5	107.0	50

Assays

From	To	Au ppb	Cu ppm	Pb	Zn	As	% S
60.0	61.0	9	169	<20	64	<10	<0.1
63.0	64.0	7	71	<20	384	16	0.1
66.0	67.0	6	123	<20	180	17	0.1
69.0	70.0	9	78	<20	82	16	<0.1
72.0	73.0	8	118	<20	72	38	0.2
75.0	76.0	17	33	<20	47	19	0.2
76.5	78.0	7	88	<20	60	10	0.1
79.0	80.0	5	46	<20	91	<10	<0.1
82.0	83.0	6	60	<20	138	<10	<0.1
85.0	86.0	5	59	<20	91	<10	<0.1
88.0	89.0	6	84	<20	96	<10	<0.1
91.0	92.1	8	89	<20	31	30	0.3

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From	To		From	To	%	From	To	%	From	To	Au ppb	Cu ppm	Pb	Zn	As	% S
92.1 continued.....	165.0	**97.8-111.2 m:** cream-light orange calcareous sediments, soft and weathered/altered; minor black shale interbeds; minor leached carbonate and quartz-carbonate veins; BCA 45-50°; minor pyrite associated with veining; **111.2-115.0 m:** black graphitic and pyritic shales; very broken; **115.0-125.8 m:** light gray calcareous sediments/carbonates; extensive silicification and carbonate replacement; brittle fracturing with fractures typically filled with white carbonate and quartz; 2-3% pyrite, locally more abundant; mainly associated with veining as coarse aggregates, vein infilling and coarse disseminated grains; **125.8-138.6 m:** black pyritic and graphitic shales; minor light gray carbonate interbeds; BCA 50°; pyrite abundant as fine grained stratabound seams and associated with veining; core very broken and fractured with high core losses in places; **138.6-147.9 m:** light gray calcareous sandstone cut by abundant 1-10 mm. carbonate and quartz-carbonate veins with minor associate pyrite; interval extremely broken and rubbly; **147.9-157.0 m:** interbedded black siltstone-shale and light gray siltstone, cut by abundant quartz and quartz-carbonate veins carrying minor pyrite; much of interval reduced to clay and sand with high core losses; **157.0-165.0 m:** more massive medium grained strongly calcareous siltstone with minor interbedded mudstone, cut by a network of1-5 mm carbonate and quartz-carbonate veins and large masses carrying minor pyrite; some sections brecciated;	107.0	109.5	100				98.0	99.0	12	10	<20	6	16	2.5
			109.5	111.2	3											
									100.0	101.0	16	<5	<20	11	<10	1.5
									103.0	104.0	12	10	<20	8	17	1.3
			111.2	112.5	40				107.0	108.0	11	9	<20	11	<10	0.7
			112.5	113.5	80											
			113.5	114.5	80				112.5	113.5	106	64	<20	17	84	9.7
			114.5	114.8	60											
			114.8	116.5	90				115.0	116.0	23	15	<20	9	13	2.8
			116.5	126.4	100											
			126.4	127.4	30				118.0	119.0	9	<5	<20	12	<10	0.7
			127.4	128.1	50											
			128.1	128.9	50				121.0	122.0	6	<5	<20	10	<10	0.3
			128.9	130.0	60											
			130.0	133.7	100				123.0	124.0	6	9	<20	16	<10	0.5
			133.7	135.2	75				124.0	125.0	4	6	66	154	16	1
			135.2	137.0	25											
			137.0	137.5	40				128.0	129.0	49	37	22	8	29	4.9
			137.5	137.9	80				129.0	130.0	61	54	24	7	39	7.5
			137.9	138.6	50											
			138.6	140.0	90				132.0	133.0	26	16	20	9	22	4.1
			140.0	149.2	100											
			149.2	149.8	50				140.0	141.0	7	<5	<20	14	<10	0.9
			149.8	150.3	40											
			150.3	151.1	50				143.0	144.0	2	<5	22	14	<10	0.8
			151.1	151.6	40											
			151.6	152.2	30				146.0	147.0	8	<5	22	10	<10	1
			152.2	152.7	0											
			152.7	153.6	20				149.0	151.0	11	<5	22	38	<10	1.2
			153.6	154.0	100											
			154.0	155.4	70				154.0	155.0	8	<5	24	8	45	1.8
			155.4	160.6	100											
			160.6	162.7	90				156.0	157.0	29	13	26	10	75	4.7
			162.7	163.2	80											
			163.2	165.0	100				158.0	159.0	10	<5	28	19	<10	0.7
									161.0	162.0	13	48	36	34	11	0.7
									163.0	164.0	12	23	34	32	13	0.9

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Description			Core Recovery			RQD			Assays							
From	To		From	To	%	From	To	%	From	To	Au ppb	Cu ppm	Pb	Zn	As	% S
165.0	186.2	**SHALE, minor sandstone and breccias, massive pyrite banding:** dark-medium gray, fine grained calcareous sediments principally shale and mudstone; minor breccia units; some sections strongly silicified and calcareous; very well bedded 50-60° CA; facing appears to be up hole; 1-10 mm quartz-carbonate veins common; feature of unit is banding of fine grained massive pyrite which is abundant in places; overall 5-10% pyrite but locally >50%; **166.0-168.5 m:** banded massive pyrite; additional pyrite as coarse disseminated grains and aggregates associated with quartz-carbonate veining; ground moderately competent with most fractures parallel to bedding; bedding planes often appear greasy (sericitic) and some sections closely fractured along bedding;	165.0	170.0	100				165.0	166.0	49	23	38	<5	18	2.8
			170.0	171.0	90				166.0	167.0	242	146	62	8	53	16.8
			171.0	186.2	100				167.0	168.0	180	159	78	10	51	16.4
									168.0	169.0	126	109	72	10	35	16.5
									169.0	170.0	51	53	54	12	20	7.2
									170.0	171.0	116	92	78	26	38	12.3
									171.0	172.0	124	81	64	12	38	13.8
									172.0	173.0	68	35	46	8	22	7.2
									173.0	174.0	62	56	66	9	29	7.5
									174.0	175.0	41	55	130	22	31	7.7
									175.0	176.0	8	37	46	9	21	6.1
									176.0	177.0	41	67	120	20	32	11.8
									177.0	178.0	10	10	34	6	<10	3.3
									178.0	179.0	9	21	34	7	14	5.7
									179.0	180.0	4	23	38	7	21	9.1
									180.0	181.0	31	31	40	18	16	0.4
									181.0	182.0	23	30	28	14	17	1.5
									182.0	183.0	7	52	30	16	17	3.8
									183.0	184.0	8	44	54	11	24	4.9
186.2	193.9	**CALCAREOUS GRITS and BRECCIAS:** dark gray medium grained grit and breccia interbedded with dark gray bedded siltstone; matrix in both brecia and grits is highly calcareous; quartz-carbonate and quartz veining common in coarser grained sections; 1-2 % pyrite as disseminated grains and discontinuous stringers especially in coarser grained grits and breccias;	186.2	193.9	100				184.0	185.0	11	40	42	7	27	6.4
									186.2	188.0	6	7	38	<5	14	0.7
									188.0	189.0	16	13	30	62	15	0.9
									190.0	191.0	23	42	36	9	34	2.8
			193.9	196.3	100											
			196.3	197.7	90				192.0	193.0	5	16	34	<5	14	1.1
			197.7	200.0	100											
			200.0	200.3	65				194.0	195.0	17	12	36	5	22	1.2
			200.3	200.8	90											
193.9	218.5	**BLACK PYRITIC SHALE and minor sandstone:** well bedded/laminated dark gray-black pyritic shale with minor interbedded light gray grit with calcareous cement, and light gray fine grained silicified volcaniclastic (?) sediments; BCA 50-55°; 5-10% pyrite as thin massive and semi-massive seams parallel bedding; 205.8-213.0 m: core extremely broken with shales reduced to rubble, sand and clay;	200.8	205.6	100				196.0	197.0	24	23	44	8	35	3
			205.6	206.9	70											
			206.9	207.4	50				198.0	199.0	3	<5	24	<5	13	0.4
			207.4	208.2	50											
			208.2	208.7	sand				200.0	201.0	31	29	50	9	35	4.2
			208.7	211.6	25											
			211.6	212.4	35				203.0	204.0	58	35	44	15	38	4.9
			212.4	212.9	40											
			212.9	213.6	70				206.0	207.0	27	19	40	7	32	3.8
			213.6	218.3	100											

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From	To		From	To	%	From	To	%	From	To	Au ppb	Cu ppm	Pb	Zn	As	% S
193.9	218.5	elsewhere core quite broken along bedding planes into "penny" core;							214.0	215.0	39	22	40	9	29	3.1
									217.0	218.0	26	26	42	9	29	2.7
218.5	255.8	**SILICIFIED SEDIMENTS (Carbonate?), minor phyllite and shaley beds:** light gray, hard, strongly silicified medium grained sediment, interbedded with minor light gray phyllitic units and pyritic black shale; remnant stylolitic structures in siliceous zones suggest sediments may originally have been carbonates; several generations of 1-10 mm. white quartz veins with no preferred orientation; finely vuggy texture in placessuggesting significant leaching; **230.7-232.0 m:** black pyritic shale; BCA 60°; **234.6-241.3 m:** light gray-light brown soft phyllitic sediments interbedded with silicified sediments; very broken; 1-2% pyrite in silicified sediments, but increasing locally towards base of unit to 3-5%, as coarse euhedral grains and aggregates both within the silicified sediments and concentrated along quartz veins; core broken; brittle irregular fracturing of siliceous sediments results in some sections being very broken and rubbly; phyllitic and shaley units soft and very broken;	218.3	220.5	90				220.3	221.0	8	19	32	12	19	2.5
			220.5	243.4	100				223.0	224.0	11	10	32	10	21	2.6
			243.4	245.6	90				226.0	227.0	3	<5	26	7	14	0.5
			245.6	248.0	55				229.0	230.0	3	<5	28	6	18	1.6
			248.0	249.6	85				232.0	233.0	57	12	44	6	40	3.6
			249.6	256.2	100				235.0	236.0	1	10	<20	5	<10	1.4
									241.0	242.0	<1	10	<20	5	<10	1.5
									243.0	244.0	<1	14	<20	10	<10	0.9
									245.0	246.0	<1	9	<20	12	<10	0.7
									248.0	249.0	<1	12	<20	10	<10	0.8
									250.0	251.0	<1	24	<20	7	<10	0.8
									252.0	253.0	3	12	<20	5	<10	1.3
									254.0	255.0	5	12	<20	11	<10	1.9
255.8	277.5	**PHYLLITIC SEDIMENTS INTERBEDDED WITH SANDSTONES, minor black shale:** light gray, fine grained mudstone-siltstone with phyllitic texture, interbedded with fine-medium grained light gray silicified sandstone; BCA 45°; 1-2% pyrite as pervasive disseminated coarse euhedral grains; minor fine grained pyrite.....	256.2	267.7	100				257.0	258.0	2	13	<20	9	<10	2.4
			267.7	269.0	90				260.0	261.0	3	16	<20	10	<10	2.7
			269.0	269.8	50				263.0	264.0	3	13	<20	7	<10	2.8
			269.8	270.9	90				266.0	267.0	24	14	<20	7	12	3.7
			270.9	272.7	100											
			272.7	275.0	70											
			275.0	277.3	60											

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From	To		From	To	%	From	To	%	From	To	Au ppb	Cu ppm	Pb	Zn	As	% S
255.8	277.5	concentrated in seams and bands parallel to bedding in shale sections;							271.0	272.0	8	9	<20	8	<10	3.2
									274.0	275.0	11	7	<20	6	<10	3.2
277.5	310.7	**ALTERED SEDIMENTS (?volcanic component?), strong silica-pyrite-carbonate alteration:** light-medium gray gritty sediments (possible volcanic component), strongly altered and replaced by white quartz and creamy white carbonate; sericite and chlorite alteration widespread resulting in "whispy" texture in places; 1-2% pyrite as coarse aggregates and euhedral grains; locally more abundant; **295.1-298.1 m:** medium grained igneous dyke; gabbroic appearance; abundant dark green amphibole needles; minor disseminated pyrite; **299.8-300.5 m:** similar dyke to that above with pervasive chlorite alteration; **302.1 m:** 200 mm semi-massive pyrite band; **305.2 m:** 100 mm semi-massive pyrite band; ground conditions generally reasonablebut several very broken, rubbly sections; widespread leaching of core evidenced by vuggy and honeycombed nature; **END OF HOLE**	277.3	280.3	15												
			280.3	298.9	100											
			298.9	301.8	90				281.0	282.0	2	9	<20	5	<10	1.7
			301.8	304.9	95											
			304.9	308.0	90				283.0	284.0	1	10	<20	8	<10	0.9
			308.0	310.7	90											
									285.0	286.0	4	8	<20	19	<10	0.9
									287.0	288.0	5	24	<20	<5	<10	1.6
									289.0	290.0	3	29	<20	5	<10	1.6
									291.0	292.0	2	11	<20	6	<10	0.6
									293.0	294.0	3	14	<20	11	<10	0.8
									295.0	296.0	2	11	<20	17	19	0.4
									297.0	298.0	2	17	<20	31	27	0.3
									299.0	300.0	2	12	<20	14	19	2.9
									300.0	301.0	3	12	<20	32	12	0.7
									301.0	302.0	<1	9	<20	7	15	1.4
									303.0	304.0	<1	16	<20	9	<10	<0.1
									305.0	306.0	<1	9	<20	11	60	4.2
									307.0	308.0	<1	9	<20	5	<10	0.7
									309.0	310.0	<1	9	<20	<5	28	0.8