823440
Sam

MINNOVA INC.
DRILL HOLE RECORD

HOLE NUMBER: RG308 IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: Lower Sam horizon

PLOTTING COORDS GRID: SAM GEOL.
NORTH: 875.00N
EAST: 10670.00W
ELEV: 1131.55

ALTERNATE COORDS GRID:
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -50° 0' 0"
LENGTH OF THE HOLE: 328.30m
START DEPTH: 0.00m
FINAL DEPTH: 328.30m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: April 17, 1990
DATE COMPLETED: April 22, 1990
DATE LOGGED: May 17, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: FRONTIER DRILLING
CASING: LEFT IN HOLE
CORE STORAGE: SAM CAMP

PURPOSE: FIRST HOLE OF 1990 PROGRAM. INFILL DRILLING BE- TWEEN 266 ZONE & SAM HORIZON. LAID OUT BY SURVEY.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
29.50	-	-50° 0'	ACID	OK		-	-	-	-	-	
102.40	-	-50° 0'	ACID	OK		-	-	-	-	-	
133.10	-	-51° 0'	ACID	OK		-	-	-	-	-	
166.70	-	-50° 0'	ACID	OK		-	-	-	-	-	
208.70	-	-50° 0'	ACID	OK		-	-	-	-	-	
255.10	-	-50° 0'	ACID	OK		-	-	-	-	-	
291.00	-	-48° 0'	ACID	OK		-	-	-	-	-	
328.30	-	-47° 0'	ACID	OK	E.O.H.	-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 24.40	«CASING»					
24.40 TO 37.40	«SER/QTZ SEDS»	Yellow to white. Aphanitic to coarse grained. Thinly laminated schist with boudins of quartz fragments (20%). {30.7-31.4} «flt. gouge» Strong fabric.	70	Yellow/grey sericite with Fe-dol along partings and within fractures of the quartz fragments.	{24.4-37.4} «2-4% py» Very fine to fine grained diss. subhedral.	24.4-27.2: is mainly thin to med. laminated argillite and siltstone sheared @ grey phyllitic (sericitic) partings. 4% py. 30.3-30.7: quartz-Fe-dol vein no sulphides @ 75deg. C.A. parallel to seds. Fault gouge from 30.7-31.4. 34.3-34.6: flt. brx.
37.40 TO 40.60	«QTZ/FE-DOL VEIN»	White. Aphanitic to coarse grained. Bull quartz and coarse crystals of Fe-dol.	70			Occasional "raft" 5-10cm of ser./qtz. seds within vein. Trace of very fine grained diss. py and green sericite appear to be associated with raft fragments.
40.60 TO 45.40	«SER/QTZ SEDS»	Yellow to white. Aphanitic to coarse grained. Thinly laminated schist with boudins of coarse qtz fragments form .1-3cm long (20-30%).	85	Yellow, brown sericite with Fe-dol along partings and within fractures of the quartz fragments.	40.6-45.4: 2-4% py. Very fine to fine grained diss. subhedral.	Texture is schist to mylonitic. Resembles a fault breccia. Occasional chaotic laminations (drag folds?).
45.40 TO 46.20	«QTZ/FE-DOL VEIN»	White. Aphanitic grained. Bull quartz and coarse crystals of Fe-dol. 45.4-45.8: fault bx.	85			Vein has 30% fragments of yellow sericite schist.
46.20 TO 55.70	«SER/QTZ SEDS»	Yellow to grey. Aphanitic to coarse grained. Thinly laminated schist with boudins of quartz fragments (15%).	85	Yellow, grey, brown sericite. 46.2-48.9: intense fe-dol flooding (a silt or sandstone unit with grey sericite alt'n).	46.2-55.7: 2-4% py.	52.8-53.0: intense silicification with 10-20% fe-dol. 5-8% 1-3mm blebs of very fine grained py, trace very fine grained galena tetra, sphal. Argillaceous laminations next to silicification.
55.70 TO 59.50	«ARG/QTZ/ SER SEDS»	Black to white. Aphanitic to fine grained. Thinly banded argillite and white bull quartz with occasional siltstone & yellow sericite laminations Late fe-dol fracturing - (flooding).	85	Yellow, grey sericite with fe-dol flooding.	55.7-59.5: 2-4% py. 57.2-57.5 trace cpy, galena in qtz fe-dol vein.	Foliation mainly @ 85deg c.a. with occasional .2-.4m section of chaotic laminations (due to drag folds?). Note: minor qtz vein (30cm) parallel with foliation within argillaceous unit with minor mineralization.
59.50 TO 73.70	«SER/QTZ SEDS»	Yellow to white. Aphanitic to coarse grained. Thinly laminated sericite schist with boudins of quartz fragments.	80	Yellow, grey sericite with fe-dol flooding along partings. 72.4-73.7: sericite schist is mod. to strongly silicified (above qtz, fe-dol vein).	{59.5-73.7} «2-4% py» {68.0-70.3} «flt. zone» (fault gouge).	Foliaiton is mainly @ 80deg. c.a. but occasional section has chaotic laminations as well as fault breccia zones causing distorted laminations. 71.1-71.7: minor interbed of what appears to be fe-dol flooded (altered)

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
						volcanic seds-possible relict unaltered fragment (conformable). 68.0-70.3: in fault zone is mainly argillaceous material (gouge +/- bx).
73.70 TO 83.50	«SIL SEDS»	White to greenish yellow. Aphanitic grained. Silicified yellow sericite with gradational boundaries into white bullish qtz fe-dol veins.	60	Silicified yellow sericite.	73.7-83.5: tr. py. Very fine grained diss. subhedral.	Silicified (+/- fe-dol late) seds with sericite (yellow) partings.
83.50 TO 87.00	«SER/QTZ SEDS»	White to yellow. Aphanitic to fine grained. Well foliated schist with boudins of qtz fragments from .1-3cm long.	60	Yellow, grey ser. fe-dol along partings	83.5-87.0: 2-4% py.	Yellow sericite with minor argillaceous laminations. Occasional gouge material (1cm wide).
87.00 TO 89.50	«QTZ FE-DOL VEIN»	White to yellow. Aphanitic to coarse grained. White bull quartz with coarse xtals of fe-dol.	60			A vein zone. There is a one metre section of yellow sericite seds in the middle of the interval with quartz fe-dol veinlets throughout.
89.50 TO 96.60	«SER/QTZ SEDS»	White - yellow - grey. Aphanitic to coarse grained Well foliated schist with boudins of quartz fragments and quartz fe-dol veinlets @ various c.a. with minor silicified sections throughout, associated with veinlets.	60	Yellow, grey sericite. Fe-dol and silicification moderate to strong.	89.5-98.6: 2-4% py.	A moderate quartz and fe-dol stockwork section in between a vein zone and a silicified section underneath.
96.60 TO 98.80	«SIL SEDS»	White to black. Aphanitic grained. Silicified seds with remnant argillaceous material.	60	Silicification intense with occasional grey sericitic partings (altered arg).		Intensely silicified seds with remnant argillaceous materials.
98.80 TO 116.00	«SER/ARG/ QTZ/SEDS»	White to yellow to black. Aphanitic to coarse grained. Well foliated schist with thin laminations of yellow. Sericite, black argillite, and white quartz, as well as boudins of quartz (laminations of quartz could also be fragments of qtz?) {107.2-110.1} «flt bx» *(foliation @ 10deg. c.a. in fault).	60	Yellow, grey, brown sericite fe-dol along partings and pervasive in coarser units.	{98.8-116.0} «2-4% py»	Small zones of gouge and brecciated core throughout. Qtz fragments are boudin and in most case have extension fractures infilled with fe-dol. Occasional qtz., fe-dol veinlet 10-15cm wide parallel with foliation.
116.00 TO 124.60	«FLTD SEDS»	Black, white and yellow. Fine grained. Chaotic, contorted black argillite with silicified portions assoc. with qtz-dol veining. Last appearance of argillite at 124.6m.	30	Patchy yellow sericite, with lesser brown.	3% py wisps and dissem.	Some indications that fault is at 30deg (?) with a reverse sense of movement (brittle-ductile).
124.60 TO 133.30	«DOL MAFIC TUFF?»	Brown and grey. Fine grained. Sharp upper contact. The unite is banded with brown sericite and grey fe-dol (80%). Banding is a 60-80degs. Some resembles relict lapilli tuff and sandy volcaniclastic textures. Posibly a transition unit between mafics and sediments?	70	Intense fe-dol with abundant brown ser development. 130.2-131.2: a coarse bully barren qdv occurs at 25degs, containing trace talc	5% wispy py.	In 1989 logs this has been called "DOL SEDS".

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
133.30 TO 136.00	«QDVN»	White. Very coarse grained. White bull qtz vein with only a few % bladed fe-dol. Contacts are meandering at 0-20degs.	10		Barren.	
136.00 TO 140.80	«DOL MPYRO?»	Brown to dark grey. Fine to coarse grained. Definite fragmental texture with 1-2cm volcanic(?) clasts. Abundant fe-dol flooded portions. Some sandy texture. Banding	80	Strong fe-dol and brown sericite. Trace green talc. Possibly traces of chl.	3% py.	Very questionable, but no relict argillaceous component, & a hint of remnant chlorite.
140.80 TO 141.20	«FAULT»	White and yellow. Broken core with qdv and yellow sericitic gouge material.	75		5% py.	
141.20 TO 170.60	«ALTN»	Grey. Fine grained. Non-descript grey granular rock comprised of 95% fe-dol with minor brown sericite and pyrite partings. Foliation	60	Complete dolomitization of the rock which could almost be a dolstone! No relict textures.	2-3% py on partings.	Cut by white qdv's at all orientations.
170.60 TO 182.10	«MAFIC FLOW»	Green to brown. Sharp conformable upper contant. Massive fine grained greenstone locally feldspar porphyritic, cut by numerous fe-dol stockwork veinlets. Weak Foliation	65	Moderately ferro-dolomitized, but chlorite remains in lesser amounts. Minor brown sericite development.	Trace galena in one 1cm wide dol. veinlet. 1-2% diss. py.	Hints of amygdoloidal and pillowed textures?
182.10 TO 227.40	«ALTN LAP TUFF»	Knife sharp confomable contact with upper unit. Texture is altered (chaotic) with stockwork qtz and/or fe-dol stringers (10%) @ various C.A.	70	Bleached altered, brown sericite fractures, (trace 5% yellow sericite). Fe-dol pervasive flooding (90%). Trace green mica along fractures.	4-6% py very fine grained diss & blebs and replacement in fractures. 2-1cm blebs of cpy @ 213.0m. Trace of galena (?) very very fine grained in a .5cm fe-dol stringer.	Bleached altered and patchy brown sericite alteration associated around a qtz (trace, fe-dol) vein. Vein located at 206.4 to 207.4. 206.5-206.8: moderate (10%) stockwork of qtz, fe-dol stringers throughout section. Possible flows in section.
227.40 TO 237.50	«MAFIC FELDSPAR PORPHYRY DYKE»	Light to dark green. Medium grained. Dark green groundmass (chlorite altered) with medium grained feldspar (altered) phenocrysts (tan) (spotty).	70	Mafic minerals are altered to dark chl. Feldspar phenocrysts are altered to lt. to medium green sericite and a tan coloured clay mineral. Pervasive fe-dol (90%) flooding.	Trace of pyrite mainly associated with a fracture very fine grained to medium grained diss.	Occasional qtz and/or fe-dol stringer @ various C.A. Homogeneous unit with "chilled margins".
237.50 TO 264.60	«ALT LAP TUFF»	Light brown to med. green. Aphanitic to med. grained. Pervasive fe-dol flooded lapilli tuff with boudin fragments of lapilli size mafic volcanics and quartz fragments. Brown (and yellow) sericite alt'n around boudins. Disseminated green	85	Fe-dol pervasive flooded (90%). Brown, green, yellow sericite alt'n.	6-8% fine grained diss, blebs and replacement pyrite trace - 1% galena very fine grained, trace cpy. (possible trace tetra? very very fine grained). Trace - 1% sphalerite very	Altered lapilli tuff which gradationally goes into a "massive sulphide (vn)" with an increase in pyrite, galena(sph) 249.1-249.4: qtz (fe-dol) vein @ 20deg. C.A. Sampling started at 251.6.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		mica (fuchsite) increasing with depth (nearer the "mssx vein").			fine grained.	
264.60 TO 266.60	«MSSX»	White to black. Aphanitic to medium grained. Disseminated and blebs of pyrite, galena, cpy, sph with boudin coarse grained fe-dol stringers and qtz fragments.	85	Fe-dol pervasive (40%) green sericite fuchsite.	60-70% fine grained, diss, blebs py. 1-3% apy, blebs .2-.4cm. 2-5% galena, diss & blebs. 1-2% sph-light honey brown, blebs. {264.6-266.6} «65%py,3%gal,2%cpy,1%sph»	Gradational contact. It appears as a vein with alteration envelopes above and below and diss sulphides above + below.
266.60 TO 273.00	«ALT LAP TUFF»	Light brown to med. green. Aphanitic to medium grained. Pervasive fe-dol flooded lapilli tuff with boudin fragments of quartz and mafic volcanic brown, yellow, green sericite.	85	Fe-dol pervasive flooded (90%). Brown wispy sericite yellow, green (diss) sericite.	6-8% fine grained py. trace 1% galena, cpy, sph.	Same as 237.5-264.6.
273.00 TO 283.40	«MAFIC SUB-PORPHYRY» (tuff flow)	Light brownish grey to med. grey. Fine grained. Fine grained with occasional fragment and short porphyritic textures. Foliation @ 85degs. C.A. & cleavage @ 60degs. C.A.	85	Brown sericite along foliation planes. Pervasive fe-dol flooding (90%).	Trace 2% very fine grained diss. py.	Mainly a mafic tuff with occasional sections less than 10cm wide of feldspar (med. grained) porphry or lapilli tuff. Unit appears to be subporphyritic throughout.
283.40 TO 292.50	«ALT LAP TUFF»	Light brown to grey. Fine to coarse grained. Pervasive fe-dol flooded lapilli tuff with boudin fragments of volcanics and quartz. Brown sericite alt'n (wispy) parallel with foliation, disseminated (trace) of green mica (fuchsite).	85	Fe-dol pervasive (90%). Brown sericite 5-10% trace green mica, qeartz and/or fe-dol stringers.	2-4% very fine to fine grained diss. sub-euhedral py.	Brown sericite alt'n appears to be related to quartz +/- fe-dol stringers (stockwork weak). Grey chalcedonic extensional fractures parallel with C.A. within fe-dol stringers.
292.50 TO 317.00	«MAFIC PORPHYRY FLOW»	Light green to brown. Med. grained. A medium grain crowded feldspar porphyry to subporphyritic. Foliation @ Cleavage @	80 80 60	Strong chlorite alt'n with pervasive fe-dol flooding. Feldspar altered to sericite and clay minerals (tan color). 310.8-317.0: intense fe-dol (grey) 95%+	Trace of very very fine grained diss. py.	Occasional section (10cm long) of subporphyritic. Appears to have a fine mylonitic texture with wispy brown ser. around feldspar phenocrysts. 310.8-317.0: grey fe-dol alt'n.
317.00 TO 328.30	«ALT LAP TUFF»	Light brown to grey. Fine to coarse grained. Pervasive fe-dol flooded unit with boudin fragments of mafic volcanics and quartz. END OF HOLE.	80	Fe-dol pervasive 90%. Brown sericite along foliation. Trace to 1% of diss dark green mica (fuchsite).	3-5% fine grained py diss, blebs. Trace galena.	Alt. lapilli tuff with quartz +/- fe-dol stringers. Bottom 2 metres has tr-1% galena (sampled).

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB		COMMENTS
BCD24127	52.70	53.20	0.50	.030	.43	.25	10.2	.02																
BCD24135	251.60	252.60	1.00	.006	.47	.25	3.8	.01																
BCD24136	252.60	253.60	1.00	.056	1.15	.51	5.4	.03																
BCD24137	253.60	254.60	1.00	.020	.35	.19	2.9	.02																
BCD24138	254.60	255.60	1.00	.010	.13	.15	2.5	.01																
BCD24139	255.60	256.60	1.00	.004	.01	.02	2.0	.01																
BCD24140	256.60	257.60	1.00	.002	.01	.03	2.4	.02																
BCD24141	257.60	258.60	1.00	.014	.09	.02	2.5	.01																
BCD24142	258.60	259.60	1.00	.148	.36	.30	4.2	.06																
BCD24143	259.60	260.60	1.00	.071	.01	.01	2.1	.05																
BCD24144	260.60	261.60	1.00	.016	.01	.01	1.9	.02																
BCD24145	261.60	262.60	1.00	.038	.01	.02	2.0	.05																
BCD24146	262.60	263.60	1.00	.009	.17	.14	2.6	.04																
BCD24147	263.60	264.60	1.00	.026	.40	.15	2.0	.05																
BCD24148	264.60	265.60	1.00	.282	3.94	2.41	14.2	.01																
BCD24149	265.60	266.60	1.00	.403	1.50	1.40	13.9	.06																
BCD24150	266.60	267.60	1.00	.032	.58	.27	5.8	.02																
BCD24176	267.60	268.60	1.00	.014	.52	.20	4.1	.02																
BCD24177	268.60	269.60	1.00	.042	.55	.39	8.0	.03																
BCD24178	269.60	270.60	1.00	.010	.35	.23	4.0	.04																
BCD24179	270.60	271.60	1.00	.006	.02	.06	2.7	.01																
BCD24180	271.60	272.60	1.00	.007	.01	.03	2.0	.01																
BCD24184	326.20	327.20	1.00	.006	.01	.01	1.9	.02																
BCD24185	327.20	328.20	1.00	.050	.01	.02	2.0	.09																

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
BCD24126	31.40	35.40	4.00	69.03	13.18	0.52	1.48	0.35	2.96	5.03	.07	.55			13	36			10	58	0.1	25	.15		.01	93.45	52	1
BCD24128	62.20	66.00	3.80	67.39	13.70	0.15	1.46	0.33	3.50	5.83	.17	.58			17	67			5	63	0.1	29	.16		.01	93.37	118	1
BCD24129	92.30	95.30	3.00	52.54	20.21	0.01	2.86	0.49	4.93	7.61	.47	.91			14	58			5	79	0.1	37	.20		.01	90.37	96	1
BCD24130	125.00	128.00	3.00	47.52	11.95	7.04	5.47	0.29	2.66	9.10	.38	1.51			68	114			20	136	0.9	165	.46		.01	86.86	326	1
BCD24131	155.00	158.00	3.00	27.27	1.84	20.45	11.91	0.08	0.48	5.11	.38	.20			7	23			10	35	2.3	5	.31		.01	68.05	8	1
BCD24132	178.90	182.00	3.10	39.48	14.47	8.03	6.59	2.79	0.97	10.95	.23	3.04			38	96			5	61	1.3	25	.82		.01	87.43	68	3
BCD24133	213.00	216.00	3.00	35.13	12.46	13.03	6.21	0.35	2.91	10.82	.19	1.14			129	27			5	422	1.6	75	.36		.01	83.35	696	1
BCD24134	228.40	231.10	2.70	37.96	14.04	4.12	16.83	0.01	0.05	10.70	.13	1.28			62	200			5	23	1.5	5	.36		.01	85.48	234	3
BCD24181	277.00	280.00	3.00	42.28	15.14	5.57	5.26	2.08	0.98	10.05	.32	3.33			43	78			5	95	0.9	45	.90		.01	85.97	140	2
2CD24182	302.00	305.00	3.00	34.54	7.00	8.32	14.79	0.08	0.05	11.00	.18	1.02			26	77			10	348	1.7	5	.39		.01	77.41	13	1
BCD24183	317.00	320.00	3.00	38.70	10.66	11.54	8.48	0.84	1.24	8.40	.47	1.15			85	1286			5	100	2.4	858	.37		.01	81.92	1130	6

MINNOVA INC.
DRILL HOLE RECORD

HOLE NUMBER: RG309 | IMPERIAL UNITS: | METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: SAM HORIZON

PLOTTING COORDS GRID: SAM GEOL
NORTH: 1000.00N
EAST: 10670.00W
ELEV: 1138.00

ALTERNATE COORDS GRID:
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -60° 0' 0"
LENGTH OF THE HOLE: 243.00m
START DEPTH: 0.00m
FINAL DEPTH: 243.00m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: April 22, 1990
DATE COMPLETED: 0, 0
DATE LOGGED: 0, 0

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: FRONTIER
CASING: LEFT IN HOLE
CORE STORAGE: SAMEX CAMP

PURPOSE: INFILL DRILLING. LAID OUT BY SURVEYORS.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
38.70	-	-58° 0'	ACID	OK		-	-	-	-	-	
84.40	-	-56° 0'	ACID	OK		-	-	-	-	-	
118.00	-	-56° 0'	ACID	OK		-	-	-	-	-	
175.90	-	-55° 0'	ACID	OK		-	-	-	-	-	
218.50	-	-53° 0'	ACID	OK		-	-	-	-	-	
243.00	-	0° 0'	ACID		BROKE.	-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 3.70	«CASING»					
3.70 TO 75.00	«MAF LAP TUFF»	Dark green. Med. grained. Typical chloritic unit cut by qtz calcite stringers that are irregular & weakly deformed. Foliation Lapilli are only slightly flattened.	60	Pervasive chlorite, with weak fe calcification envelopes. Numerous lapilli sized fragments are slightly lighter green colour, but unaltered.	Traces of accessory pyrite.	Rock is competant with no signs of faulting.
75.00 TO 82.90	«DOL LAP TUFF»	Green to grey. Med. grained. Gradationally the interval is becoming more altered and acquiring a "churned up" tectonic (?) texture. Foliation	65	Relict lapilli still visible through dark chlorite and ferrodolomite patches .	Tr. py. except ‡78.5-79.0‡ «3% py, tr. gn» assoc with fe-dol veining.	Not a typical looking rock with a notable lack of brown sericite.
82.90 TO 95.30	«SER/SIL SEDS»	Grey, yellow, greenish grey & black. Fine grained Sharp but irregular contact marked by first appearance of argillaceous matrix and a decrease in dolomitization. Interval is fragmental & highly contorted and may contain a mafic component (?). Poorly developed fabric in all orientations.		Patchy yellow to pale green sericite & weak pervasive silicification. Possible interfingering of mafic tuff(?). Interval is well healed by silica flooding.	1-2% diss. py.	Very atypical looking San seds.
95.30 TO 98.80	«SIL SEDS»	Dark grey. Fine grained. Intense silicification of argillaceous seds to form pseudo (?) chert.		Hazy bordered qtz veinlets & pervasive almost complete replacement of the rock by silica.	Disseminated & fracture filling pyrite (3%) with traces of sphalerite.	
98.80 TO 102.70	«GREY SER SEDS»	Dark grey. Fine grained. Very siliceous and intense pyritic ("MUT"). Grey sericite schist with relict fragmental (lithic wacke?) texture cut by high and low angle white qdv's. Wavy schistosity	45	Intense grey sericitization and local silicification.	Patchy fine disseminated pyrite. ‡98.8-102.7‡ «10% pyrite»	Some late (?) brecciation and friable core... Late white qdv at 20degs. from 100.9-101.3.
102.70 TO 119.30	«QTZ VEIN/ FLT ZONE»	White and grey. Coarse grained. Interval is badly broken and contains 70% low angly, white, coarse grained qtz veins. The veins are primarily barren except for uncommon dots of py with lesser cpy, galena and sphalerite. Veins at 0-40degs. to core axis.		Wallrock fragments are grey sericitic down to 1090, below which they are weakly bleached argillites. Ferrodolomite present but uncommon as coarse blades within the veins.	‡107.3-108.4‡ «30% py, 3% cp&sp, tr gn» ‡107.3-108.4‡ «70% rec.» This interval contains coarse clotty sulphides within a broken quartz vein. Overall the entire interval has 2-3% sulphides.	Recovery about 70% overall due to coarse vuggy nature of veining & gouges ‡115.0-116.3‡ «flt gou»
119.30 TO 140.60	«ARG& SILT»	Black and grey. Fine grained. Fault brecciated and gouged contact with rel. unaltered black arg. and siltstone, thinly bedded. Small scale folding (open to tight), disharmonic, and commonly placing bedding parallel to the core axis. Weak clearage	45	Faint greenish grey tinge to silty and fine sandy beds may be primary (?) carbonate.	Trace accessory py.	Major fold hinge zone with axial planar cleavage and brittle faulting (ie. the zone above). Notably the bedding cleavage relationships reates a "rippled" fracture like that seen in the pit.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
140.60 TO 142.30	«QTZ/DOL VEIN»	White. Coarse grained. Barren white quartz vein with 1m wide envelope of lightly bleached wallrock Contacts irregular but roughly at	20	Weak fe-dol pervasive alteration of wallrock.	Trace py.	
142.30 TO 158.90	«SILT &ARG»	Black and grey. Fine grained. Thingly bedded with minor warping and fairly fresh look. Top indicates (grading, flames) show tops uphole. Bedding at 151m Cleavage @ 151m Bedding at 157m	60 45 80	Very weak fe-dol in sandy members increasing in strength downhole.	Trace py.	
158.90 TO 164.50	«SIL GREY SER SEDS»	Grey. Fine grained. Cherty silicification of silty argillaceous sediments. Contact is gougey over .2m & numerous widely spaced mud seam gouges occur up to 163.6m.		{158.9-159.1} «flt gou.» Grey sericite development is moderate along partings.	{158.9-163.6} «5-10% py» as fine patches and disseminations. {164.1-164.5} «qdv» white and barren.	Relict fragmental? textures locally. Litho and assay sampled.
164.50 TO 173.30	«SER/SIL MAFICS?»	Pale green to yellow grey. Fine grained. Schistose banded interval with poor relict texture preservation. Strong fabric with qtz boudins and qtz dol patches. Gradational contact with underlying unit.	60	Sericitization and silicification with weaker fe-dol concentrated around flooded portions.	Wispy py disseminations totally 2-3%.	Check TiO2 in litho sample.
173.30 TO 221.00	«DOL MAF LAP TUFF»	Dark green and white. Fine to med. grained. Typical chloritic fragmental interval with visible lapilli and contorted qtz-dol veinlets and patches Mod. Foliation	60	Weak to mod. ferrodolomitization in patches with only trace brown sericita development.	Trace accessory & euhedral disseminated pyrite, with the latter assoc. with dol veining. {200.3-206.0} «dol vnlts, tr gn»	Its possible that this unit is a fragmental flow:
221.00 TO 225.80	«DOL FLOW BX»	Grey. Fine grained. Possible flow top (?) breccia now fe-dol flooded. Gougey lower contact, upper is sharp and conformable.		Strong fe-dol assoc with flooding and veinlets.	Tr. gn, py, sp.	
225.80 TO 243.00	«MAFIC FLOWS»	Green. Fine to med. grained. Competant fine to med. grained weakly fragmental to massive flows. Good igneous (aphitic?) texture locally. Weak foliation locally displayed. END OF HOLE.	70	Weakly ferrodolomitized but this is warning downhole.		

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB		COMMENTS
BCD24153	78.50	79.00	0.50	.070	3.80	.73	6.5	.01																
BCD24155	94.30	95.30	1.00	.001	.01	.01	1.6	.02																
BCD24156	95.30	96.40	1.10	.018	.08	.04	6.2	.01																
BCD24157	96.40	97.40	1.00	.064	.30	.18	18.0	.04																
BCD24158	97.40	98.80	1.40	.016	.07	.04	5.9	.01																
BCD24159	98.80	99.70	0.90	.004	.01	.01	1.7	.02																
BCD24160	99.70	101.20	1.50	.034	.34	.14	8.0	.20																
BCD24161	101.20	102.70	1.50	.068	.10	.06	5.8	.10																
BCD24162	102.70	103.90	1.20	.317	.09	.07	8.5	.07																
BCD24163	103.90	105.00	1.10	.003	.01	.01	1.0	.04																
BCD24164	105.00	106.80	1.80	.068	.01	.01	0.4	.01																
BCD24165	106.80	107.30	0.50	.030	.01	.01	0.4	.01																
BCD24166	107.30	108.40	1.10	2.850	.20	.03	178.0	.20																
BCD24167	108.40	108.90	0.50	.018	.01	.01	2.0	.01																
BCD24168	108.90	111.20	2.30	.005	.01	.01	1.5	.01																
BCD24169	111.20	112.80	1.60	.022	.01	.01	0.2	.02																
BCD24170	112.80	113.80	1.00	.008	.01	.01	0.3	.02																
BCD24171	113.80	114.80	1.10	.001	.01	.01	0.5	.01																
BCD24174	160.40	161.90	1.50	.028	.01	.02	4.0	.10																
BCD24175	161.90	163.40	1.50	.012	.01	.01	2.0	.04																
BCD24201	163.40	164.10	0.70	.010	.01	.01	2.4	.25																
BCD24202	164.10	164.50	0.40	.001	.01	.01	1.2	.02																
BCD24203	164.50	166.00	1.50	.006	.07	.08	2.1	.04																
BCD24207	222.00	222.60	0.60	.001	.01	.02	1.7	.02																

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
BCD24151	30.00	33.00	3.00	40.61	13.30	7.79	12.13	1.86	.01	10.41	.21	1.49			103	166			5	16	1.5	69	.28		.95	89.02	21	3
BCD24152	62.00	65.00	3.00	42.16	13.61	5.61	12.97	1.70	.01	11.24	.22	1.25			326	1416			5	38	1.9	994	.20		1.11	90.07	22	6
BCD24154	90.50	93.50	3.00	65.88	10.46	2.48	5.30	.20	1.75	4.90	.28	.47			19	110			5	64	0.7	50	.08		1.10	92.95	61	1
BCD24172	124.00	127.00	3.00	48.11	14.78	5.05	5.09	.44	2.65	8.77	.16	.76			39	118			10	89	0.9	31	.21		.24	86.39	238	1
BCD24173	158.90	160.40	1.50	84.64	6.23	0.13	0.46	.13	1.36	3.15	.01	.26			969	736			180	164	5.0	267	.21		2.60	99.32	131	3
BCD24204	166.00	169.00	3.00	69.22	11.78	1.19	1.34	.26	3.10	5.35	.11	.48			22	19			5	60	0.9	31	.09		4.50	97.53	44	2
BCD24205	197.00	200.00	3.00	34.41	10.97	11.33	9.81	.14	1.95	8.28	.42	1.34			69	74			10	46	1.6	28	.23		1.09	80.04	79	1
BCD24206	230.50	233.50	3.00	38.01	12.21	8.67	11.02	.55	.92	9.36	.29	1.54			56	75			5	26	1.4	6	.35		.55	83.50	120	2

MINNOVA INC.
DRILL HOLE RECORD

HOLE NUMBER: RG310 | IMPERIAL UNITS: | METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: Sam horizon

PLOTTING COORDS GRID: SAM GEOL.
NORTH: 963.00N
EAST: 10603.00W
ELEV: 1159.53

ALTERNATE COORDS GRID:
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -75x 0' 0"
LENGTH OF THE HOLE: 239.90m
START DEPTH: 0.00m
FINAL DEPTH: 239.90m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: April 26, 1990
DATE COMPLETED: April 30, 1990
DATE LOGGED: April 27, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NO

CONTRACTOR: FRONTIER DRILLING
CASING: LEFT IN HOLE.
CORE STORAGE: SAM CAMP

PURPOSE: INFILL

DRILLING

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
50.30	-	-75x 0'	ACID	OK		-	-	-	-	-	
96.60	-	-75x 0'	ACID	OK		-	-	-	-	-	
139.30	-	-75x 0'	ACID	OK		-	-	-	-	-	
173.70	-	-74x 0'	ACID	OK		-	-	-	-	-	
203.30	-	-73x 0'	ACID	OK		-	-	-	-	-	
233.80	-	-73x 0'	ACID	OK	(BOTTOM OF HOLE @ 239.9m)	-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 3.00	.CASING/					
3.00 TO 93.80	.MAF LAP TUFF/	Light to dark green. Aphanitic to medium grained. Well foliated fragmental unit with fragments from 1mm to 50mm, boudined parallel with foliation. Calcareous stringers 10% @ various Core Axis with majority @ approx. 60deg. C.A. (parallel with foliation). FOLIATION Minor fault zones at: 31-32, 78-78.2, 90.5-91.0. parallel with foliation(?) Appears to be very little movement in fault zones with 50-70% composed of competent rock and 30-50% composed of gouge +/- bx.	60	From 3.0 to approx. 11.0 is a pervasive fe-dol flooding (80%)(light grey/green) Main alteration of unit is green chlorite. ~ 90.0-93.8 pervasive fe-dol flooding (80-90%) light grey/green appears as an alteration contact with the lower silicified, pyritic breccia.	Trace 6% very fine grained diss py subhedral. (majority of unit has trace amount of py). Trace very very fine grained galena (diss in qtz + fe-dol stringers). Trace fine grained cpy (blebs in stringers). 93-93.8L .tr.-6% py, tr. gal, cpy/	Minor intervals of subporphyritic and porphyritic flows, usually less than 30cm. Occasional qtz + fe-dol stringer (1-5cm) with trace cpy (1-10mm bleb) & trace galena (.5-1mm diss). These stringers are widespread and @ various C.A. - majority @ 80-90degs. C.A. 3-11: in pervasive fe-dol flooding is 2-4% fine grained diss green mica (fuchsite) with 4-6% fine grained py., trace galena and chalcopyrite. Lapilli fragments are porphyritic with felspar (?) crystals replaced with quartz. Few of the lapilli fragments in section have a pumice texture (altered out feldspar(?) porphyry and occasionally replaced).
93.80 TO 205.60	.PYRITIC SIL BX/	Light grey to black. Aphanitic to coarse grained. Brecciated fragments from .1-50mm long composed of white quartz vein clasts, light grey and green silicified clasts, and argillaceous fragments. Fragments are subangular to subrounded & boudined. (shearing or) FOLIATION 9131-139L .flt zn/ 9136.4-137.5L .qzdv/ @ 30degs. C.A. (3-5% fe-dol). 9144-144.7L .qzvn/ @ 10degs. C.A. (tr. fe-dol). 9152.5-153.5L .qzdv/ @ 70degs. C.A. (3% fe-dol). 9154.5-165.4L .qzdv/ @ 10degs. C.A. (3% fe-dol). 9198.0-203.5L .flt zn/	60	Pervasive silicification (+80%). Occasional grey sericite along partings (10%). minor sections have green diss. mica (1-10%) (144.5-150.0). 166.5-181.5: is 5-10% yellow sericite alteration.	993.8-205.6L .20-50%py, tr sph,gal,cpy/ Pyrite is very very fine grained to fine grained. Located around fragments (wispy), 1-4cm blebs, bands which maybe larger blebs, & subhedral fine grained xtals in silicified flooded groundmass sphalerite is very fine grained, light yellow blebs (1mm) galena is very very fine grained diss. euhedral crystals. Cpy is very very fine grained blebs (1mm).	Unit appears to be a silicified (healed) fault bx with an occasional quartz (+ fe-dol) vein (white, bull) cutting through @ 10-30degs. C.A. (one @ 70degs. C.A.). 131.-139.: is a fault zone with gouge & brecciated silicified fragments (late faulting) contact @ 70degs. C.A. 144.5-150.0: medium green sericite alt. is in the footwall of a quartz vein containing tetrahedrite? Due to the protolith from 166.5-181.5 yellow 30% & green 5% sericite alteration is formed #for the entire interval the Protolith is probably turbiditic sediments as black argillaceous sections are the only recognizable rock unit. At 93.8 the upper contact is faulted (unconformable or compentency change?) 194.5-197.5 qtz stringer-veins @ 30degs C.A. 198.0-203.5: late fault zone with gouge brecciated silicified fragments 70% sheared pyritic, grey sericitic and 10-20% gouge, 10% brecciated fragments.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
205.60 TO 209.90	.ARGL/	Black. Aphanitic. Massive black argillite. Upper contact @ Foliation (or shearing) @ 40-60degs. C.A.	50	Weak silicification due to fractures @ various C.A. infilled with white to lt. grey quartz.	Trace 4% very very fine grained diss pyrite. Deformed stringer (?) in drill core.	Massive very weakly altered unit may be good marker unit.
209.90 TO 213.60	.PYRITIC SIL BX AND SIL ARGL/	White to black. Aphanitic to fine grained. Quartz (white to grey) brecciated fragments and pervasive silcification.	60	Silicification (+80%)	9209.9-213.6% .10-30% py/	From 209.9-212.3 is a healed (silicified) fault breccia with fragments of white vein quartz to grey silicified fragments & black argillite clasts. 212.3-213.6: is a silicified argillite with stockwork of quartz stringers throughout.
213.60 TO 239.90	.MAF LAP TUFF/	Light to medium green. Aphanitic to medium grained FOLIATION Fragmental unit with 50-80% fragments from 1-50mm long, boudined parallel with foliation. END OF HOLE.	60	Moderate to strong fe-dol altered with pervasive silicification near mineralized veins.	Tr.- 5% very fine diss. py. Tr.- 2% very fine diss gal. Tr.- 2% very fine bleb sph. Tr.- 1% very fine bleb cpy.	Fragments are altered to a light olive green. 223.3-223.6: qtz, fe-dol, calcite vein with 2% gal, 2% sph, 2% cpy, 10% py contact. @ 55degs C.A. parallel with foliation. 228.7-229.3: qtz, fe-dol, calcite vein with 20% py, 4% gal, 2% sph, 2% cpy. Contact @ 60degs C.A. parallel with foliation.

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
BCD24186	8.00	9.00	1.00	.007	.01	.01	1.6	.03															
BCD24187	9.00	10.00	1.00	.008	.01	.01	1.5	.02															
BCD24189	33.50	35.00	1.50	.016	.32	.39	2.3	.01															
BCD24191	75.20	75.70	0.50	.006	.03	.02	1.8	.01															
BCD24192	81.10	82.60	1.50	.011	.06	.04	1.7	.02															
BCD24194	93.80	95.50	1.70	.005	.02	.02	1.7	.03															
BCD24195	95.50	97.00	1.50	.012	.05	.04	2.2	.19															
BCD24196	97.00	98.50	1.50	.011	.01	.03	2.4	.17															
BCD24197	98.50	100.00	1.50	.028	.23	.11	9.9	.18															
BCD24198	100.00	101.50	1.50	.374	.79	.62	220.0	.21															
BCD24199	101.50	103.00	1.50	.032	.07	.03	8.1	.04															
BCD24200	103.00	104.50	1.50	.106	.41	.22	39.8	.10															
BCD24208	104.50	106.00	1.50	.024	.07	.04	7.6	.08															
BCD24209	106.00	107.50	1.50	.020	.03	.03	9.7	.40															
BCD24210	107.50	109.00	1.50	.008	.01	.02	2.1	.01															
BCD24211	109.00	110.50	1.50	.004	.02	.02	1.8	.02															
BCD24212	110.50	112.00	1.50	.356	.46	.40	139.0	.20															
BCD24213	112.00	113.50	1.50	.229	.87	.46	91.0	.41															
BCD24214	113.50	115.00	1.50	.033	.08	.10	11.7	.12															
BCD24215	115.00	116.50	1.50	.022	.06	.04	9.3	.38															
BCD24216	116.50	118.00	1.50	.046	.15	.09	17.6	.22															
BCD24217	118.00	119.50	1.50	.025	.13	.10	10.0	.24															
BCD24218	119.50	121.00	1.50	.007	.02	.05	3.9	.22															
BCD24219	121.00	122.50	1.50	.017	.21	.18	6.1	.27															
BCD24220	122.50	124.00	1.50	.008	.02	.03	1.8	.20															
BCD24221	124.00	125.50	1.50	.012	.04	.03	3.0	.12															
BCD24222	125.50	127.00	1.50	.011	.04	.07	3.4	.14															
BCD24223	127.00	128.50	1.50	.040	.27	.14	9.2	.16															
BCD24224	128.50	130.00	1.50	.006	.01	.02	3.5	.27															
BCD24225	130.00	131.50	1.50	.021	.09	.02	3.4	.16															
BCD24226	131.50	133.00	1.50	.008	.02	.02	1.7	.04															
BCD24227	133.00	134.50	1.50	.008	.04	.02	1.6	.01															
BCD24228	134.50	136.00	1.50	.005	.02	.06	1.8	.02															
BCD24229	136.00	137.50	1.50	.003	.01	.01	0.4	.17															
BCD24230	137.50	139.00	1.50	.015	.02	.02	1.9	.22															
BCD24231	139.00	140.50	1.50	.016	.16	.13	5.7	.02															
BCD24232	140.50	142.00	1.50	.015	.10	.02	1.2	.01															
BCD24233	142.00	143.50	1.50	.004	.03	.03	1.6	.02															
BCD24234	143.50	145.00	1.50	.004	.04	.05	1.0	.01															
BCD24235	145.00	146.50	1.50	.003	.01	.01	1.8	.03															

Sample	From (m)	To (m)	Length (m)	CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB
BCD24236	146.50	148.00	1.50	.002	.01	.03	1.7	.01														
BCD24237	148.00	149.50	1.50	.006	.03	.05	3.0	.01														
BCD24238	149.50	151.00	1.50	.017	.16	.06	5.9	.02														
BCD24239	151.00	152.50	1.50	.003	.01	.01	2.0	.02														
BCD24240	152.50	154.00	1.50	.001	.01	.01	2.1	.01														
BCD24241	154.00	155.50	1.50	.002	.01	.01	1.9	.01														
BCD24242	155.50	157.00	1.50	.001	.01	.01	1.8	.01														
BCD24243	157.00	158.50	1.50	.001	.01	.01	1.7	.01														
BCD24244	158.50	160.00	1.50	.002	.01	.01	2.0	.01														
BCD24245	160.00	161.50	1.50	.001	.01	.01	2.0	.01														
BCD24246	161.50	163.00	1.50	.001	.01	.01	1.8	.02														
BCD24247	163.00	164.50	1.50	.002	.01	.01	2.1	.01														
BCD24248	164.50	166.00	1.50	.001	.01	.01	1.2	.01														
BCD24249	166.00	167.50	1.50	.001	.01	.01	1.5	.04														
BCD24250	167.50	169.00	1.50	.001	.01	.01	1.7	.03														
BCD24251	169.00	170.50	1.50	.002	.01	.01	1.6	.01														
BCD24252	170.50	172.00	1.50	.002	.01	.01	1.2	.01														
BCD24253	172.00	173.50	1.50	.002	.01	.01	1.0	.01														
BCD24254	173.50	175.00	1.50	.001	.01	.01	1.3	.01														
BCD24255	175.00	176.50	1.50	.001	.01	.01	1.5	.02														
BCD24256	176.50	178.00	1.50	.002	.01	.01	1.2	.01														
BCD24257	178.00	179.50	1.50	.002	.01	.01	1.4	.01														
BCD24258	179.50	181.00	1.50	.001	.01	.01	1.1	.01														
BCD24259	181.00	182.50	1.50	.001	.01	.01	0.2	.10														
BCD24260	182.50	184.00	1.50	.002	.01	.01	1.4	.07														
BCD24261	184.00	185.50	1.50	.002	.01	.01	0.7	.11														
BCD24262	185.50	187.00	1.50	.007	.01	.03	2.5	.06														
BCD24263	187.00	188.50	1.50	.005	.04	.02	1.9	.15														
BCD24264	188.50	190.00	1.50	.006	.04	.02	2.0	.18														
BCD24265	190.00	191.50	1.50	.004	.02	.01	0.4	.05														
BCD24266	191.50	193.00	1.50	.006	.02	.01	0.6	.10														
BCD24267	193.00	194.50	1.50	.041	.22	.03	3.1	.17														
BCD24268	194.50	196.00	1.50	.004	.01	.01	1.1	.05														
BCD24269	196.00	197.50	1.50	.003	.01	.01	0.5	.16														
BCD24270	197.50	199.00	1.50	.004	.01	.01	0.8	.05														
BCD24271	199.00	200.50	1.50	.009	.02	.01	1.9	.04														
BCD24272	200.50	202.00	1.50	.005	.01	.01	1.0	.12														
BCD24273	202.00	203.50	1.50	.002	.01	.01	0.3	.10														
BCD24274	203.50	205.00	1.50	.006	.01	.01	0.5	.11														
BCD24275	205.00	206.50	1.50	.008	.06	.01	2.4	.19														

Sample	From (m)	To (m)	Length (m)	CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB
BCD24276	206.50	208.00	1.50	.009	.15	.01	1.6	.12														
BCD24277	208.00	209.50	1.50	.012	.07	.02	2.2	.12														
BCD24278	209.50	211.00	1.50	.028	.07	.01	1.8	.07														
BCD24279	211.00	212.50	1.50	.008	.06	.01	1.7	.16														
BCD24280	212.50	213.70	1.20	.019	.07	.01	2.2	.22														
BCD24281	213.70	215.20	1.50	.008	.02	.01	0.7	.02														
BCD24282	224.20	224.70	0.50	.030	.14	.11	2.1	.01														
BCD24283	226.00	227.50	1.50	.174	.46	.62	4.8	.01														
BCD24284	227.50	228.70	1.20	.012	.06	.01	1.5	.01														
BCD24285	228.70	229.30	0.60	.152	1.90	1.39	11.5	.01														
BCD24286	229.30	230.80	1.50	.014	.07	.13	2.2	.01														

HOLE NUMBER: RG310 GEOCHEM. SHEET DATE: 17-May-1990

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
BCD24188	15.00	18.00	3.00	40.30	12.20	9.75	9.54	2.40	.03	9.86	.19	1.49			77	127			10	49	2.0	57	.32		1.29	87.38	33	8
BCD24190	45.00	48.00	3.00	40.67	14.23	6.04	12.66	1.79	.01	10.75	.15	1.26			113	76			5	16	1.4	5	.23		.19	87.98	1	5
BCD24193	82.60	85.60	3.00	38.06	11.71	12.66	8.31	2.27	.13	8.66	.15	1.25			74	80			5	41	1.4	13	.25		.80	84.25	24	5

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: Sam horizon

PLOTTING COORDS GRID: Sam Geol.
NORTH: 900.00N
EAST: 10540.00W
ELEV: 1171.58

ALTERNATE COORDS GRID:
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -50x 0' 0"
LENGTH OF THE HOLE: 157.50m
START DEPTH: 0.00m
FINAL DEPTH: 157.50m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: April 3, 1990
DATE COMPLETED: May 2, 1990
DATE LOGGED: May 1, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NO

CONTRACTOR: FRONTIER DRILLING
CASING: LEFT IN HOLE.
CORE STORAGE: SAM CAMP

PURPOSE: INFILL DRILLING.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
19.80	-	-50x 0'	ACID	OK		-	-	-	-	-	
56.10	-	-49x 0'	ACID	OK		-	-	-	-	-	
108.80	-	-49x 0'	ACID	OK		-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 3.70	.CASING/					
3.70 TO 39.60	.MAF LAP TUFF/	Light to medium green.Aphanitic to medium grained. Fragmental unit with minor interbedded subporphyritic to porphyritic flows and ash tuff. Fragments from 1-50mm long, boudined parallel with foliation. Foliation Foliation varies from 70-90deg. with average of 80deg.	80	3.7-11.0: moderately fe-dol altered. 35-39.6: moderately to strongly fe-dol altered - increasing in alteration with depth and near contact with next unit. Mainly chloritic alteration (+80%).	Trace of fine grained pyrite mainly along fractures. Trace of very very fine grained galena in occasional fracture (late qtz-carbonate stringer).	A calcareous, chloritic altered fragmental volcanic unit from andesitic (?) to basaltic composition, with minor very fine grained ash tuffs and porphyritic flows interbedded.
39.60 TO 65.00	.ALT SER ARG SIL BX-SHR/	Finely laminated yellow (semi-massive) sericite with occasional thin to thick (.1-300mm) interbed (?) of black (argillaceous?) laminations with grey sericite alteration. Occasional quartz vein from 10-30cm wide, parallel to subparallel with foliation, which is brecciated and has yellow sericite and fe-dol along fractures & around fragments. (shearing or) Foliation 945-48.8L .flt zn/ approx. parallel with foliation. 957-58.8L .flt zn/ 40% recovery 961.4-61.9L .flt zn/ Brittle fault breccia with silicifed bx fragments.	85	Yellow sericite (+70%) silicification (1-10%) grey sericite (1-4%) fe-dol (1-4%) along fractures.	2-4% of fine grained pyrite mainly along fractures. 964.1-64.5L .50% py, 5% sph./	39.6-51.0: mainly an altered yellow sericite unit with minor black (argillaceous?) interbeds. 46.5-48.8: is a black (argillaceous) unit in a fault breccia zone. Movement is parallel with foliation (or shearing?) In the interval most silicification and quartz stringers are brecciated (brittle fracture). 61.0-65.0: there is an increase in silicification with numerous brecciated fragments held together in a silicified matrix. (Possible Footwall) The entire zone from 39.6-65.0 appears to be a large healed shear and fault breccia zone. The protolith appears to be seimentary (ie. turbiditic seds) with only argillaceous beds recognizable.
65.00 TO 92.00	.ARG SLST SST/	Grey to black. Aphanitic to fine grained. Interbedded arg, siltstone and sandstone from fine to medium laminations (beds). Bedding @ 70-70.4: is a soft sedimentary ductile fold. 73.7: fault @ 55deg C.A. crossing bedding.	75	Unaltered.	Trace of fing grained py mainly as blebs in sandstone beds.	By using flame structures (4) & graded (6) the sedimentary unit appears to be tops up. At 65.7 there is a 10cm sandstone unit which appears to have "reverse bedding" (questionable). Coarse sst units have argillite rip-up clasts, blebs (1-3mm) of pyrite, and blue nodules of chalcedonic quartz and appear to contain a weak silicification or recrystalization.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
92.00 TO 118.80	.ARG PY SIL SHR/BX/	White to black. Aphanitic to fine grained. Black, massive, graphitic argillite with wispy "bands" of very very fine grained py & light grey chalcedonic quartz. 997.5-99.5L .flt zn/ gouge + bx @ 25deg c.a. 9106.6-109.2L .flt zn/ late @ approx. 55deg. c.a. with grey sericitic gouge. 9110.9-112.0L .flt zn/ late @ 55deg. c.a. 9116.5-117.2L .flt zn/ late @ approx. 90deg. c.a. (bx).	85	Weak to strong silicification.	992-118L .5-25% py, tr. sph/	Pyrite-quartz (pyrite is 1-30mm blebs) "bands" appear as wispy stringers along bedding planes or replacement of silt-sandstone interbeds.Possible syngenetia (or diagenetic) pyrite (+ quartz exhalative) but silicified sections of argillite has fractures (stringers) of white to light grey chalcedonic quartz @ various C.A. Therefore mineralization appears epigenetic. 99.5-100.8: weak sillicified argillite 100.8-118.8: is a mod to strong silicified, pyritic shear-breccia zone with shearing @ 85deg. c.a. and a cleavage @ 55deg c.a. (parallel with late faulting @ 110.9-112.0) Fragments in the zone is composed of silicified argillite & silicified light grey clasts which may be primary chert (?) (112.8-113.8 is silicified arg)
118.80 TO 120.30	.QZDV/	White. Aphanitic. Massvie white bull quartz vein with approx. 3% fe-dol crystals. Upper Contact @	75		2-5% very very fine grained py in gouge material.	Grey and brown sericitic gouge material associated in vein.
120.30 TO 132.20	.ALT SER SIL/	White/yellow/green. Aphanitic to fine grained. Chaotic laminations, brecciated fragments with a strongly quartz stringer stockwork (or flooding).		Yellow sericite 20-30%. Green sericite 5% (or chlorite). Silicification 30%. Fe-dol 10-20%.	Tr. 5% very fine grained diss py (rare occasional bleb or bx fragment).	Unit appears as contorted due to either being in a breccia zone or else near the nose of a fold with abundant quartz (30%) being concentrated in the hinge of the fold.
132.20 TO 135.50	.SIL ARG/	Grey to black. Aphanitic. Black and grey laminations of silicified argillite and siltstone(?). Bedding is from 10-90degs. c.a. (hinge of a fold?)		Silicification 80%+. Fe-dol 3-5% (along late fractures).	3-5% very very fine grained diss py tr. sph.	It appears as thinly laminated argillite and siltstone which is intensely silicified. 132.8-133.0: minor fault breccia approx parallel with unit (?). 134.6-135.5: green and yellow sericitic quartz flooded unit-graclational contact to quartz vein below with traces of sph, gal.
135.50 TO 136.90	.QZVN/	White to grey. Aphanitic to fine grained. Massive white/grey quartz vein with blebs and fractures of sulphides.	60		3-5% very fine grained blebs py. 3-5% very fine grained light yellowish-brown sph. 1-2% very fine grained diss galena. Tr 1% very fine grained blebs cpy.	Upper part of vein is sampled with yellow/green sericitic silicified unit because of weak-mod quartz stringer stock work carrying sph and gal. Bottom 30cm contact is fault breccia. Trace of green sericite.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
136.90 TO 137.70	.SIL ARG/	Grey to black. Aphanitic. Chaotic bedding of silicified argillite possible breccia. Numerous microfractures of white quartz, distorted.		Silicification 80%+.	3-5% very fine grained wispy py.	Appears the same as the unit from 132.2-135.5.
137.70 TO 142.60	.SIL/	White to grey. Aphanitic. White to grey intensely silicified unit with chaotic fractures of grey sericite.		Silicification 95%+, trace yellow sericite at upper contact. Trace grey sericite in fractures.	Trace very fine grained py.	Gradational upper contact. Possible "nose" of fold.
142.60 TO 154.50	.ALT SER ARG/	Yellow to black. Aphanitic to fine grained. Finely laminated yellow/brown and trace green ser. altered rock with boudined, brecciated white qtz fragments & stringers (larger, flatten fragments?) (shearing or) Foliation @148.1-152.1% .flt zn/ Breccia and gouge with 50% sheared rock and occasional qtz stringer in fault zone. Fault appears to be subparallel with foliation.	85	Yellow sericite 30%, brown sericite 5%, green sericite (or chlorite(?)) 1%.	Trace 3% very fine grained diss py.	Argillaceous laminations from 148.1-148.5 and 149.2-149.6.
154.50 TO 157.50	.ALT MAF VOL/	Grey to green. Aphanitic to fine grained. Moderately altered unit with possible "ghosts" of fragments well foliated, brown sericitic altered with 5% composed of fe-dol and/or quartz stringers parallel with foliation. Foliation END OF HOLE.	85	Brown sericite 10%, fe-dol pervasive 30%, green sericite 1-2%.	Trace 2% very fine grained diss py.	Moderately to strongly altered unit which appears as a mafic volcanic fragmental unit with possible "ghosts" of lapilli size fragments.

HOLE NUMBER: RG311 ASSAY SHEET DATE: 17-May-1990

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
BCD24289	61.10	62.10	1.00	.003	.01	.01	0.2	.01															
BCD24290	62.10	63.10	1.00	.008	.02	.01	0.9	.02															
BCD24291	63.10	64.10	1.00	.023	.11	.02	2.6	.02															
BCD24292	64.10	64.50	0.40	.012	.02	.04	2.4	.16															
BCD24293	64.50	65.00	0.50	.030	.10	.06	4.3	.19															
BCD24294	92.00	93.50	1.50	.010	.03	.01	2.2	.85															
BCD24295	93.50	95.00	1.50	.218	.14	.07	45.5	2.01															
BCD24296	95.00	96.50	1.50	.009	.03	.03	4.1	.60															
BCD24297	100.80	102.30	1.50	.010	.04	.02	2.0	.01															
BCD24298	102.30	103.80	1.50	.010	.07	.02	1.6	.01															
BCD24299	103.80	105.30	1.50	.010	.05	.02	0.8	.03															
BCD24300	105.30	106.80	1.50	.012	.08	.03	1.7	.01															
BCD24301	106.80	108.30	1.50	.004	.03	.01	0.2	.01															
BCD24302	108.30	109.80	1.50	.004	.01	.01	0.2	.01															
BCD24303	109.80	111.30	1.50	.004	.01	.01	0.3	.02															
BCD24304	111.30	112.80	1.50	.005	.02	.01	1.3	.01															
BCD24305	117.20	118.80	1.60	.007	.02	.01	0.3	.01															
BCD24306	118.80	120.30	1.50	.002	.01	.01	0.2	.02															
BCD24307	133.90	134.90	1.00	.032	.15	.10	2.2	.01															
BCD24308	134.90	135.90	1.00	.001	.09	.02	0.2	.02															
BCD24309	135.90	136.90	1.00	.262	1.49	1.08	106.0	.02															
BCD24310	136.90	137.90	1.00	.011	.04	.01	1.2	.02															

HOLE NUMBER: RG311 GEOCHEM. SHEET DATE: 26-May-1990

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
BCD24287	16.00	19.00	3.00	43.95	12.90	11.23	5.06	3.87	0.09	8.54	0.16	1.99			57	114			5	10	1.6	36	0.63		0.92	89.35	41	5
BCD24288	42.00	45.00	3.00	68.53	12.30	0.69	2.04	0.25	2.70	5.71	0.24	0.57			54	180			5	44	1.0	200	0.12		2.65	95.88	178	6
BCD24311	154.50	157.50	3.00	53.14	13.42	3.21	5.20	0.77	1.90	8.05	0.38	1.12			54	95			5	40	1.4	58	0.23		1.07	88.54	169	8

MINNOVA INC.
DRILL HOLE RECORD

HOLE NUMBER: RG312 | IMPERIAL UNITS: | METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: SAM HORIZON

PLOTTING COORDS GRID: SAM GEOL.
NORTH: 900.00N
EAST: 10450.00W
ELEV: 1194.58

ALTERNATE COORDS GRID:
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -50x 0' 0"
LENGTH OF THE HOLE: 161.10m
START DEPTH: 0.00m
FINAL DEPTH: 161.10m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: May 2, 1990
DATE COMPLETED: May 6, 1990
DATE LOGGED: May 4, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
ROD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NO

CONTRACTOR: FRONTIER
CASING: PULLED
CORE STORAGE: SAMEX CAMP

PURPOSE: INFILL DRILLING. LAID OUT BY SURVEY. HOLE WASHED OUT AND RODS BROKE RESULTING IN HOLE BEING LOST AT

DIRECTIONAL DATA: 161.1m.

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
56.10	-	-50x 0'	ACID	OK		-	-	-	-	-	
90.50	-	-51x 0'	ACID	OK		-	-	-	-	-	
150.60	-	-53x 0'	ACID	OK		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 9.80	.CASE/					
9.80 TO 36.60	.OVER(?)/	GREEN - APHANTIC TO FINE. 9.8 - 36.6 FAUKT GOUGE? AND BRECCIA THROUGHOUT WITH 10-20CM SECTIONS OF COMPETENT MAFIC LAPILLI TUFF. APPEARS AS OVERBURDEN? NOT A FAULT ZONE DUE TO HETEGENUS FRAGMENTS IN GOUGE. *(34.1 TO 36.6 TRICONED NO CORE)		CLAY	Tr of v.v.f.g. diss py	APPROX 20% RECOVERY IN AN OVERBURDEN (GLACIAL TILL?). CLAY IS OLIVE GREEN WITH 10-20% BRECCIATED FRAGMENTS (0.1 - 1.0CM) OF VARIOUS COMPOSITION. APPROX 2 - 4% OF SECTION HAS MAFIC VOLCANICS COMPETENT SECTION WITH FOLIATION FROM 45 DEGREES TO 80 DEGREES CELCIUS. A (POSSIBLY ROTATED IN TRANSPORT). 33.8 - 33.9 HAS 1 - 10MM BLEBS OF MAGNETITE, (TRANSPORTED) IN A MAFIC VOLCANIC PORPHYRY.
36.60 TO 38.70	.FLT BX/	GREY TO GREEN - APHANTIC TO FINE. GOUGE AND BRECCIA (50% RECOVERY) LOST CORE ?			5 - 10% v.v.f.g. py	CLAY ALTERED AND PYRITIC FRAGMENTS AS WELL AS FRAGMENTS OF GREEN CHLORITE /SERICITE? (HANGING WALL OF VEIN)
38.70 TO 39.70	.QZVN/	GREY - APHANTIC A GREY SILICIFIED CHALCEDONIC SECTION WITH SHORT (1 - 5CM) SECTIONS OF SEMI-MASSIVE PYRITE.		(SILICIFICATION? 80%+)	10 - 15% v.f.g. DISS AND BLEBS OF PY.	APPEARS AS A BX SILICIFIED SECTION IN A FLT BX ZN.
39.70 TO 57.00	.ARGL SLST SHR/BX/	GREY TO BLACK - APHANTIC TO FINE. BRECCIATED FRAGMENTS FROM 1 TO 50 MM LONG WITH GRAPHITIC ARGILLITE SHEARING @	75	CLAY (GOUGE)	tr - 5% PY (ALONG SHEARED PLANES)	APPEARS AS A REACTIVATING FAULT ZONE IN ARGILLITE AND SILTSTONE (FURBIDITIC) SEDIMENTS WITH SMALL SECTIONS OF "HEAKED" FAULT BRECCIA (DOES NOT APPEAR AS A DEBRIS FLOW)
57.00 TO 66.00	.ARGL SLST/	GREY TO BLACK - APHANTIC TO FINE. THINLY LAMINATED ARGILLITE AND SILTSTONE. BEDDING @ 59.5 - 59.6 FAULT @ 80 DEGREES C.A. 61.0 - 61.4 FAULT ? BROKEN CORE 62.5 - 63.1 FAULT BX @ ? C.A. 64.0 - 65.0 FAULT ? BROKEN CORE	70	UNALTERED	TR. V.F.G. DISS PY (DIAGENETIC)	SECTION IS BROKEN CORE THROUGHOUT WITH BRITTLE FAULT BRECCIA SMALL ZONES (APPROX 20% RECOVERY) FEW GRAPHITIC FRACTURES. APPEARS AS AN UNALTERED REMNANT WITH LATE BRITTLE FAULTING. (CORE IS TO BROKEN TO DETERMINE TOPS U?).
66.00 TO 121.00	.PY/GREY SE R/BX/	GREY - APHANITIC TO FINE VERY, VERY FINELY LAMINATED/SHEAR PLANES OF VERY, VERY FINE GRAINED PYRITE AND SILVER GREY SERICITE. SHEARING @ 966.0 - 71.2L .FLT BX/ 71.2 - 71.6 ABOUT PARALLEL LAMINATIONS 971.6 - 72.0L .FLT GOUGE/ @ ABOUT 70% C.A. ABOUT PARALLEL WITH SHEARING. 75.0 THE LAMINATIONS DISPLAY A FOLD HINGE	70	SILVER-GREY SERICITE 10 - 15% RELICT FRAGMENTAL TEXTURES LOCALLY APPARENT, AS ARE SPOTTY WHITE PORPHYROBLASTIC TEXTURES (FE-DOL?) PATCHY BLACK ARGILLACEOUS INTERVALS ALSO COMMON	20 - 30% V.V.F.G. DISS AND WISPY, LAMINATIONS OF PYRITE 966.0 - 121.0L 20% PY	UPPER CONTACT IS A SHEAR/FAULT BRECCIA 71.2 - 71.6 THE LAMINATIONS ARE APPROX SUBPARRALEL WITH C.A. WHICH APPEARS TO BE EITHER GOING THROUGH THE NOSE OF A FOLD OR POSSIBLY A DRAG FOLD DUE TO FAULT GOUGE ABOVE AND BELOW. THE SHEARING IS FROM 0 DEGREES TO 90 THROUGHOUT SECTION WITH THE MAJORITY

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		@ 90 DEGREE C.A. 77.0 - 77.1 SMALL FAULT GOUSE/GR ABOUT PARALLEL WITH SHEARING 978.3 - 78.9L .FLT BX/ BRECCIATED FRAGMENTS AND COUDINED QTZ-FE-DOL STRINGERS IN ZONE. 987.8 - 88.0L .FLT GOU/ WITH MINOR DRAG FOLDING FOLIATION AT 100M	60			@ 70 DEGREES C.A. 80.3 - 81.6 A FE-DOL (+QTZ) VEIN @ ABOUT 70 DEGREES C.A. PARALLEL WITH SHEARING WITH A TRACE OF SPHALERITE AND THREE 10 CM SILVER-GREY SERICITIC SECTIONS POSSIBLY A LITHIC WACKE DOMINANT TURBIDITE INTERVAL.
121.00 TO 131.20	.GRAPH ARG BX/	BLACK - FINE CRACKLE BRECCIATED WITH QTZ-DOL FRACTURE FILLINGS. 9122.5 - 123.0L .FLT GOU/ FOLIATION	65	WEAKLY GRAPHITIC WITH LOCAL WEAK SIL. AND DOL.	TR. PY	126.8 TO 127.2: WHITE COARSE DOLOMITE VEIN BARREN OF SULFIDES.
131.20 TO 143.40	.GREY SER/P Y HET FRAG/	GREY - FINE RESUMPTION OF STRONGLY ALTERED UNIT. FRAGMENTAL RELICT TEXTURES VISIBLE WITH ARG, SILT AND CHERTY CLASTS NOW STRETCHED OUT. MATRIX IS STRONGLY PYRITIC. SCHISTOSITY	65	PERVASIVE GREY SERICITIZATION: 9130.9 - 131.9L .WHITE BULL QDV/ WEAK STRINGER CONTROLLED FE-DOL.	PATCHY PERVASIVE DISSEMINATIONS VERY FINE GRAINED 9131.2 - 143.4L .10 - 15% PY/	
143.40 TO 150.20	.ARG/GREY SER SCH/	GREY TO BLACK INTERVAL IS 40% COMPRISED OF BLACK ARGILLACEOUS CONTORTED AND LAMINATED INTERVALS SEPARATED BY GREY SERICITE ALTERED COARSE CLASTICS. FOLIATION AT 149 M	80	PATCHY, PROTOLITH DEPENDANT GREY SERICITE AND PY ALTERATION.	.10% PG/ 9143.4 - 150.2L	
150.20 TO 154.90	.SIL ARG BX /	BLACK AD WHITE - FINE INTENSELY SILICIFIED WITH MARBLY, STYLOLITIC, VEINED AND FLOODED ARGILLITE WITH GRAPHITIC PARTINGS, CONTORTIONS, AND INTRAFORMATIONAL BRECCIA TEXTURES.		PERVASIVE AND VEIN CONTROLLED SILICIFICATION	5 - 7% DISSEM AND FRACTURE FILLING PYRITE ABARIT 1% COMBINED BASE METALS.	
154.90 TO 161.10	.YELLOW SER /QTZ SCH/	YELLOW AND GREY WITH SOME BLACK - FINE SCHISTOSE INTERVAL WITH ABRUPT COLOUR CHANGE TO PREDOMINANTLY YELLOW, WITH WISPY BLACK ARGILLACEOUS BANDS AND SILICA BOUDINS FAIRLY TYPICAL OF "SERT". THE ARGILLACEOUS BANDS DECREASE AND DISAPPEAR BY 159.0M IRREGULAR AND WARPED FOLIATION FROM 60 - 90 DEGREES. END OF HOLE		PATCHY YELLOW SERICITE BECOMES PERVASIVE AFTER 159.0M. SILICA FLOODING	FRACTURE FILLING WISPY FINE PG (3 - 5%) . FROM 159- 150.1 QUARTZ RICH SEAMS HAVE CONCENTRATIONS OF PYRITE AND TRACE BASE METALS OVER 1 [illegible] CM. 9159 - 160.1L .5% PY, 1% CP, GN, SP/	MAY REPRESENT THE ALTERED GRADATIONAL CONTACT FROM SEDIMENTS TO MAFIC PYROCLASTICS. HINTS OF GREEN CHLORITE, REPLACED BY SERICITE PRESENT NEAR 159.3 HOLE ABANDONED WHEN RODS BROKE DUE TO THE HOLE WASHING OUT.

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB		COMMENTS
BCD24312	36.70	37.70	1.00	.006	.01	.01	1.6	.05																
BCD24313	37.70	38.70	1.00	.006	.01	.01	1.7	.05																
BCD24314	38.70	39.70	1.00	.004	.01	.01	1.5	.04																
BCD24315	39.70	40.70	1.00	.001	.01	.01	1.4	.04																
BCD24318	80.30	81.60	1.30	.005	.01	.01	1.5	.04																
BCD24323	130.90	131.00	0.10	.001	.01	.01	0.4	.01																
BCD24325	148.70	150.20	1.50	.007	.01	.01	2.0	.06																
BCD24326	150.20	151.50	1.30	.108	.32	.26	24.2	.71																
BCD24327	151.50	153.00	1.50	.030	.06	.04	4.5	.13																
BCD24328	153.00	154.00	1.00	.004	.01	.01	0.4	.01																
BCD24329	154.00	154.90	0.90	.004	.01	.01	0.5	.01																
BCD24331	159.00	160.00	1.00	.079	.50	.32	7.9	.23																
BCD24332	160.00	161.10	1.10	.077	.16	.19	5.4	.16																

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
BCD24316	57.00	60.00	3.00	62.83	12.62	2.63	3.15	0.34	2.29	6.24	0.08	0.76			29	66			5	75	0.8	18	0.20		0.29	91.59	56	1
BCD24317	72.00	75.00	3.00	52.03	19.34	1.90	1.62	1.89	2.35	8.05	0.04	0.76			41	104			5	38	0.7	33	0.34		7.89	96.38	90	6
BCD24319	88.00	91.00	3.00	46.10	22.70	1.27	1.70	2.30	2.61	10.40	0.04	0.89			45	77			10	29	0.7	51	0.14		10.83	99.14	107	8
BCD24320	97.00	100.00	3.00	57.08	17.51	1.54	1.22	1.55	2.48	8.06	0.03	0.69			37	48			5	44	0.5	34	0.29		8.97	99.58	78	3
BCD24321	112.00	115.00	3.00	50.30	17.19	2.00	2.90	1.37	2.28	10.41	0.04	1.23			92	57			5	42	0.5	27	0.25		10.51	98.54	70	2
BCD24322	127.50	130.50	3.00	52.06	16.00	0.74	4.84	0.76	2.24	11.17	0.04	1.118			97	60			5	40	0.8	22	0.27		7.26	96.70	62	1
BCD24324	139.00	142.00	3.00	58.49	17.33	2.00	2.04	1.08	2.93	5.80	0.02	0.67			36	36			5	70	0.9	24	0.18		6.16	96.84	47	1
BCD24330	156.00	159.00	3.00	66.52	15.15	0.09	1.97	0.36	3.24	5.44	0.21	0.71			37	57			10	47	0.4	50	0.11		0.82	94.75	152	1

MINNOVA INC.

HOLE NUMBER: RG313 — DRILL HOLE RECORD — IMPERIAL UNITS: — METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: SAM HORIZON

PLOTTING COORDS GRID: SAM GEOL.
NORTH: 900.00N
EAST: 10600.00W
ELEV: 1151.06

ALTERNATE COORDS GRID:
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -65x 0' 0"
LENGTH OF THE HOLE: 156.00m
START DEPTH: 0.00m
FINAL DEPTH: 156.00m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: May 6, 1990
DATE COMPLETED: May 7, 1990
DATE LOGGED: May 8, 1990

COLLAR SURVEY: NO
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: FRONTIER
CASING: PULLED
CORE STORAGE: SAMEX CAMP

PURPOSE: INFILL DRILLING, PROPOSED HOLE P-8 AS LAID OUT BY SURVEY.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
41.80	-	-65x 0'	ACID	OK		-	-	-	-	-	
135.20	-	-62x 0'	ACID	OK		-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 0.00 0.00 TO 5.00	.CSG/ "CASING"					
5.00 TO 20.00	.MAF LAP TU FF/	GREEN - COARSE TYPICAL LAPILLI TUFF WITH YELLOW FRAGMENTS AVERAGING 3 - 4 CM. WAVY FOLIATION	55	PATCHY TO PERVASIVE FERRODOLAMITIZATION MINOR DEFORMED QDVEINLETS. MODERATE ALTERATION	1% PB	95.0 - 8.1L .FLT BX DOL HEALED/
20.00 TO 20.60	.DOL/QTZ VE INS/	WHITE - COARSE BROKEN CONTACTS BUT FAIRLY CONCORDANT TO FOLIATION	55		.1% CPY. 1% GN, 2% PY/ L20.0 - 20.6L	MOSTLY BLADED SOLOMITE WITH FINE DISSEM AND CLOTTY SULFIDES.
20.60 TO 27.60	.DOL MAF TU FF/	GREEN TO YELLOW - COARSE INTENSELY ALTERED BUT RECOGNIZABLE LAPILLI TUFF. ONLY MODERATE FLATTENING AND FOLIATION AT LOWER CONTACT SHARP AND MARKED BY ABRABT CHANGE FROM DOL. TO SILICIFICATION.	65	STRONG PERVASIVE FERRODOLOMITIZATION WITH DEFORMED VEINLETS COMMON.	2 - 3% DISS PY.	
27.60 TO 30.50	.YELLOW SER /QTZ SCH/	YELLOW - FINE STRONGLY ALTERED SEDIMENTS (?) COMPRISED OF YELLOW SERICITE WITH VEIN QYZ BOUDINS AND WISPY PYRITE. MINOR BLACK ARGILL WISPS ALSO COMMON, AS ARE PALE GREEN PATCHES. FOLIATION	65	SILICIFIED, SERICITIZED, WITH SECONDARY PYRITE.	3 - 5% PY IN WISPS AND FRACTURE FILLINGS.	POSSIBLY AN ALTERED TRANSITIONAL VOLCONICLASTIC UNIT?
30.50 TO 49.30	.HET SIL/AR G/PY FRAG/	BLACK - FINE TO COARSE CONTACT MARKED BY 1 CM GOUGE. THE UNIT IS COMPRISED OF A COARSE FRAGMENTAL WITH MOSTLY BLACK ARGILLACEOUS INTRAFORMATIONAL MATERIAL, AND LESSER CHERT, SILTSTONE, MASSIVE PYRITE, AND WACKE LITHOCLASTS IN A RICH MATRIX INTERVAL IS OVERALL MATRIX GOOD.		933.3 - 34.0L .FLT GOU + BX/ LOOKS LIKE A FAULT BRECCIATED SED. BRECCIA. STRONG SILICIFICATION UP TO 33.3 M, FOLLOWED BY PATCHY SILICIFICATION TO END OF INTERVAL. NO SERICITE.	.5 - 10% PY, TR, SPH/ 930.5 - 49.3L AS LITHOCLASTS (?) AND IN MATRIX.	RESEMBLES IN PART "REA BRECCIA"
49.30 TO 80.40	.ARG/WACKE/	BLACK TO GREY - FINE TO MED. FAIRLY FRESH AND UNDISTURBED WITH GOOD BEDDING. INTERVAL IS COMPRISED OF 50% ARGILLITE, 30% COARSE SANDY WACKE, AND 10% SILTSTONE. BEDDING UPRIGHT AT	70	MINOR QTZ STRINGERS.	TR. PY.	APPARENTLY TOPS ARE UPHOLE AS INDICATED BY GRADING.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
60.40 TO 66.10	.PY/ARG BX/	BROWN AND BLACK - FINE SHARP CONTACT WITH DELICATELY LAMINATED ARGILLITE AND PRIMARY (?) PYRITE. STRONG FLATTENING FABRIC, BUT FRAGMENTAL TEXTURE STILL VISIBLE. CHERTY AND ARGILLACEOUS SLIVERS COMMON.	45	MINOR SIL.	960.4 - 66.1L .10 - 20% PY/	STRAIN INCREASING DOWNHOLE.
66.10 TO 69.80	.GREY SER F LT GOU/	GREY - FINE FRIABLE, MUTLIKE AND CLAY RICH FAULT GOUGE FRAGMENTS OF ABOVE UNIT COMMON. ANGLES CHAOTIC.		STRONG GREY SERICITE.	5 - 10% PG	
69.80 TO 78.00	.ARG/WACKE/	BLACK TO GREY - FINE TO MED. AS BEFORE, REL. FRESH SEDS WITH INTERBEDDING AT 1 - 5 CM SCALE TOPS UPHOLE (?) BEDDING CLEAVAGE	65 40	MINOR BLEACHING APPEARS AT 77M AND INTENSIFIES DOWNHOLE WITH THE CREATION OF A PHYLLITIC SHEEN AND BUFF SERICITE.	TR. PY	
78.00 TO 86.50	.QV FLT ZON E/	WHITE AND GREY LOW ANGLE WHITE BULL VEINS CUTTING BLEACHED SERICITIC ARGILLITES. CORE IS LOCALLY BROKEN TO GOUGEY VEINING	15	BUFF TO GREY SERICITIZATION. VEINS CONTAIN ONLY TRACE FE-DOL.	978.0 - 86.5L .10% PY, TR, CPY/ AS FINE DISSEM IN SERICITE, EXCEPT FOR 3 CM ALDT OF COARSE PY, CPY IN QTZ AT 84.3M.	VEINS FROM 2 CM TO 1 M WIDE. EVIDENCE OF DRAG FOLDING.
86.50 TO 96.20	.GREY SER/P Y SCH/	GREY - FINE FAIRLY COMPETANT, DENSE GREY SERICITE AND PYRITE SCHIST WITH "SNOWY" WHITE CONTORTED AND WISPY FE-DOL AND QTZ VEINLETS. STRONG FOLIATION	45	INTENSE, PERVASIVE GREY SERICITIZATION WITH FINE PYRITE. MINOR FE-DOL IN PATCHES. 994.5 - 96.2L .FLT GOU/	986.5 - 96.2L .10 - 15% PY/	ALL RELICT TEXTURES DESTROYED.
96.20 TO 97.10	.GREY SER/A RG BX/	GREY TO BLACK PATCHY SILICIFIED AND GREY SERICITIC ARGILLITE BRECCIA. STRONGLY SCHISTOSITY	50		FINELY DISSEM PYRITE (15%)	SHARP CONFORMABLE LOWER CONTACT.
97.10 TO 105.50	.YELLOW SER QTZ SCH/	YELLOW, GREY, BLACK - FINE. HETEROGENEOUS INTERVAL OF YELLOW SERICITIC PATCHES SEPARATED BY BULL QTZ "BANDS" OR BONDING, WITH LESSER FE-DOL BANDS AND ARGILLACEOUS WISPS. SOME RELICT FRAGMENTAL AND LAMINATED TEXTURES. FOLIATION	45	SILICIFICATION AND YELLOW SERICITE PREDOMINATES WITH LESSER FE-DOL. FROM 100.9 - 101.4 FUCHSITE IS PRESENT. MINOR GREY SERICITE AFTER ARGILLACEOUS PORTIONS.	DISSEM AND WISPY BANDED PYRITE 5 - 10%	PROBABLY A TRANSITION UNIT WITH MIXED SEDS AND VOLCONICS.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
105.50 TO 108.00	.YELLOW SER MAFICS?/	YELLOW - FINE. UNIT MARKED BY SHARP DECREASE IN PYRITE. NOW JUST A YELLOW SERICITE SCHIST CUT BY QTZ STRINGERS. MASSIVE TO POSSIBLY BEDDED RELICT TEXTURES. FOLIATION	50	STRONG YELLOW SER. AND QTZ.	3 - 4% PY.	NO ARGILLACEOUS COMPONENT.
108.00 TO 110.60	.QTZ VEIN Z ONE/	YELLOW AND WHITE - COARSE. NUMEROUS WHITE BULL QTZ VEINS CUTTING CONTORTED SILICIFIED YELLOW SERICITE SCHIST. VEINS AT	40	SILICIFICATION AND YELLOW SERICITE.	VEINS BARREN BUT WALLROCK CONTAINS 10% PY.	VEINS 10 CM TO 1 M WIDE. OVERALL 50% VEINS.
110.50 TO 156.00	.DOL MAF LA P TUFF/	GREEN TO GREY AND BROWN. CLEARLY RECOGNIZABLE THROUGH STRONG ALTERATION, MAFIC LAPILLI TUFF WITH FRAGMENTS FROM 1 - 5 CM. FOLIATION -------END OF HOLE----------	50	CHLORITE OVERPRINTED BY BROWN SERICITE AND FEDOL FLOODING.	TR. PY EXCEPT: 9144.1 - 145.5L .5% PG, 1% GN, SP, CP/ ASSOC. WITH DOL VEINING AND FLOODING. 9139.7 - 140.0L .FLT GOU/	SAME AS IN HOLE RG308. STRONGLY DOLOMITIZED INTERVAL (+90%) FROM ABOUT 140 TO E.O.H.
156.00 TO 156.10						

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
RCD24333	20.00	20.60	0.60	.006	.01	.02	0.4	.07															
RCD24336	29.50	30.50	1.00	.006	.01	.01	4.0	.01															
RCD24337	30.50	32.00	1.50	.030	.28	.11	10.2	1.47															
RCD24338	32.00	33.30	1.30	.034	.47	.31	14.0	.01															
RCD24339	33.30	34.00	0.70	.020	.05	.03	6.0	.46															
RCD24340	34.00	35.50	1.50	.012	.02	.01	2.2	.17															
RCD24341	35.50	37.00	1.50	.012	.02	.01	5.7	.10															
RCD24342	37.00	38.50	1.50	.012	.03	.01	5.7	.27															
RCD24343	38.50	40.00	1.50	.009	.04	.01	4.0	.04															
RCD24345	60.40	61.90	1.50	.007	.01	.01	2.0	.28															
RCD24346	61.90	63.40	1.50	.008	.01	.01	2.2	.21															
RCD24347	63.40	64.90	1.50	.006	.01	.01	2.1	.20															
RCD24348	64.90	66.10	1.20	.005	.01	.01	2.4	.27															
RCD24349	66.10	67.60	1.50	.004	.01	.01	2.2	.51															
RCD24350	67.60	69.10	1.50	.004	.01	.01	2.1	.31															
RCD24351	69.10	69.80	0.70	.004	.02	.01	1.5	.01															
RCD24352	69.80	71.00	1.20	.004	.01	.01	0.3	.06															
RCD24354	78.00	79.50	1.50	.003	.01	.01	0.2	.01															
RCD24355	79.50	81.00	1.50	.022	.01	.01	1.0	.23															
RCD24356	81.00	82.50	1.50	.013	.08	.03	1.5	.08															
RCD24357	82.50	84.00	1.50	.011	.03	.02	0.4	.27															
RCD24358	84.00	85.00	1.00	.014	.01	.01	0.8	.21															
RCD24359	85.00	86.50	1.50	.014	.01	.01	1.5	.19															
RCD24360	86.50	88.00	1.50	.004	.01	.01	2.0	.01															
RCD24361	88.00	89.50	1.50	.004	.01	.01	1.7	.01															
RCD24363	96.50	97.10	0.60	.010	.03	.01	1.2	.01															
RCD24364	97.10	98.60	1.50	.048	.01	.01	4.5	.02															
RCD24366	108.00	109.10	1.10	.010	.01	.01	2.0	1.15															
RCD24367	109.10	110.60	1.50	.003	.01	.01	1.2	.01															
RCD24369	144.10	145.60	1.50	.048	.85	.42	7.0	.02															

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
BCD24334	11.00	14.00	3.00	39.04	12.31	7.10	12.09	1.08	0.08	10.14	0.18	1.52			74	51			5	26	1.7	5	0.36		0.23	84.14	1	3
BCD24335	23.00	26.00	3.00	41.37	11.66	7.24	11.90	0.06	0.75	9.17	0.25	1.29			87	148			10	42	1.2	20	0.31		0.97	85.00	71	2
BCD24344	40.00	43.00	3.00	58.90	17.21	1.37	0.88	0.95	3.26	6.96	0.04	0.74			51	352			25	90	3.1	92	0.42		7.15	98.07	156	13
BCD24353	72.00	75.00	3.00	52.28	17.45	2.90	2.46	0.58	3.87	7.68	0.08	0.70			33	61			5	108	0.9	51	0.23		8.93	97.36	62	1
BCD24362	89.50	91.50	2.00	40.16	12.38	9.85	6.55	0.17	2.66	9.18	0.25	1.27			45	55			10	47	1.5	38	0.23		2.07	84.90	70	1
BCD24365	100.90	103.90	3.00	62.63	12.83	1.67	2.41	0.38	2.93	6.56	0.15	0.62			22	131			5	67	0.7	50	0.13		4.01	94.47	128	1
BCD24368	130.10	133.10	3.00	68.85	14.61	0.14	2.04	0.54	2.71	3.56	0.03	0.84			12	50			10	105	0.2	21	0.15		0.55	94.21	189	1
BCD24370	153.00	156.00	3.00	36.00	11.79	12.09	6.39	0.21	2.79	8.02	0.50	1.52			51	32			5	55	1.6	33	0.36		1.20	80.95	134	1

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: San Horizon

PLOTTING COORDS GRID: Estimated
NORTH: 1050.00N
EAST: 10720.00W
ELEV: 1110.00

ALTERNATE COORDS GRID:
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -50° 0' 0"
LENGTH OF THE HOLE: 43.50m
START DEPTH: 0.00m
FINAL DEPTH: 43.50m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: May 7, 1990
DATE COMPLETED: May 8, 1990
DATE LOGGED: May 9, 1990

COLLAR SURVEY: NO
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: Frontier
CASING: Pulled
CORE STORAGE: Samex Camp

PURPOSE: Laid out by hip chain only. To be surveyed in Holeabandoned since rig shifted.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
41.80	-	-51° 0'	ACID	OK		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 3.00	«Csg» "Casing"					
3.00 TO 43.50	«Maf Lap Tuff» End of hole (Abandoned)	Green and White. Typical calcareous, chloritic, mafic lapilli tuff with abundant broken and deformed qtz-calcite veinlets. Foliation	55	Pervasive calcification and regional (?) chlorite.	tr. py	Minor fuchsite and dol veining in broken core at 3.0 - 5.1 m. Hole abandoned because drill had shifted off line. No samples taken!

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS

No SAMPLES TAKEN

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER:
CLAIM NUMBER:
LOCATION: San Horizon

PLOTTING COORDS GRID: Estimated
NORTH: 1050.00N
EAST: 10718.00W
ELEV: 1110.00

ALTERNATE COORDS GRID:
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -50° 0' 0"
LENGTH OF THE HOLE: 257.20m
START DEPTH: 0.00m
FINAL DEPTH: 257.20m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: May 9, 1990
DATE COMPLETED: May 10, 1990
DATE LOGGED: May 11, 1990

COLLAR SURVEY: NO
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: Frontier
CASING: LIN
CORE STORAGE: Sanex Camp

PURPOSE: Infill drilling on the San Horizon.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
99.70	-	-48° 0'	ACID	OK		-	-	-	-	-	
159.40	-	-48° 0'	ACID	OK		-	-	-	-	-	
208.20	-	-47° 0'	ACID	OK		-	-	-	-	-	
249.00	-	-47° 0'	ACID			-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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-	-	-	-	-		-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 3.00	«Csg»					
3.00 TO 98.60	«Maf Lap Tuff»	Green. Typical "San mafics" with clearly visible lapilli in a dark green chloritic matrix. Numerous calcareous qtz stringers and boudins. Wavy foliation	70	Pervasively chloritic and calcareous Fe-dol is patchy and assoc. with veining and or faulting. {7.3 - 7.5} «flt. gou» {38.7 - 38.9} «flt. gou»	Tr. accessory pyrite except for minor base metal min assoc. with dol veinlets. {6.6 - 9.6} «2%pg, tr, gn, cp, sp» {61.7 - 65.7} «3% pg, 1% gn, tr, cp, sp» {68.7 - 68.9} «flt gou»	Thin mineralized veinlets with "granular" pyrite, galena, sphalerite and chalcopyrite with remarkably little wallrock alteration.
98.60 TO 108.20	«Dol Maf Lap Tuff»	Green to buff. Rapid increase in fenrodolomitization but not the expected increase in strain usually encountered as you approach the contact. Weak foliation only.	70	Patchy Fe-dol centered about lapillis and fracture porosity.	{98.6 - 100.0} «5% pg, tr, gn, sp» assoc. with dol veinlets and flooding.	
108.20 TO 120.10	«Vol/Arg Trans. Zone»	Green, yellow and black. Gradational contact with heterolithic fragments unit containing volcanic, cherty and argillaceous clasts in a largely argillaceous matrix. Some yellow sericitic (mafic?) clasts up to 10 cm. From 112.5 to 120.1 the interval is more massive to interbedded volcaniclastics and argillite. Foliation	65	Patchy silicification, yellow sericite, and Fe-dol. {111.8 - 111.0} «gou» Traces of fuchsite and fractures.	1 - 2% pyrite except: {108.2 - 108.8} «7% pg» in silicified heterolithic breccia.	This gradational contact with mafic clasts within the sediments would suggest an overturned sequence.
120.10 TO 125.00	«Metro. FGM MTL/Grey Sr»	Contact marked by 8 cm. of graphic gouge, followed by 20 cm. of contorted silicified argillite and two more thin gouges to 121.3. Interval comprised of an argillite/chert clast fragmental in a highly pyritic matrix. Clasts stretched out about 5 to 1.	65	Strong grey sericite alteration with accompanying pg. {120.7 - 121.3} «flt zone.» Contorted and broken qtz stringers common.	{120.7 - 125.0} «10% pg.»	Check geochem samples for As enrichment
125.00 TO 175.00	«Arg/Silt/Wacke»	Gougey and qd veined contact with relatively fresh and unaltered siltstone - wacke - argillite sediments. About 20% qtz-dol veining up to 130.5 cm, with disharmonic drag (?) folding of the seds. Tops uphole(?) Cleavage Bedding	50 70	Minor Fe-dol in porous wacke beds. {129.7 - 130.4} «flt.bx»	1% pyrite only.	Interval is almost bimodal arg-wacke up to 150 m after which it has more thinly bedded siltstone-arg.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
175.00 TO 181.00	«Pyritic Argillite«	Black to brown. Fine. Gradational contact. The black argillite unit becomes denser and contains very finely disseminated pyrite giving it a deep brown colour, patches and bands. Bedding	75	Fresh and unaltered.	Finely disseminated primary (?) pyrite in bands and patches. {175.0 - 181.0} «5 - 15% pg»	
181.00 TO 194.80	«Grey Ser/Met. Frag»	Grey to black. Coarse. Abrubt change to heterolithic fragmental with grey sericitic matrix. Clasts of argillite, chert, possibly mafic (?) sericite schist, and rarely fine grained pyritic lithoclasts. Clasts from 5mm. to 5cm. (Avg 1cm) are subrounded. Foliation	70	Patchy grey sericite in matrix. {194.3 - 194.8} «flt. gou + bx» includes gouge and qtz-healed fault breccia.	Finely dissem py and in lithoclasts. {181.0 - 194.9} «15% pg, 1% sp» also {193.0 - 194.0} «10% py, 2% cpy» as disseminations in grey ser. schist.	Very distinctive unit. Check geochem samples for As enrichment cf. Rea Horizon.
194.80 TO 208.00	«Qtz-Dol Stwk/Mafics?»	Yellow, brown, green and white. Interval begins with a short gouge and is comprised of 40% qtz-dol veins and veinlets deformed and (1cm to 20 cm wide) with highly altered yellow to brown sericitic wallrock. Faint relict textures are of lapilli tuff (?) Foliation	60	Fe-dol and sericitization is intense. {202.5 - 207.5} «flt. bx + gou's» with broken core common	{194.8 - 208.0} «5% py, tr. bn in qdvs»	Could this be the deformed FW stringer zone below the "exhalative horizon" (?)
208.00 TO 213.50	«Maf Lap Tuff»	Green. Typical distinctive, "SAM" mafics with rel. unaltered lapilli only slightly flattened.	65	Chloritic with minor yellow-brown sericite altered lapillis Fe-dol pervasive alteration is weak.	1% access pg.	
213.50 TO 257.20	«Var Altd Mafics»	Green, brown, grey. Variably altered mafic volcanic pile. 213.5 - 217.5: qdv stockwork zone with traces of base metal min. and sericitic wallrock. Relict lapilli texture visible. 217.5 - 230.0: Fe-dol altered yellow lapilli in chloritic matriz. 230.0 - 232.0: Porous, sericitic flow-top breccia? 232.0 - 235.2: Grey dense, aphanitic intermediate flow? with minor pyrite, chlorite and dolomite on fractures. 235.2 - 248.0: Mafic flows with relict porph texture now Fe-dol "spots" 248.0 - 257.2: 15% dol-qtz veinlets with minor base metal dissem. Host is dolomitized but resembles a lapilli tuff. Foliation	55	Patchy Fe-dol assoc. with stockwork veining and local flooding.	2 - 3% pyrite overall with traces of galena, sphalerite, and chalcopyrite assoc. with dol-qtz veinlets. (now deformed).	

END OF HOLE

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
BCD23951	6.60	8.10	1.50	.008	0.01	0.01	0.6	0.02															
BCD23952	8.10	9.60	1.50	.007	0.01	0.02	1.5	0.01															
BCD23954	61.70	62.70	1.00	.285	1.06	1.00	5.8	0.02															
BCD23955	62.70	64.27	1.57	.016	.12	0.12	1.7	0.02															
BCD23956	64.20	65.70	1.50	.032	0.18	0.17	1.8	0.01															
BCD23957	74.80	75.70	0.90	.046	0.83	0.94	5.9	0.05															
BCD23959	98.40	100.00	1.60	.008	0.16	0.07	2.0	0.04															
BCD23960	108.20	108.80	0.60	.004	0.01	0.04	0.9	0.03															
BCD23962	119.20	120.70	1.50	.006	0.02	0.01	1.4	.06			56	227	55				175			2	1.4	57	
BCD23963	120.70	122.20	1.50	.011	0.02	.02	2.6	.08			114	195	256				250			21	2.6	78	
BCD23965	122.00	123.50	1.50	.008	0.02	.02	2.2	0.11															
BCD23964	122.20	123.70	1.50	.008	.02	.02	2.2	0.11			84	228	220				150			1	2.2	107	
BCD23965	123.50	125.00	1.50	.018	.07	.05	2.8	0.10			181	700	450				275			2	2.8	99	
BCD23966	125.90	126.00	1.00	.004	0.01	.01	1.0	0.06			36	132	52				110			1	1.0	56	
BCD23968	173.00	175.00	1.20	.007	0.03	.01	4.2	0.46			70	360	94				850			3	4.2	462	
BCD23969	175.00	176.50	1.50	.006	0.03	.01	3.2	0.18			64	262	77				350			2	3.2	187	
BCD23970	176.50	178.00	1.50	.006	0.03	.01	4.9	0.18			62	285	85				250			9	4.9	184	
BCD23971	178.00	175.00	1.50	.009	0.04	.01	3.8	.24			91	402	123				475			10	3.8	240	
BCD23972	179.50	181.00	1.50	.008	0.04	.01	3.9	.20			78	440	145				375			2	3.9	197	
BCD23973	181.00	182.50	1.50	.008	0.10	.01	4.4	0.14			83	977	148				275			5	4.4	138	
BCD23974	182.50	184.00	1.50	.008	0.02	.01	2.7	0.14			76	240	144				325			2	2.7	142	
BCD23975	184.00	185.50	1.50	.015	0.05	0.02	3.2	0.16			158	525	217				550			24	3.2	159	
BCD23976	188.50	187.00	1.50	.010	0.03	.01	2.0	0.11			100	306	123				425			1	2.0	110	
BCD23977	187.00	188.50	1.50	.008	0.02	.02	1.8	0.15			82	315	170				450			1	1.8	152	
BCD23978	188.50	190.00	1.50	.135	0.21	.11	17.2	0.46			1350	2100	1100				1025			536	17.2	460	
BCD23979	190.00	191.50	1.50	.011	.02	.01	2.4	0.42			112	150	130				350			18	2.4	426	
BCD23980	191.50	193.00	1.50	.017	.02	.01	2.6	.60			168	220	140				450			20	2.6	601	
BCD23981	193.00	194.00	1.00	.300	.12	.03	11.0	2.22			3000	1200	255				350			15	11.0	2225	
BCD23982	194.00	194.80	0.80	.015	.01	.02	2.0	0.40			154	44	174				250			1	2.0	397	
BCD23983	194.80	196.00	1.20	.015	.04	.02	1.4	0.12			150	360	172				400			1	1.4	124	
BCD23984	196.00	197.50	1.50	.006	.07	.13	2.3	0.12			58	715	1300				325			1	2.3	119	
BCD23985	197.50	199.00	1.50	.005	.07	.07	1.2	0.05			52	730	720				200			1	1.2	46	
BCD23986	199.00	200.50	1.50	.002	.04	.02	1.2	0.03			20	354	157				125			1	1.2	26	
BCD23987	200.50	202.00	1.50	.016	.40	.17	2.4	.05			159	4000	1660				375			13	2.4	49	
BCD23988	202.00	203.50	1.50	.036	.80	.58	6.2	0.06			360	8000	5840				425			12	6.2	61	
BCD23989	203.50	205.00	1.50	.006	.29	.17	2.4	0.04			57	2850	1720				225			12	2.4	41	
BCD23990	213.50	215.00	1.50	.013	.47	.34	2.8	0.05			132	4700	3400				125			10	2.8	48	
BCD23991	215.00	216.50	1.50	.005	.04	.02	1.2	0.03			54	422	198				79			2	1.2	29	
BCD23992	216.50	217.50	1.00	.002	.02	.01	0.9	0.02			17	152	52				78			2	0.9	20	
BCD23995	244.00	246.00	1.20	.006	.01	.01	1.0	0.02			60	92	42				325			1	1.0	16	

Sample	From (m)	To (m)	Length (m)	CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB		
BCD23996	247.80	248.80	1.00	.011	.09	.09	1.6	0.04			112	910	920				375			1	1.6	35		
BCD23997	252.70	254.20	1.50	.004	0.01	.01	1.1	0.02			40	62	55				175			4	1.1	19		
BCD23998	254.20	255.70	1.50	.005	.05	.05	1.6	0.03			48	530	460				550			4	1.6	34		
BCD23999	255.70	257.20	1.50	.003	.02	.04	1.0	0.04			30	228	360				625			2	1.0	42		

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	SR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
23953	33.00	36.00	3.00	37.88	10.94	9.39	13.53	0.01	0.01	10.60	0.20	0.92			236	516			5	25	1.0	760	0.32		1.15	84.95	37	5
23958	80.00	83.00	3.00	42.82	12.81	9.70	7.77	3.18	0.05	8.88	.19	1.08			310	1371			5	44	1.1	566	.29		1.11	87.88	48	4
23961	108.00	111.00	3.00	60.85	14.01	2.42	4.47	0.13	2.77	6.06	.20	0.63			137	652			5	169	2.0	565	.17		1.80	93.62	62	17
23967	161.00	164.00	3.00	61.37	17.10	0.33	2.52	0.26	3.03	8.32	.10	0.92			52	122			5	175	0.1	44	.21		0.54	94.93	100	1
23993	220.00	223.00	3.00	36.56	11.98	9.35	9.24	2.70	0.52	9.36	.19	1.40			85	149			5	28	0.3	7	.33		0.30	81.95	9	1
23994	232.00	234.00	2.00	47.78	14.25	4.39	2.54	3.15	2.33	10.26	.07	3.04			21	13			5	81	0.1	47	.78		8.17	96.81	63	1

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: San Horizon

PLOTTING COORDS GRID: San Geol.
NORTH: 950.00N
EAST: 10820.00W
ELEV: 1084.37

ALTERNATE COORDS GRID:
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -50° 0' 0"
LENGTH OF THE HOLE: 157.50m
START DEPTH: 0.00m
FINAL DEPTH: 157.50m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: May 11, 1990
DATE COMPLETED: May 13, 1990
DATE LOGGED: May 14, 1990

COLLAR SURVEY: NO
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: Frontier
CASING: Pulled
CORE STORAGE: Sanex Camp

PURPOSE: As laid out by survey (p-16). Infill drilling.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
157.50	-	-47° 0'	ACID	OK		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 5.10	«Casing»	No core recovered.				
5.10 TO 11.20	«Qtz Veins/ grey Ser Sch»	White. Badly broken and ground up core so interval is sampled between blocks at 10' spacings. 5.1 - 8.2m: 25% recovery and 30% of that is white bull quartz with one 2cm bleb of cpy, pg, tet, and spn. Wallrock consists of silicified pyrite and grey sericite schist. 8.2 - 11.2m: Comprised of 65% white bull qtz, broken and ground with about six blebs of cpy, py, tet, sph and gal. Wallrock is grey schist or argillite. Last 30cm. is fault gouge. Foliation	58	Silicified wallrock is grey and cherty with grey sericite and finely dissem. pyrite abundant. The veins also contain proportionately about 10% ankerite, as coarse blades.	{5.1 - 8.2} «10% pg, tr, tet, cpy, sp» {8.2 - 11.2} «7% pg, 3% cpy, 2% tet, 1% sph, gal» {5.1 - 11.2} «30% recovery» {10.9 - 11.2} «flt. gou.»	Samples may be baised by the fact that more wallrock was ground up or washed away then the vein material. Also, with such badly broken core, contamination is a probability.
11.20 TO 14.30	«Heterolithic Py Fgmtl.»	Black and brown. Coarse. Cherty, argillaceous and pyritic stretched out in silica/pyrite/argillaceous matrix. Avg. clast size about 5 mm to 1 cm with some as large as 4 cm Clasts are angular and poorly sorted like in a debris flow. Foliation Possibly affected by drag folding in adjacent faults.	40	Patchy silicification with a hint of grey sericite on some partings. Minor qtz-dol veinlets weakly deformed and barren. {14.1 - 14.3} «Graph flt. gou»	About 15% pg overall. {11.2 - 14.3} «15% pg»	
14.30 TO 22.00	«Contorted Arg/Silt»	Black. Fine. Contorted, but relatively unaltered fine sediments, thinly bedded. Probably drag-folded due to numerous fault slips.		Bedding often down core axis indicating possible hinge (?) zone. Weak stringer (rare) related carbonatization.	None. {15.8 - 16.4} «Flt. gou» {19.8 - 19.9} «Flt. gou»	
22.00 TO 37.00	«Arg/Silt/Wacke»	Black and Grey. Aph. to coarse sand. The unit settles down into a rhythmically laminated to thin planar bedded fresh sedimentary package. Good definite crossbedding flames and grading all indicate TOPS UPHOLE! Bedding on a 3mm to 10 cm scale at: A hint of cleavage locally at:	60 45	Weak Fe-dol pervasive in coarser beds and fracture controlled in argillites and siltstone beds. The interval contains a few lithic wacke beds near 24 - 26.5. The unit becomes sandstone/wacke dominated downhole and ends with a 1 m. thick bed from 36.0 - 37.0	Tr. pg only.	Tops uphole. Definitive evidence.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
37.00 TO 60.00	«Dol. Altd. Trans Zone»	Grey, grey-green, and brown. Fine to sandy. Strongly ferrodolomitized wacke to volcaniclastic (?) interval. Hints of green chlorite and fuchsite locally. Numerous boudined grey dol. patches or veins (?) Wavy foliation avg.	80	Strong Fe-dol flooding with brown sericite on partings. Traces of chlorite and tale locally.	Overall 3% pg except: {48.7 - 53.2} «7% pg, 1% sp, tr, gn» assoc. with very strong dol. flooding tr. galena in dol. stringers throughout 53.2 - 60.0	Previously logged as "DOL SEDS" in 266 zone.
60.00 TO 62.70	«Met Fgntl»	Black grey, and brown. Heterolithic fragmental with argillaceous matrix along lightly pyritic. Clasts of brown sericite probably mafic in origin, along with cherty and silty clasts, well stretched out at	85	Pervasive silicification and cut by uncommon qtz-dol stringers.	{60.0 - 62.7} «5% pg, tr, gn, sp»	
62.70 TO 64.20	«Brittle Fl t Zone»	Friable core containing angular fragments of dolomitized fragmental (as below). Suggestions of little or no movement (a fluid pathway following a tension fracture or zone of introformational breccia. Angles locally appear similiar to unit above.		Strong Fe-dol	3% pg.	
64.20 TO 116.50	«Mafic Frag /Lap Tuff»	Green. Up to 78.3 has a fragmental "debris flow" texture but contains only mafic clasts. Below this typical lapilli tuff is present. Wavy foliation	85	Moderate Fe-dol related to numerous Fe-dol stringers at all orientations and deformed. Chlorite pervasive. Minor brown ser.	2% pg except {83.3 - 84.2} «10% pg, 2% gn, 1% sp» in a dol vein which meanders along the core axis. And {97.5 - 98.9} «10% pg. 3% gn, dol vn.»	
116.50 TO 157.50	«Dol Maf Lap Tuff»	Grey - green. Marked increase in ferrodolomitization assoc. with numerous white creamy dol. veins at low angles and usually barren and with 10 - 20% qtz. Foliation Dolomitization is waning slightly at end of hole.	80	Strong vein and stringer related Fe-dol pervasive, and replacing lapilli. Pervasive chlorite largely destroyed and replaced by green to brown sericite	Only 1 - 2% pg except for mineralized dol-qtz veins. {120.5 - 121.8} «dol. vein»	

END OF HOLE

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
BCD24001	5.10	8.20	3.10	0.475	0.55	0.16	110.5	0.21															
BCD24002	8.20	11.20	3.00	.590	.16	.04	16.6	.03															
BCD24003	11.20	12.70	1.50	.070	.16	.05	7.3	.22															
BCD24004	12.70	14.30	1.60	.021	.11	.02	2.9	.21															
BCD24005	14.30	15.80	1.50	.009	.04	.01	0.8	.01															
BCD24007	48.70	50.20	1.50	.002	.03	.02	1.0	.04															
BCD24008	50.20	51.20	1.00	.002	.35	.02	0.9	.02															
BCD24009	51.20	52.20	1.00	.012	.16	.12	2.8	.09															
BCD24010	52.20	53.20	1.00	.021	.15	.04	2.4	.13															
BCD24012	59.00	60.00	1.00	.002	.03	.02	1.1	.03															
BCD24013	60.00	61.00	1.00	.004	.02	.04	2.8	.14															
BCD24014	61.00	62.70	1.70	.051	.14	.06	31.9	.84															
BCD24015	83.30	84.20	0.90	.080	2.66	3.99	18.7	0.09															
BCD24017	97.50	98.90	1.40	.030	.89	1.18	7.9	0.04															
BCD24018	120.50	121.80	1.30	.004	.14	.49	3.2	.01															

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
RCD24006	27.50	30.50	3.00	59.61	16.47	1.64	2.94	0.28	3.37	6.35	0.07	0.90	~~BA~~		44	113			5	105	0.1	75	0.20		0.38	92.37	78	1
RCD24011	54.00	57.00	3.00	62.59	11.74	2.14	3.18	0.36	1.85	7.12	.16	1.13			83	122			10	46	3.4	850	.21		2.74	93.26	162	1
RCD24016	88.00	91.00	3.00	38.46	12.53	7.22	11.46	1.12	0.61	9.95	.33	1.68			46	52			10	27	0.8	48	.40		1.70	85.48	93	2
RCD24019	145.50	148.50	3.00	38.60	12.16	7.30	11.96	1.38	0.15	10.12	.41	1.59			60	105			5	83	0.8	19	.44		1.97	86.09	176	3

Waste of money
Hole is 20m downdip of hole 316

MINNOVA INC.

HOLE NUMBER: RG317 | DRILL HOLE RECORD | IMPERIAL UNITS: | METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: San Horizon

PLOTTING COORDS GRID: Sam Geol.
NORTH: 973.21N
EAST: 10822.87W
ELEV: 1086.26

ALTERNATE COORDS GRID:
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -50° 0' 0"
LENGTH OF THE HOLE: 108.80m
START DEPTH: 0.00m
FINAL DEPTH: 108.80m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: May 15, 1990
DATE COMPLETED: May 16, 1990
DATE LOGGED: May 18, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: Frontier
CASING: LIH
CORE STORAGE: Samex Camp

PURPOSE: 25in. stepback from RG316.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
8.30	-	-51° 0'	ACID	OK		-	-	-	-	-	
93.60	-	-50° 0'	ACID	OK		-	-	-	-	-	
108.80	-	-49° 0'	ACID	OK		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 3.00	«Casing					
3.00 TO 16.50	«Dol Maf Lap Tuff»	Blue - green. Moderate to strongly ferrodolomitized but with relict lapillis recognizable. Weak foliation Gradational lower contact.	65	Fe-dol veinlets and flooding with only traces of brown sericite development. Still pale green (Chloritic?) to pale blue in colour. Veinlets appear to be deformed.	3 - 4% dissem pg except {9.9 - 11.6} «7% pg, 2% sp, 1% gn, dol vn.»	
16.50 TO 22.00	«Maf/Arg Trans Zone»	Black, grey and green. Interfingering of argillaceous matrix fragmental and chloritic/dol matrix fragmental on a 10 cm. to 1 m. scale of interfingering. Clasts are Fe-dol altered and thought to be predominantly mafic volcanic and angular.		Patchy Fe-dol alteration centered about clasts in argillaceous ints and pervasive in mafic fragmental ints. Minor brown sericite. Mod. fuchsite 19 - 20 m.	3 - 4% diss pg.	Minor flt. gouge at 17.6 - 17.7 m.
22.00 TO 30.30	«Intense Sil. Arg & Frag»	White and grey to black. Apantic. Highly contorted relict laminated texture along with hydrobreccia, tectonic breccia and possibly "debris-flow" sed. breccia. Argillaceous material on fractures stockwork qtz veining common. Clasts are either bull or cherty quartz. Local schistosity	65	Pervasive silicification with abundant white bull stwk. veinlets of qtz. Very broken interval with numerous thin gouge and brittle fault breccia zones.	Fracture filling and fine patches of pyrite. Possibly some lithoclasts of pyrite. 5 - 10% pg overall with traces of sphalerite only.	Almost a chert! {22.4 - 22.8} «Flt. gou. & bx.» {23.9 - 24.3} «Flt. gou. w/ fuchsite»
30.30 TO 32.00	«Qv Flt Zone»	White and grey. Interval begins with badly broken silicified rock as above and includes about 20 - 30 cm. of carbonaceous and grey sericitic gouge. The remainder is white, bull, barren quartz vein material with 10% Fe-dol. Mixed and broken.		Intense silicification and grey sericite alteration of wallrock. Interval is 80% white bull qtz vein(s?) by volume.	{30.3 - 32.0} «3% pg» only.	75% recovery.
32.00 TO 34.90	«Qv & Het. Frag»	White, brown, grey and black. Comprised of 30% white, bull, barren and broken qtz veins. The remainder is a heterolithic fragmental with stretched out angular argillite and chert clasts in a pyrite and grey sericite matrix. Stretching & foliation	70	Weak grey sericite alteration adjacent to qtz veins and in gouges. Moderate pervasive silicification. {32.0 - 33.8} «Flt. gou. & qv's»	{32.0 - 34.9} «10% pg» overall, although veins are barren.	Conformable lower sedimentary contact.
34.90 TO 74.00	«Arg/Silt/Wacke»	Black and grey. Fine and aphantic. Fresh, thinly bedded distal turbidites. From {35.6 - 39.0} «hinge zone?» the bedding is highly contorted. Below this the bedding is planar and consistent with tops uphole.		{45.0 - 45.1} «Tops uphole» Very weakly dolomitic in coarser beds. Very minor qtz-dol stringers.	tr. pg only.	From 66 m. to 74.9 the interval is mostly thickly bedded wacke. Therefore, overall its a fining upward sequence.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		Cleavage Avg. Bedding	50 70			
74.00 TO 84.30	«Qdv Zone/Alt Arg.»	White and buff. Knife sharp contact with weakly bleached, buff colored turbidites forming an altered envelope about barren, white, qtz-dol. Veins from 10 - 50 cm. wide and at about 30 degree to core axis. Overall the interval is 30% veins, only rarely broken, and with 30% creamy Fe-dol bladed crystals.		Buff, bleached argillites do not stain, but appear weakly sericitic. The wackes stain dark blue (ankeritic) and are flooded.	1 - 2% diss pg only.	
84.30 TO 89.10	«Met Frag/Qv Zone»	Conformable contact with very pyritic and flattened heterolithic fragmental with chert, argillite, pyrite (?) clasts. Foliation	70	Cut by numerous white qtz veinlets up to 1 m. thick, containing only minor py. Minor grey sericite development.	[84.3 - 89.1] «15% pg, tr sp»	Minor gouge and broken core. Some brown sericite towards end of interval may suggest mafic transition?
89.10 TO 89.60	«Flt Gou/Bx»	Grey. Coarse. Angular qdv shards in a friable matrix. Strain centered about this gouge and decreasing outwards for 3 m. in both directions. Schistosity	65	Grey and brown sericite common in gouges matrix.	5% fine pyrite.	
89.60 TO 94.50	«Altd Py Trans Zone»	Brown and grey. Strongly qtz-dol flooded with brown sericitic partings. Relict fragmental texture visible away from fault.		Minor talc.	[89.6 - 94.5] «10% pg, tr sp» in patchy dissem.	Thought to be mafic-sed transition fragmental unit.
94.50 TO 108.80	«Dol Maf Lap Tuff»	Green and brown. Relict lapillis and chlorite component now clearly visible. Wavy Weak Foliation	60	Brown sericite and deformed Fe-dol veins warning downhole.	3% pg dissem.	

79.8

END OF HOLE

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
RG24026	9.90	11.60	1.70	.064	1.62	.48	6.0	0.20															
RG24028	26.80	28.30	1.50	.002	0.02	0.01	1.2	.03															
RG24029	28.30	29.50	1.20	.004	0.03	0.01	1.9	.02															
RG24030	29.50	30.30	0.80	.004	0.01	0.01	1.7	.01															
RG24031	30.30	32.00	1.70	.040	0.09	0.05	6.6	.12															
RG24032	32.00	32.60	0.60	.050	0.14	0.07	7.3	.21															
RG24033	32.60	33.80	1.20	.031	0.05	0.05	17.5	.45															
RG24034	33.80	34.90	1.10	.053	0.13	0.06	8.2	.39															
RG24035	34.90	35.90	1.00	.011	0.02	0.01	2.0	.01															
RG24037	77.30	78.30	1.00	.003	.01	.01	0.4	.04			27	69	29				38			3	0.4	40	
RG24038	78.30	79.80	1.50	.001	.01	.01	0.4	.01			10	47	16				17			1	0.4	2	
RG24039	79.80	81.30	1.50	.004	.01	.01	0.7	*1.75			36	50	35				75			3	0.7	1600	
RG24040	81.30	82.80	1.50	.004	.01	.01	0.5	.01			42	44	34				56			2	0.5	12	
RG24041	82.80	84.30	1.50	.010	.01	.01	0.6	.06			97	34	23				75			1	0.6	60	
RG24042	84.30	84.70	0.40	.010	.01	.02	2.0	.50			92	67	158				400			1	2.0	502	
RG24043	84.70	86.00	1.30	.002	.01	.01	0.9	0.28			17	70	57				43			2	0.9	280	
RG24044	86.00	86.90	0.90	.001	.01	.01	0.4	.01			12	20	16				13			1	0.4	3	
RG24045	86.90	88.20	1.30	.007	.02	.01	1.2	.08			69	180	75				125			2	1.2	82	
RG24046	88.20	89.10	0.90	.005	.23	.05	1.1	.02			46	2300	500				150			2	1.1	22	
RG24047	89.10	89.60	0.50	.005	.01	.01	1.2	.06			50	90	59				175			3	1.2	60	
RG24048	89.60	90.10	0.50	.002	.01	.01	0.8	.04			20	45	76				250			3	0.8	42	
RG24049	90.10	92.00	1.90	.002	.03	.01	1.0	.04			22	250	148				225			1	1.0	37	
RG24050	92.00	93.00	1.00	.009	.02	.03	1.5	.10			90	152	315				275			1	1.5	96	
RG24371	93.00	94.50	1.50	.003	.04	.01	1.2	.02			30	428	138				725			2	1.2	17	

* re-analyzed by F.A.

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
24027	14.00	16.00	2.00	39.20	14.52	6.02	10.49	0.08	1.50	11.78	0.35	1.85			37	463			5	54	1.0	426	0.40		1.89	88.15	43	4
24036	54.00	57.00	3.00	66.34	13.51	2.01	2.25	0.26	2.86	4.55	0.06	0.71			25	67			5	75	0.4	29	0.15		0.21	93.03	45	1
24372	100.00	103.00	3.00	51.23	13.93	4.58	4.71	0.17	2.87	9.39	0.20	1.39			30	110			10	63	0.9	104	0.23		3.37	92.17	101	2

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: San Horizon

PLOTTING COORDS GRID: San Geol.
NORTH:
EAST:
ELEV:

ALTERNATE COORDS GRID: Estimated
NORTH: 11+30N
EAST: 108+20W
ELEV: 1095.00

COLLAR DIP: -50° 0' 0"
LENGTH OF THE HOLE: 300.80m
START DEPTH: 0.00m
FINAL DEPTH: 300.80m

COLLAR GRID AZIMUTH: 180° 0' 0"

COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: May 17, 1990
DATE COMPLETED: May 20, 1990
DATE LOGGED: May 20, 1990

COLLAR SURVEY: NO
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: Frontier
CASING: Pulled
CORE STORAGE: Samex Camp

PURPOSE: Infill drilling.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
63.10	-	-51° 0'	ACID	OK		-	-	-	-	-	
133.20	-	-49° 0'	ACID	OK		-	-	-	-	-	
178.90	-	-49° 0'	ACID	OK		-	-	-	-	-	
218.50	-	-48° 0'	ACID	OK		-	-	-	-	-	
255.10	-	-48° 0'	ACID	OK		-	-	-	-	-	
297.80	-	-47° 0'	ACID	OK		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 5.00	«Csg»					
5.00 TO 10.20	«Dol/Py Vn»	White and brown to grey. Med to Coarse. The hole collars in the centerof a highly pyritic Fe-dol (Qtz) vein. The vein has a high pyrite core with faint banding distinguished by py conc. and grain size. Banding 6.3 - 9.3: Approx. 30% altered wallrock gives core greyer colour; blue green talc more common to 3% locally. 6.3 - 8.2: intermittant fault breccia - max width 20 cm.	60	Vein comprised mainly of dol with subordinate qtz, and late crosscutting. Qtz-dol str's overall 8.1 dol vs qtz.	Almost massive pyrite in the core of the vein {5.0 - 5.8} «45% pg» while margin is barren and siliceous. No visible base metals. {6.3 - 8.2} «8% py» as dissem and stringers decreases downhole.	Traces of brown sericite and talc probably representing alt'd wallrock inclusions.
10.20 TO 20.50	«Dol Maf Lap Tuf»	Yellow - Green and Grey. Fine to coarse. Mafics indistinguishable at top of interval due to alter Fe-dol flooding consists of 80% dol, 20% qtz. Qyz occurs as cross cutting stringers and in the dol. Where alt'n is less intense can locally see relict lapilli.		Intensely Fe-dol flooded at top of interval - decr. downhole, yellow to green clays and sericite assoc. with flooding, minor talc.	About 4% med to coarse Py occurring as fine to coarse dissem, stringers .	
20.50 TO 159.30	«Maf Lap Tuff»	Grey to dark and light green. Lapilli fragments to 10 cms. angular frags locally some flattening evident. Light green color; matrix generally dark green non-magnetic; lapilli clasts comprise up to 40% of core hosted by finer matrix; Fe-dol (Qtz) makes up 1 to 10% of the corel dol occurs as stringers and patches. - some stringers are offset by fractures and others have undergone deformation, qtz occurs in the dol. as crystals and cross cutting stringers. max dol vein width 6 cm. 23 - 23.45: 60% Dol 9 to vein. {23.45 - 24.6} «Plt gou» - weakly developed. 45.7 - 46.05 Weakly developed fault gouge.		Chloritization of matrix; minor yellow sericite alt'n of lapilli clasts; clasts weakly preferentially dolomitized. 26.5 - 27.8: Chlorite alteration moderately well developed.	1 - 2% fine to med grained Py dissem throughout interval. 23 - 23.45 - Minor py. {83.07 - 86.6} «Minor gn, cp, 2% py/dol vns» Sx occur as fine - coarse grains in Fe-dol veins and stringers. The dolomite stringers are widely spaced. Locally have concentrations of up to	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		105.7 - 127.8: 5 - 10% patchy Fe-dol (Qtz) veins. Veins increase in number downhole. Veins locally contorted, boudined. 126: weak banding by Dol veins at {135.7 - 136.2} «Flt. bx» Weakly developed contains angular clasts of Dol.	50		10% gn, 1% cp. 131.4: 6 cm. wide band containing fine grained cp, gn, py assoc. with weak Dol alteration. 1% gn, 1-% cp, 15% py. {151.4 - 151.46} «10% gn, 5% sp, minor cp/dol vein» Sx coarsely dissem. silicified envelope, with 2% py. 157.06 - 157.08: No crew dolomitized Zone with 5% combined BM, 20% py.	
159.30 TO 160.00	«Py Sil Fra ns Zone»	Brown - Grey. Fine. Interval consists of ribbons and fragments of black argillite, grey qtz and Fe-dol in a pyrite matrix, qtz is cryptocrystalline. The qtz and dol also exhibit some clastic textures. Top of interval consists of laminated argillite qtz/dol - the base of the interval is primarily clastic material. Bedding at	80	Interval has been silicified weak to moderately grey sericite alteration present.	{159.5 - 160} «40% py, minor cp» Py occurs as fine grained matrix and as coarse grained dissem throughout the interval. Cp is fine grained; Py is most predominant at the base of the interval.	
160.00 TO 160.85	«Sil Arg»	Grey and black. Fine. Black argillite is the host rock. White qtz brecciates the argillite and also occurs as subrounded clasts. About 40% white qtz vn/str. material. About 10% Fe-dol.		Intense silicification of argillite - Local yellow clays and sericitic at top of interval.	{160 - 160.85} «Minor cp, 10% py» Py occurs as fine to coarse dissem. Cp is fine grained dissem.	Appears to be two stages of qtz - some initial qtz veining which was brx and then subsequent flooding.
160.85 TO 162.40	«Flt Bx»	Black. Fine. Black arg. with 15% white qtz and Fe-dol veins arg and vein material is brown by fault action qtz/dol ratio 9:1 14 cm. wide qtz/dol vein at base of interval.			1% fine grained Py as dissem and stringers.	
162.40 TO 166.85	«Arg/Silt»	Grey to black. Fine. Arg and silt are interbedded in thin laminae. Overall bedding is approx. 70 - 80 degrees to c/a but interval contains strong deform of the beds locally; 10% white qtz vein and Pods. Veins contain minor Dol.	75		1% med grained Py generally coarsely dissem. in stringers.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
166.85 TO 180.40	«Wcke/Arg»	Grey and black. Fine to med. 80% wacke, 20% Arg. Wacke shows graded bedding indicating tops is uphole. Some qtz grains visible. Cleavage at Bedding at There are local variations in the bedding orient. Arg. beds contain thin silt. laminae with local contorted bedding. 1% Qtz/dol vn.	 25 70	Feldspar grains are partially alt. to carbonate.	Less than 1% fine to med grained Py in fine diss and stringers. Local minor po patches. - weakly magnetic.	
180.40 TO 209.90	«Arg/Silt»	Black. Fine. 55% Arg, 40% Silt, 5% Wacke. Arg and silt occur in interbedded laminae and beds to 2 cm. Laminae exhibits deform and offset along fractures wcke forms occasional beds to 10 cm. wide. 188.1 - 189: 20% Qtz/Dol (80%/20%) Vn. Bedding at Approx.	 80	Locally argillite is graphitic.	Less than 1% med grained Py coarse dissem and str. minor po.	
209.90 TO 221.20	«Arg/Py Het Frag»	Grey to black. Fine grained. 209.9 - 214.45: Alt arg: clasts of argillite, qtz/dol vein in a strongly pyritic matrix; some alignment of clasts at Arg. clasts angular with minor deformation locally; Qtz clasts are white to grey and very fine grained; clasts are framework and matrix supported - up to 60% matrix, Upper contact conformed. 210.54 - 210.75: Black arg bed. 211.5 - 221.2: Core is still comprised of alt arg but the fragmental nature is diminished. Py and silicification replacement has occurred preferentially along bedding; Py content generally greater than 30%. {213.4 - 213.6} «Flt. gou»	 70	Local wk silicification and/or development of grey sericite. 210.75 - 210.87: intense silicification destroys all textures. 215.4 - 215.9: Core is paler grey colour, slightly more silicified with a slight increase in grey sericite.	{209.9 - 211.45} «50% py» py occurs as fine grained brownish - semimassive to coarse dissem. About 5^ Py is coarse grained dissem. 210.75 - 210.87: About 1/2% cp, 1% py. {216.4 - 217.1} «80% py - massv» - fine to coarse py strongly replacing	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		220.1 - 221: Bed of clean arg. - 5% qtz/dol stringers, 3% Py stringers.			host rock.	
221.20 TO 222.45	«Grey Ser Py/Arg»	Grey. Fine. 5% of core consists of unaltered arg. beds top and bottom contacts are altered to gouge. 221.222.2: 20% qtz/dol stringers and fragments. Fragments are locally subrounded; caused by stretching and deformation - Boudinage. Pyrite bands also show deformations.		Strong grey sericite alteration and Py replacement of arg.	{221 - 222.45} «30% py» Py occurs as pervasive dissem. and stringers/bands.	
222.45 TO 225.40	«Py Sil Arg»	Grey to black. Fine. Rock is more altered at top of interval alt. decr down hole. Banding at Locally there is some fragmental texture which alteration/deformation has produced. 5% white qtz (80%) dol (20%) stringers. Crenulation Cleavage?	80 40	Arg is bleached at top of hole by mod. silicification and sericitization. - alter. intensity decr. down hole.	{222.45 - 225.4} «20% Py» Py occurs in thin bands of fine and med grained xtals. Cleavage is local and poorly develped.	Core is similar to that in 211.45 to 221.2.
225.40 TO 227.30	«Grey Ser Py Dol Act»	Grey. Fine to med. 10% white dol (90%) Qtz (10%) veins and fragments; qdv are brx by py and sericite.		Abundant well developed grey sericite, rock is moderately dolomitized.	20% Py - fine grained dissem and mesh text.	Original rock type indeterminable - may be part of Arg/Maf Trans.
227.30 TO 233.90	«Arg/Maf Trans Zone»	Green/Grey and black. Fine. An irregular mixture (mottled) of arg and greenish alt. mafic? patchy cryptocrystalline qtz stringers - cherty locally. {227.55 - 228.4} «Flt. brx» weakly developed - strongly developed at ends of interval. 232.1 - 237.9: Core is primarily altered mafics? Textures destroyed. Minor dol pods/frags.		Local weak silicification mafics? are chloritized grey sericite well developed some alteration of chlorite to brown sericite. 232.1 - 233.9: Patchy intense silicification.	3% fine to med py in finr coarse dissem.	
233.90 TO 237.20	«Grey Ser/Py Silt»	Grey. Fine. Original rock textures completely destroyed. - possibly mafic in origin. - 10% white qtz (5%) dol (95%) clasts - rounded to angular appear to have been veins which were boudined. foliation given by the clasts is Base of interval is indistinct.	60	Rock has been extensively altered to grey sericite.	3% fine grained dissem. py - locally to 5%.	It is possible that this interval represents an ashy tuff layer in the mafic pile which was preferentailly alt.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
237.20 TO 239.55	«Grey Ser/Py Frag MF?»	Grey. Fine. Most textures indistinguish - able due to alteration. 3% recognizable relict fragments which appear to be mafic. 2% qtz (70%) Dol (30%) str. and patches. 239 - 239.15 - fault gouge - abundant swollen clays. {239.15 - 239.55} «qtz/dol vn» 50% qtz, 50% Fe-dol		Pervasive grey sericite alt; minor patchy silicification.	5 to 15% fine grained pervasively disseminated py. py content increases downhole. 239.15 - 239.55 - minor py.	
239.55 TO 241.10	«Grey Ser/Py Dol Alt»	Grey. Fine. Original textures completely destroyed. 15% qtz (20%) Fe-dol (80%) veining - primarily at base of interval. {240 - 241.1} «wk flt gouge» intermittantly developed brx, qtz/dol/vns.		Patchy, weak silicification intense grey sericitic alteration throughout interva.	Fine grained Py makes up to 50% of core Py is most abundant of the top of the interval.	
241.10 TO 300.80	MFLT	Green. Fine to med. Clasts are matrix supported, coarse clasts can comprise up to 50% of the rock; qtz (5%) Fe-dol (95%) veins and patches comprise 5% of the core - locally to 15% - veins have no preferred orientation; non magnetic.		Matrix is chloritic intensity of chlorite alteration increases down hole; minor brown sericite alteration clasts weakly sericitized and dolomitized. 24.1 - 24.8: Moderate to weak ferrodolomitization yellow green, bleached colour.	Minor fine grained dissem. py.	

E.O.H.

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
24076	5.00	6.30	1.30	.001	0.02	0.03	4.5	0.57															
24077	6.30	7.80	1.50	.001	.01	.01	2.3	.07															
24078	7.80	9.30	1.50	.001	.01	.01	2.2	.05															
24079	9.30	10.20	0.90	.001	.01	.01	2.3	.02															
24080	10.20	11.70	1.50	.001	.01	.01	1.9	.07															
24081	11.70	13.20	1.50	.001	.01	.01	2.0	.04															
24082	13.20	14.70	1.50	.003	.02	.01	0.9	.08			25	230	30				250			1	0.9	82	
24083	14.70	16.20	1.50	.002	.01	.01	0.6	.07			17	147	29				200			1	0.6	67	
24084	16.20	17.70	1.50	.003	.01	.01	1.0	.06			25	129	30				250			1	1.0	62	
24085	17.70	19.20	1.50	.004	.01	.01	0.8	.08			42	112	37				375			2	0.8	76	
24086	19.20	20.30	1.30	.004	.01	.01	1.2	.05			35	104	62				200			1	1.2	48	
24087	23.21	21.80	-1.41	.004	.024	.01	0.9	.14			37	213	103				104			2	0.9	138	
24089	82.80	83.80	1.00	.041	.43	.23	2.2	.04			405	4250	2300				225			1	2.2	37	
24090	85.00	86.00	1.00	.042	.17	.57	3.4	.04			415	1700	5650				300			2	3.4	37	
24091	86.00	87.10	1.10	.008	.03	.03	1.0	.01			80	285	290				250			2	1.0	12	
24092	105.70	107.20	1.50	.010	.05	.05	1.2	.03			96	455	460				91			1	1.2	26	
24093	107.20	108.70	1.50	.015	.08	.05	1.2	.02			152	266	530				93			1	1.2	18	
24094	108.70	110.10	1.50	.010	.02	.01	1.1	.02			106	245	120				104			2	1.1	15	
24095	110.20	111.70	1.50	.070	.27	.12	2.5	.03			700	2700	1200				250			1	2.5	34	
24096	111.70	113.20	1.50	.005	.03	.03	1.1	.03			52	335	315				83			2	1.1	32	
24097	113.20	114.70	1.50	.011	.07	.05	1.2	.03			108	660	510				225			1	1.2	30	
24098	114.70	116.30	1.50	.035	.08	.13	3.2	.04			310	785	1300				300			1	3.2	36	
24099	116.20	117.70	1.50	.010	.05	.01	1.2	.04			95	485	122				93			1	1.2	37	
24100	117.70	119.20	1.50	.009	.16	.07	1.2	.04			94	1600	645				275			2	1.2	40	
24101	119.20	120.70	1.50	.007	.04	.02	1.3	.01			73	415	198				88			1	1.3	2	
24102	120.70	122.20	1.50	.010	.05	.02	1.0	.01			98	520	158				90			1	1.0	3	
24103	122.20	123.70	1.50	.010	.23	.08	1.6	.01			95	2250	840				92			1	1.6	1	
24105	131.00	133.10	2.10	.042	.43	.26	2.4	.02			420	4250	2600				475			1	2.4	17	
24106	150.90	152.00	1.10	.058	.65	.56	4.3	.01			580	6450	5550				88			1	4.3	10	
24107	156.50	157.50	1.00	.017	.10	.08	1.6	.01			172	980	745				225			1	1.6	1	
24108	158.10	159.50	1.40	.015	.05	.03	1.4	.01			146	495	275				225			2	1.4	1	
24109	159.50	160.00	0.50	.042	.09	.03	3.2	.08			415	895	315				450			5	3.2	83	
24110	160.00	160.85	0.85	.091	.25	.16	8.0	.02			905	2550	1550				325			2	8.0	20	
24111	160.85	162.40	1.55	.007	.01	.01	1.3	.02			67	128	66				175			1	1.3	20	
24113	209.90	211.10	1.20	.050	.10	.08	6.6	.20			495	985	790				425			1	6.6	203	
24114	211.10	212.60	1.50	.046	.08	.12	7.3	.20			455	745	1150				63			160	7.3	173	
24115	212.60	213.90	1.30	.060	.47	.25	11.4	.13			600	4650	2450				69			262	11.4	131	
24116	213.90	215.30	1.60	.036	.09	.09	3.0	.08			360	885	865				450			140	3.0	83	
24117	215.50	217.10	1.60	.040	.53	.21	5.2	.17			395	5250	2100				700			94	5.2	165	
24118	217.10	218.60	1.50	.099	.70	.39	12.0	.11			985	6950	3850				56			390	12.0	117	

Sample	From (m)	To (m)	Length (m)	CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB
24119	218.60	220.10	1.50	.053	.30	.09	14.4	.01			530	2950	920				65			200	14.4	6
24120	220.10	221.00	0.90	.013	.06	.01	3.0	.05			125	580	128				69			35	3.0	47
24121	221.00	222.50	1.50	.017	.04	.02	3.8	.06			165	392	167				84			44	3.8	61
24122	222.50	224.00	1.50	.006	.01	.01	1.6	.06			60	112	126				84			1	1.6	60
24123	224.00	225.40	1.40	.005	.04	.01	1.7	.09			54	373	72				700			2	1.7	86
24124	225.40	226.80	1.40	.006	.01	.01	1.4	.01			55	49	42				81			1	1.4	1
24125	226.80	228.40	1.60	.003	.01	.01	0.8	.01			34	79	18				400			1	0.8	1
24051	228.40	229.90	1.50	.004	.01	.01	0.9	.01			40	104	19				275			1	0.9	1
24052	229.90	231.50	1.60	.004	.01	.01	0.8	.01			42	118	22				375			1	0.8	3
24053	231.50	232.90	1.40	.006	.01	.01	0.9	.02			60	136	26				1150			1	0.9	24
24054	232.90	234.40	1.50	.008	.01	.01	0.8	.03			81	110	30				275			1	0.8	27
24055	234.40	235.90	1.50	.003	.01	.01	0.6	.02			25	87	39				49			2	0.6	21
24056	235.90	237.40	1.50	.003	.01	.01	0.6	.04			32	97	36				43			1	0.6	38
24057	237.40	238.60	1.20	.006	.01	.01	0.8	.08			60	102	46				80			1	0.8	77
24058	238.60	239.55	0.95	.010	.610	.02	0.9	.04			95	149	245				74			5	0.9	41
24059	239.55	240.00	0.45	.016	.02	.02	1.8	.06			160	229	166				200			2	1.8	63
24060	240.00	241.10	1.10	.007	.01	.01	0.8	.05			70	98	49				66			1	0.8	53
24061	241.10	242.60	1.50	.006	.01	.01	1.0	.01			56	85	36				89			1	1.0	6
24062	249.00	252.00	3.00	.006	.03	.01	1.0	.02			55	250	136				91			1	1.0	19

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
24088	48.00	51.00	3.00	40.30	12.89	5.71	11.34	2.36	0.26	9.89	.24	1.32			82	122			5	15	1.1	17	.29		1.57	87.01	70	1
24104	127.00	130.00	3.00	40.67	12.11	8.52	9.20	2.03	0.53	6.30	.23	1.10			95	154			5	39	1.3	36	.32		2.59	87.21	98	2
24112	167.00	170.00	3.00	66.97	12.88	.052	2.20	0.55	2.14	10.89	.06	0.66			39	88			5	63	0.4	29	.20		0.34	92.92	59	1
24062	249.00	252.00	3.00	39.43	13.83	4.46	12.97	1.56	0.34	9.92	.25	1.93			52	240			5	16	0.5	34	.35		1.16	87.17	14	1
24063	297.30	300.30	3.00	38.18	12.36	10.39	10.24	2.03	0.39	10.73	.20	1.51			82	72			5	404	1.7	16	.36		0.48	86.11	10	2

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: San Horizon

PLOTTING COORDS GRID: San Geol.
NORTH: 1011.56N
EAST: 10872.26W
ELEV: 1073.88

ALTERNATE COORDS GRID: Estimated
NORTH: 10+20N
EAST: 108+70W
ELEV: 1075.00

COLLAR DIP: -50° 0' 0"
LENGTH OF THE HOLE: 141.40m
START DEPTH: 0.00m
FINAL DEPTH: 141.40m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: May 20, 1990
DATE COMPLETED: May 22, 1990
DATE LOGGED: May 23, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: Frontier
CASING: Pulled
CORE STORAGE: Samex Camp

PURPOSE: Infill drilling.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
44.80	-	-50° 0'	ACID	OK		-	-	-	-	-	
108.80	-	-48° 0'	ACID	OK		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 4.50	«Csg»					
4.50 TO 16.30	«Dol Mflt»	Grey - Green. Fine. Original textures somewhate obscured, local relict lapilli sized clasts present. Patchy qtz (60%) dol (40%) stringers and veins make up 5% of interval.		The rock has a pervasive weak dolomitic alteration which obscures original textures. Intervals not dolomitized have a moderate chloritic alteration with minor brown sericite after chlorite. Chlorite alteration is frequently assoc. with abundant py minor mod to intense silicification.	1 - 2% med grained dissem py present throughout; locally other sulphides are present as indicated below: 7.1: lens of fine grained gn, 1cm wide, 4% po coarsely dissem. in and adjacent to gn - weakly magnetic. 10.3 - 11.3: 15% med to coarse py in coarse dissem. and str. 12.4 - 13: 20% med to coarse py. 15.4: minor gn assoc. with qd str. 15.9: 1% gn, minor cp assoc. with km wide patchy qd str.	
16.30 TO 39.15	«Mflt»	Green. Fine to med. 16.3 - 22.1: Typical mafic assemblaye; 40% to 60% clasts to 10 cm wide, matrix supported; 3% qtz (70%) dol (30%) veining clasts are lighter in colour than the matrix. 22.1 - 39.15: Core is a more uniform grey green colour; lapilli do not stand out as previously. Locally the lapilli 's have been replaced by qd and the dol, subsequently removed. In general there is a washing out of textures downhole and a graying of the rock. The exact contact with underlying argillites is indeterminable.		Matrix is chloritized with minor amounts of brown sericite.	1% fine grained dissem. py. {21.3 - 24.3} Patches of fined grained cp and gn assoc. with qdv. «1/2% comb gn, cp/qdv»	The contact was placed at a small gouge zone.
39.15 TO 49.70	«Arg»	Black Grey. Fine. Arg contains minor qtz (95%) dol (5%) veins/str. to 10 cm. many of the veins have been fragmented/ distorted by deformation. Deformation is strongest at the top of the interval local intense dragfolds. Bedding at 45.7 {49.1 - 49.6} «Flt brx/gou» Some sericite, minor alt. mafic?	80	Local graphite.	1% fine to med grained py.	
49.70 TO 50.70	«Py/Grey Se r Met Frag»	Grey. Fine to med. Fragments of arg, qtz (chert?) in a pyritiferous, sericitic siltstone matrix; Arg fragments generally flat lying. Bedding at 50.6 cm. Graded bedding fines uphole.	70	Some grey clays developed, gray sericite is weak to moderately well developed. 49.7 - 50.1: Moderate silicification.	Minor cp. 10% fine grained py dissem. and bonds parallel to bedding.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
50.70 TO 96.70	«Dol Arg/Silt Wcke»	Black gray. Fine to med. 50.7 - 54.3: Arg exhibiting chaotic bedding - from 90 degrees to sub parallel to C/A. A wide variety of folds are present. 54.3 - 80: Interbedded arg (+/- silt) and med grained wcke. Rock types locally grade into one another, beds up to 1 meter. Bedding at 74.8 m. (Locally contorted within argillites). 60.9 - 61.3: qtz (70%) dol (30%) vn. 61.7 - 62.55: qtz (85%) dol (15%) vn. 75.3 - 75.65: qtz (50%) dol (50%) vn. {75.65 - 76.2} «flt gou» 80 - : Arg/silt is much more finely interbedded wcke occur in beds from 1 to 70 cm. Bedding at 84.3 is 95.5 - 96.7: Foliation at - Foliation is oriented opposite to bedding.	 70 80 40	Arg is largley unaltered; minor graphite. Wcke are ferro - dolomitized. 95.5 - 96.7: Sericite is weakly developed in arg/silt.	1% med grained py dissem. and clots.	
96.70 TO 98.90	«Yell Ser Alt Arg»	Yellowish to grey. Fine. The rock is an altered thinly bedded arg. Bedding at 97.3 m is the base of the interval consists of a white qtz (95%) dol (5%) vn 40 cm. wide at top of interval the core yellowish in colour due to sericite alter'n. The sericite is oriented at between 97.75 - 98.05 m. there is another qdv's the core is grayer and less sericitically altered.	 70 50	The original argillites have been stronlgy sericitically altered. - yellow sericite.	<1% coarsely dissem. py.	
98.90 TO 110.80	«Arg/Silt»	Black Grey. Fine. Typical thinly interbedded arg/siltstone sequence local contortation of bedding. - eg drug folds. Cleavage? at 103 m at 5% white qdv - primarily in two veins 15 - 20 cm. wide.	 25	Local weak develop of yellow sericite. {106.8 - 107.5} «Yell Ser Alt» The alteration weak to intense and is centered on a small patch of qtz/dol.	1% med grained dissem. py. 106.8 - 107.5 3% py.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
110.80 TO 112.10	«Yel Ser Sch»	Gradational contact with the above arg original rock was arg - the present rock retains the previous sense of banding/bedding Foliation at Minor qtz dol stringers (30%/70%)	70	Primarily alteration is yellow ser. Alter. is weak at top of interval, intense at the base.	Minor med grained py, content increases to 2% at base of interval.	
112.10 TO 114.90	«Grey Ser Py Sch»	Grey. Med. Schistose foliation given by grey sericite and pyritic bands. Foliation at 5% white qtz/dol veining. Minor qtz clasts? and pyritic clasts. 114.6: Minor gouge.	65	Abundant grey ser. well developed replacing original rock texures local minor brown sericite - very fine grained. 113.9 - 114.15: Intense silicification.	20% fine to med grained py in dissem. stringers and bands parallelling foliation. {112.9 - 113.4} «40% py»	
114.90 TO 141.40	«Dol Mflt»	Grey Green. Fine to med. Transitional contact with above white unit; clasts not readily recognizable unit. 121.0: 15% qtz (50%) dol (50%) vn and str. - no preferred orientation.		Mod to strong ferrodolomitization of unit; local brown sericite alter. matrix is chloritized. 114.9 - 117.9: Patchy mod. silicification brown ser alt of mafics destroy origin textures.	2% py throughout unit - to 5% locally spotty gn and cp mineralization assoc. with qtz/dol vn/alt. overall % is only minor {127.9 - 129.2} «1% comb. gn, cp»	

E.O.H.

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
24064	6.50	8.00	1.50	.009	.06	.12	2.3	.14			90	586	1200				425			2	2.3	140	
24065	14.80	16.30	1.50	.008	.02	.08	1.6	.01			79	205	800				150			1	1.6	7	
24066	20.60	22.10	1.50	.071	.08	.07	1.6	.02			705	810	665				225			1	1.6	19	
24067	22.10	23.50	1.40	.031	.47	.29	2.8	.01			312	4700	2900				200			4	2.8	14	
24068	23.50	25.00	1.50	.068	.18	.21	2.2	.02			680	1750	2050				175			3	2.2	16	
24070	33.70	35.20	1.50	.008	.01	.01	1.0	.01			77	119	66				51			1	1.0	4	
24071	35.60	37.10	1.50	.005	.03	.01	1.0	.01			53	263	138				200			2	1.0	8	
24072	49.70	50.90	1.20	.042	.07	.06	7.8	.18			420	650	610				375			3	7.8	183	
24074	96.70	98.00	1.30	.006	.02	.01	1.3	.01			62	215	46				350			1	1.3	7	
24075	98.00	98.90	0.90	.006	.01	.01	0.6	.01			56	125	25				550			1	0.6	2	
24401	106.80	107.50	0.70	.008	.04	.07	1.8	.01			76	375	745				225			1	1.8	4	
24402	110.80	112.10	1.30	.007	.01	.01	0.9	.02			70	139	29				300			1	0.9	24	
24403	112.10	113.40	1.30	.001	.04	.02	2.3	.36			12	425	164				350			3	2.3	356	
24404	113.40	114.90	1.50	.015	.01	.01	1.4	.08			150	126	122				225			2	1.4	80	
24405	114.90	116.40	1.50	.013	.04	.06	1.5	.02			125	372	565				200			1	1.5	17	
24406	116.40	117.90	1.50	.014	.01	.01	1.0	.01			144	142	105				175			3	1.0	9	
24408	119.40	120.90	1.50																				
24407	121.00	122.50	1.50	.005	.03	.05	1.2	.01			50	275	500				175			2	1.2	8	
24408	124.20	125.30	1.10	.076	.68	.36	4.0	.06			760	6750	3550				200			3	4.0	62	
24409	127.90	129.20	1.30	.090	.73	.25	4.5	.06			900	7250	2450				475			7	4.5	60	
24411	137.10	138.60	1.50	.007	.01	.01	1.4	.01			72	112	42				21			1	1.4	3	

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
24069	26.50	29.50	3.00	42.55	13.40	9.29	7.00	2.13	2.12	8.63	.18	1.38			85	140			5	78	1.2	93	.60		.42	87.77	64	6
24073	69.00	72.00	3.00	67.86	13.01	1.41	2.09	0.08	3.11	4.48	.04	0.66			31	78			5	121	0.8	29	.56		.04	93.48	55	1
24410	134.10	137.10	3.00	36.24	10.43	12.70	9.88	1.34	1.69	7.83	.21	1.21			65	86			5	21	1.5	16	.62		.23	82.39	16	5

MINNOVA INC.
DRILL HOLE RECORD

HOLE NUMBER: RG320 | IMPERIAL UNITS: | METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: San Horizons

PLOTTING COORDS GRID: San Geol.
NORTH: 1019.40N
EAST: 10919.57W
ELEV: 1066.61

ALTERNATE COORDS GRID: Estimated
NORTH: 10+25N
EAST: 109+20W
ELEV: 1070.00

COLLAR DIP: -50° 0' 0"
LENGTH OF THE HOLE: 191.10m
START DEPTH: 0.00m
FINAL DEPTH: 191.10m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: May 22, 1990
DATE COMPLETED: May 24, 1990
DATE LOGGED: May 23, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: Frontier
CASING: Pulled
CORE STORAGE: San Camp

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
23.50	-	-49° 0'	ACID	OK		-	-	-	-	-	
66.10	-	-49° 0'	ACID	OK		-	-	-	-	-	
121.00	-	-50° 0'	ACID	OK		-	-	-	-	-	
172.80	-	-48° 0'	ACID	OK		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 3.00	«Casing»					
3.00 TO 25.90	«Dol Maf Lap Tuff»	Green. Very chaotic mixture of broken, contorted, and boudined Fe-Dol veinlets and floodings, in strongly altered but recognizable lapilli tuff. Warped foliation	60	Patchy fracture controlled ferrodolomitization after chloritic and calcareous mafics. Numerous thin gouges and broken sections including: {25.7 - 25.9} «flt gou and bx»	2 - 3% pyrite except a few mineralized dol veinlets: {7.0 - 8.1} «10% py, tr, sp, gn»	
25.90 TO 36.40	«Intense Dol Maf Bx»	Grey to grey green. Very contorted and broken up (tectonically) with a strong pervasive dolomitization. A few 10 cm. lapilli like blocks recognizable as mafic derived.		Pervasive strong Fe-Dol, with patchy brown ser. and minor relict chlorite.	1% py dissem.	Well healed and competant core.
36.40 TO 47.80	«Sil Arg/Silt Tect Bx»	Black and white. Gradational, brecciated contact best identified by a switch from carbonatization to silicification. Contorted laminated bedding and qtz stringers indicate a structural shortening (thrust?). Interval chaotic but most common foliation/cleavage. Possible mafic fragments are present but uncommon.	75	Numerous broken and feformed qtz (+- dol) stringers and veins up to 30 cm. Pervasive silic. of silty beds. {47.0 - 47.5} «Flt gou»	Tt py only.	
47.80 TO 49.90	«Lithic Wacke»	Grey. Coarse. Distinctive thick bed of lithic wacke. Cherty and argillaceous clasts, angular, and up to 1 cm. in length. Flattened at least 3 to 1 Foliation	65	Pervasive silicification.	Tr. dissem. euhedral pyrite.	Competant unit.
49.90 TO 51.00	«Dol Maf Volc»	Gre Green. Sharp conformable contacts. A strongly ferrodolomitized, chloritic unit. Probably an interbed of tuff.		Very strong pervasive Fe-dol with accompanying brown sericite after chlorite.	Tr. py.	
51.00 TO 51.90	«Met Frag»	Grey. Fine to coarse. Distinct contacts. 5% qtz (90%) dolomite (20%) veinlets - occur predominantly at ends of interval Veinlets exhibit some drag folding. - interval contains 40% flat angular clasts of argillite mafic? 2% qtz clasts? in a fine gray matrix.		Unit has been weakly silicified locally; ferrodolomite alteration is pervasive throughout interval; weak grey sericite alt. parallelling foliation.	15% fine to coarse grained dissem. py trace gn in qdv.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		Clasts to 4 cm. Weakly developed foliation	65			
51.90 TO 58.50	«Arg»	Black. Fine. 90% fine grained arg with 10% thin interbeds of silt. Bedding is strongly contorted with multiple tight folds evident. 10% qtz (65%) dol (35%) veins to 20 cm - barren. {53.8 - 55.1} «Flt gou brx» developed locally throughtout interval.		No noticeable alteration.	<1% dissem. cubic py.	
58.50 TO 69.10	«Arg/Silt Wcke»	Black Gray. Fine med. Interbedded arg/silt/wcke. Wcke beds to 150 cm competent; fine to med. grained. arg beds contain thin silty laminae. Bedding is contorted. - ranges from 0 degrees to 90 degrees to C/A. 5% qtz/dol stringers within arg.		Weak carbonate alteration of wcke - after folds per. Minor graphite developed within arg.	1% med grained cubic py in fine to coarse dissem.	
69.10 TO 70.20	«Qtz Dol Vn »	White. Fine to med. White qtz (70%) cream ferrodolomite (30%) vn contains 10% arg wedges; the arg is metamorph to phylhite locally.		Grey sericite is abundant where arg. has been metamorph.	Contains minor cubic dissem. py.	
70.20 TO 91.40	«Arg/silt W cke»	Black Grey. Fine. Black arg interbedded with gray siltstones and wckes. Bedding within the arg are still contorted with bedding angles ranging from 0 degrees to 80 degree to C.A. but generally in range of 20 - 20 degrees to C.A. Arg interbedded within thin laminae of silt. 5% qdv and stringers offset of stringers visible - shppage along bedding planes. {78.5 - 79} «Qtz/dol vn» 70% white bull qtz 30% creamy/grey dolomite.		Local weak to med white/grey sericite alter. in arg and wcke. Mod yellow ser. at contact with qdv. Weak dolomitization of wckes. Minor graphitic alt of arg.	Trace cp, gn assoc. with qdv. <1% fine grained dissem. py.	
91.40 TO 99.50	«Intb Seds Yel Ser Phy llite»	Yellow Grey. Fine med. Textures are indentical to the above arg/silt/wcke unit. This interval the original rocks have been bleached by alteration - relict textures. Contacts are gradational. {91.8 - 92.3} «qtz/dol vn»		Strong pervasive formation of yellow sericite overprinting the host rocks wcke units are ferrodolomitized. - alteration weakens towards end of interval.	Minor dissem py. {92.4 - 92.65} «10% py»	Similar alteration in other holes has previously been call schist.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		{92.9 - 93.2} «patchy qdv» 80% dol, 20% qtz. {94.2 - 94.55} «90% dol, 10% qtz.				
99.50 TO 102.90	«Arg/silt w cke»	Black Grey. Fine. Gradational contacts unit similar to that between 70.2 and 91.4 m. bedding relatively consistent - at 100 m. graded bedding indicate tops uphole.	80	Weak dolomitization of wcke.	<1% py.	
102.90 TO 111.20	«Intb Seds Tel Ser Phy llite»	Yellow Grey. Fine. Interbedded seds have been metamorph to phyllite Original textures are still evident. 2% qtz/dol stringers and veins. Locally veins are drag folded and boudined. {106.3 - 108} «Flt. gou, brx» Generally strongly developed, locally weak. {107.5 - 107.8} «Qtz/dol vn»		Intense yellow sericite alteration of the original interbedded seds. Ferrodolomitization of wcke (alt of feldspar)	1 - 2% dissem. fine grained pg. tp 5% locally , coarsely dissem.	This unit similar to that between 91.4 - 99.5 m. 80% recovery between 107.8 and 108.8.
111.20 TO 113.65	«Grey Ser/P y Payllite»	Grey. Fine. The original rock (seds) has been intensely alt. original bedding textures are preserved. Phyllitic foliation {111.2 - 111.4} «flt gou and brx» Strongly developed.	80	Intense grey sericitic alteration of sediments. - phyllite grade of metamorph.	{111.2 - 113.65} «30% pt» Py is fine grained and occurs as dissem. and bands.	Previously called Grey Sericite Pyrite Schist.
113.65 TO 130.50	«Sil/Dol Ma f»	Green. Fine. The mafics are fine grained; origins indeterminable, the rock is prevasively cut by thin stringers and patches of silicate veining +/- carbonate veins consist locally of qtz, feldspar (kspar?) Fe-Calcite, Fedolomite In many instances these veins/stringers vuggy probably due to the removal of an easily sohible carbonate (Calcite?). At the top of the interval the stringers exhibit folding, offsets and boudinage. Approx. 20% veining present.		Contact zone has patchy weak to mod. silicification throughout rest of interval silicification is generally in the form of veining. Mafics are chloritized strong reaction to staining - moderate ferrodolomitisation	2 - 3% coasely dissem py.	
130.50 TO 179.25	«Mflt»	Green. Fine to med. Cone varies from dark green (Chl) to mottled dark and light green. The clasts preferential bleach to light green due to dol and sericite lapilli sized clastic material makes up to 60% of unit		Matrix is chloritized weak to intense ferrodolomitization. {141.9 - 142.4} «Patchy sil» Core bleached.	1 - 3% dissem, fine grained py. {141.9 - 142.4} «10% py»	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		5 - 10% qtz/dol/Fe-calcite, veining locally brx mafics. {173.1 - 173.7} «20% qtz, 80% Fe dol vn» Contact zone mafics are bleached and sericite alt. {176.5 - 176.8} «qtz/dol vn brx»			{183.8 - 185.6} «min gn» assoc. with veins. {178.3 - 179.2} «15% py» {173.1 - 173.7} «1% gn, minor cp, 4% py» {176.5 - 178.3} «5% py, assoc. with qdv»	
179.25 TO 180.90	«Ser/Dol Mflt»	Green Grey. Fine. Mafics are altered 10% white qtz/dol/Fe calcite veining textures destroyed. Foliation at	75	Strong chlorite alt. of mafics yellow to brown sericite alt present - weak to mod in intensity.	5% med grained coarsely dissem py.	
180.90 TO 191.10	«Mflt»	Green. Fine. 5 - 15% qtz (50%) dol(40%) Fe calcite (10%) veins and pods intruding mafic lapilli tuffs. Clasts make up to 70% of core. END OF HOLE		Strong chlorite alteration. Weak sericite dol alt of clasts patchy dol. of matrix.	1 - 3% fine grained dissem. py, minor gn assoc. with qtz/dol vns.	A fresh looking continuation of the mafic pile.

1535

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
24376	7.00	8.00	1.00	.023	.03	.02	1.8	.01			230	275	189				62			1	1.8	20	
24379	51.00	51.90	0.90	.010	.05	.06	3.7	.01			98	540	600				86			1	3.7	24	
24381	108.20	109.70	1.50	.003	.01	.01	0.7	.01			27	118	27				42			1	0.7	48	
24382	109.70	111.20	1.50	.007	.02	.01	0.8	.01			67	245	24				64			1	0.8	36	
24383	111.20	112.40	1.20	.004	.01	.01	1.5	.01			37	65	52				76			2	1.5	143	
24384	112.40	113.65	1.25	.005	.01	.01	1.0	.01			49	94	60				70			3	1.0	75	
24385	113.65	115.15	1.50	.008	.01	.01	0.9	.01			82	142	49				52			2	0.9	13	
24386	115.15	116.65	1.50	.007	.03	.04	1.2	.01			65	285	400				50			1	1.2	2	
24388	118.15	119.65	1.50																				
24388	171.25	173.70	2.45	.020	.30	.23	4.1	.01			200	2950	2320				68			12	4.1	30	
24389	173.70	175.60	1.90	.006	.01	.01	1.3	.01			63	127	74				83			2	1.3	20	
24390	176.50	178.30	1.80	.004	.02	.01	1.4	.01			42	163	103				75			1	1.4	40	
24391	183.80	185.60	1.80	.015	.03	.07	6.2	1.97			151	340	700				92			20	6.2	2000	

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
24377	14.00	17.00	3.00	41.33	11.00	6.99	14.24	.18	.29	10.56	.26	.97			63	130			5	119	1.1	34	.36		2.58	88.77	105	6
24378	29.00	32.00	3.00	39.62	11.31	7.69	13.50	.63	.44	10.36	.36	1.30			151	184			5	21	1.0	124	.41		3.03	88.68	60	7
24380	60.00	63.00	3.00	68.54	12.25	2.09	2.30	.21	2.44	4.66	.07	.65			35	84			5	97	0.4	47	.26		.24	93.79	83	1
24387	145.30	148.30	3.00	40.04	13.62	6.70	12.53	1.34	.25	10.76	.25	1.66			77	117			10	17	0.8	15	.43		.91	88.49	14	9
24392	187.40	190.40	3.00	39.12	13.09	6.20	13.15	1.39	.30	11.39	.23	1.23			73	130			5	15	1.1	31	.32		1.02	87.45	25	9

MINNOVA INC.

HOLE NUMBER: RG321 — DRILL HOLE RECORD — IMPERIAL UNITS: — METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: San Horizon

PLOTTING COORDS GRID: San Geol.
NORTH: 1064.48N
EAST: 10979.50W
ELEV: 1060.48

ALTERNATE COORDS GRID: Estimated
NORTH: 10+57N
EAST: 109+80W
ELEV: 1060.30

COLLAR DIP: -50° 0' 0"
LENGTH OF THE HOLE: 175.80m
START DEPTH: 0.00m
FINAL DEPTH: 175.80m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: May 24, 1990
DATE COMPLETED: May 26, 1990
DATE LOGGED: May 26, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: Frontier
CASING: Pulled
CORE STORAGE: Samex Camp

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
26.50	-	-50° 0'	ACID	OK		-	-	-	-	-	
75.30	-	-50° 0'	ACID	OK		-	-	-	-	-	
133.20	-	-50° 0'	ACID	OK		-	-	-	-	-	
175.90	-	0° 0'	ACID	BD	Incomplete Etch.	-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 26.50	«Csg»					
26.50 TO 43.20	«Mflt Flt Bx»	Green Gray White. Fine to med. Mafic lapilli tuff is the predominant host rock. Clasts to 6 cm. present; readily recognizable clasts (original) comprise 30% - 40% of core. 20% white to grey qtz (20%) dol (80%) present in in stringers and veins to 30 cm; veins exhibit numerous open space, some of which are fault related and some which are possibly due to dissolution of minerals. The entire interval has been highly brecc. by faulting. Tectonically brx frags of MFLT and qdv are supported by a pale green grey carbonate/ sericitic matrix. 32.6 - 37.5: Interval is less brx - textures show a good MFLT.		Fault brx matrix is a strongly calcareous. Mafics are also calcareous with local weak dolomitization of MFLT. Minor fuchsite developed adjacent to qdv. Compentent intervals of MFLT are chloritic minor talc.	1% dissem. py within MFLT. 1 - 5% cubic dissem. py in fault brx matrix.	
43.20 TO 45.80	«Qtz/Dol Vn Flt Bx»	White. Med coarse. 90% white to grey qtz (10%) dol (90%) vn material which has been strongly tectonically brecc. 10% of interval is alt. MFLT - mafics occur as clasts within the fault brx. Fault matrix is strongly calcareous.		Minor fuchsite alteration developed clay/carbonate in matrix.	<1% coarsely dissem. fine grain gn, sp, tr tet? 1% py up to 5% py in fault gou. {43.2 - 45.8} «Min gn, sp, tet?»	
45.80 TO 61.70	«Dol Maf/Flt bx»	Grey. Fault brec. still intense throughout interval with chloritic to dolomitic clasts of Maf clasts and matrix is calcareous. 20% white qtz (30%) dol (70%) veining and tectonic brx. 58.2: 3 cm. wide black graphitic shear oriented at	25	Mod to int dolomitization of mafics locally tectonically brx maf clasts are still chloritic - predominantly towards base of interval. Minor talc and yellow sericite alt'n also present. 48.8 - 49.9: Intense dolomitic alt'n.	2 - 5% fine to med. grained py.	The mafic clasts are probably derived from MFLT but clastic textures no longer evident.
61.70 TO 68.10	«Dol Maf/Arg Tran»	Grey Black. Fine. 70% arg, 30% maf. The arg are black - locally bleached by alter. to a grayish color. Mafics are dolomitic grey color with no-relict textures; Mafics are strongly calcareous. 5% qtz (15%) dol (85%) veining. Core still exhibits the effects of the fault zone - particularly within arg beds.		Mafics are strongly ferrodolomitized and have associated talc alt. locally.	2 - 5% med. - coarse grained py overall {61.7 - 63.5} «20% py» Locally to 30% py.	The location of the contacts are arbitrary alteation makes identification of rock types difficult. Differentiation based on alteration minerals and appearance, some ferrodolomitized mafics may be dolomitized arg/silt.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
68.10 TO 72.00	«Dol Arg»	Black. Fine. Black arg laminated by folded stringers of ferrodolomite. Fault zone is rubbling core - locally brx and gouge well developed. Particulary towards end of interval.		Arg are weakly graphitic. Pervasive dolomitic stringers.	3% py.	
72.00 TO 75.65	«Dol Maf»	Green/Grey. Fine. Massive unit 10% qtz/dol veining sharp upper contact at no preferred orientation to veins. 72 - 74: Weak fault brecc.	15	Minor silicification and sericite alt'n moderate dolomite alt'n.	2% dissem. py, about 1% gn assoc. with qtz/dol - gn is in coarsely dissem. and stringers.	
75.65 TO 76.10	«Dol Maf/Arg Tran»	Green. Fine. Interval is primarily mafic in origin with 3% org clasts 15% white and grey qtz (80%) dol (20%) veining and clastic fragments. Upper contact is marked by a vein at Lower contact at	50 35	Pervasive weak dolomitization.	4% coarse dissem. med. grain py.	Arg clasts may be caused by tectonism.
76.10 TO 80.30	«Sil/Dol Arg»	Black. Fine. Black arg is extensively banded by thin qtz/dol laminae - possibly along bedding planes. Foliation at	50	Numerous fine siliceous and dolomitic laminae within the arg. Local weak graphite.	1 - 2% dissem. py.	
80.30 TO 82.30	«Dol Maf/Arg Trans»	Black grey. Fine. 65% black arg, 35% alt mafics. Textures within mafics destroyed. 10% qtz/dol {81.7 - 82.3} «Flt gou, brx»		Mafics are dolomitized and clay altered.	2% py.	
82.30 TO 137.30	«Arg/Silt Wcke»	Black grey. Fine to med. 40% massive grey med. grained wcke beds to 70 cm. interbedded with well bedded arg/silt bedding is highly variable at top of interval with bedding varying from 0 to 70 degrees to C/A. Warps, folds and fold noses present. Assymetric limbs of folds point downhole; graded bedding directions vary. 5% white qtz/dol veining at 136 m. bedding at Cleavage at Gradational lower contact. {127.6 - 130.2} «Flt bx» weak to moderately well developed.	40 60	Weak carbonatization of feldspars within wcke. Grey sericite increasingly well developed towards base of unit.	1% dissem. py.	Arg appear to be in the hinge zone of fold structure.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
137.30 TO 138.00	«Gt Ser/Py Bx Arg»	Grey Black. Med. Clasts of black arg in a matrix of sericite and py. Contacts are healed arg. bx. 10% qtz/dol/silicified? material.		Well developed silver grey sericite.	{137.3 - 138} «10% py» in fine to coarse grained dissem. and bands.	An altered/bx section of arg within arg.
138.00 TO 139.50	«Arg»	Black. Fine. Relatively consistent bedding/banding at minor qtz/dol stringers	40	Local weakly bleached bands - possible silicification or dolomitization.	5 - 20% fiee grained dissem. py and py bands.	
139.50 TO 140.65	«Qz/Ser/Py Met Frag»	Grey. Med. Well foliated at 139.5 m at 140.5 m 10% thin clasts of arg. some clasts show cleavage at a low angle to foliation - some flattening. 5% qtz clasts - rounded - chert? Matrix comprised of Qtz/Ser/Py.	30 55	Abundant silver gray sericite well developed - 30%. 45% ribbon qtz.	{139.5 - 140.65} fine to coarse cubic grained dissem. py «10% py tr cp?»	"Muddy Tuff"
140.65 TO 141.90	«Qz/Ser/Py Alt Maf?»	Grey. Fine to coarse. Foliation at mafics are intensely altered, alteration has destroyed all original textures. 10% qtz vein clast/vein material.	40 50	Intense silver gray sericite and clay alteration.	Fine to coarse grained, cubic py. 25% py at top of interval decreasing to 10% at base.	Possibly a transition zone.
141.90 TO 145.10	«Tel Ser/Do l Maf»	Green, Gray. Fine. Massive to locally brecc. (tectonic) original textures completely destroyed by alteration. 3% qtz (20%) dol (80%) veining.		Mod. to intense patchy dolomitization and yellow sericite alt'n chlorite alteration increasing down-hole.	Tr med grain gn assoc. with qtz/dol veining. 3% dissem. py.	
145.10 TO 175.80	«Maft/Tuff? »	Green. Fine to med. Massive to 40% lapilli sized clastic unit. 10 - 20% Fe calcite veining/stringers and patches In upper portion of interval (to 149 m.) clasts are rare - possibly on ashy tuff. {145.4 - 146.9} «Flt bx, gn» interval contains 20% qtz (20%) dol (80%) brec. fragments in a green clay alt. gouge. {156.6 - 157.5} «Flt bx, gou» 30% Fe calcite (siderite) clasts in a chloritic gouge. END OF HOLE 178.8 m.		Strong chlorite alt.	1% dissem. py. Trace gn, cp assoc. with qtz/Fe calcite veining. {164.55 - 165.35} «4% gn cp, 35% py» cp is coarse grained and coarsely dissem as selvage to qtz/carb vein gn is fine to med grained in fine to coarse dissem. Py is fine to med grained semi-massive.	

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
BCD24393	41.70	43.20	1.50	.024	.02	.01	2.7	.09			240	220	89				400			1	2.7	86	
BCD24394	43.20	44.50	1.30	.023	.04	.09	2.2	.04			228	385	940				110			7	2.2	40	
BCD24395	44.50	45.80	1.30	.002	.02	.03	1.6	.02			15	152	265				95			4	1.6	21	
BCD24396	45.80	47.30	1.50	.009	.02	.02	2.2	.06			89	240	235				425			1	2.2	56	
BCD24397	61.70	63.50	1.80	.008	.05	.05	2.1	.04			76	490	520				500			1	2.1	40	
BCD24398	72.20	72.80	0.60	.008	.34	.28	2.3	.05															
BCD24400	139.50	140.65	1.15	.026	.19	.06	2.7	.17			260	1900	645				450			2	2.7	167	
BCD24412	140.65	141.90	1.25	.010	.03	.02	1.3	.07			95	345	170				82			1	1.3	66	
BCD24413	141.90	143.40	1.50	.007	.01	.01	1.1	.01			69	139	77				79			2	1.1	1	
BCD24414	143.40	144.90	1.50	.004	.01	.01	1.4	.01			43	144	53				106			3	1.4	3	
BCD24415	144.90	146.40	1.50	.003	.01	.01	1.5	.01			27	105	95				63			2	1.5	5	
BCD24416	146.40	147.30	0.90	.007	.02	.02	1.2	.01			72	198	246				40			2	1.2	1	
BCD24418	164.55	165.35	0.80	.090	3.45	2.19	10.4	.13															

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
24399	87.50	90.50	3.00	57.33	16.37	2.74	3.39	.24	2.84	6.96	.09	.94			41	111			5	107	.7	37	.28		.29	91.59	58	1
24417	160.60	163.60	3.00	35.39	12.13	14.45	9.14	.99	15.3	9.56	.24	1.60			55	185			5	46	1.3	43	.37		1.48	85.92	29	3

MINNOVA INC.

HOLE NUMBER: RG322 | DRILL HOLE RECORD | IMPERIAL UNITS: | METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: Sam Horizon

PLOTTING COORDS GRID:
NORTH:
EAST:
ELEV:

ALTERNATE COORDS GRID: Estimated
NORTH: 10+75N
EAST: 110+80W
ELEV: 1050.00

COLLAR DIP: -50° 0' 0"
LENGTH OF THE HOLE: 221.50m
START DEPTH: 0.00m
FINAL DEPTH: 221.50m

COLLAR GRID AZIMUTH: 180° 0' 0"

COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: May 26, 1990
DATE COMPLETED: May 28, 1990
DATE LOGGED: May 27, 1990

COLLAR SURVEY: NO
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: Frontier
CASING: Pulled
CORE STORAGE: Sanex Camp

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
35.70	-	-49° 0'	ACID	OK		-	-	-	-	-	
102.70	-	-48° 0'	ACID	OK	Tube Broken	-	-	-	-	-	
163.70	-	-48° 0'	ACID	OK	Was labelled RG321	-	-	-	-	-	
190.20	-	-49° 0'	ACID	OK		-	-	-	-	-	
214.30	-	-48° 0'	ACID	OK		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 12.50	«Csg»					
12.50 TO 33.50	«Maf Tuff?»	Green. Fine to med. Dk, generally fine grained local dark chloritic spots - after glassy shards?? Loaclly feldspathic. {31.7 - 32.05} «Flt bx gou»		Limonitic alteration on fractures near surface. Chloritic alteration throughout. Rock is sericitically altered adjacent to flt zone.	<1% dissem. py.	Core is very blocky rock may be an ash or crystal tuff.
33.50 TO 58.40	«Dol Maf»	Gray. Original textures destroyed by alteration; the alteration grades into and out of Maf. 56.4 - 57.3: Patchy white qtz (90%) dol (10%) veining. 56.4 - 58.4: Weak fault gouge/brx.		Intense dolomite alteration; locally the alteration is patchy or streaky with interstial chloritic alter. Some chlorite altered to brown sericite minor fuchsite and talc.	2% - 15% py in fine to coarse dissem. {36.8 - 37.15} «4% cp, 1% gn, 5% py» Assoc. with intense dolomitization and minor qtz veining. {56.5 - 57.4} «30% py» Semi - massive assoc. with vein.	
58.40 TO 69.60	«Sil/Dol/Ser Maf»	Gray Brown. Fine. Intense alt. destroys all original textures. 5% white qtz (+- dol) veins. 60.2 - 62.5: Highly rubbled core. 61.8 - 62.5: Fault bx.		Patchy intense silica flooding brown dolomitized mafics. Weak brown sericite local massive green sericite, minor talc, fuchsite. 65.7 - 69.3: Minor patchy silicification.	5% coarsely dissem. py. 2% gn, cp, sp overall throughout interval as indicated below. {60 - 62.4} «6% bm, 15% py» bm include gn, cp, sp and some very fine grained silvery metallics - gn, tet?	61.8 - 62.5: Approx. 50% recovery.
69.60 TO 129.90	«Maft»	Green Gray. Fine to med. Typical lapilli tuff. - Matrix is fine grained to med grained locally with feldspathic crystals. Rock is calcareous. Clasts show little evidence of flattening; large clasts comprise up to 60% of unit. Max clast size 8 cm. core is non-magnetic 3% white qtz (80%) dol (20%) veining. Rock is carbonate enriched. 108 - 129.9: Clastic texture is generally less distinct through present - less sericite and greater chloritic alteration.		Weak sericitic alteration action of clasts matrix is chloritic.	<1% py disseminated throughout. Minor gn associated with veinsl; gn is fine grained, usually coarsely dissem.	

61.2 - 62.5

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
129.90 TO 140.10	«Dol/Sil Arg/Maf?»	Black Gray. Fine. 80% fine grained black argillite; argillite contains 30% qtz (40%) dol (60%) veins and stringers max vein width 5 cm. two stages of veining in first stage preferred. Orientation is at (Bedding?); the second stage of veining consists of fine stringers cross cutting the arg. and 1st. stage veins. These stringers are locallized, oriented subparallel to core axis. The MAF? are fine grained and strongly altered, gray green color. Origin is uncertain. Patchy shear and gouge zones through interval. MAF? intervals occur at 125.5 - 125.85 m. 132.5 - 133.3 m 134.3 - 134.4 m. 135 - 135.1 m	70 80	Dol/Sil alt within the argillites is in the form of veining and minor silicification; argillites are locally graphitic. The MAF? are dol and seritically altered, local minor talc.	2 - 5% coarse grained dissem. py.	The MAF? could be an altered sediment/volvanic - clastic sediment A transition zone.
140.10 TO 144.20	«Qtz/Dol/Ser Met Frg»	Green Gray White. Fine. Non descript unit - some whitish green altered mafic? Clasts visible has a smeared appearance. 25% white bull qtz veining. veins contain 5% moderately hard, pink, fine grained mineral - possibly kspar. {141.8 - 144.2} «Flt bx, gou» Strongly developed bx the qtz veins and MET FRG is clay alt.		Pervasive yellow green sericite alt'n (fine grained) and dolomitization. Silica is primarily in the form of veining.	1 - 2% dissem. py.	
144.20 TO 150.80	«Arg/Silt Wcke»	Black Gray. Fine. 90% arg +- silty material, 10% grey wcke, 3% white qtz +/- dol veining. {144.2 - 144.5} «Flt. bx»		Locally graphitic.	1% dissem. py.	
150.80 TO 155.90	«Qtz/Ser Alt Sed»	Buff White. Fine to med. White bull qtz veins located at 151.2 - 152.35 m. 155 - 155.4 m 155.65 - 155.9 m. Cause sericitic alt'n Foliation at	40 60	Strong yellow to gray sericite alt. Replacing original minerology.	<1% py, tr cp.	Protolith appear to have been locally coarse grained - possibly wcke beds.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
155.90 TO 162.20	«Arg/Silt/Wcke»	Black. Fine. Gadational upper and lower contacts. Local graded bedding appears to be fining uphole. Bedding at Local arg beds contain 40% qtz/dol lens, with lengths parallel to bedding. - Due to slippage along bedding?? 20% wcke beds.	65	Weak dolomitization locally. Weak to moderate sericite alt's at contacts.	<1% dissem. py.	
162.20 TO 174.10	«Arg/Slf/Wcke Phyl»	Baff gray. Fine to med. Sediments are phyllitic relict bedding textures present from 162.2 - 170.3 at 164.8 m sericite foliation at Bedding at {166.6 - 168.7} «Flt bx, gou» not continously developed but intense where it occurs. {170.65 - 172} «qtz vn» makes up 80% of interval; locally contains brx sed frags. Locally rubbled. «Flt gou» 172.15 - 174.1: Core is a non discript gray spotted by white qtz/dol irregular nodule.	50 90	Strong yellow to gray sericite alt'n alteration is not as intense in some wcke beds, alteration is most intense adjacent to qtz veins.	Minor dissem. py.	
174.10 TO 191.10	«Sil/Dol Frg Trans»	Gray. Fine. 35% white qtz/dol in irregular veins/patches veins have no preferred orientation. Matrix is fine grained and altered; 40% matrix 20% clast material - matrix supported; 80% of recognizable clasts are argillite or argillite/qtz 20% appear to be mafic; clasts are angular wisps/ fragments to subrounded. {179 - 180} «Met Frg?» Interval is the most clear clastic 40% clasts - composition arg 80% mafic 10%, qtz 10%		The core is pervasively moderately dolomitized. Silification is in the form of qtz veining and localized flooding; weak to moderate yellow brown sericite and chlorite alter'n of matrix.	Minor gn, cp associated with qtz veins. Locally gn can be as much as 2%. up to 5% dissem. py.	Matrix appears to have a substantial mafic component.
191.10 TO 197.30	«Dol Maf»	Buff Green. Original textures destroyed 3% white qyz veining some veins are vuggy where more soluble minerals have been removed leaving qtz/dol.		Moderate to intense dolomitization bleaching rock; minor silicification; fuchsite alteration - minor to 4% patchy moderate yellow sericite alt'n (5%)	3% coarsely dissem. py, trace galena.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
197.30 TO 221.50	«Maf»	Green. Core is calcareous. 20% patchy qtz/dol stringers. - stringers and chlorite alt. destroy original textures at top of interval to 213.5 m. 213.5 - 221.5: Relict lapilli visible, lapilli are lighter in color than matrix. 20% coarse clastic material. 202 - 205: Blocky core - fault related? END OF HOLE		Intense chloritic alteration. 213.5 - 221.5 - Weak sericite/dol alt'n of clasts.	2 - 5% coarsely dissem. py.	

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
24419	36.60	37.70	1.10	.186	.20	.06	3.5	0.18															
24420	56.50	57.90	1.40	.005	.07	.10	2.4	.08			51	665	1000				425			2	2.4	84	
24421	57.40	58.40	1.00	.008	.25	.13	2.9	.11			76	2500	1330				575			1	2.9	112	
24422	58.40	60.00	1.60	.006	.04	.08	2.2	.09			64	410	825				675			14	2.2	92	
24423	60.00	61.20	1.20	.100	.69	.61	6.1	.19			1000	6900	6100				600			12	6.1	188	
24424	61.20	62.50	1.30	.433	2.85	2.10	19.6	.37			4330	28500	21000				650			22	19.6	368	
24425	62.50	64.00	1.50	.007	.09	.06	1.6	.15			72	910	560				625			1	1.6	150	
24426	64.00	65.50	1.50	.005	.01	.03	1.2	.11			50	135	285				575			2	1.2	107	
24427	65.50	67.00	1.50	.002	.01	.02	1.2	.06			24	89	193				550			1	1.2	62	
24428	69.30	70.80	1.50	.005	.24	.05	1.8	.08			54	2400	520				650			1	1.8	76	
24429	70.80	72.30	1.50	.009	.29	.17	2.8	.02				350			1	2.8	21						
24431	73.80	75.30	1.50																				
24433	140.90	142.60	1.70	.009	.02	.01	0.8	.01			91	170	43				104			4	0.8	5	
24435	170.10	171.60	1.50	.003	.01	.01	0.5	.03			26	30	22				71			1	0.5	27	
24436	171.60	173.10	1.50	.004	.03	.01	0.8	.06			42	340	37				58			6	0.8	62	
24437	173.10	174.60	1.50	.005	.01	.01	1.0	.04			50	65	120				74			1	1.0	41	
24438	174.60	176.10	1.50	.007	.05	.08	2.4	.01			65	450	800				425			1	2.4	10	
24439	176.10	177.60	1.50	.005	.02	.01	1.1	.01			46	213	62				325			2	1.1	12	
24440	177.60	179.10	1.50	.004	.01	.01	0.7	.01			40	123	73				225			1	0.7	2	
24441	179.10	180.60	1.50	.002	.02	.01	1.0	.02			23	190	120				375			3	1.0	15	
24442	180.60	182.10	1.50	.002	.01	.01	0.8	.01			20	144	35				225			2	0.8	5	
24443	182.10	183.60	1.50	.003	.06	.04	1.2	.01			26	590	440				200			1	1.2	4	
24444	183.60	185.10	1.50	.010	.07	.28	3.2	.01			109	4700	2790				450			1	3.2	4	
24445	185.10	186.60	1.50	.003	.03	.02	1.0	.01			27	302	185				150			2	1.0	1	
24446	186.60	188.10	1.50	.005	.09	.01	1.6	.01			45	915	685				175			2	1.6	3	
24447	188.10	189.60	1.50	.006	.14	.06	1.4	.01			60	1370	595				125			1	1.4	3	
24448	189.60	191.10	1.50	.002	.04	.05	1.2	.01			24	445	520				84			1	1.2	2	
24449	191.10	192.80	1.70	.003	.02	.01	1.0	.01			25	206	97				56			1	1.0	1	
24450	192.80	194.10	1.30	.006	.03	.01	1.2	.01			57	305	99				58			4	1.2	2	
24451	194.10	195.60	1.50	.003	.02	.01	1.2	.01			34	220	64				59			2	1.2	1	
24452	195.60	197.30	1.70	.008	.04	.02	1.3	.01			75	402	163				57			4	1.3	8	

MINNOVA INC.
DRILL HOLE RECORD

HOLE NUMBER: RG323 | IMPERIAL UNITS: | METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: San Horizon

PLOTTING COORDS GRID:
NORTH:
EAST:
ELEV:

ALTERNATE COORDS GRID: Estimated
NORTH: 9+20N
EAST: 110+80W
ELEV: 1050.00

COLLAR DIP: -50° 0' 0"
LENGTH OF THE HOLE: 145.40m
START DEPTH: 0.00m
FINAL DEPTH: 145.40m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: May 29, 1990
DATE COMPLETED: May 31, 1990
DATE LOGGED: May 31, 1990

COLLAR SURVEY: NO
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: Frontier
CASING: Pulled
CORE STORAGE: Sauer Camp

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
72.20	-	-51° 0'	ACID	OK		-	-	-	-	-	
127.10	-	-51° 0'	ACID	OK		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 27.40	«Csg»	Mixture of chloritized granddiorite, mafics, quartz, limonitic mud and argillite.				Casing was pulled once and then reset.
27.40 TO 32.40	«Arg & Flt Bx»	Black. Fine. Argillites are highly rubbled in general due to fault action. Argillite contains 5% qtz/dol stringers which are oriented preferentailly parallel to foliation 28.8 - 29.2: Gravel sized fragments of qtz and arg.	70	Argillite is weakly graphitic; patchy weak silisification.	<1% dissem. py.	
32.40 TO 43.50	«Dol Seds/Flt Bx»	Gray. Fine. Original rock textures destroyed. Original rock type appears to have been sediments. Interval is strongly fault brecc. and altered to gouge. Doloite nodules appear to originate from faulted dol veins. 1% white qyz (50%) dol (50%) veining. 60% of the interval shows strong signs of faulting		Core is highly bleached with weak patchy dolomitization throughout with intense dol patches/lenses.	5 - 10% py - fine to coarse grained coarse dissem. to semi mesh text. Minor sp. gn, assoc. with qtz/dol veining. {37.8 - 38.5} «20% py» cubic.	Core recovery between 38.4 - 41.4 m. is 60% most of the loss occurs in a gouge zone at 41.4 m. Dol nodules may be due to an older stage of faulting.
43.50 TO 48.60	«Sil Arg/Silt»	Black. Fine. Massive, fine grained, 3% white qtz veining, core is moderately rubbled - weak faulting.		Minor graphite. Patchy weak to moderate silicification.	2% dissem py throughout 10% - semi-massive coarse py assoc. with qtz veining; minor sp present. - sp associated with veins - locally 3% sp.	43.5 - 44.5: 70% core recovery - loss occurs at upper contact.
48.60 TO 51.40	«Qz/Py/Ser Met Frg?»	Black. Fine to coarse. The interval varies from a massive valned argillite to a clastic unit. Clasts include argillite, minor pyrite, and qtz/chert (?) Clasts may be flattened with long axis parallel to foliation which is at qtz clasts are more rounded matrix is pyrite and grey sericite, arg. Clast composition: 20% arg, 5% py?, 75% qtz/dol. The most intense pyrite mineralization occurs with qtz veining. Weak fault brecciation.	70 90	Interval is moderately silicified and sericitionally altered - gray sericite occurs in argillite and with pyrite, and gives core some of its foliation.	5 - 30% py - fine to coarse grained. fine dissem/bands/clasts/mesh textures possible very fine grained sphalerite present - looks like a brown sericite.	
51.40 TO 63.10	«Dol Arg/Maf? Trans»	Gray. Fine. 85% fine grained black argillites veined by up to 15% qtz/dol veins; vein orientation is Vein orientation appears to parallel bedding, locally contorted 15% MAF - completely altered - may be mafic seds. intermittant fault bx/gouge notably at {51.9 - 52.3}	80	Pervasive dolomitic alteration and qtz/dol veining; minor grey sericite alt'n fuchsite alt'n assoc. with altered mafics. {52.3 - 52.5} «Int. sil» minor talc.	1 - 5% py as dissem. and stringers.	Primarily argillic material interbedded with minor seds or mafic volcanicistics?

MINNOVA INC.
DRILL HOLE RECORD

HOLE NUMBER: RG323 DATE: 22-June-1990

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		«Flt gou» 56.8 - 56.9 59.8 - 60.1 {54.7 - 56.1} «qtz vn» white, bull not continuous throughout interval.				
63.10 TO 70.20	«Dol/Sil/Ser Trans?»	Yellow gray. Fine. Majority of interval is an intensely altered transition zone between arg. and mafics? 3% beds of black arg oriented at Fault/cleavage foliation at 66.1 m. 20% qtz (60%) dol (40%) veins/stringers. 77% alt mafic volcanics/volcaniclastics? {64.1 - 64.25} «Flt gou» immediately adjacent to gouge is a 10 cm. qtz vn - pyritized. 69.0 - 69.3: White qtz vn, unmineralized.	85 40	Intense yellow sericitic alt'n of mafics. Weak to mod. dol alt'n silicification occurs primarily as veining.	4% coarse grained dissem. py. {64.25 - 64.35} «15% py, 1% gn» py occurs as coarse crystal agglom in mineralized bands with interstial gn.	
70.20 TO 72.60	«Ser Arg»	Yellow black. Fine. Argillite unit with sericitic alt'n along bedding planes. Bedding at 5% white qtz/dol veining/stringers. {70.4 - 70.6} «flt gou»	75	Yellow sericite alt'n along bedding.	4% med. grained dissem. py.	
72.60 TO 83.80	«Dol Seds?»	Gray. Fine. Original textures destroyed; nondescript appearance. 10% white qyz/dol veining/patches.		Pervasive intense dolomitic alteration moderate gray to brown sericite; minor fuchsite and chlorite.	{72.6 - 83.8} «10% py, 2% bn» Py content ranges 5 - 15% bn include sp, gn, cp in order of decreasing amounts. Bn are generally assoc. with veining and are scattered evenly throughout interval.	Alt'n is the primary characteristic of the interval protolith may have been sediments, volcaniclastics ashy tuff etc.
83.80 TO 106.60	«Dol/Chl Maf»	Grey Green. Fine to med. 10% white qtz (20%) dol (80%) veining. Some folding of veins; original textures destroyed by alteration towards base of interval; some clastic textures present gradational contact.		Pervasive mod to intense dolomite alt - decreases downhole. Pervasive chloritic alt'n of rock interstial to zones of dolomitization gives rock mottled appearance. Brown Sericite (after chlorite?) locally abundant.	{83.8 - 106.6} «min sp, gn, cp» +/- tr chalcocite assoc. with veins and stringers. In larger veins mineralization occurs as selvage - where bn occur they are fine to med grained coarsely dissem. 2 - 5% py.	
106.60 TO 175.40	«KFLT»	Green. Fine. 5% qtz/dol vn. 40% lapilli clasts to 4 cm. Clasts are paler in color than matrix; clasts exhibit some flattening subperpendicular to C.A. Matrix is generally aphanitic locally feldspathic.		Strong chloritic alter. local weak dolomite +/- sericite alt'n.	1 - 2% py.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		- crystal ash tuff?				
		END OF HOLE				

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
24454	33.00	34.50	1.50	.003	.01	.01	1.2	.01			31	73	40				37			1	1.2	3	
24455	34.50	36.00	1.50	.007	.02	.01	1.2	.02			65	177	26				73			2	1.2	17	
24456	36.00	37.50	1.50	.002	.01	.01	1.0	.06			23	118	22				250			1	1.0	58	
24457	37.50	39.00	1.50	.008	.03	.01	3.8	.01			79	338	46				85			23	3.8	2	
24458	39.00	42.00	3.00	.034	.04	.03	17.0	.04			335	443	340				75			190	17.0	36	
24459	42.00	43.50	1.50	.002	.01	.01	1.1	.01			24	62	35				57			9	1.1	6	
24460	43.50	45.20	1.70	.002	.01	.01	0.5	.02			19	30	73				200			2	0.5	18	
24461	45.20	46.75	1.55	.041	.14	.05	13.4	.04			410	1440	480				300			228	13.4	44	
24462	46.75	48.60	1.85	.004	.06	.06	2.8	.02			37	590	560				225			18	2.8	20	
24463	48.60	49.90	1.30	.007	.18	.05	4.0	.08			65	1780	450				550			62	4.0	84	
24464	49.90	51.40	1.50	.005	.12	.01	1.3	.06			52	1210	140				375			5	1.3	62	
24465	51.40	53.90	2.50	.002	.02	.02	1.2	.13			20	182	155				425			1	1.2	133	
24466	53.10	54.50	1.40	.002	.01	.01	1.2	.10			17	125	74				325			1	1.2	96	
24467	54.50	56.10	1.60	.001	.01	.01	0.9	.13			12	81	52				225			1	0.9	132	
24468	63.10	64.60	1.50	.005	.13	.16	1.9	.01			48	1300	1560				325			2	1.9	55	
24469	64.60	66.10	1.50	.007	.01	.01	3.0	.01			66	57	34				175			4	3.0	44	
24470	66.10	67.60	1.50	.015	.01	.01	1.2	.01			48	27	23				300			6	1.2	22	
24471	67.60	69.10	1.50	.003	.01	.01	0.8	.01			34	32	35				225			2	0.8	21	
24472	69.10	70.20	1.10	.005	.02	.01	0.8	.01			45	33	23				250			1	0.8	19	
24473	72.60	74.10	1.50	.004	.03	.04	7.0	.01			40	315	420				300			1	2.0	39	
24474	74.10	75.60	1.50	.017	.36	.40	10.0	.05			171	3640	4000				400			15	10.0	49	
24475	75.60	77.10	1.50	.020	.07	.10	3.0	.01			204	650	1020				250			1	3.0	12	
24476	77.10	78.60	1.50	.012	.06	.11	2.9	.02			123	595	1070				225			14	2.9	20	
24477	78.60	80.10	1.50	.003	.02	.02	1.2	.01			33	208	196				107			1	1.2	6	
24478	80.10	81.60	1.50	.011	.02	.04	1.4	.02			110	220	380				275			1	1.4	18	
24479	81.60	82.00	0.40	.072	.30	.30	5.4	.06			720	3000	3000				275			40	5.4	62	
24480	82.40	83.80	1.60	.062	.41	.35	4.9	.02			620	4100	3500				325			1	4.9	20	
24481	83.80	85.30	1.50	.015	.07	.02	1.4	.01			149	690	210				300			1	1.4	12	
24484	85.40	87.00	1.60	.007	.16	.05	1.4	.01			65	155	500				325			1	1.4	4	
24482	89.50	90.50	1.00	.035	.24	.09	2.9	.02			352	2370	940				350			1	2.9	17	
24485	93.90	95.40	1.50	.024	.01	.01	4.4	.01			243	142	108				375			4	4.4	2	
24486	99.60	101.10	1.50	.015	.03	.01	1.8	.01			146	302	148				83			1	1.8	3	
24487	103.60	105.10	1.50	.006	.01	.01	1.2	.01			55	143	37				300			1	1.2	2	
24488	105.10	106.60	1.50	.006	.03	.09	2.0	.01			64	287	890				825			1	2.0	1	

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
24483	96.60	99.60	3.00	43.28	10.89	10.35	7.67	.66	.20	7.44	.28	1.00			157	217			5	67	2.2	109	.19		1.86	83.84	183	3
24489	139.30	142.30	3.00	42.00	12.66	6.27	11.35	.19	.10	10.54	.20	1.24			82	197			5	33	1.3	20	.26		1.09	85.91	84	3

MINNOVA INC.

HOLE NUMBER: RG324 — DRILL HOLE RECORD — IMPERIAL UNITS: — METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: San Horizon

PLOTTING COORDS GRID:
NORTH:
EAST:
ELEV:

ALTERNATE COORDS GRID: Estimated
NORTH: 10+62N
EAST: 111+95W
ELEV: 1035.00

COLLAR DIP: -50° 0' 0"
LENGTH OF THE HOLE: 212.40m
START DEPTH: 0.00m
FINAL DEPTH: 212.40m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: May 31, 1990
DATE COMPLETED: June 3, 1990
DATE LOGGED: June 3, 1990

COLLAR SURVEY: NO
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: Frontier
CASING: Pulled
CORE STORAGE: Samex Camp

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
93.60	-	-51° 0'	ACID	OK		-	-	-	-	-	
130.40	-	-51° 0'	ACID	OK		-	-	-	-	-	
182.00	-	-52° 0'	ACID	OK		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 73.10	«Csg»					
73.10 TO 93.60	«Dol Maf»	Gray. Fine. F.g. nondescript unit. Locally appears to be feldspathic. - possible a crystal tuff. Rock is calcareous. 5% white qyz (40%) dol (60%) veining/patches. Veins tend to be oriented at a low angle to C.A. {78.2 - 81.4} «int. flt gou/bx» 40% recovery.		Pervasive moderate dol alt'n increases to intense in veinity of qdv's. Increasing brown +/- yellow sericite downhole local minor talc +/- fuchsite.	2% fine to coarse grained py - minor zones of semimassive py. {82.5 - 93.6} «<1% bm» sp, gn, cp are assoc. with veining and intense dol; f - c.g., dissem. ratio of sp, gn, cp is 10:20:1 py content increases where bm occur.	73.1 - 78.2: Core highly rabbled - probable cause is adjacent fault zone.
93.60 TO 95.40	«Arg/Maf Tr an Zone»	Black white gray. Fine. Laminated bands consist of black chloritic mafics +/- or arg, yellowish sericitized mafics and white/gray qtz dol stringers/veins/lens. 15% qtz/dol veins; veins show signs of offset /brecc. 5% arg. 80% alt. Volcaniclastic foliation at	40 50	Moderate yellow sericite and chlorite alteration of mafic component. Locally talc developed.	1 - 5% med to coarse grained py.	
95.40 TO 113.40	«Arg/Silt F lt Zone»	Black gray. Fine. Finely laminated beds of arg and silt with minor wcke. Some beds show folding, offset and locally strong contortions. Some fold noses (minor) present. Changes from highly contorted bedding to consistent planar bedding are rapid. 10% white/gray qtz/dol veining, occurs predominantly from 95.4 - 97.9 m. Interval contains patchy weak gou/brx. Intense fault zones at {99.5 - 101.5} «Flt bx» 70% recovery. {104.7 - 105.8} «Flt bx/gou» {110.4 - 110.6} «Flt gou» Minor patches of altered mafics? 106.3 - 107.1: White qtz (98%) dol (2%) vn, massive nonmineralization.		Graphite alt'n of arg near fault zones.	1/2% dissem. py, except from 95.4 to 11 3.4 m, 2% py.	Mafic? patches possibly introduced by faulting.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
113.40 TO 119.10	«Qtz Vn Flt Bx»	White Black. Fine to med. 80% of interval is white, bull qtz with minor dol. Vn is rubbled. 20% of interval is arg, which is largely alt. to gouge vn is fractured, vn oriented at low angle to C.A.			Local Minor py.	80% recovery; loss appears to have occurred in both qtz and arg. zones.
119.10 TO 127.60	«Arg/Silt»	Black gray. Fine. 10% white bull qtz veins to 50 cm. and irregular patches. Black arg laminated by gray silt. Bedding locally contorted but general sense of bedding is at {126.8 - 127.6} «qtz vn»	65		Minor py.	
127.60 TO 131.70	«Py Het Frg»	Gray. Fine to med. Interval is composite of py, sericite and arg. Clasts and matrix top contact is with qdv. 3% white qtz/dol occurs as veins and clasts 5% flattened clasts of argillite and thin wispy pyritic clasts parallelling the local foliation Sericite foliation at increasing amount of flt gou/brx downhole.	35 55	Gray sericite is pervasive throughout unit; derived from sediments.	py content ranges 15 - 40%, fine to med grained; occurs as dissem. trace sp.	
131.70 TO 134.30	«Flt Gou/Bx»	Gray. Intense fault activity destroys original rock textures. 5% white qtz/dol clasts present. Black graphite material present - after argillite minor green, chlorite/sericite - after mafics?		Clay alteration.	Minor dissem. py.	Possibly a ARG/MAF TRAN ZONE and HET FRAG ZONE in part - overprinting the contact.
134.30 TO 136.80	«Arg/Maf Tran Zone»	Mottled Gray, black and white. Fine to med. A melange of argillite fragments, sericite/chlorite wisps; qtz/dol fragments/clasts/stringers sericite foliation at argillite component decreases downhole in fault contact with lower unit.	60	Well developed v.f.g. sericite/chlorite patchy mod silicification. Local intense yellow/brown sericite increasing dol alt downhole, washing out textures.	1 - 2% c.g. py.	Can be considered a non pyritiferous Het frag.
136.80 TO 140.90	«Ser Seds?»	Gray. Fine. Nondescript massive looking alt'n has destroyed textures. 1% qtz/dol nodules - vein remnants? Sericite foliation non calcareous. {136.8 - 137.2} «flt.gou/bx»	60	Pervasive, intense v.f.g. gray sericite alt.	<5% v.f.g. py, dissem. 10% locally.	Not reactive with super juice.

127-133

HOLE NUMBER: RG324

MINNOVA INC.
DRILL HOLE RECORD

DATE: 22-June-1990

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
140.90 TO 146.20	«Arg»	Gray, black. Fine to med. Argillite has been variably altered and silicified 141.1 - 143.7: 50% massive and silicified arg. interspersed with altered mafics. (ser, dol) and locally a finely laminated arg/mafic. Foliation at 141.5 m. {143.8 - 145} «Flt bx/gou» bx clasts are arg/dol and pyritiferous qtz/dol. 144.5 - 145: Arg with qtz/dol stringers which show some warp and breakage. 145 - 145.7: Black arg with 25% white/gray qtz/dol clasts; clasts are flattened parallel to foliation. Foliation likely due to fault action Foliation is at Core is blocky. 145.7 - 145.95: Fine to med grained tuff?/ epiclastic? feldspathic crystals present chloritized. 145.95 - 146.2: Finely laminated arg and py. Arg is locally bleached; some flatteded arg clasts/wisps fault gouge contacts.	80 90	Patchy intense silicification, local mod to intense yellow/gray sericite alt'n clay alt'n in fault zones.	141.1 - 143.7: 1 - 5% dissem. py. {143.7 - 144.5} «10% py» overall in some clasts py is seminassive. 144.5 - 145: 5 - 10% f.g. stringers/ bands. 145 - 145.7: 3% dissem py. 145.95 - 146.2: Possible Met frag?	
146.20 TO 148.60	«Ser/Py Sed s?»	Gray. Fine. 2% white qtz/dol nodules - remnants of veins? alt'n destroys original textures, non descript massive, non calcareous lower contact is faulted - gouge and brx. - upper contact appears to be gradational.		Pervasive v.f.g. gray sericite alt'n	10% fine to med grained py dissem.	
148.60 TO 151.05	«Dol Maf Flt Bx»	Gray Green. Fine. Majority of interval has been fault brecciated locally gouge is well developed. 10% white qtz +/- dol veining. Veins can be massive or fractured and open. Original rock textures destroyed by alteration and faulting.		Pervasive weak to moderate dolomite alt'n in areas that have not been sericitized (yellow, brown) or chloritized.	5% med grained py; semi massive py assoc. with some veins. Minor gn, sp, also assoc. with veins.	
151.05 TO 155.40	«Arg/Flt Bx»	Black, white. Fine. Host rock is argillite which contains 20% white to gray qtz +/- dol veins/stringers. The interval 151.5 - 152.2 m. contains brecciated qtz clasts in a healed argillite matrix. 10% of interval consists of altered mafic volcaniclastic material which contains spotty qtz/dol the entire unit is strongly fault brecc.		Graphitic developed locally; weak sericite or chlorite alt'n of mafics.	<1% py.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
155.40 TO 162.80	«Crystal Tuff?»	Pale green. Fine to med. Core is blocky with local gouge developed. Fine grained chloritic matrix supports. 25% pale, hazy altered feldspar? crystal and growths. Minor white qtz patches.		Chlorite alt'n well developed, brown sericite after chlorite present.	2% dissem. py.	Possibly an altered sediment.
162.80 TO 171.40	«Arg/Qtz Bx»	Black, white. Fine. Unit consists of fine grained brown to black matrix which hosts clasts of: 1. White qyz +/- dol. 2. Black arg. 3. Black arg & qtz. the latter clast type indicates rotation of the fragments. Locally rock has not been completed brecciated - in these areas qtz veins exhibit open and closed folds. foliation at 169 m. is 5% altered mafic interbeds. {169 - 171.4} strong «flt bx» or core.	70	Local weak graphite.	1% dissem. py.	169.7 - 171: 85% core recovery.
171.40 TO 182.60	«Maf/Flt bx»	Green. Fine. Aphanitic matrix hosts 15% qtz/dol vns. Veins are apparently of two ages. 1. Early veining oriented subperpendicular to C.A. These veins exhibit folding and locally are totally torn apart into rounded nodules. These veins are narrow and numerous. 2. Late stage massive white qtz veins. Veins oriental parallel to C.A. These veins have minor amounts of associate base metals. The interval contains numerous zones of fault bx.		Local zones of intense silicification up to 20 cm. wide make up 10% interval mafics are intensely chloritized. Minor amounts of cherty green qtz silicification.	2% dissem. py locally content is up to 20% and has a mesh-like texture minor gn, sp, cp assoc. with late stage vns. {174.6 - 176} «20% py»	
182.60 TO 212.40	«MFLT»	Green. Fine. Typical calcareous mafic lapilli tuff clasts to 4 cm. tend to be elongated perpendicular to C.C. Clasts are paler in colour that the matrix. Up to 10% white qts (5%) (95%) veining, non-magnetic. 198.2 - 198.9: Vein brecciating the country rock and possibly some pyrite. END OF HOLE		Core is bleached towards top of interval and becomes less so with depth increasing chlorite alt'n with depth clasts are more altered (ser, carbonate) than the matrix.	1% py; locally to 5%. {198.2 - 198.9} «20% py» fine to coarse grained in dissem. and seminassive mesh textures.	

HOLE NUMBER: RG324 ASSAY SHEET DATE: 22-June-1990

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
24491	81.40	83.00	1.60	.020	.10	.14	2.5	.03			203	990	1387				108	108		1	2.5	108	
24492	83.00	84.60	1.60	.009	.08	.10	2.4	.05			87	837	1004				216	90		1	2.4	45	
24493	84.60	86.10	1.50	.003	.03	.04	1.7	.07			33	374	443				177	103		1	1.7	68	
24494	86.50	87.60	1.50	.013	.26	.12	2.3	.04			131	2594	1208				300	124		3	2.3	40	
24495	87.60	89.10	1.50	.007	.04	.05	1.7	.04			68	366	492				237	131		1	1.7	37	
24496	89.10	90.60	1.50	.009	.04	.10	1.9	.04			85	355	959				296	181		2	1.9	40	
24497	90.60	92.10	1.50	.004	.06	.04	1.4	.03			40	602	360				341	140		1	1.4	25	
24498	92.10	93.60	1.50	.004	.01	.01	1.3	.01			41	87	31				219	121		1	1.3	4	
24499	93.60	95.40	1.80	.005	.01	.03	1.0	.02			48	53	263				159	122		1	1.0	22	
24500	95.40	96.90	1.50	.003	.01	.01	1.0	.02			33	73	53				82	72		1	1.0	19	
24501	96.90	97.90	1.00	.006	.01	.01	0.4	.01			60	111	31				114	54		1	0.4	4	
24507	106.30	107.10	0.80	.004	.02	.01	3.0	.01			43	156	24				47	43		1	0.3	1	
24508	113.70	115.40	1.70	.002	.01	.01	1.0	.01			21	35	15				71	58		1	0.1	2	
24509	115.40	117.80	2.50	.005	.01	.01	0.2	.01			54	43	17				180	68		1	0.2	2	
24503	126.10	127.60	1.50	.007	.05	.02	0.7	.01			68	502	223				158	84		1	0.7	10	
24504	127.60	129.00	1.40	.037	.05	.02	7.1	.37			370	463	171				425	85		53	7.1	368	
24505	139.00	130.50	1.50	.008	.01	.01	3.0	.31			77	125	109				318	94		10	3.0	305	
24506	130.50	131.70	1.20	.010	.04	.01	3.8	.37			103	419	102				431	128		16	3.8	366	
24510	131.70	133.20	1.50	.006	.03	.02	2.5	.13			60	276	191				246	118		6	2.5	126	
24511	133.20	134.30	1.10	.006	.02	.03	2.4	.04			62	163	315				177	61		4	2.4	40	
24512	134.30	135.50	1.20	.012	.05	.03	4.5	.01			120	472	279				172	69		23	4.5	8	
24513	135.50	136.80	1.30	.020	.11	.09	7.4	.54			200	1142	887				173	62		30	7.4	535	
24514	136.80	138.20	1.40	.006	.01	.01	1.4	.08			56	49	105				151	117		6	1.4	78	
24515	138.10	139.70	1.50	.006	.01	.01	1.1	.04			60	46	84				101	130		2	1.1	42	
24516	139.70	140.90	1.20	.005	.01	.01	0.8	.04			54	84	79				142	110		8	0.8	41	
24517	140.90	142.30	1.40	.003	.01	.01	0.4	.04			34	75	88				231	92		2	0.4	39	
24518	142.30	143.70	1.40	.044	.03	.03	6.2	.15			435	801	253				254	65		22	6.2	146	
24519	143.70	145.00	1.30	.005	.03	.02	1.3	.05			48	295	223				290	109		1	1.3	45	
24520	148.10	146.20	1.10	.005	.07	.01	1.3	.01			48	168	93				115	63		3	1.3	14	
24521	146.20	147.50	1.30	.009	.01	.01	1.4	.02			87	49	89				132	91		8	1.4	22	
24522	147.50	148.60	1.10	.009	.01	.01	0.5	.02			85	75	51				100	94		3	0.5	24	
24523	148.60	150.10	1.50	.004	.04	.04	1.6	.08			38	383	368				557	54		16	1.6	80	
24524	150.10	151.05	0.95	.003	.02	.01	0.7	.02			31	165	82				266	45		1	0.7	18	
24525	164.40	166.90	2.10	.004	.01	.01	0.7	.01			40	149	141				66	62		1	0.7	2	
24526	166.90	168.40	1.50	.009	.03	.02	1.1	.01			86	272	225				84	56		1	1.1	1	
24527	168.40	169.90	1.50	.005	.03	.02	1.1	.01			49	323	194				96	51		1	1.1	1	
24529	169.90	171.40	1.50	.002	.03	.02	1.1	.01			22	265	225				58	43		1	1.1	2	
24530	171.40	172.50	1.10	.005	.12	.03	2.0	.06			45	1203	313				153	133		2	2.0	62	
24531	172.50	174.00	1.50	.001	.02	.01	0.9	.01			12	184	7				52	37		1	0.9	5	
24532	174.00	175.50	1.50	.010	.17	.04	1.6	.02			95	1715	429				156	37		20	1.6	24	

Sample	From (m)	To (m)	Length (m)	CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB		
24533	175.50	177.00	1.50	.009	.30	.19	3.5	.03			86	2954	1863				241	49		2	3.5	28		
24534	177.00	178.50	1.50	.004	.07	.04	1.9	.01			37	669	443				107	49		1	1.9	2		
24535	178.50	180.00	1.50	.002	.02	.02	1.5	.01			24	227	185				110	34		1	1.5	6		
24536	180.00	181.50	1.50	.002	.06	.06	2.0	.01			20	552	570				149	31		1	2.0	9		
24537	181.50	182.60	1.10	.009	.02	.06	1.8	.05			91	229	579				421	106		1	1.8	52		
24538	198.20	198.90	0.70	.009	.02	.04	2.6	.10			91	203	374				690	14		6	2.6	104		

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
24490	73.10	76.50	3.40	44.07	12.511	6.21	10.23	.48	.28	9.37	.24	1.16			100	270			10	36	1.4	72	.28		1.68	86.53	85	1
24502	101.50	104.50	3.00	51.86	13.85	5.63	4.82	.42	2.39	5.90	.21	.98			40	101			5	123	1.1	82	.35		3.37	89.97	95	1
24528	157.50	160.50	3.00	43.96	10.28	9.06	8.81	.12	1.07	8.51	.34	1.06			58	162			5	46	1.5	137	.33		1.14	84.72	59	1
24539	200.30	203.30	3.00	37.46	14.59	5.65	15.29	1.02	.01	11.36	.30	1.74			46	178			5	10	1.5	21	.34		1.89	89.66	1	1

MINNOVA INC.
DRILL HOLE RECORD

HOLE NUMBER: RG325 | IMPERIAL UNITS: | METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: Sam Horizon(s)

PLOTTING COORDS GRID: est.
NORTH: 1150.00N
EAST: 11300.00W
ELEV: 1032.00

COLLAR GRID AZIMUTH: 180° 0' 0"

ALTERNATE COORDS GRID: ~~Estimated~~ Surveyed cds.:
NORTH: ~~1150N~~ 1152.74 N
EAST: ~~11300W~~ 11303.72 W
ELEV: ~~1032.00~~ 1025.52 el.

COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

COLLAR DIP: -75° 0' 0"
LENGTH OF THE HOLE: 313.00m
START DEPTH: 0.00m
FINAL DEPTH: 313.00m

DATE STARTED: June 4, 1990
DATE COMPLETED: May 8, 1990
DATE LOGGED: June 6, 1990

COLLAR SURVEY: NO
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: Frontier
CASING: Pulled
CORE STORAGE: Samex Camp

PURPOSE: Extension drilling on Sam horizons 100m, grid east of the "Creek Zone"

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
57.00	-	-74° 0'	ACID	OK		-	-	-	-	-	
111.00	-	-71° 0'	ACID	OK		-	-	-	-	-	
157.60	-	-67° 0'	ACID	OK		-	-	-	-	-	
212.40	-	-73° 0'	ACID		Erratic	-	-	-	-	-	
261.20	-	-68° 0'	ACID	OK		-	-	-	-	-	
288.60	-	-64° 0'	ACID	OK		-	-	-	-	-	
313.00	-	-62° 0'	ACID	OK		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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-	-	-	-	-		-	-	-	-	-	
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-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 42.60	«CSG»					
42.60 TO 121.40	«Maf Flt Zone»	Green; Maroon. Fine. Massive, no original clastic texture evident locally magnetic - magnetite. - Minor occurences; calcareous 5 - 10% white qtz (40%) carbonate (60%) veining. Carbonate is 3% Fe-poor calcite, 97% Fe-dolomite veins range from .5 mm. to 30 cm., locally stringers exhibit fine folding, veins are locally fractured/brecciated by faulting. Interval is weakly to intensely affeced by faulting throughout. 93.3 - 111.9: Pervasive generally strong fault zone bx country rock rotation of clasts sense of foliation of fault is at Much of the faulted material is relatively competent - some what healed. Core is moderately bleached. 114.6 - 118.4: 10-15% finely boudined qtz/dol veins	50	Pervasive chlorite alt'n, green clay gouge developed in strongly faulted intervals. Maroon colored mafics found near top of hole grade into and out of green mafics coloration may be due to presence of hematite. Minor white sericite and fuchsite associated with sheared vein margins. 109.5 - 110.5: Moderate yellow sericite alt'n assoc. with patchy qtz/dol vein.	<1% dissem py. 109.5 - 110.5: Med - coarse grained py. Coarse dissem, 4%.	Core is very blocky.
121.40 TO 134.80	«Ser Dol Maf»	Gray, yellow, green. Fine. Original textures destroyed 20% white qtz (15%) dol (85%) veining. Foliation at Pervasive weak shearing {131.2 - 134.8} «Flt bx, gou»	40 60	Moderate - intense yellow sericite alt'n patchy; associated with zones of strong veining +/or dolomitization 3% brown sericite after chlorite. Minor fuchsite assoc. with veins. Talc developed in shear zones. Country rock is weak to moderately dolomitized.	3 - 5% med grained coarsely dissem py. {134.3 - 134.6} «20% py» coarsely dissem, med-coarse grained in fractured qdv.	
134.80 TO 142.80	«Mflt»	Green. Fine. 65% chlaritically altered amfic tuff which contains 10% dol and ser altered clasts to 5 cm. Interval is sheared and faulted Foliation {134.8 - 135.6} «flt bx» 5% white qtz/dol veining gradational lower contact. {138.8 - 141.6} «flt bx» zone containing 1.6 m. of mafic; faulting brx some vein material	60	Pervasive chlorite alt'n. Patches of intense dolomitization - primarily between 139.3 m. and 140.9 m. Patchy mod. yellow sericite alt'n. Minor talc alt'n with dol. Minor brown sericite.	3% fine - med grained dissem py.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
142.80 TO 165.30	«Dol Maf»	Gray, green, white. Fine to Med. Original testures destroyed a few altered, rounded clasts present - may be either original texture or tectonic. Qtz/dol (30%/70%) veins commonly associated with bleached dolomitized core, veins are tight to fractured with open spaces. Base metal sulphides commonly associated with veins centimeters. Some veins contain brecciated wall rock. Localized shearing and fault bx. 163.9 - 165.3: Mottled qtz (15%) dol (85%) vn upper contact has been ground.		Mod to strong dolomitic alt'n and veining yellow sericite with local fuchsite. Mod well developed detween 144.3 m. - 147 m. and 161.9 - 163.8 m. patchy elsewhere. 150 - 152.6 Dominant alt'n is chloritic. Minore patches of massive v.f.g. green sericite.	Interval contains 2 - 10% fine to med. grained dine to coarsely dissem py. {152.3 - 163.9} «2 - 10% py» «<1% gn, sp, cp» combined bm. sx are fine to med. grained and very coarsely dissem. - primarly assoc. with veins/ intense dolomitization in order of decreasing abundance gn, sp, cp. Local occurrences can contain upwards of 3% bm sx. {163.6 - 163.71} «50% semi-masive py» {163.9 - 165.3} «3% gn, sp, cp in qdv»	
165.30 TO 174.80	«Maf Tuff?»	Green. Fine to med. Generally massive and fine grained matrix which supports small chlorite clots, chlorite clots tend to be elongate and give a foliation 1% white qtz/dol stringers having a prefered orientation of 60 degrees to C.A. 173.1 - 173.0: Fault brec/gauge interval of qtz/sericite/dolomite.	60	Prevasive strong chlorite alt'n. 165.3 - 165.85: Mod. yellow sericite and brown sericite alt'n, alt'n weakens downhole.	1% f.g. dissem py. 173.1 - 173.9: Minor gn. 174.7 - 174.8: 30% py.	The chlorite "clots" may be altered tuffaceous fragments.
174.80 TO 190.90	«Flt Zone/Maf Tuff?»	Green. Fine to Coarse. The country rock was similar to that immediately above - an alt. mafic tuff? but with substantial more dark chloritic, elongated clots. This rock has been strongly brecciated by fault activity At the top of the interval the fault blocks are large but they decrease in size with depth to 187.4m. and the foliation given by the chlorite clearly show rotation. At 187.4 m. there is a 7 cm. wide qtz/dol. Below the vein there does not appear to be any brecciation although ductile shearing is probable - core is competent but qtz/dol stringers indicate (drag) folding. - gradational basal contact.		Chlorite alt'n pervasive.	<1% py.	
190.90 TO 196.90	«Ser/Dol Maf»	Yellow, gray. Fine. Matrix is fine grained contains 20% clasts - of altered mafics - 20% white qtz (30%) dol (70%) patches/stringers/veins. Some fault brecciation and brittle offsets, minor folding of qtz stringers. - gradational contact with lower unit.		Pervasive weak dolimite alteration bleaches core, patchy moderate yellow sericite alt'n.	Trace sp, gn, 3 - 5% py - fine to coarse dissem.	Altered mafic clasts may be due to fault action rather than original texture.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
196.90 TO 200.20	«Het Frag?»	Gray, buff. Fine. Fine grained sericite matrix contains subrounded to subangular clasts of qtz (27%) dol (70%) cherty qtz. (2%) , minor pyrite clasts and chloritic, sericitic and dolomite altered mafics - clasts make up to 60% of the core, 3% white qtz/carb veining. basal contact is gradational.		Brown sericite mod well developed interstitial to clasts.	Minor amounts of fine grained gn, sp associated with veins. 3 - 5% py.	Clasts texture may be due to tectonism rather than original textures.
200.20 TO 211.90	«Dol Mflt?»	Gray. Fine. 5% clastic material in a fine grained altered mafic matrix, 15% qtz/dol veining/patches which locally exhibit offset along fractures/shears. 203.7 - 205.3: Local zones of fault bx/gouge Basel contact at	50	Pervasive mod. dolomitization, localized brown sericite developed locally; minor massive green sericite, clasts? are weakly sericite altered.	Minor coarsely dissem gn, sp, cp assoc. with veins. 3 - 5% py in dissem and bands.	Core is blocky.
211.90 TO 215.50	«Arg Maf Trans Zone»	Black yellow. Fine to med. 80% of interval is black argillite which is silicified and exhibits fine clastic textures - clasts are argillite, qtz/dol. The clasts textured arg is located between 211.9 to 213.4 m. Mafic textures are completely destroyed. Contacts between arg and mafics are sheared and gouged.		15% qtz/dol veining of argillite and patchy weak silicification. Mafics are extremely altered to yellow sericite.	Minor gn, sp, cp assoc. with veins coarsely dissem, <1% comb. bm sx. 2 - 3% dissem py and primarily within arg.	211.9 - 213.4: possible altered Frg.
215.50 TO 222.50	«Ser Maf»	Yellow gray. Fine. Original textures destroyed. 10% white qtz veining, weakly calcareous, some folding present.		Intense alteration to yellow sericite.	Trace sphalerite associated with veins 2% coarsely dissem pyrite.	Litho samples to test for barite.
222.50 TO 234.20	«Arg/Silt/Wcke»	Black , gray. fine to med. 30% wcke interbedded with argillite/siltstone bedding in general at Cleavage at and offset along fractures 226.2 - 227.7: Zone of fold noses - fold hinge. Abundant faulting/offset of beds gives core a wispy clastic texture locally. 222.5 - 225.4: Faulted brecciated interval, 10% white qtz veining.	 45 30 80	Minor graphite wcke are weakly calcareous.	<1% pyrite. 222.5 - 225.4 «10% py»	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
234.20 TO 237.40	«Ser Seds»	Gray, green. Fine. Original textures destroyed by alteration, seds are foliated. Foliation at given sericite; 1% qtz/dol veining. 235.2 - 235.9; clasts of qtz/dol in sericite matrix. Clastic texture due to tectonism. 225.9 - 237.4; 5% qtz/dol veining, local graphitic gouge, possible mafic component.	50	Intense alt. to green/gray sericite. 235.9 - 237.4; Sericite alt'n decreases downhole with increase in qtz/dol veining and alt'n.	2% pyrite in disseminations and stringers.	
237.40 TO 257.65	«Arg/Silt F lt Br»	Black, gray, white. Fine grained finely laminated sediments, 15% white qtz (80%) dol (20%) veins/stringers. Tectonic activity frequently stretches, folds, boudins and brecciates the veins while leaving the seds appearing unaltered and competent; foliation if breccia fragment is at 241.5 m. bedding at 251 m. is and brecciation is parallel to bedding. Intermittant brittle fault breccia and fault gouge.	55 90	Graphite shears minor local moderate silicification.	Minor sp, gn, in some qtz veins. 1 - 3% dissem. py.	
257.65 TO 287.70	«Arg/Maf Tr ans Zone»	Black, gray, white. Fine to med. Large intervals of arg/sed and mafics (epiclastic seds?) as indicate below: 257.65 - 262.6: Interval is 75% altered mafics/seds. 15% black arg, 10% white qtz/dol veining, mafics/seds are calcareous; qtz (80%) dol (20%) vein material occurs as a 35 cm. vein and as stringers, patches and clasts in a fault bx. Some stringers are folded weak fault bx/gouge between 258.7-261.5 262.6 - 263.7: Black arg, impregnated by gray banded and folded qtz arg and early qtz veins are cut by discontinuous randomly oriented qtz/dol stringers. 263.7 - 268: Fine grained epiclastic seds? with minor arg. interbedded laminae. Bedding at Between 266.9 - 288.9 m. core contains 20% white qtz veining, veins are locally bx. 268 - 273.5: Predominantly arg and silt. 10% altered wcke/epiclastic - med grained. 20% white qtz veins/patches. 273.5 - 274.65: Minor white qtz/carb veining at top of interval altered mafics?	65	257.65 - 262: Dolomitic and sericitic alteration bleaches mafic seds. 262.2 - 263.7: Intense silicification. 263.7 - 268: Weak green to brown, fine grained sericite alt'n patchy weak to mod dol. alt'n, chloritic alt'n predominant downhole. Minor graphite 268 - 273.5: Patchy intense silicification of the countru rock - predominantly within the arg, some chloritic alt'n of wcke/epiclastics; local gray sericite within arg. 273.5 - 274.65: Intense dolomitization of country rock, brx in appearance with	257.65 - 262: 3 - 5% py in med. grained dissem. - concentrations higher in faulted areas. Minor coarsely dissem gn in veins. 262.2 - 263.7: 4% med. grained py in coarse dissem, patches and stringers. 263.7 - 268: 3% dissem py. Trace gn in qtz vn. {268 - 273.5} «<1% bn 7% py» Equal amounts of fine grained cp, gn, sp; coarsely dissem within the silicified argillites. 273.5 - 274.65: 5% coarsely dissem py 3% gn, Minor cp; f.g. occurs as	The mafics in this interval are similar (when weakly altered) to the underlying unit. Some of the silicified argillites are similar to what has been called black cherts in previous logs.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
				green to gray sericite and pyrite matrix.	selvage in a two cm wide qtz vn.	
		274.65 - 277.4: Altered mafics? foliation at 5% white/gray qtz veining.	45	274.65 - 277.4: Intense banded green/gray sericite and chlorite alt'n destroys original textures; patchy moderate gray to green silicification - cherty in appearance.	274.65 - 277.4: 7% med grained dissem py. Minor gn, cp, assoc. with veins.	
		277.4 - 281: Black arg comprises 95% of interval arg is flooded by qtz (90%). Fe dol (10%) stringers/veins stringers exhibit folding axial plane foliation at 5% interval is bleached and altered mafics?	65	277.4 - 281: Patchy mod/intense silicification particularly between 277.4 and 278.6 m.	277.4 - 281: Minor gn, cp assoc with qtz vns. 3% dissem py.	
		281 - 283.8: 90% altered mafics? interbedded with 10% black arg/silt; Sed content increased downhole mafics are calcareous bedding varies from	70	281 - 283.8: Weak yellow sericite/dol alt'n, patchy chlorite alt'n.	281 - 283.8: 2% diss py.	
		283.8 - 287.7: Black arg cut by 15% white qtz veins. Bedding generally at	90 70	283.8 - 287.7: Minor graphite.	283.8 - 287.7: 2% med to coarse grained diss py.	
287.70 TO 313.00	«Maf»	Green. Fine to med. Generally fine grained with local chlorite spots. Minor lapilli sezed clasts, 15% Fe calcite veining +/- qtz. Veins have no prefered orientation calcite veins start 294 in. 287.7 - 289.1: Contact white qtz veining.		Perviasive chlorite alt'n. locally weakly bleached due to sericite alt'n. Weak sericite/dol/alt'n from 287.7 to 290.9 m.	Minor gn, sp associated with calcite, <1% py.	
					{207.7 - 289.1} «<1/2% bm»	
		{290.4 - 290.0} Clastic interval, clasts are qtz/dol chl. mafic and py in a fine grained sericite, chlorite, pyrite matrix «HET FRG?»			{290.4 - 290.9} «10% py» diss.	290.4 - 290.0: Small interval of HET FRG?, textures may be tectonic rather than primary.
					{298.3 - 200.1} «1% bm» sp, qn, cp in order of decr. abund; occur with 2 small quartz veins.	
		END OF HOLE				

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
24542	109.50	110.50	1.00								64	35	25				72	33		1	0.8	24	
24543	121.40	123.00	1.60								90	37	32				286	120		2	1.4	86	
24544	128.80	132.00	3.20								56	459	55				182	58		2	1.3	63	
24545	132.00	133.40	1.40								63	57	32				131	71		1	1.5	39	
24546	133.40	134.80	1.40								79	46	38				235	69		1	1.5	61	
24548	136.20	137.60	1.40																				
24548	142.80	144.20	1.40	.042	.14	.09	1.8	.01			418	1407	856				218	54		1	1.8	12	
24549	144.20	145.50	1.30								61	60	25				353	62		1	0.5	5	
24550	145.50	147.00	1.50								87	82	36				271	44		1	0.8	10	
24551	147.00	148.40	1.40								75	158	53				286	47		1	1.5	40	
24552	148.40	149.60	1.20	.005	.02	.01	1.7	.03			48	153	69				210	52		1	1.7	30	
24553	149.60	151.00	1.40	.031	.35	.28	3.7	.05			312	3465	2789				301	26		2	3.7	45	
24554	151.00	152.30	1.30	.027	.14	.11	2.3	.04			271	1377	1102				333	20		1	2.3	41	
24555	152.30	153.50	1.20	.021	.10	.09	2.0	.04			208	1032	911				486	36		1	2.0	42	
24556	153.50	155.00	1.50	.019	.14	.08	1.6	.03			188	1428	802				560	76		1	1.6	26	
24557	155.00	156.40	1.40	.058	.14	.16	2.1	.04			579	1449	1585				687	47		6	2.1	42	
24558	156.40	157.60	1.20	.137	.14	.08	4.5	.27			1365	1412	826				1181	31		48	4.5	268	
24559	157.60	159.00	1.40	.029	.25	.09	2.0	.04			290	2520	864				542	26		7	2.0	42	
24560	159.00	160.40	1.40	.065	.43	.29	4.0	.06			653	4316	2884				331	27		11	4.0	60	
24561	160.40	161.90	1.50	.008	.09	.08	2.2	.03			81	929	761				440	35		1	2.2	32	
24562	161.90	162.90	1.00	.007	.01	.01	0.9	.02			67	72	118				445	50		1	0.9	18	
24563	162.90	163.90	1.00								120	188	321				581	46		8	1.8	62	
24564	163.90	165.30	1.40	.051	.33	.30	5.2	.09			509	3326	3030				307	23		27	5.2	86	
24565	165.30	166.70	1.40								82	113	112				288	50		1	0.8	16	
24566	173.10	173.90	0.80								82	114	196				343	71		1	1.1	40	
24587	191.40	192.90	1.50								48	200	152				158	141		1	1.1	5	
24567	192.90	195.40	2.50	.016	.12	.11	1.6	.04			158	1173	1068				301	94		1	1.6	42	
24568	195.40	196.90	1.50								101	363	242				279	98		1	1.0	10	
24569	196.90	198.40	1.50								173	157	145				218	73		1	1.0	14	
24570	198.40	199.90	1.50								120	117	108				306	76		1	1.0	18	
24571	199.90	201.40	1.50								89	131	186				312	55		1	1.3	20	
24572	201.40	202.90	1.50								82	90	12				89	49		1	1.1	8	
24573	202.90	204.40	1.50								91	325	176				141	53		3	1.8	17	
24574	204.40	205.90	1.50								66	357	742				281	106		6	2.1	3	
24575	205.90	207.40	1.50								43	133	138				424	140		6	1.3	45	
24576	207.40	208.90	1.50								33	135	114				365	61		4	1.2	40	
24577	208.90	210.40	1.50	.009	.11	.06	2.1	.04			85	1117	557				318	341		7	2.1	41	
24578	210.40	211.90	1.50	.061	.23	.27	4.2	.06			605	2302	2733				368	147		11	4.2	60	
24579	211.90	213.40	1.50	.009	.07	.08	1.8	.03			94	658	779				165	385		4	1.8	25	
24580	213.40	215.20	1.80								60	82	69				131	163		3	0.6	5	

Sample	From (m)	To (m)	Length (m)	CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB		
24581	217.00	218.50	1.50								74	74	79				128	181		2	0.5	4		
24584	235.60	236.80	1.20	.013	.14	.06	3.2	.03			128	1353	553				174	347		9	3.2	32		
24585	236.80	238.20	1.40								57	1007	301				106	145		2	0.8	2		
24586	238.20	239.60	1.40	.050	.60	.29	13.6	.02			495	5986	2869				189	185		198	13.6	21		
24588	262.60	263.70	1.10								35	52	47				65	53		2	0.5	8		
24589	266.60	268.00	1.40								50	104	96				33	68		1	1.1	35		
24590	268.00	269.40	1.40								41	566	469				69	53		2	1.3	27		
24591	269.40	270.90	1.50								40	170	39				82	71		1	1.0	8		
24592	270.90	272.40	1.50								291	598	477				88	49		20	4.6	7		
24593	272.40	273.50	1.10								88	186	541				44	62		18	3.1	2		
24594	273.50	274.60	1.10								179	140	492				28	85		13	2.7	3		
24595	274.60	276.00	1.40								124	316	731				156	51		3	2.7	2		
24596	276.00	277.40	1.40								62	88	35				94	100		1	0.3	1		
24597	277.40	278.50	1.10								44	179	35				112	58		4	1.0	3		
24598	278.50	279.90	1.40								40	349	98				173	31		1	1.1	6		
24599	279.90	281.00	1.10	.037	.11	.11	4.9	.02			373	1069	925				190	25		23	4.9	15		
24600	281.00	282.50	1.50								72	104	13				195	40		2	1.4	1		
24602	287.70	289.10	1.40								55	129	505				31	117		1	1.1	6		
24603	289.10	290.40	1.30								61	653	466				123	12		1	1.8	14		
24604	290.40	290.90	0.50	.011	.20	.20	2.5	.02			112	2032	1339				77	12		1	2.5	22		
24605	290.90	292.70	1.80	.013	.08	.08	2.2	.03			126	814	588				100	12		2	2.2	32		
24606	298.05	299.55	1.50	.046	.44	.31	3.6	.02			462	4447	3055				15	37		4	3.6	16		

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
24540	54.90	57.90	3.00	45.48	15.03	9.31	7.63	1.84	2.55	13.05	.22	2.10			6	54			5	51	1.7	25	.44		1.00	98.75	1	2
24541	89.90	92.90	3.00	46.08	15.00	9.06	2.67	0.19	11.25	.20	1.61				90	71			10	74	2.0	11	.41		1.00	98.80	1	1
24547	135.80	138.80	3.00	44.96	13.54	11.39	12.05	1.78	0.67	11.70	.38	1.30			88	81			15	67	2.3	11	.40		1.00	99.21	89	2
24582	219.50	222.50	3.00	66.25	17.46	0.92	2.71	0.25	3.37	5.73	.15	0.79			19	71			20	116	1.1	37	.20		1.00	99.01	126	1
24584	225.50	228.50	3.00																									
24583	227.70	230.70	3.00	65.18	16.12	2.20	3.10	0.21	2.80	6.87	.07	1.06			56	100			10	120	0.9	33	.26		1.00	98.98	94	1
24601	283.80	286.90	3.10	67.99	11.69	2.37	6.60	0.01	1.73	6.57	.13	.72			46	102			5	79	0.8	22	.31		1.00	99.19	53	1
24607	306.90	309.90	3.00	47.11	15.40	11.47	8.14	3.56	0.66	9.51	.18	1.53			63	154			5	124	1.8	19	.39		1.00	98.98	1	1

HOLE NUMBER: RG326

Surveyed cds.

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: Sam Horizon

PLOTTING COORDS GRID:
NORTH: 1266.54N
EAST: 11393.87W
ELEV: 1022.37 el.

ALTERNATE COORDS GRID: Estimated
NORTH: 12+64N
EAST: 113+97W
ELEV: 1027.00

COLLAR DIP: -50° 0' 0"
LENGTH OF THE HOLE: 404.40m
START DEPTH: 0.00m
FINAL DEPTH: 404.40m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: June 9, 1990
DATE COMPLETED: June 16, 1990
DATE LOGGED: June 11, 1990

COLLAR SURVEY: NO
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: Frontier
CASING: Pulled
CORE STORAGE: Samex Camp

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
71.60	-	-50° 0'	ACID	OK		-	-	-	-	-	
118.90	-	0° 0'	ACID		BAD	-	-	-	-	-	
139.30	-	-49° 0'	ACID	OK		-	-	-	-	-	
188.10	-	-49° 0'	ACID	OK		-	-	-	-	-	
203.30	-	-49° 0'	ACID	OK		-	-	-	-	-	
238.00	-	0° 0'	ACID		BAD/BROKEN TUBE	-	-	-	-	-	
297.80	-	-47° 0'	ACID	OK		-	-	-	-	-	
328.30	-	-48° 0'	ACID	OK		-	-	-	-	-	
361.80	-	-46° 0'	ACID	OK		-	-	-	-	-	
383.10	-	-45° 0'	ACID	OK		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 51.80	«CSG»					
51.80 TO 55.00	«Maf/Arg Trans Zone»	Black, green. Fine med. 10% black argillite with siltstone laminae interbedded with mafic tuff? The tuff contains subrounded grains/clasts to a few mm with minor larger clasts. Local brx by alteration causes a coarser clastic appearance. Mafics are calcareous. Bedding contacts at Foliation with mafics Minor qtz stringers.	 70 70	Argillites are locally weakly silicified in vicinity of qtz stringers Mafic tuffs are altered to chlorite and green/brown sericite, weak dol.	1% py.	
55.00 TO 79.20	«Arg»	Black. Fine. Arg interbedded with silty laminae; Bedding locally contorted. General sense of bedding at 62.9 m. cleavage. Off setting bedding at Slaty cleavage along bedding. Local fault gou/bx develop 3% white qtz veins to 15 cm. 74 - 79.2: Faulting more intense. {78.8 - 79.2} «Flt gou contact»	 60 70 90	Weak to mod. silicification of arg in vicinity of qtz vn. Minor graphite developed in zones of faulting.	Minor py.	Core is blocky.
79.20 TO 93.70	«Ser/Dol Maf»	Yellow, green, gray. Fine. Rock is calcareous, original textures destroyed, patchy altered mafics in fine grained sericite matrix. Some clastic textures may be due to fault bx (healed).		Patchy (clasts?) of gray dol. altered mafics in a matrix yellow sericite/ chlorite yellow sericite is predominant at the top of the interval, weakening downhole and being replaced by chlorite.	Minor py.	Core is blocky.
93.70 TO 178.80	«Maf Fault Zone»	Green. Fine. 10 - 15% white qtz/dol (30/70%) veining aphantic matrix core is very blocky. Numerous intervals on intense fault brecciation gouge. Some of interval consists of tectonically bx mafic and vein in a healed chlorite matrix, giving a competent appearance rather than rubble. 137.3 - 139.7: 35% veining qtz (12%) dol (85%) siderite. (3%) in maroon colored, altered mafics veins are patchy. Interval is between two intensely fault gouged intervals. Sharp lower contact at		Intense chlorite alteration of mafics. 134.9 - 135.2: Weak to mod. yellow sericite alt'n between two veins. {140.1 - 141.5} mod. «yellow sericite» alt'n with fault bx/gou.	Minor py. 135.2 - 135.6: brx vn contains tr, cp, vn approx. 20 cm. wide.	There may be two stages of faulting. The earlier fault zones being somewhat healed and the later zones being rubbled and open. Local core loss: 127.7 - 129.2: 30% recovery. 135.6 - 136.8: 55% recovery.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		20 degrees. 147.7 - 164: Less faulting present.		 {158.8 - 162.1} «wk yel ser & dol» associated with veins and narrow gouge zones. 175.6 - 177.2: Weak patchy yellow sericite alt'n.		 Lower contact is gradational/ subjective.
178.80 TO 269.20	«MFLT/MAF TUFF»	Green. Mafic lapilli tuff: Fine grained chloritic matrix supports paler homogenous mafic clasts to 5 cm. At top of interval there is a strong flattening clasts foliation given by flattening varies between Flattening decreases downhole (seperate beds). Locally clasts are indistinct. Mafic tuff: fine grained chloritic matrix with white feldspathic? crystals. Minor lappili sized material contacts, gradational or replaced by veining. 85% MFLT, 15% MAF TUFF. 3 - 10% white qtz (30%) dol (70%) veins to 20 cm. Some folding and offset of veins. 197.2 - 198.3: Veining consists of 20% qtz, 80% Fe-poor to Fe-free calcite. From 236.7 m. much of the veining exhibit open space filling and bx textures. Vein incorporate altered wallrock fragments, some vuggy cavities with euhedra/quartz crystals. Vein composition 40% qtz, 1% calcite, 59% dol, lapilli clasts are less distinct and frequent. 151.6 - 152.4: Qtz/dol vein. {261.2 - 269.2} intermittant «fault zone» bx/gou dissrupt mafics, mafics are strongly chloritic.	 70 90	Moderate to intense pervasive chlorite alt'n. Local yellow sericite and/or dol alt'n and bleaching in vicinity of intense veining. 180.4 - 181.9: Wk yel sericite alt'n. 186.2 - 188.4: Weak yellow sericite alt'n. Some veins are surrounded by envelopes of weak sericite alt'n. 244.5 - 244.9: Qtz/carb vein with fuchsite selvage.	1% dissem py to 3% in vicinity of veins. {180.6 - 181.7} «10% py» fine to med. grained coarse dissem and patches.	
269.20 TO 271.10	«Qtz/dol vn /flt bx»	White, gray. Fine, 85% white to gray qtz (40%) dol (60%) vein material with 15% highly altered mafics. veining and mafics are fault bx and alt. to gouge locally.		Yellow sericite alt'n present in gouge. 2% talc present.	Minor fien grained gn, sp, coarsely dissem within veins. 2% dissem py.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
271.10 TO 273.95	«Qdv/ser/py alt maf»	Gray. Fine to med. Mafics are completely altered, 15% white patchy qtz dol veining. Minor fault bx.		Original rock has been replaced by and altered to a mixture of qtz/dol veining. Minor weak silicification and yellow sericite alt'n.	{271.1 - 272.5} «25% py» in fine grained, coarse dissem.	
273.95 TO 277.50	«Ser Alt Maf»	Buff. Fine. Generally fine grained mafic tuff with minor lapilli, 5% white qtz/dol veining/stringers. Weak fault bx/gou from 275.4 m.		Very weak to weak yellow sericite alt'n. Alt'n strengthens downhole.	5% fine to med grained coarsely dissem py.	
277.50 TO 278.50	«Qtz Dol Vn Alt»	Gray, white. Fine. 80% of interval consists of qtz (30%) dol (70%) veins, remainder of interval is faulted mafics +/- vein.		Mafic component is sericitically altered.	5 - 8% dissem py.	
278.50 TO 286.75	«Maf Tuff Sed. Tran»	Green, gray. Fine to med. Fine to med grained siltstone/lithic wcke beds containing 1% fine clasts of argillite comprise 10% of interval. Minor alt. mafic clasts also present. Matrix (95%) is uniform in appearance outside of local alt'n. 4% white Fe dol stringers preferentially oriented at Contacts with mafics are generally sharp and oriented at Mafics are coarser grained with local lapilli sized clasts. Mafics are preferentially qtz/dolomitized, which gives rock mottled appearance.	70 70	Mafics are preferentailly dolomitized/silicified. Fe minerals altered to chlorite.	<2% py dissem in the fine grained seds; <1% in mafics.	Fine grained nature of seds; indicates a distal basin. It is possible some 20% of the mafics are actually epiclastic seds (based on rounded fine grained clastic? Material locally present.
286.75 TO 287.80	«Sil/Py Maf»	Gray. Fine. Original textures destroyed 5% white qtz/carbonate veining - Carbonates include Fe rich and poor calcite and dolomite.		Weak to moderate silicification.	{286.75 - 287.8} «5 - 20% py» in fine to med grains, dissem.	
287.80 TO 291.05	«Mflt»	Green. Med to fine. Mafic lapilli tuff patchy qtz/dol veining gives core a mottled appearance locally mafic clasts indistinct.		Variable chlorite +/- brown sericite alt'n; increasing dol (+/- qtz) alt'n downhole.	2% dissem py.	Rock is similar in appearance to the mafics between 278.5 - 286.75 m.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
291.05 TO 300.90	«Dol Volc Sed» "Dolomitized" Volcanic lastic Sediments"	Gray, buff. Med to fine. Generally uniform med grained texture which appears to have been a sandstone derived from volcaniclastic. Minor chips of argillite within the unit. 2% interbeds of altered black arg. Bedding at 15% zones/beds? of med. grained darker chlorite rock - possible altered mafic tuff beds or volvaniclastic seds. 10% gray & white qtz (50%) dol (50%) veins to 2 cm. Minor gouge.	60	Prevasive dolomite alteration, brown sericite alt'n locally gives rock a brownish cast. Patchy minor silicification adjacent to veins.	{291.05 - 300.9} «7% py, mn, gn, sp» py is pervasive, occurs as fine to coarse dissem. gn, sp occur together in fine grains, coarsely dissem, with in qtz veins.	The presence of chlorite and brown sericite seem to indicate a fairly iron rich protolith - mafic volcanics?
300.90 TO 302.15	«Flt Bx/Dol Volc Seds»	Gray. Fine. Altered sediments as those overlying this interval but here they have been strongly brecciated and altered to gouge.		Intense dol alt. of seds.	3% py.	
302.15 TO 304.30	«Flt Bx/Qtz Vn»	Gray, green, white. Fine. Strong sheared and brecc. zone of 75% qtz +/- dol veining, 25% altered seds. Principal plane of shear	50 70	Intense sericite alt'n of sediments caught up in the fault. Minor fuchsite.	3- 5% med grained py, minor gn coarsely dissem within qtz.	
304.30 TO 311.25	«Qtz Vn Ser Sed»	White. Fine. The qtz vn is massive, fine grained, white, fairly well fractured but competant. The vn has inclusions of sericitically alt seds. The altered seds comprise 35% of the interval. The main occurences of alt. seds are between: {304.8 - 305.3} «Ser sed» {305.5 - 306.3} «Ser sed» 307.1 - 307.4 {310.1 - 311} «Ser sed»		Sediments are intensely altered to gray sericite. Some contacts are talc altered.	Quartz vn is generally barren; one patch of coarse dissem gn and cp at 307.9 m. alt seds contain <1% py generally but locally up to 25% as pyrite occurs in coarse dissem and bands.	
311.25 TO 316.20	«Ser/Dol Arg»	Yellow, gray, black and white. Fine. Argillitic ore largely altered to ser and dot. Alteration has bleached and discolored core. Local zones of black dol arg. Qtz/dol veins are discontinuous & fragmental within these intervals. Upper contact is sheared. 315.6 - 316.2: Weak to moderatly gouge altered.		Intense yellow sericite alt'n streated with bands and patches of dolomite and qta alt'n. Qtz occurs as veins/stringers local fuchsite. {313.9 - 314.2} «Mod sil., 15% py»	2 - 5% dissem py. 313.9 - 314.2 - 15% pyrite occurs in bands and coarse dissem along fractures	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
316.20 TO 326.90	«Dol Seds»	Gray, black. Fine. Altered sediments. Sediments are 20% arg and 80% coarser silts and sandstones. 3% white qtz veining. vns are fractured, offset and sometimes crackle breccia, fractures are lined with dolomite.		Patchy moderate to intense dolomite alt'n and dol/qtz veining. Local bands of brown sericite alt'n. Minor fuchsite. Minor silicification.	<5% py in dissem and bands.	Again appears to be ab immature sediment - volcanic?.
326.90 TO 329.20	«Sil Arg»	Black, gray. Fine to med. Argillite is cut by qtz/dol stringers and veins with orientations at 50 - 90 to C.A. 25% vn material locally vns are crackle brecciated to brecciated.		Patchy weak to mod. silicification.	1% dissem py at 327.5 m. there is a 10 cm. wide zone containing 20% semimassive py.	
329.20 TO 332.70	«Dol Seds»	Gray. Fine to med. Alteration of immature sediments - high Fe content 5% white/gray fine grained qtz/dol veining. 331.1 - 331.4: Black arg. {331.1 - 332.7} «zones of flt. gou»		Pervasive mod to intense dol alt'n. Minor graphite alt'n. 329.2 - 331.1: Weak chlorite and brown sericite alt'n. 331.4 - 332.7 - Yellow to gray sericite alt'n. Degree of alt'n increases downhole.	4% dissem py.	Original rock may have been volcanic seds.
332.70 TO 334.40	«Arg/Flt Bx»	Black. Fine. Argillite contains 15% gray, white qtz stringers and veins. The argillite and most veins are brecciated by faulting veins contain dolomite along fractures. Gouge is well developed locally.		Minor dolomite alt'n.	2% dissem py.	
334.40 TO 338.80	«Ser/Sil Trans? Zone»	Gray, yellow, white. Intense alteration makes identification of rock difficult - some of the sericitically altered material may have been mafics. Small zones of qtz +/- dol veining to 15 cm. comprise 10% of interval. Minor zones of black argillite and wisps/clasts of argillite caught up in sericitically altered rock. Intermittant fault gouge. {337.3 - 338.4} «Chert?» A intense silica zone which is distinct from the majority of veins in that it is somewhat laminated at Laminae up to 2 cm. wide, minor argillite interbeds Chert? is seperated from an overlying massive vn by a gouge interval.	40 60	Intense yellow sericite alteration peripheral to veins; moderate to intense silicification in vicinity of distinct veins - flooding.	5% dissem py.	Chert? May be just an intensely silicified and slightly sheared argillite.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
338.80 TO 347.70	«Dol Arg/Arg Bx»	Black, gray. Fine. Black argillite finely laminated by gray silty beds, silty beds have a maximum thickness of 1 cm. Bedding at 338.8 - 339.3: Weakly sheared core, minor gouge. 339.3 - 342.3: Arg Bx: Within this interval the silty beds have strongly disrupted. Some small scale folds, boudinage and tetonic brecciation present clasts are angular to subrounded but locally retain a faint sense of bedding. Max clast size is approx. 1x2 cm. Clasts are generally matrix supported. Matrix is argillite. The bx seds grade into less contorted and then consistent seds. 342.7 - 344.2: Block core. Minor faulting. {345.8 - 346.35} strongly «flt bx arg»	70	Silty laminae are weakly dolomitized possibly patchy, very weak silicification some graphite.	1% dissem py.	Possibly some primary sedimentary brecciation.
347.70 TO 361.45	«Volc Sed/Arg Tran»	Green, black. Fine 347.7 - 352.1: 50% black arg contain nig. Minor gray silty laminae interbedded with 50% green volcaniclastic sediments. Volc. seds are weakly calcareous grain size reaches 1 mm. in the volc seds. from 352.1 m. the rok is 97% volc. seds with minor argillite interbeds/laminae with a width generally <1 cm. Argillite content increases towards base of interval. 354.8 - 357.6: 25% qtz (70%) dol (30%) veining veins are massive to fractured. Frequent inclusions of wallrock veins are largely barren.		Mod. to intense chlorite alteration of the volc. seds. {357.6 - 359.3} «ser alt'n» wk to mod. in intensity related to veining.	1% py in less altered rocks; in vicinity of veins or sericite alt'n py content to 5%.	
361.45 TO 386.70	«Sil Arg/Chrt? + Silt»	Black, gray. Fine Core is moderately to highly blocky with minor flt gouge. The primary rock type is black argillite which is prevasively penetrated by fine qtz +/- dol stringers and occasional veins. 3% gray, non silicified siltstone? beds increasing to 25% towards base of interval - interbedded argillite and siltstone. 364.8: Flt gouge.		90% the argillite is moderately to intensely silicified. Some graphitic surfaces present. 367.5 - 386.7: Argillites are no longer silicified.	{361.45 - 386.7} «minor cp, gn, sp» coarsely dissem and stringers within sil. arg. Pyrite content varies from minor dissem to semi massive banded zones. Overall content 3%.	Remobilization and introduction of silica in cherty? arg. 364.5 - 367.2: Core is very rubbled 85% recovery. 373 - 373.6: 25% recovery.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		369 - 372.8: 20% white, massive qtz veins, some tight, small scale disharmonic folds.				
		372.8: 2 cm. wide. Light gray chert? bed at 372.8 - 373.6: Flt gou, rubble.	40			
		{376.9 - 378.35} «banded chert?» banding at contains a 12 cm. wide white quartz base of chert? is also in contact with white qtz vein.	50			
		{379.3 - 385.3} «flt bx, gou» rubble core. Lower contact weakly brecciated.			379.4: 3 cm. wide interval of 15% combined cp, sp, gn.	382.2 - 383.1: 60% recovery.
386.70 TO 393.40	«Mflt Flt Bx»	Green. Fine Mafic lapilli tuff is strongly and generally pervasively brecciated by fault activity. Chloritic, clay matrix supports clasts to 4 cm. Clasts are subangular to rounded, 5% qtz carbonate veining.		Chlorite alteration of mafics. Minor sericite alt'n.	5% fine grained py generally located interstially to MFLT fragments. Locally appears to be semi-massive approx 15% pyrite in these areas. Minor galena associated with veins.	
393.40 TO 404.40	«Mflt»	Green. Fine 25% rounded to slightly flattened clasts in a darker chloritic fine grained matrix. 5% white qtz/carb veins. Minor fault bx.		Chlorite alt'n of mafics.	3% fine grained dissem py.	
		END OF HOLE				

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
24610	134.60	135.60	1.00								75	27	29				198	54		5	1.8	28	
24612	180.60	181.70	1.10								64	30	21				44	61		2	1.6	16	
24613	186.10	187.60	1.50								65	38	25				289	50		5	1.8	71	
24622	269.20	270.10	0.90	.015	.13	.14	2.9	.03			148	1281	1445				466	31		8	2.9	29	
24623	270.10	271.10	1.00								53	51	314				246	73		7	2.5	23	
24624	271.10	272.50	1.40								53	39	83				227	39		7	1.5	46	
24625	272.50	273.95	1.45								70	23	48				225	37		7	1.6	28	
24626	273.95	275.20	1.25								102	84	17				196	30		1	1.1	9	
24627	275.20	276.20	1.00								60	46	21				18232		3	1.2	8		
24628	276.20	277.50	1.30								44	46	26				182	45		3	1.5	11	
24629	277.50	278.80	1.30								41	31	57				212	49		6	2.2	26	
24630	278.80	280.40	1.60								142	343	278				191	21		1	2.0	18	
24631	280.40	281.80	1.40								76	59	10				83	8		1	1.7	1	
24632	281.80	283.30	1.50								83	94	48				42	10		1	1.8	7	
24633	283.30	285.00	1.70								94	72	48				102	10		1	1.9	2	
24634	285.00	286.75	1.75								58	111	66				188	10		2	1.7	5	
24635	286.75	287.80	1.05								52	42	26				99	12		2	1.6	18	
24636	287.80	288.90	1.10								81	73	18				123	39		1	1.8	3	
24637	288.90	290.00	1.10								68	93	10				128	8		1	1.8	2	
24638	290.00	291.00	1.00								64	87	76				192	12		1	1.9	9	
24639	291.00	292.50	1.50								43	151	82				191	40		1	2.0	27	
24640	292.50	294.00	1.50								119	110	101				244	66		4	1.7	28	
24641	294.00	295.50	1.50								59	153	107				156	49		1	1.6	16	
24642	295.50	297.00	1.50	.126	.02	.01	1.7	.01			76	1259	215				107	36		1	1.7	8	
24643	297.00	298.50	1.50								111	466	96				145	52		1	1.5	7	
24644	298.50	299.70	1.20								60	98	30				282	86		7	1.9	20	
24645	299.70	300.90	1.20								70	94	49				186	34		1	1.9	14	
24646	300.90	302.15	1.25								85	236	261				289	48		6	1.6	23	
24647	302.18	303.30	1.12								114	446	486				240	60		6	1.3	36	
24648	303.30	304.30	1.00								61	58	73				282	64		7	0.7	56	
24649	304.30	305.80	1.50								67	72	70				168	120		6	2.5	49	
24650	305.80	307.30	1.50								25	83	33				79	69		1	1.1	2	
24651	307.30	308.80	1.50								258	71	569				46	43		1	2.9	20	
24652	308.80	310.30	1.50								11	32	25				38	44		1	0.6	1	
24653	310.30	311.25	0.95								16	72	25				63	77		1	1.1	2	
24654	311.25	312.75	1.50								43	128	45				289	89		1	1.7	8	
24655	312.75	314.20	1.45								13	128	47				386	95		5	0.8	3	
24656	314.20	315.30	1.10								33	94	53				420	83		1	0.6	4	
24657	315.30	316.20	0.90								26	65	53				450	69		5	0.9	23	
24659	325.40	326.90	1.50								17	149	85				111	85		3	2.0	6	

Sample	From (m)	To (m)	Length (m)	CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB
24660	326.90	328.20	1.30								60	186	105				141	80		15	2.1	8
24661	328.20	329.20	1.00								41	71	49				59	80		4	1.3	4
24662	334.40	335.90	1.50								29	272	130				55	60		1	1.6	2
24663	335.90	337.30	1.40								26	65	118				94	73		4.	1.4	1
24664	337.30	338.80	1.50								17	95	110				91	62		1	1.4	2
24665	354.80	356.30	1.50								17	104	33				26	106		1	1.9	6
24666	356.30	357.80	1.50								33	40	37				109	137		1	1.1	21
24667	357.80	359.30	1.50								32	44	48				110	138		1	1.0	4
24669	361.45	363.00	1.55	.009	.27	.09	3.8	.02			92	2676	908				135	77		11	3.8	24
24670	363.00	364.50	1.50	.087	.15	.19	8.0	.18			865	1534	1857				321	135		40	8.0	179
24671	364.50	366.00	1.50								47	72	49				104	99		2	2.0	7
24672	366.00	367.90	1.90								68	115	33				80	69		1	1.8	4
24673	367.90	369.40	1.50								55	121	39				86	103		2	1.9	5
24674	369.40	370.90	1.90								345	731	178				78	141		1	2.2	2
24675	370.90	372.40	1.50								23	124	109				75	191		1	1.3	6
24676	372.40	373.90	1.50								62	142	48				87	379		1	1.4	4
24677	373.90	375.40	1.50								116	200	28				62	60		1	1.0	2
24678	375.40	376.90	1.50								92	187	25				64	49		1	1.3	3
24679	376.90	378.40	1.50								42	56	32				45	241		1	1.0	5
24680	378.40	379.90	1.50	.042	.09	.06	0.7	.01			421	864	638				60	59		3	3.3	10
24681	379.90	381.40	1.50								74	182	39				42	75		1	0.7	1
24682	381.40	383.10	1.70								43	189	65				43	53		1	0.9	9
24683	383.10	384.80	1.70								36	91	52				2	108		1	0.6	8
24684	384.80	386.70	1.90								48	76	50				8	231		1	0.9	2
24685	386.70	388.20	1.50	.007	.07	.04	2.4	.01			72	727	419				36	81		1	2.4	7
24686	388.20	389.70	1.50	.007	.01	.03	3.0	.01			67	111	259				69	101		1	3.0	14
24687	389.70	391.00	1.30	.007	.04	.05	3.7	.02			67	396	469				127	133		1	3.7	24
24688	391.00	392.40	1.40	.006	.08	.21	2.9	.02			61	774	2104				83	76		1	2.9	19
24689	392.40	393.40	1.00	.009	.14	.07	2.2	.01			86	1362	749				1	48		1	2.2	8

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
24608	60.10	63.10	3.00	67.55	9.48	2.62	3.81	0.47	1.93	4.81	.08	0.45			50	89			5	90	1.0	44	.21	.18	91.66	16	1
24609	121.00	124.00	3.00	38.96	12.41	9.15	9.38	2.61	0.16	10.04	.21	1.99			134	66			5	22	1.8	13	.50	.23	85.65	1	1
24611	163.60	166.60	3.00	42.72	13.07	8.75	6.67	0.82	1.94	9.89	.22	1.66			88	48			10	49	1.4	18	.28	1.32	87.38	44	1
24614	209.30	212.30	3.00	44.11	10.90	7.60	10.22	1.34	0.48	8.88	.32	1.01			85	114			5	42	1.7	13	.24	1.88	87.00	34	1
24621	258.20	261.20	3.00	39.79	12.61	9.62	9.12	2.40	0.27	11.12	.27	1.22			126	82			10	17	2.2	17	.30	2.20	88.93	66	1
24658	319.10	322.10	3.00	42.29	12.87	8.65	7.83	0.90	1.12	10.99	.43	1.13			153	2274			5	39	3.2	541	.21	3.48	89.96	222	7
24668	359.30	361.45	2.15	61.83	17.26	0.78	2.79	0.40	3.71	5.84	.21	0.94			34	66			5	78	0.4	46	.17	2.05	96.13	58	1
24669	398.30	401.30	3.00	38.24	11.46	13.51	9.53	1.13	0.47	8.14	.26	1.31			56	131			5	52	2.2	14	.31	1.17	85.56	1	1

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: Sam Horizon

PLOTTING COORDS GRID: Sam Geol
NORTH: 1063.99N
EAST: 11656.42W
ELEV: 1017.42

ALTERNATE COORDS GRID: Estimated
NORTH: 10+60N
EAST: 116+50W
ELEV: 1027.00

COLLAR DIP: -75° 0' 0"
LENGTH OF THE HOLE: 282.50m
START DEPTH: 0.00m
FINAL DEPTH: 282.50m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: June 18, 1990
DATE COMPLETED: June 21, 1990
DATE LOGGED: June 19, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: Frontier
CASING: Pulled
CORE STORAGE: Samex Camp

PURPOSE: Drilled from the NW side of the Johnson Creek swamp.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
60.00	-	-75° 0'	ACID	OK	Possibly -74 degrees	-	-	-	-	-	
133.20	-	-68° 0'	ACID	OK		-	-	-	-	-	
239.90	-	-65° 0'	ACID	OK		-	-	-	-	-	
276.50	-	0° 0'	ACID		Double Etch - 64+59 degrees	-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 33.50	«CSG»					
33.50 TO 42.10	«Xtal Lithic Tuff»	Green. Fine. Matrix is aphantic, prob. mafic composition with 10% white grains to 1 mm. - possible altered feldspar crystals. 4% lithic fragments, subangular to subrounded, to 2 cm. in length. Fragments are pale in color, sericitically altered. Core is weakly calcareous. 10% white qtz/carb stringers to 2 cm. generally oriented at high angles to C.A.		Pervasive chlorite alt'n. Weak sericite alt'n of lithic frags.	Minor pyrite.	
42.10 TO 87.70	«Mafic Flows»	Green. Fine. Matrix is generally aphantic, weakly calcareous 3 - 20% white qtz-carb veining. Max vein width 20 cm. Average width 1 cm. Vein composition roughly 30% qtz, 35% calcite, 35% siderite. Flow contacts contain more qtz/carbs material frequently in nodular form vesicular in filling? and as inter breccia cement? Local . Some small cavities present - vesicle? Flow breccias located between: 43 - 45 m. 50.7 - 51.8 m. 59.5 - 62.9 m, very poor indistinct. 67.3 - 67.7 m, poor 77.2 - 77.8 m, poor General sense of foliation Basel contact is gradational; based on alterantion	 55 70	Pervasive wk to mod. chlorite alt'n Minor weak sericite alt'n at flow breccias. 83.0 - 87.7: Core remains chloritically altered but has progressively dolomite stringers/patches. Streaked throughout leading to gradational contact.	Patcht pyrite - content varies from minor dissem to 5% coarse dissem.	73.2 - 74.1: Core very blocky.
87.70 TO 94.20	«Dol/Ser Maf»	Gray, green, white. Fine. Original mafics have been extensively replaced/altered. 3% white to gray qtz stringers crossout dol veins.		Chlorite has been extensively replaced by brown sericite dolomite is prevasive throughout - occurs as veins and throughout groundmass. Minor to 3% fuchsite.	Pyrite occurs as med to coarse. Xtals and agglomerations of xtals. At top of interval pyrite occurs as dissemination to 5%, with increasing depth py occurs in bands, fracture fillings and dissem to 15%.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
94.20 TO 103.40	«Mafic Flows»	Green. Fine. Aphanitic flows, wide intervals containing nodular dolomite - infilled vesicles. 20% qtz/dol throughout lower contact is faulted.		Chlorite alteration pervasive, local weak to mod. ser alt'n; patchy dol. alt.	2 - 5% coarsely dissem py.	94.7 - 96.5 - 40% recovery. Core is rubbled but does not look as though that much core should have been lost.
103.40 TO 108.70	«Mflt»	Green. Fine. Upper contact is faulted from 103.6 - 105.8 m., veined by qtz (10%) dol (90%), core is bleached. Locally dolomitized. Matrix is aphanitic and contains 20% clasts to 7 cm. in length, 5 cm in width, clasts are compositionally similar to the matrix.		Pervasive chlorite alt; local bleaching and dol alt. Bands of brown sericite replacing chlorite. Clasts are preferentially ser. alt.	3% pyrite coarsely dissem, some py bands/clots in dol veins.	
108.70 TO 113.20	«Qtz Dol Py Vn»	White, Gray. Fine to med. 30% of interval is altered mafics - MFLT? host qtz (10%) dol (70%) py (20%) vn. Vein brecc country rock. Upper contact at Lower contact at	 90 40	Mafics are chl and ser alt.	Py makes up to 35% of the vein material from 110.2 to 113.2 m; uphole of this interval the vein is largely barren py occurs as fine to med. xtals; coarsely dissem to semi massive.	
113.20 TO 139.75	«Mflt»	Green. Fine. Typical mafic lapilli tuff unflattened clasts make up to 40% of interval, matrix supported is very fine grained with grains to 2 mm; clasts to 7 cm. 1% white qtz/dol veining. Minor fault bx/gouge. {114.3 - 115.5} «flt gouge» 117.9: Narrow flt gouge zone. 135.2 - 139.75: qtz/dol veining increases to 5% with veins reaching 20 cm. Vns are 70% qtz, 30% dol. Some veins are vuggy.		Matrix is chl alt. clasts are Preferentially ser. alt. 135.2 - 139.75: 25% yellow sericite present. Locally appears to be related to veins.	Minor dissem py. 135.2 - 139.75: Py content increases to 3 - 5% coarse dissem.	Core is blocky. 114.3 - 115.5: 65% core recovery.
139.75 TO 141.70	«Qtz Dol Ser Alt»	Yellow, white. Fine. Interval appears to be a qtz vein structure which are bosed by dol alt mafics. Core is blocky. Interval is comprised of qtz (5%) dol (50%) ser (34%) py (1%) chl alt maf (10%).		Yellow sericite occurs as bands and interstially to intensely dol. Mafics where alt. is less intense chl alt present.	Py is fine grained.	
141.70 TO 142.50	«Flt Bx»	Green, yellow. Fine. Interval is a somewhat healed fault brecc. Qtz/Dol/Ser of the overlying unit. 141.9 - 142.5: flt bx mafics of the underlying unit. Some bx qtz/dol vein.		Chl + ser alt present. Minor talc.		

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
142.50 TO 145.00	«Mflt»	Green. Med. 2% coarse clastic material; matrix consists of grains to 2 mm. with foliation at 3% white qtz/dol stringers.	45	Chlorite alt'n of mafics, local weak bleaching and silicification.	Minor py.	
145.00 TO 145.85	«Het Frag»	Gray, black, white. Fine. Matrix appears to be a mixture of argillite and fine grained altered volc seds, 20% white qtz/dol veining and local flooding. 35% fine subrounded clasts - generally greater than or equal to 3 mm. but ranging to 1 cm. Clasts comprised of qtz/dol, sericitically alt. mafics and possibly pyrite. Faulted lower contact.		Mafic clasts are strongly alt. to sericite; locallized mod. silicification associated with veins.	10% pyrite, fine to med grains, coarse dissem, + clasts? (minor). Some pyrite is brecc by silica.	
145.85 TO 167.80	«Arg/Silt/Wcke»	Black, gray. Fine to med. Interbedded arg/silt/wcke. From 145.85 - 156.2 the interval is 70% arg/silt with 30% wcke, there is no clear sense of bedding until 150.5 m. uphole of this core textures consist of lenses, flames in wcke/silt (or the reverse) from 160.2 - 167.8 m. the core is 65% wcke bedding at generally Some offsets to bedding along cleavages cleavage. No clear consistent younging direcions present.	60	167 - 167.8: V. Weak sericite alt.	<1% py, med grained, coarsely dissem within arg.	145.85 - 146.3: 45% recovery. Wckes are more mature than volc seds seen in RG-326. Younging appears to indicate tops up and downhole without hinge zones being evident.
167.80 TO 170.10	«Ser/Dol Seds»	Buff. Fine. Original sediments have been completely altered. Two white qtz veins present with widths of 10 and 20 cm. Veins are lightly fractured, minor open spaces along fractures; veins contain 5% cream dolomite core is highly blocky with some clay gouge developed - minor faulting.		Pervasive yellow ser. alt. and weak dolomitization replace original minerals.	Veins contain 1% py and minor galena.	
170.10 TO 173.20	«Arg/Silt/Wcke»	Black, gray, white. Fine. Upper and lower interbedded arg/silt/wcke as above at 10% white qtz veins to 20 cm. Core is blocky with frequent fault bx and gouge.	70 90		1% coarsely dissem py within quartz veins, minor cp within veins.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
173.20 TO 179.80	«Ser Seds»	Buff. Fine. Original mineralogy extensively altered interval encompasses a broad hinge zone between 175.8 + 5% white qtz (70%) dole (29%) sericite (1%) veining.		Intense pervasive yellow sericite alteration. 179.25 - 179.40: weakly alt arg.	10% coarsely dissem coarse grained py selvage at 176.8 m. <2% fine grained dissem py thoughout.	
179.80 TO 186.60	«Arg/Wcke F lt Zone»	Interbedded argillites and wackes; bedding angles vary between 60 - 80 degrees to C.A. 185.1 - 185.4: White qyz (80%) dol (20%) vein brecc country rock. 181.6 - 186.6: Core is intermittaltly rubbled, fault brecc and gouge alt.		Weak gray sericite developed giving rock a phyllitic sheen.	Minor dissem py.	183.2 - 185: 60% core recovery. Appear to coming out of the fold hinge. Direction of state tops indeterminant.
186.60 TO 196.70	«Qtz/Dol/Se r Alt Maf?»	White, gray, brown. Fine. Rock appears to have been mafic in origin interval is cut by 20% white qtz/dol veins. Stringers which exhibit a slight preferred orientation at high angles to C.A. Vein composition 55% qtz 45% dol. [186.6 - 189] «Flt bx, gou» zone some argillite, alt, arg fragments within this interval.		Original mineralogy is strongly altered to a mixture of brown, yellow and gray sericites.	5% fine grained dissem py narrows intervals of 10 - 20% py. Trace cp? within veins.	The protolith may have been sediments rather than mafics. Core is blocky.
196.70 TO 201.90	«Qtz/Dol/Se r alt Seds»	Yellow, Gray. Fine. Rock is laminated with banding at laminations may be analgans to a bedded sediment, laminations are less than 1 cm. thick at top of interval with depth alteration becomes more massive and/or patchy. Narrow zones of fault gouge present.	70 90	Rock has been extensively altered to yellow sericite and dolomite. Quartz occurs as laminae in the ground constituent of veins. The alteration becomes weak and patchy in a gradational contact with the underlying arg.	5 - 10% dissem, f.g. py.	
201.90 TO 209.00	«Sil/Cherty /Arg»	Black, gray. Fine. Host rock is primarily black arg which contains 15% gray cherty interbeds; bedding at Chert beds contain thin nonsiliceous laminae of argillite, interval contains 10% white to gray qtz veins to 20 cm. wide which contain argilliceous material and minor sulphides. Fine qtz stringers crosscut the argillites.	60 80	Argillites is moderately silicified throughout most of interval.	Minor sp, gn, cp? found within quartz veins. 2% pyrite within veins, minor py within chert, <10% within black arg.	
209.00 TO 212.00	«Arg Flt Bx »	Black, white. Fine. Intensely fault bx an gouge alt arg. 15% white to gray qtz veining with dol along fractures.		Graphite developed in some fault zones.	1% pyrite.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
212.00 TO 215.90	«Dol/Py Sed s Flt Bx»	Gray, black. Fine. Entire interval has been fault brecciated. 10% white qtz/dol clasts/veins. Unaltered, bx rock is argillite.		80% of interval is intensely dolomitized and gray sericite/clay altered.	Up to 20% fine grained pyrite within intensely altered clasts, 5 - 10% pyrite within gouge.	Possible a transition zone between seds and mafics.
215.90 TO 218.50	«Dol Maf Fl t Bx»	Gray. Fine. Rock is extensively altered and is flt bx. over 95% of its extent. Minor narrow interbeds of faulted arg make up <1% of interval. 5% qtz/dol stringers.		Pervasive mod dol alt'n.	Generally 1% fine grained dissem py. 5% py assoc. with qtz/dol veining.	
218.50 TO 248.20	«Dol Maf»	Gray. Fine. Mafics have been extensively and pervasively altered. 3% white qtz/dol veins.		Core has been mod. to very intensely altered to dol, with associated patchy mod yellow to brown sericite, or less dol alt. Zones some chl alt still present. Minor to 1% fuchsite alt'n in sericite altered zones. 240.1 - 248.2: dol alt'n decreases downhole to weak to mod. somewhat spotty chl content increases chl also altering to brown sericite.	Minor amounts of galena in interval associated with qtz veins <3 cm. wide. Within these veins gn content is <4%. 2 - 5% f.g. pyrite in f. to coarse dissem. {218.5 - 220.2} «10 - 20% py» {246.15 - 247} sx in order of decreasing abundance are «15% py, 4% gn, sp, cp» base metals are fine grained bm are generally in selvage or envelopes of veins sp is very pale. Rock immediately above the zone of mineralization is weakly fault bx. Py is continuous throughout interval, bm sporadic. {248.08 - 248.13} «20% py, 1% gn» gn is coarsely dissem.	Veining /flooding may be in a zone of flow breccia.
248.20 TO 257.60	«Maf Flw?»	Green. Fine. Aphanitic to fine grained generally massive in appearance. <5% white qtz (80%) dol (20%) veining locally mottled core. 249.4 - 250.2: weakly flt gouged, rubbled core.		Pervasive chl alt. weak silic. adjacent to veins, locally bleached.	3 - 10% coarsely dissem and stringers py.	May be a pre-tert dyke/sill
257.60 TO 282.50	«Maf»	Green. Fine. Aphanitic matrix core is strongly calcareous. 3% qtz calcite veining. Veins to 5 cm. prevasive spotty qtz/calcite mottles core. END OF HOLE		Pervasive chlorite alt, variable carbonate alt wk to locally intense.	<1% dissem py {257.6 - 263.9} «Min gn, sp in vns» coarsely dissem.	

MINNOVA INC.

HOLE NUMBER: RG327 DRILL HOLE RECORD DATE: 22-July-1990

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
24693	87.70	89.00	1.30								64	114	62				106	48		1	1.6	28	
24694	89.00	90.50	1.50								70	37	17				105	51		1	1.6	18	
24695	90.50	92.00	1.50								64	37	22				87	65		1	1.5	6	
24696	92.00	93.20	1.20								69	54	22				140	71		1	1.9	26	
24697	93.20	94.20	1.00								63	32	19				147	58		2	2.0	1	
24698	108.70	110.20	1.50								39	53	12				116	99		3	2.4	16	
24699	110.20	111.70	1.50								73	38	23				159	74		11	2.9	44	
24700	111.70	113.20	1.50								67	34	30				154	45		10	2.5	52	
24702	139.75	140.90	1.15								64	28	12				384	15		1	1.6	2	
24703	140.90	141.90	1.00								72	53	12				55	20		1	1.4	1	
24704	145.00	145.85	0.85								79	49	111				191	28		4	1.5	23	
24706	167.80	169.00	1.20								55	85	50				150	29		1	0.4	1	
24707	169.00	170.10	1.10								37	108	27				105	36		1	0.5	2	
24708	170.10	171.60	1.50								40	59	32				143	39		1	0.7	1	
24709	171.60	173.20	1.60								46	82	31				176	52		1	0.8	19	
24710	186.60	189.00	2.40								70	76	33				104	103		1	0.7	2	
24711	189.00	190.50	1.50								123	1011	128				152	96		1	1.4	41	
24713	201.90	203.40	1.50								46	89	110				79	29		2	0.2	1	
24714	205.10	206.60	1.50								42	59	49				107	62		4	0.1	23	
24715	212.00	212.90	0.90								123	3254	434				369	38		28	2.1	56	
24716	212.90	214.40	1.50	.007	.09	.05	1.6	.02			68	894	483				200	48		10	1.6	21	
24717	214.40	215.90	1.50	.007	.09	.04	1.6	.02			74	885	351				65	46		6	1.6	15	
24718	218.50	219.70	1.20								59	53	65				94	49		4	1.0	19	
24719	219.70	221.20	1.50								41	67	50				52	53		1	1.6	2	
24720	221.20	222.70	1.50								68	88	31				29	51		1	1.3	1	
24722	232.50	234.00	1.50								78	168	776				95	48		2	2.8	16	
24723	234.00	235.50	1.50								81	222	66				72	34		1	1.7	1	
8054	235.50	237.20	1.70	.011	.11	.07	1.6	.01			107	1113	735				48	46		1	1.6	4	
24724	237.20	238.90	1.70								72	190	60				178	30		5	2.3	2	
24725	244.65	246.15	1.50								79	283	55				1	45		1	1.9	1	
8051	246.15	247.00	0.85	.102	3.12	1.58	17.7	.01															
8052	247.00	248.50	1.50	.010	.19	13	3.1	.01			101	1852	1254				95	20		1	3.1	1	
8055	258.90	260.50	1.60	.019	.06	.04	2.6	.01			191	587	415				58	66		2	2.6	8	
8056	260.50	262.00	1.50	.012	.03	.03	1.7	.01			118	315	319				1	81		1	1.7	3	
8057	262.00	263.50	1.50	.046	.06	.10	2.9	.05			463	610	1033				32	35		1	2.9	50	
8058	266.10	267.60	1.50	.020	.04	.05	1.9	.01			201	391	459				1	110		1	1.9	6	

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
24691	38.70	41.70	3.00	37.38	13.03	7.99	10.48	1.90	0.20	10.58	.19	2.02			98	57			5	45	1.5	8	.48		0.25	84.56	1	1
24692	83.40	86.40	3.00	37.77	11.99	9.62	10.76	.18	1.48	9.98	.24	1.36			77	48			15	27	1.6	10	.31		2.41	86.13	1	1
24701	130.10	133.10	3.00	41.25	13.48	6.92	10.05	1.89	.44	10.00	.17	1.23			87	64			40	15	1.6	8	.29		1.18	86.90	263	1
24705	160.00	163.00	3.00	70.58	12.39	1.44	1.92	.48	2.38	4.60	.05	0.60			22	68			5	31	0.3	19	.19		0.19	94.87	32	1
24712	197.20	200.20	3.00	65.80	14.56	.27	2.48	.33	2.84	6.00	.29	.62			37	43			10	186	0.1	28	.16		1.51	94.96	59	1
24721	224.60	227.60	3.00	46.08	12.82	7.81	6.86	.36	1.68	8.86	.21	1.27			73	141			5	40	1.5	43	.28		1.34	87.62	39	1
8053	252.00	255.00	3.00	47.90	14.20	3.00	6.89	3.38	.03	12.07	.26	2.79			114	65			5	11	1.8	8	.55		.34	91.42	1	1
8059	276.50	279.50	3.00	40.78	12.30	9.36	11.22	0.29	.01	10.75	.15	1.16			35	276			5	8	1.1	87	.28		3.44	89.72	27	1

MINNOVA INC.
DRILL HOLE RECORD

HOLE NUMBER: RG328 | IMPERIAL UNITS: | METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: Sam Horizon

PLOTTING COORDS GRID: Surveyed cds.
NORTH: 942.27 N
EAST: 11808.63 W
ELEV: 1038.80 el.

ALTERNATE COORDS GRID: Est
NORTH: 9+50N
EAST: 118+ 0W
ELEV: 1040.00

COLLAR DIP: -55° 0' 0"
LENGTH OF THE HOLE: 303.90m
START DEPTH: 0.00m
FINAL DEPTH: 303.90m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: June 22, 1990
DATE COMPLETED: June 26, 1990
DATE LOGGED: June 23, 1990

COLLAR SURVEY: NO
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: Frontier
CASING: Pulled
CORE STORAGE: Samex Camp

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
69.20	-	-54° 0'	ACID	OK		-	-	-	-	-	
169.80	-	-54° 0'	ACID	OK		-	-	-	-	-	
197.20	-	0° 0'	ACID		Double etch -48+-50 degrees	-	-	-	-	-	
239.90	-	-53° 0'	ACID	OK		-	-	-	-	-	
264.30	-	-53° 0'	ACID	OK		-	-	-	-	-	
303.90	-	-51° 0'	ACID	OK		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 45.70	«CSG»					
45.70 TO 70.40	«Arg/Silt Wacke»	Black, gray. Fine to med. Approx 50% black arg interbedded with med grained siliceous wackes bedded at Some offset along cleavage Minor foliation at Core is blocky - falls apart along argillite layers, minor fault gouge, minor carb veins. {63.6 - 70.4} «flt bx, gou» 85% core recovery.	70 90 60		1% py.	
70.40 TO 74.80	«Dol Sed»	White, gray. Fine. Protolith was argillite? Weak faulting throughout. {72.1 - 73.4} intermittant «flt bx, gou» 74.6- 74.8: fault gouge at contact.		Strong carbonate alteration. Carbonates include dolomite calcite. Much of the alteration appears to originate in 'seeds' which grow outwards until there is a near massive zone of alt. Some alt appears to carb flooding. Minor silica. Matrix is fine grained, weakly sericitic and pyritiferous.	5% f.g. py interstial to dol alt seds.	
74.80 TO 76.40	«Dol/Ser Alt Maf?»	Gray, brown. Fine. Original rock texture are completely replaced labelled as mafic because of its brown sericite content - may be a sedimentary rock.		Rock has been pervasively and intensely dolomitized. 20% of interval is patchy brown to yellow sericite.	5 - 10% f.g. py.	
76.40 TO 80.70	«Het Frag?»	Gray. Fine to med. 98% of interval is intensely altered, small interbeds of argillite. Clasts consist of flat angular argillite wisps - 1% fine grained pyrite clasts - minor, 20% white soft round noncalcareous grains? <1 mm. wide - clay? in a pyrite, ser matrix. Bedding at Sericite foliation at Minor qtz veining. {78.6 - 80.7} «flt gou»	70 60	Intense gray sericite alteration.	10 - 30% v.g.f. py dissem to semi-massive indistribution. Local zones with <4% py.	78.6 - 80.7: 33% recovery. Unit could be called lithic gray sericite/Py phyllite.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
80.70 TO 89.30	«Dol Maf?»	Gray, white. Fine. Gradational, faulted upper contact. Lower contact at Minor massive white qtz veining except {84.5 - 85.5} fractured white bull «qtz vn» containing 5% gray dol. {88.5 - 89} «flt bx»	15	Pervasive dolomite alt and veining with subordinate amounts of brown sericite, minor fuchsite.	3 - 5% f.g. py in dissem and stringers.	
89.30 TO 91.95	«Qtz Vn»	White. Med to coarse. Bull white qtz vein which contains 1% med/coarse gray dol and 5% alt maf.		Mafics contain fuchsite.	Minor med grained py assoc with mafics.	Core is very blocky.
91.95 TO 96.60	«Dol/Ser Alt Maf»	Green, gray, white. Fine. Mafics are strongly altered. 15% white qtz (80%) dol (20%) veining. Primary veins located between 93.8 - 94 m. and 94.3 - 95 m. Additional stringers and veins throughout interval veins are fractured, minor open spaces. Alteration gives core a mottled coloration. {96.4 - 96.6} «flt bx, gou»		Pervasive dol and brown yellow to brown sericite, weak fuchsite alt'n associated with veins.	2 - 5% fine grained, fine to coarsely dissem py.	Note: 90.5 - 100 m. 5 - 10% yellowish carbonate mineral present. Litho seems to indicate that this mineral is magnesite.
96.60 TO 99.90	«Dol Maf?»	Gray. Fine. Pervasive alteration destroys original textures between 96.6 and 96.95 m. there is a white qtz (90%) gray dol (10%) vein. Upper contact is graphitic. at 98.1 m the rock is foliated at	75	Generally non discript mod to int dol alt prevasive throughout although patchy locally 5% brown sericite and minor fuchsite stringers/bands.	2% dissem py. 5% py associated with sericite.	Protholith may have been sedimentary rock but strong dolomite alteration seems to indicate a calc. Volc or volcaniclastic.
99.90 TO 103.30	«Dol Tran Zone Flt Bx»	Gray, white. Fine to coarse. There are 20 cm. wide white qtz/dol veins at the upper and lower contacts. Vns are coarse gr. Another vein occurs between {102.1 - 102.7} «qtz/dol vn» interval is fault brecciated with local clay gouge. Original textures are strongly altered but there appears to be both mafics and argillite present.		Pervasive mod to intense dol alt. Minor sericite.	3% dissem py.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
103.30 TO 107.30	«Dol/Ser Seds»	Gray, buff. Fine. Rock is fairly intensely altered, local intervals are weakly altered argillite, 3% qtz/dol vn. {104.3 - 105.7} interval is intensely «flt bx, gou»		Mod to intense yellow sericite prevasive at top of interval, decreasing with depth, and becoming weakly silicified at base or unit. Pervasive mod to intense dol alt throughout.	103.3 - 105.7: 1% py. {105.7 - 107.2} «1% bm, 3% py» bm are coarsely dissem, associated silica , in order of decreasing abundance cp, gn, sp. Py occurs in fine to v. coarse cubes assoc with silica.	
107.30 TO 110.50	«Sil Arg»	Black, Fine. Black argillites have been variably silicified bedding at 10% white qtz veining. {109.1 - 109.9} «flt bx»	90	Mod to int, pervasive silic + veining. Minor graphite in fault zone.	<1% combined cp, gn, sp in interval bm associated with silicification. 2% coarsely dissem py. {108.8 - 109.1} «3% cp, sp, gn, 30% py» in qtz flooded zone.	109.1 - 109.9: 73% core recovery.
110.50 TO 121.15	«Sil/Chrty Arg»	Black, gray. Fine. Fairly laminated argillite, cherty beds and siltstone. Bedding is highly contorted. Bedding offset along cleavage plane at 3% white qtz (80%) dol (20%) veining - some veins folded cherty? bedding is primarily visible towards top of interval fracture/bedding partings are phyllitic.	70 80	15% of the interval is weak to mod. silicified, very weakly graphitic.	2% dissem py. {120.3 - 120.9} «35% py in silic» a grained, semi-massive in qtz flooded interval.	
121.15 TO 136.20	«Dol Seds»	Gray. Fine. A generally nondescript rock with 3% interbeds of black arg? 5% dol +/- qtz veins much of the arg? is thin laminae which is locally disrupted by alt'n. 135.4 - 136: Core exhibits some breccia. Textures clasts are wisps of arg and minor qtz/dol.		Throughout some arg? may be graphite alteration. Minor talc. {124 - 124.8} «sil zone, 20% py»	124 - 124.8: Py is coarse grained locally semi-massive.	Immature seds.
136.20 TO 139.90	«Sil/Arg»	Black, white. Fine. Host is black arg containing 15% white qtz veining. Veins are generally disrupted/brecciated by tectonic activity - healed. 137.9 - 138.2: Weak fault bx and gou.		Arg is weakly silicified in areas of intense veining.	3% py med to coarse grains, of py in dissems and stringers.	
139.90 TO 147.50	«Arg Flt Bx»	Black. Fine. The argillites are weak to mod fault brecc and weakly altered to clay gouge. 10% white brecc qtz veins with dol along fractures.		Minor graphite.	Minor coarsely dissem cp associated with bx qtz vn at 143.8 m. 3% py overall up to 10% locally py occurs as fine to med. grains. Minor ground py clasts in fault zones.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
147.50 TO 156.90	«Arg/Dol Maf Tran Zon»	Black, Gray, Green. Fine. 50% mafics, pale grey green color, non-descript fairly massive. 50% black arg. Arg contains 30% white to gray qtz (60%) dol (40%) veins, patches. The veins are frequently tectonically disrupted. 5% late stage white qtz veins. 153.1 - 153.8: Weakly fault brecciated.		The mafics are weakly calcareous and prevasively mod. dolomitized. 151.6 - 152.1: Weak gray sericite alt'n.	Minor amounts of sp, gn, cp present in veins - locally to 1% bm are fine grained coarsely dissem. < = 5% coarsely dissem py.	50% of the mafics may actually be sediments.
156.90 TO 170.25	«Dol Maf»	Gray, green. Fine. Generally non-descript. 5% arg interbeds. 2% white qtz veining, very weakly reactive to HCl. Bedding and upper contact at	90	Per mod. dol. alt, 1% rusty brown ser alt'n, minor fuchsite.	3% f.g. dissem py overall. < = 10% coarsely dissem py assoc with veins. 160.2: 6 cm. wide zone contains 5% combined sp, gn, cp, 10% py assoc. with narrow qtz vein.	Possibly a volv sed.
170.25 TO 174.10	«Arg/Maf? Tran Zone»	Black, gray white. Interbedded black arg (60%) and gray-green. Mafic (40%) arg, is predominant at top of interval, mafics at base. Mafics are fine grained, possibly volv seds, bedding at 15% gray - white qtz veining. {173.2 - 173.28} «Het frg» clasts of arg, alt maf? xtal tuff? in a fine grained siliceous matrix; 5% py cubes minor sp? 5% brown ser alt.	65	Mafics are dolomitic altered with 3% brown sericite.	2 - 7% py in bands and f-c dissem. 173.12: 2% brown sp in a 1 cm. qtz vn.	
174.10 TO 174.35	«Het Frg»	Gray. Fine to coarse. Fine grained, weakly siliceous non-calcareous matrix supports angular to subrounded clasts of arg, qtz, cherty qtz and pyritiferous clasts. Clasts range in size from 2 mm. to 4 cm. 50% matrix, 50% clasts. Weak graded bedding indicate tops uphole.		Matrix is dolomitic.	4% dissem py.	
174.35 TO 175.60	«Sil/Chrty Arg»	Black, gray. Fine. Black arg with cherty laminae (arg ribbon chert?) laminae are controted, 2% white qtz veining, amounts increasing downhole.		Weak gray sericite alt'n gives phyllitic fracture surfaces. Rock may be weakly silicified; Minor dolomite present.	5% f. grained py. Mainly interstial to cherty? layers.	The silica present in the rock may be mainly sgnsenetic rather than epigenetic.
175.60 TO 177.40	«Het Frg»	gray. Fine to coarse. Similar to the two overlying Het Frg zones, 50% clasts consisting of arg, qtz +/- dol and minor alt. maf? clasts are matrix supported clasts are up to 5 cm. long and tend to be		Matrix weakly dol altered local weak brown ser alt. 177.2 - 177.4: Intense silic.	10% py in f-med. grains; py occurs as dissem to bands 2% sp?	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		subangular.				
177.40 TO 239.30	«Dol Maf»	Green, Gray, buff. Fine to coarse. Original textures are destroyed by alteration. 5 - 10% white qtz veining generally veins are wide, massive, barren, main vein intersections as indicated below. 184.2 - 185.9: Patchy vein material, 45% alt mafics within interval. 200.05 - 200.4: Coarse grained bull qtz vein. 202.2 - 203.1: 5 cm wide vein oriented sub-parellel to C.A. 203.4 - 204.15: Massive bull qtz. {179 - 185.9} rubbled core and «flt bx zones» 186 - 190.4: 35% white to gray qtz veining and flooding, 65% dol alt/flooding occurs as veins, laminations at at depth the laminations become contorted and folded. With increasing depth the alteration becomes massive to patchy rather than lamellar. 221.1 - 221.6: Gray qtz vein material is broken semirounded - healed fault bx? {223.4 - 227.7} intermittant «flt bx zone» {230.8 - 231} flt bx» {233 - 233.6} «flt bx»	90	Rock is pervasively dol altered. Alteration intensity varies from mod to v. intense bands of brown sericite common locally - along fractures, assoc with veins. Weak gray to yellow sericite present in fault intervals and associated with qtz veins. {177.4 - 179} «Mod sil» flooding assoc with white to gray qtz veining. {209.2 - 211.6} Patchy «wk silic» 217.7 - 221.5: 10% rusty sericite and limonite give dol alt core bx appearance. 222 - 223.2: Patchy chlorite alt'n in weakly altered mafics and interstial to dol alt. 220.8 - 223.1: Patchy wk to mod - silic -predominantly gray qtz veining. 225.55 - 227.5: Intense dol alt, gray. 233.8 - 234.2: Rel unaltered mafic. 237.9 - 239.3: Mod dol alt;n, wk chl alt'n.	Minor gn, sp, along margins some of qtz veins. 2 - 5% f-c dissem py. {225.55 - 227.5} «10% py blebs» associated with qtz veins.	221.1 - 221.6: The broken qtz vein material is likely related to the underlying fault zone.
239.30 TO 245.05	«Py/Sil Alt Maf?»	Gray, pink. Original textures destroyed; massive to mottled in appearance. 1% white qtz veining. {242.8 -243.8}		Core is moderately to intensely silicified with subordinate amounts of folomite/dolomitization and gray sericite.	10% pyrite overall locally pyrite content is 50% with semimassive f-c grains and blebs - assoc with silica, <1% fine grained honey sp in these zones.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		«flt bx zone» qtz/dol veins at upper and lower contacts.		239.9 - 241.4: Silicification less intense and a corresponding increase in dol, ser fuchsite.		
245.05 TO 246.55	«Brn Ser/Dol Altn»	Buff, brown. Fine. Original rock textures destroyed. Gradational contacts 2% white dol stringers. Sercitie foliation	65	Bunded brown sericitically altered rock alternating with buff colored dolomite altered rock.	5% f. grained, f. dissem py.	
246.55 TO 249.90	«Flt Bx Altn» Silicification Ser, Py, Dol, Alt'n + Flt bx.	Gray, buff. Fine. Interval is weakly but pervasively fault brecciated. Original textures destroyed. 1% white qtz veining.		246.55 - 248.6: Interval is strongly silicified towards center of interval. Weakening and being replaced by dol alt towards margins. 248.6 - 249.9: Interval dolomitically altered with 25% v.f.g. brown sericite.	{246.55 - 248.6} «<20% py, minor sp» Py is f. grained and occurs as blebs, coarse dissem primarily within silicified core, sp is v.f. grained, honey colored, assoc. with silic. 248.6 - 249.9: 5% py cubes, f-c dissem.	
249.90 TO 262.75	«Dol/Ser Maf?»	Gray, brown. Fine to med. Original textures destroyed by alt. 252 - 256.8: 15% white to gray, patchy qtz veining. {256 - 256.8} «qtz vn» has been brecciated and recemented by silica.		Pervasive mod to intense dolomite alt, 15% rusty brown sericite - primarily towards base of interval. 249.9 - 250.6: 5% fuchsite.	Minor sp, gn, cp associated with qtz vein, 15% f-med grained coarsely dissem py. {249.9 - 256} «Min gn, sp, cp, 15% py»	
262.75 TO 275.85	«Atz Ser Alt Maf?»	Yellow, gray. Fine. Most original textures are destroyed but presence of minor argillite fragments/beds indicate a sedimentary origin. Sericite foliation/banding weak bx adjacent to veins. Massive white qtz (85%) pink to gray dol (15%) veining. Main qtz veins between: 256.7 - 266.5: Mssv; bull qtz vn, 10% alt seds; 266.9 - 267.3: 20% alt seds in bull qtz. 270.8 - 271.4: Bull qtz vn. In addition to these veins there is an additional 5% qtz veining.	40 50	Core is strongly sericite altered predom yell. sericite with subordinate grey sericite. Minor fuchsite at top of interval. Weak patchy dolomite alt'n.	1 - 2% coarsely dissem py.	May be volcaniclastic in origin. Sericite alteration distributed around qtz veining.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
275.85 TO 277.20	«Dol Maf Dyre?»	Green. Med. Narrow gradational lower contacts, 3% gray qtz veining; dolomite alteration bleaches/speckles core.		Chlorite alt, minor fuchsite, becomes sericitically altered and bleached at base of interval, pervasive wk to mod. dol alt throughout interval. Weak silicification at base of interval.	2% py.	
277.20 TO 283.85	«Qtz/Ser Alt Maf»	Green, yellow, white. Fine. Alteration has largely replaced original textures, basal contact is faulted 15 - 20% white qtz veining. Some veins are truncated and folded. Interval grades into and out of a dark green chlorite altered mafic between 280.35 - 280.65 m. 281.55 - 282.1 m. - gradational contacts. 282.8 - 283.2 m. - gradational contacts.	60	Intense yellow sericite alt banded by some qtz veining, local zones of intense chlorite alt'n.	1% py.	The chlorite altered mafic appears to be similar to the overlying mafic dyke.
283.85 TO 290.50	«Ser Maf/Sed Tran Bx»	Yellow, green, black. Fine. 90% of the interval is int altered mafic in composition, 10% argillite, 90% of the argillite ocurs in two beds between: 286.55 - 286.9 m. and 288.2 - 288.5 m. 5% patchy qtz veining. 35% of the mafic exhibits sericitically altered bx clasts, clasts are subangular to rounded. The bedding contacts between the mafics and the argillites are contorted. The lower argillite bed is in contact with a 1 cm. wide qtz vein and contains 30% siliceous clasts.		The mafic component is strongly yellow sericite altered with minor patches of chlorite alteration.	Trace cp in qtz veins. 2% f.g. py.	The origin of the breccia texture is uncertain - appears to tectonic.
290.50 TO 303.90	«Ser Alt Maf»	Green. Fine. Massive to banded at Pale to (minor) dark green coloration. 1% bands are med green, siliceous - cherty qtz, ash beds? Pervasive alteration. 2% white qtz veining. 296.4 - 296.7: Weakly flt bx. END OF HOLE	80	Mafics are weak to moderately yellow sericitically altered minot chlorite alteration.	1% f. med grained coarsely dissem py.	

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
8061	71.00	72.80	1.80								39	86	85				40	106		6	2.1	19	
8062	74.80	76.40	1.60								54	95	34				250	61		1	1.7	34	
8063	76.40	77.40	1.00								76	18	58				116	161		9	0.9	62	
8064	77.40	78.40	1.00								81	11	51				52	143		7	0.6	54	
8065	78.40	80.70	2.30								29	12	29				69	46		4	0.9	44	
8066	80.70	82.20	1.50								92	144	17				23	78		1	2.0	25	
8067	90.50	91.95	1.45								5	56	29				15	17		1	1.5	2	
8071	104.20	105.70	1.50								256	177	857				161	52		13	3.7	41	
8072	105.70	107.30	1.60	.030	.12	.11	3.5	.17			304	1160	1130				412	52		32	3.5	172	
8073	107.30	108.80	1.50	.029	.05	.08	3.0	.17			294	474	788				325	64		29	3.0	172	
8069	108.80	110.50	1.70	.189	.86	.39	31.9	.44			1885	8582	3976				610	28		845	31.9	435	
8070	110.50	112.00	1.50	.003	.01	.01	0.7	.02			26	83	60				81	54		12	0.7	61	
8075	119.85	121.35	1.50								38	70	68				120	55		5	1.8	22	
8076	124.00	125.50	1.50								74	46	43				134	37		3	1.7	13	
8077	136.40	137.90	1.50								26	36	51				122	86		2	0.9	4	
8078	143.10	144.60	1.50	.093	.26	.13	12.8	.04			927	2623	1305				187	130		129	12.8	36	
8079	151.60	153.00	1.40								52	296	87				66	35		1	2.7	1	
8080	153.00	154.40	1.40								46	405	480				145	54		1	2.9	25	
8081	155.50	156.90	1.40								30	137	104				290	78		2	2.4	18	
8082	159.10	160.60	1.50								81	811	1082				166	26		1	4.7	44	
8084	170.20	171.70	1.50								29	139	91				206	47		1	1.5	34	
8085	171.70	173.50	1.80								52	353	156				568	55		2	1.7	21	
8086	173.50	174.35	0.85								28	243	93				333	23		1	1.8	17	
8087	174.35	175.60	1.25								21	78	54				68	77		1	0.7	19	
8088	175.60	177.40	1.80								29	277	156				39	46		1	1.2	29	
8089	177.40	179.20	1.80								21	90	47				52	78		1	1.0	10	
26004	184.00	185.90	1.90								24	90	55				56	35		1	0.9	18	
26005	185.90	187.70	1.80								29	78	51				30	37		1	0.8	9	
8090	187.40	188.90	1.50								22	86	61				57	62		1	1.2	9	
8091	188.90	190.40	1.50								18	72	43				55	51		1	1.2	2	
8092	199.00	200.50	1.50								40	97	26				67	56		1	1.6	1	
8093	203.40	204.80	1.40								45	43	87				97	44		2	1.9	4	
8094	204.80	206.20	1.40								57	322	74				133	46		3	1.9	21	
8096	207.60	209.00	1.40																				
8095	209.50	211.00	1.50								75	91	93				67	34		1	1.3	16	
8096	211.00	212.50	1.50								74	133	168				72	38		1	1.9	19	
8098	218.50	220.00	1.50								70	113	131				114	59		1	1.9	19	
8099	220.00	221.50	1.50								77	577	291				143	38		5	2.1	6	
8100	221.50	223.00	1.50								31	166	157				70	53		2	2.3	3	
26001	223.00	224.50	1.50								81	1048	469				197	214		5	2.7	11	

Sample	From (m)	To (m)	Length (m)	CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB
26002	224.50	226.00	1.50								61	85	74				116	93		5	2.1	24
26003	226.00	227.50	1.50								70	98	86				106	80		6	1.8	40
26006	231.60	233.10	1.50								56	405	160				185	78		5	2.0	18
26007	239.30	240.80	1.50								61	355	167				229	61		11	2.2	2
26008	240.80	242.30	1.50								38	174	120				143	37		6	1.2	27
26009	242.30	243.80	1.50								26	35	86				108	30		6	1.2	21
26010	243.80	245.05	1.25								25	112	98				142	43		6	1.3	23
26011	246.55	248.05	1.50								52	491	270				140	128		7	2.1	48
26012	248.05	249.50	1.45								132	242	133				228	92		7	1.9	70
26013	249.50	251.00	1.50								164	190	100				334	238		623	2.9	36
26014	251.00	252.50	1.50								108	109	93				360	77		8	2.4	58
26015	252.50	254.00	1.50								117	205	128				431	78		849	2.7	68
26016	254.00	255.50	1.50	.041	.05	.03	6.7	.03			411	456	320				206	79		17	6.7	26
26017	255.50	257.00	1.50								124	686	399				101	57		33	3.1	18
26018	258.20	261.20	3.00								49	80	37				293	58		247	1.8	24
26019	284.60	286.10	1.50								38	55	30				61	73		13	0.5	2

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
8060	50.90	53.90	3.00	60.03	14.90	2.31	2.48	.35	3.53	5.45	.07	.59			57	131			5	37	1.3	55	.18		.55	90.50	40	1
8068	97.00	99.90	2.90	29.83	17.93	5.28	16.77	.32	.89	10.77	.33	.85			25	181			10	49	2.2	15	.16		2.17	84.63	1	1
8074	114.90	117.90	3.00	70.49	8.57	3.12	3.05	.22	1.81	3.82	.19	.62			62	61			5	90	1.2	34	.31		1.63	93.95	69	7
8083	163.60	166.60	3.00	39.83	15.28	5.80	9.73	.26	2.06	10.01	.33	1.49			114	141			5	97	1.8	40	.20		3.55	88.67	15	1
8097	212.50	215.50	3.00	42.08	13.35	9.40	6.08	1.11	1.31	8.75	.24	1.37			77	312			5	59	2.1	72	.20		1.46	85.41	92	1
26020	297.80	300.80	3.00	67.28	15.09	.16	2.40	.51	3.15	5.03	.10	.61			13	46			5	57	0.5	28	.09		1.40	95.92	4	1

MINNOVA INC.
DRILL HOLE RECORD

HOLE NUMBER: RG329 | IMPERIAL UNITS: | METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: Sam Horizon

PLOTTING COORDS GRID: Surveyed cds.
NORTH: 1050.79 N
EAST: 11814.88 W
ELEV: 1038.80 el.

ALTERNATE COORDS GRID: Estimated
NORTH: 10+50N
EAST: 118+ 0W
ELEV: 1038.00

COLLAR DIP: -55° 0' 0"
LENGTH OF THE HOLE: 299.90m
START DEPTH: 0.00m
FINAL DEPTH: 299.90m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: June 27, 1990
DATE COMPLETED: July 1, 1990
DATE LOGGED: June 29, 1990

COLLAR SURVEY: NO
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: Frontier
CASING: Pulled
CORE STORAGE: Samex Camp

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
63.10	-	-58° 0'	ACID	OK		-	-	-	-	-	
102.70	-	-56° 0'	ACID	OK		-	-	-	-	-	
153.60	-	-51° 0'	ACID	OK		-	-	-	-	-	
203.30	-	-51° 0'	ACID	OK		-	-	-	-	-	
299.90	-	-47° 0'	ACID	OK		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 54.80	«CSG»					
54.80 TO 114.20	«Dol/Ser Maf»	Gray, Buff, green. Fine. Where alteration is weak the matrix is fine grained to aphanitic, non-clastic, flow? The core is variably altered throughout intense dol alt core is bleached green to gray, sericite altered core is yellowish to gray, chlorite all core is green. [59.5 - 66.4] «flt bx, gou zone» 10% white qtz (45%) dol (55%) veining. Some veins are weakly folded or brecciated in competant core. Brecciation tends to be located in zones of more intense alteration where fault activity is not otherwise noticeable. Intervals with clastic textures between 57 - 57.7m 88 - 94.3: Tectonic? Brecciation, gray matrix, clasts are subangular to subrounded. Max clast length 5 cm. 95.3 - 96.5: Patchy c. grained dol vein with 15% qtz. 96.5 - 114.2: Non descript fairly massive, minor clasts - lapillis? wkly calc. at 108.8 m. core is foliated at contains two qtz (15%) dol (85%) vns between 108.9 - 109.2 m. and 111.5 - 112.2 m. Lower contact is sharp at appears to be conformable.	45 60	Core is generally mod to intensely dol. altered, local intervals where dol alt weakens, and chlorite alt also present, predominantly between 62 - 67.2 m. Patchy yellow brown sericite alteration strong yellow sericite between 86.5 - 88.1 m. Mod yellow and brown ser, minor massive green sericite between 88.1 - 94.3 m. 80 - 86.5: Gray/brown sericite alt'n and dol patches.	2 - 5% fine to coarse grained py, disseminated.	63 - 65.8: 90% recovery.
114.20 TO 149.60	«Arg/Silt Wcke»	Black, gray. Fine to coarse. Core is strongly rubbled throughout interval - decreases towards base, local zones of fault breccia and gouge. [122.3 - 123.7] «flt bx» [130.9 - 133.2] «flt bx» [140 - 140.4] «flt bx» 70% of interval is argillite and siltstone, 30% is fine to coarse grained weakly calcareous wackes. Grains to 1 mm.		Argillites are weak to moderately graphitic, local minor gray/white sericite developed.	Minor to 1% py dissem, minor py bands.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		Bedding is variable - ranging from 0 to 70 degrees with the latter being most common. At 127 m. graded bedding fines up hole. At 136 - 138 m. hinge zone? At 146.3 m. graded bedding fines uphole. 5% white qtz veining containing 10% cream to gray dol; max vein width 20 cm.; preferred vein orientation at veins locally brecciate wall rock. Locally beds are offset forming breccia textures. 114.2 - 115: Cleavage plane offsetting bedding at Where bedding is at at 118 m.; ser foliation at bedding non-planar. [114.4 - 114.5] «Met Frag» grades into fragmental arg in either direction; contains subangular clasts of arg, dol/qtz, sericite alt. clasts.	90 30 70 30			
149.60 TO 151.30	«Py/Ser Met Frags?»	Gray. Fine. Matrix is similar to overlying wckes - ie. f=c grained but unit contains sericitically altered clasts, argillite clasts and qtz/dol clasts (in order of increasing abundance) and is pyritized and sericitically altered max clast size 4 cm. Clasts are subangular to subrounded. 5% white qtz/dol veining to 1 cm. Foliation at	55	Top of interval is weakly gray sericite altered, alteration increasing downhole. 150.5 - 151: Strong dol. content.	[149.6 - 151.3] «15% py» f - med. grained, dissem and bands py content ranges from 5 - 30%, high pyrite content assoc. with sericite.	Qtz/dol clasts are probably produced by shearing action. Subparallel to bedding.
151.30 TO 153.40	«Sil/Dol Arg»	Black. Fine. Black argillite with 15% dol veins and patches some of the patches are nodular and appear to be discrete from the argillite - alt. wckes? Weakly fault bx. 1% late stage, discontinuous qt dol stringers - tension fracture in filling?		Patchy weak to mod silicification. Mod to int dol alt.	<1% coarsely dissem py in later stage qtz dol stringers. 5% pyrite bands/patches in basel 20 cm. of interval.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
153.40 TO 154.40	«Sil/Py Het Frag?»	Gray. Fine. Core is qtz flooded which masks some textures, clasts include arg, qtz?, sericitic alt. fragments. 1% qtz/dol veining.		Weak to mod gray sericite alt.	5% f. - med grained py coarsely dissem, stringers and interstial to clasts. Basel 10 cm. of interval contains 35% semi-massive py. {154.3 - 154.4} «35% py»	
154.40 TO 166.55	«Dol/Ser Maf?»	Gray, yellow, brown. Fine. Original textures completely destroyed. 3% white qtz/dol stringers. {162.2 - 162.85} «flt bx»		40% patchy, massive yellow brown sericite which is brecc. by intense dolomite alt. glassy in appearance but silicification is minor.	1 - 2% dissem py.	Similar style of alteration and rock as seen in hole RG-328 between 80.7 - 89.3. Alteration is much more intense in hole. RG-329 originally labelled this unit as Sed?
166.55 TO 203.00	«Ser Seds?/ Arg»	Yellow, black, gray. Fine. Patchy qtz (30%) gray dol (70%) veining between 166.55 - 168 m. Core consists of ser alt, qtz stringers and veins and black arg. The sericitically altered material frequently occurs as laminae with argillite. 166.55 - 185: Composition is 20% qtz vein, 15% arg, 65% sericite. 185 - 203: 20% sericite alt core, 3% qtz veining 77% arg/siltstone. Sericite alt'n decreasing downhole. Bedding angles at 168.5 m. 173 m. 179 m. Contorted Bedding, cleavage at 197.4 m. 201 m. bedding at Offsetting cleavage at Numerous narrow intervals of flt bx/gou.	 80 70 80 90 80 0 15	Intense yellow to yellow/green sericite alteration. General decrease in yellow sericite downhole.	2 - 5% dissem py.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
203.00 TO 205.80	«Sil Arg»	Black. Fine. Gradational upper contact. 10% gray qtz veining cutting argillites, wk fault breccation disrupts some beds/veins.		Patchy moderate silicification, bleaches core locally, minor wk gray sericite alteration.	5% py - f - med grained, coarse dissem, stringers, patches and minor beds? Py is primarily associated with and in vicinity of qtz veins.	
205.80 TO 207.70	«Flt Tran Z one?»	Gray. Fine. Original rock textures destroyed by faulting and a alteration. Pervasive fault bx and clay gouge alt'n. 5% black argillite remnants. 207.45 - 207.6: White dol (50%) gray qtz (50%) vein with sericite alt margins.		Rock is gray sericite and dolomite alt. Minor amounts of green talc.	5% f = med grained py, coarsely dissem. {205.8 - 206.8} «<1% sp, 15% py» sp occurs in a 1 cm. wide interval containing 20% sp at 206.6 m. Py is locally semi-massive.	Interval appears to have been predominantly sedimentory.
207.70 TO 212.40	«Dol Maf?»	Gray. Fine. Generally a non-descript gray with 1% black arg beds having a max thickness of 4 cm. Origin of primary rock type uncertain. 15% gray dolomite (85%) qtz (15%) veining. Gouged upper contact gradational lower contact. Minor gouge zones.		Pervasive moderate dolomite alt'n. Patchy brown sericite alt'n. Minor fuchsite.	2% dissem py. 110.6 - 110.9: 20% f-coarse grained py.	Protholith may be an immature sed.
212.40 TO 223.70	«Dol Arg Fl t Bx»	Black, gray. Fine. Interval is pervasively faulted - weakly to intensely frequently clay gouge. 10% white to gray qtz/dol veins and stringers. Bedding is contorted, some beds/veins are offset/brecciated.		Banded black arg and dol gray alt/silt weak to mod gray sericite alt'n in faulted zones. 212.6 - 213.8: Dol flooded interval weakly brecciates arg. {219.8 - 222.5} mod. «sil, graph arg» interval contains 20% qtz veining and stringers. Strongly graphitic.	2 - 5% f = med. grained coarsely dissem py.	
223.70 TO 225.20	«Sil Chrty Arg»	Gray. Fine. Weakly laminated/bedding beds have variable/ folded orientations, intensely siliceous, minor patches late stage/remobilized? White qtz veining.			<1% f = med grained dissem py.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
225.20 TO 237.05	«Ser Arg/Silt Bx»	Black, Gray, White. Fine. 15% white to gray qtz vein to 15 cm, veins contain minor dolomite primarily along fractures. Argillite and altered arg/silt stone from laminae, fine beds. Beds and some veins are tectonically stretched, boudined and locally brecciated primarily foliation/bedding? Orientation at 226.2 - 226.5: Alter mafics?	60 70	Minor patchy brown sericite, weak to mod. patchy dol veining and alt'n. Gray sericite alteration of silty? beds.	10% med - coarse grained py, coarsely dissem, pervasive.	
237.05 TO 237.65	«Met Frag?»	Gray. Med. Med grained matrix supports 30% clastic material. The predominant clast type is angular fragments of argillite to 4 cm. long by 1 cm. thick, Lesser amounts of clasts include qtz/dol and brown ser alt. fragments. Arg fragments comprise 80% of clasts.		Pervasive mod dol alt of matrix patchy sericitic - brown to gray.	Appears to be a lithic wcke or debris flow.	
237.65 TO 270.30	«Arg/Maf? Tran Zone»	Black, gray. Fine. 65% black arg interbedded with 35% of a non-descript green gray, fine grained mafic?/ volcaniclastic sed? Various beds/unit can exceed 1 meter in thickness. 10% white to gray qtz veins to 20 cm. thick which contain <20% gray to pink dolomite veins are fine to coarse grained and are locally assoc. with sulphide mineralization. {241.2 - 242.3} «flt bx» {239.55 - 239.8} «Cherty arg» {244.9 - 245.04} «Cherty arg» Primary bedding orientation Locally contorted.	60 70	Mafics? are moderately dolomite altered with patchy brown sericite. Arg is locally bleached and weakly ser. or dol alt. Minor silicification.	<5% py dissem throughout core with local concentrations. Minor cp, sp, gn mineralization overall concentrated in qtz veins as indicated below: {244.1 - 244.7} «2% gn, cp, 10% sp» Coarsely dissem with 15% py in qtz vein. {247.7 - 249.2} «15% py, 3% gn, sp, cp» from 247.7 - 248 m. there is 50% med. grained py, semi-massive with <5% gn, 2% cp, remainder of above interval contains subintervals, <7 cm wide which contain semi-massive py 10% sp. Sulphides assoc with silica.	
270.30 TO 275.70	«Dol/Sil Maf»	Gray, green. Fine. Mafics are v. fine grained, sharp upper contact with a 3 cm. wide mineralized qtz vein. Base of interval is a 25 cm. wide white qtz vein.		Pervasive weak to mod. dol alt, patchy weak to moderate silicification. 1% brown sericite alt'n along fractures.	2% fine grained very coarsely dissem base metals in strongly silicified/ veined interval between 270.3 - 274.3m. in order of abundance sp, cp, gn.	

2440

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
				270.3 - 270.9: Not silicified.	3% f - med. grained py, coarsely dissem.	
275.70 TO 299.90	«Dol Maf»	Green, gray. Fine. Mod to intensely altered fine grained mafics. 8% white qtz (60%) pink dol (40%) veining. ‖278.1 - 283.6‖ patchy «flt bx, gou» END OF HOLE		Patchy mod to intense gray dol alt'n, locally exhibits rounded brecciated textures in a chlorite/brown sericite matrix. Minor fuchsite. 277.2 - 278.6: 5% rusty limonite/ siderite.	Minor coarsely dissem cp, gn assoc. with qtz veining (locally to 3%) between 278.3 - 280.5 m. 2% dissem py within mafics <10% py in qtz veins.	

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
26022	76.10	77.40	1.30								72	45	34				25	36		1	0.9	1	
26023	82.90	84.40	1.50								49	86	27				170	87		1	0.9	2	
26051	114.20	114.90	0.70								79	66	72				161	82		1	1.5	27	
26025	148.00	149.60	1.60								42	93	48				44	124		1	0.8	1	
26026	149.60	151.30	1.70								305	943	568				209	122		8	3.0	51	
26027	151.30	152.80	1.50								87	330	139				124	204		22	2.8	79	
26028	152.80	154.40	1.60								33	97	108				190	109		7	1.9	91	
26029	154.40	155.80	1.40								75	97	65				199	84		3	1.1	52	
26030	155.80	157.30	1.50								96	88	15				92	63		1	0.9	3	
26031	166.50	168.20	1.70								67	63	35				42	39		1	0.5	1	
26033	205.80	207.40	1.60								53	1048	216				775	43		12	0.2	25	
26035	237.05	237.65	0.60								111	236	174				65	60		34	2.0	2	
26036	244.00	245.20	1.20	.049	2.40	1.08	12.0	.03															
26037	247.70	249.20	1.50	.161	.59	.68	13.7	.04			1609	5861	6827				155	50		25	13.7	31	
26038	270.30	271.60	1.30	.049	.77	.25	4.2	.08			492	7744	2538				360	38		10	4.2	40	
26039	271.60	272.90	1.30	.016	.48	.19	4.1	.11			164	4752	1987				224	37		8	4.1	82	
26040	272.90	274.30	1.40	.131	.29	.17	5.1	.01			1310	2955	1710				294	34		9	5.1	106	
26041	278.00	279.50	1.50								78	529	235				100	260		1	1.2	2	
26042	279.50	285.00	5.50								2318	352	573				80	35		10	5.4	1	

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
26021	65.00	68.80	3.80	38.32	11.12	10.17	8.94	.43	1.31	9.61	.42	1.31			93	50			5	54	1.7	23	.45		2.40	84.52	95	1
26024	129.90	132.90	3.00	53.82	16.60	1.89	3.46	.29	3.71	7.85	.10	.79			48	95			5	64	1.0	38	.30		0.18	89.07	42	1
26032	175.90	178.90	3.00	59.52	15.85	.45	2.62	.73	3.23	7.20	.46	.77			29	65			5	64	0.2	41	.23		1.15	92.30	86	1
26034	230.70	233.70	3.00	60.95	15.23	0.43	2.64	.39	3.41	6.66	.24	.83			44	82			5	141	0.4	57	.26		2.90	94.12	87	1
26043	288.60	291.60	3.00	42.53	9.76	9.55	7.33	.69	.84	9.44	.44	.91			65	150			5	76	1.6	81	.36		2.74	84.69	70	5

MINNOVA INC.
DRILL HOLE RECORD

HOLE NUMBER: RG330 IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: Sam Horizon

PLOTTING COORDS GRID: Sam Survey
NORTH: 806.20N
EAST: 11802.50W
ELEV: 1030.14

ALTERNATE COORDS GRID: Estimated
NORTH: 8+ 0N
EAST: 118+ 0W
ELEV: 1030.00

COLLAR DIP: -55° 0' 0"
LENGTH OF THE HOLE: 293.20m
START DEPTH: 0.00m
FINAL DEPTH: 293.20m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: July 1, 1990
DATE COMPLETED: July 6, 1990
DATE LOGGED: July 4, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: Frontier
CASING: Pulled
CORE STORAGE: Samex Camp

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
84.40	-	-52° 0'	ACID	OK		-	-	-	-	-	
142.30	-	-56° 0'	ACID	OK		-	-	-	-	-	
227.70	-	-54° 0'	ACID	OK		-	-	-	-	-	
267.30	-	-54° 0'	ACID	OK		-	-	-	-	-	
293.20	-	-54° 0'	ACID	OK		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 48.70	«Csg»					
48.70 TO 67.45	«Arg/Alt Wcke?»	Gray, Black, white. Fine med. 75% of interval consists of black argillites. Argillites contain up to 50% white to gray qtz veins and stringers. The veins contain <20% dol most of which coats fracture surfaces veins parallel and crosscut bedding and local brx and silcify the argillites. Bedding is frequently disrupted and contorted. Cleavage plane fairly consistent at Weak secondary cleavage. 25% of interva is green-gray wcke? Wacke beds locally contain argillite laminae. Wckes grain size to med; unit generally nondescript. {61.5 - 62.2} «Flt gouge bx»	70 30	Minor patchy mod silicification. v.f.g. sericite is developed throughout much of the interval which gives phyllitic surfaces. Argillite is graphitic . Wcke beds are weakly dolomitized and locally bleached silicified.	2 - 10% py in fine to med grained, fine - coarse dissem.	Wckes? may be volcaniclastics on possibly tuffaceous beds (in which case the unit would be a MAF/ARG TRAN ZONE).
67.45 TO 68.75	«HET FRAG»	Gray, black, white. Fine. Clast composition include argillite, silicified argillite, sericitically altered clasts and qtz vein clasts. Clasts are angular to subrounded. Max clast size is over 5cm matrix is fine to med grained and altered. Coarse clast content varies frame work supported at top of interval, matrix supported at base, gauged lower contact.		Matrix is dolomitically altered, patchy /streaky brown sericita alt, some argillite clasts are silicified.	5% py in f - c grained dissem and stringers.	
68.75 TO 69.50	«Sil Arg»	Black, white. Fine. Black argillite veined by 3% white/gray qtz veins and stringers. Veins have no preferred orientation.		The arg are moderately silicified.	3 - 5% py in dissem and stringers.	
69.50 TO 88.50	«Dol Maf»	Gray. Fine. Non-descript gray mafics, 1% massive white qtz veining which contains <20% dolomite. Upper contact is weakly brecciated and silicified. 3% gray qtz stringers.		Rock is pervasively moderately dolomitized. Locally intensely alt. minor to 10% brown sericitically altered patches, minor fuchsite. {69.5 - 73.1} «intense dol alt'n.»	Minor v.f.g. gn in gray qtz stringers. 3 - 10% py in dissem and minor pyritic bands.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
88.50 TO 90.30	«Qtz Vein»	White. Coarse. White, massive bull qtz vein containing 10% coarse grained gray dol.				
90.30 TO 102.20	«Dol Maf»	Gray. Fine. Non-descript, gray contains 1% white qtz veining. 94.3 - 96.1: Narrow intermittant zones of flt gauge. {101 - 102.2} «flt bx gau» increasing in intensity downhole.		Pervasive mod dol. alt, minor brown sericite alt'n.	<5% py, f - med dissem. Minor gn in qtz veins. {90.3 - 92.2} «10 - 20% f.g. py»	
102.20 TO 106.50	«Flt Bx Dol /Ser Maf»	Green, gray. Fine. Plane of foliation elongate, ductile shearing tect. brecc., flattened and rounded qtz/dol/carb veining and altered mafics. Iron rich components have altered to sericite. Faulted upper contact. Gradational lower contact.	60	Intense brown sericite altered interstial to sheared qtz/dol vn and dol. alt maf.		
106.50 TO 139.50	«Dol Maf Tu ff?»	Gray, green. Fine. Fine grained mafic tuff? Rock is foliated at locally this foliation warped. 5% gray qtz stringers prefer oriented at low angles to foliation. Sericite/chl alt'n locally cuts the stringers.	60 70	Pervasive weak to med. dolomite alt'n. <15% brown ser. alt'n paralleling foliation, pervasive chl alt'n. 134.7 - 139.5 dol alt'n increasing to mod -int with corresponding decrease in chlorite. Moderate fuchsite alteration.	Minor gn, sp in qtz stringers. 3% v.f.g. py dissem.	Foliation may be along bedding.
139.50 TO 188.30	«Qtz Ser Ma f?»	Yellow, green, white. Fine. Original rock textures completely altered. 10% white qtz veining, veins are massive, generally barren, max vein width 80 cm. Sericite foliation at some brecciation of qtz/dol stringers. Fault plane appears to parallel ser. foliation. {139.5 - 140.5} «int. flt bx, gou» {140.5 - 141.2} «qtz vn» {141.3 - 142.3} «qtz vn» 169.9 - 176.6: intermittant wk fault bx.	50	Rock is comprised primarily of a green to yellow sericite matrix which contains 20 - 40% f.g. white qtz/dol in matrix as grain stringers and veins.	1 - 8% f - med grained py in f - coarse dissem. Py occurs primarily within yellow sericite alt'n.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		{177.05 - 177.8} massive white «qtz vn» with 5% dolomite patches. {177.8 - 181.4} mod to int «flt bx, gou» {180.4 - 181.75} massive white «qtz vn» with 5 - 10% gray dolomite. {181.75 - 185} «flt gou, bx» intense faulting from 181.75 - 183.2 m. and weakening throughout remainder of interval. {188 - 188.3} «int flt bx, gou» 186.65 - 188.3: Core is intermittantly banded which may be original bedded texture. Banding is weakly contorted and varying in orientation at 187.7 m. banding at offsetting cleavages at and	30 60 90			
188.30 TO 213.20	«Arg»	Black. Fine. Black argillite are interbedded with silty laminae and art by 10 - 15% white qtz veins and stringers. Laminae and veins exhibit pervasive weak to intense deformational structures: brecciation, folds, fold noses, disharmonic folding, brittle and ductile offsets. Bedding angles are inconsistent but cleavage planes are consistent at with a preference for the higher angles. Max vein width 25 cm. veins locally brecciate the argillites, up to 20% gray dol. in veins. {188.3 - 188.7} «flt bx» upper contact. {196.3 - 196.5} «35% gray cherty beds» {203.4 - 203.75} «mod flt bx»	70 90	Argillites are locally v. weakly graphitic. Weak sericite alt'n gives rock phyllitic surfaces between 188.7 - 191.2. Sericite is pervasive alteration is spotty elsewhere.	<1% dissem py in the arg. 5% coarsely dissem, py is qtz/dol veins.	Core is relatively competent but is clearly a tectonic.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
213.20 TO 241.80	«Qtz/Ser Do l Alt Seds»	Yellow, gray, black, white. Fine, 5% remnant argillite beds in intensely altered seds. {215.6 - 216.8} principal «argillite» remnant - gradational upper contact. 5% white qtz veins from 1 to 20 cm. wide veins are generally massive with <20% dolomite, minor pyrite, local wallrock clasts fault zones occur at: {216.7 - 221.5} intermittant «flt bx, gou zone» varying from wk to intense. {232.4 - 233.1} wk to mod «flt gou» {235.8 - 236.2} intense «flt gouge» {237.8 - 238.7} intermit mod to int «flt gouge zone» Alteration has largely destroyed/masked original rock types. The rock still appears to be banded/ laminated principal foliation/banding orientation core contains abundant tectonically brecciated zones throughout the interval. {237.7 - 241.8} «int. tect. bx» zone qtz veining is pretectonism. Cleavage plane (axial?) at 239.4 m. at {241.1 - 241.25} interval is approaching «Met Frg?» texture - contains clasts of qtz/dol, arg, ser, stretched pyrite wisps.	70 80	Alteration mineralogy in order of decreasing abundance are yellow sericite, qtz, dolomite. Locally the sericite takes on a greenish tinge.	1 - 8% med. grained py. Fine to coarsely dissem. Local fine grained seminassive pyrite with a max width of 3 cm. (located at 236.9 m.) pyrite bands are generally discontinuous and offset by tectonism. Pyrite bands primarily located at base of unit in the strongly tect. bx. 239.4 m., 5 mm. seam containing silver gray fractured aspy in gray qtz with yellow fine grained pyrite, dissem and envelope	This unit is the same type of rock/ alteration that was called "SERT" in previous years drillign by/in the mine.
241.80 TO 245.30	«Qtz Vein»	White. Coarse. Massive white qtz vein moderately fractured; contains 10% sericitically altered country rock, late stage, cross cutting gray qtz stringers. 242.8 - 242.9: Black arg. 244.2 - 245.3: Increasing ser. alt. wallrock downhole qtz vein fades into gradational contact at 245.3 m.		Wall rock bands/inclusions are sericitically altered.	5% f.g. patches of massive py in qtz.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
245.30 TO 284.60	«Qtz/Ser Alt Sed»	Yellow, gray, green, white. Fine. Original mineralogy largely replaced small intervals of remnant black argillite largest zones occur at {256.8 - 257.17} «Arg» {263.7 - 264.3} «Arg» brittle shearing, fold hinge zone bedding {264.85 - 265.1} «Arg bx» {265.25 - 266} «Arg bx« arg. matrix contains clasts of qtz, sericite alt rock, broken pyrite and pyrite patches, bands, faulted lower contact. 255.2 m: a 1 cm. wide trancated gray chert bed. tect. bx textures disrupt laminated beds? Laminations/beds are locally contorted, folded. Fold hinge zone between 258.9 - 261.3: bedding angles vary locally but generally at low angle to core axis. Axial cleavage Beds are drag folded along cleavage. 5 - 10% massive, white qtz veining which contain variable amounts of coarsely dissem/patches of py, sericitically altered seds. {272 - 272.5} «flt bx, gou» {283.9 - 284.6} «wk flt bx, gou» 279 - 282.6: 35% qtz veining varying orientations veins to 25 cm. 266 - 271: Broad hinge zone, bedding laminations vary in orientation from 0 - 45 degrees to C.A., Axial cleavage at 269 m. at Some brecciation associated the folded zones.	90 75 90	245.3 - 249.4: Interval consists of 55% qtz, 35% greenish sericite and up to 10% pyrite. - intensely silica flooded/veined interval. 249.4 - 254.55: Sericite is an olive green color, sericite makes up 60% of interval with 35% qtz. Minor dol. 5% pyrite. 254.55 - 256: Sericite is predominantly pale yellow to mustard. 256 - 270.3: A mixture of olive green and yellow sericites. 270.3 - 284.6: Olive green sericite and silica.	2 - 5% med. grained py in f - coarse dissem, str. {246.9 - 249.4} «3 - 20% py» in f.g. patches, coarse dissem semi-massive bands. {271.05 - 271.36} «45% py, 1% cp» py is semi-massive in a qtz sericite matrix.	
284.60 TO 285.50	«Qtz Vein»	White. Coarse. 5% pink to gray dolomite, 5% sericite alt seds in massive white qtz.		Sericite alt of sed. inclusions.	<1% py in alt. seds.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
285.50 TO 293.20	«Qtz/Ser Alt Sed»	Yellow, green, gray, white. Fine. Intensely alt seds as in the overlying interval 245.3 - 284.6 m. upper contact is rubbled 10% white qtz veining. END OF HOLE		A mixture of olive green and yellow sericite alt'n forms 40 - 70% of interval with remainder comprised of qtz, minor dol and py.	5% med. grained pyrite in f - coarse dissem.	

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
26045	67.45	68.75	1.30								50	170	95				249	42		1	0.9	10	
26046	68.75	69.50	0.75								47	33	42				141	55		1	1.3	2	
26047	69.50	71.30	1.80								55	125	92				270	76		1	1.3	58	
26053	223.10	224.60	1.50								32	90	78				140	36		1	0.4	2	
26054	237.30	238.80	1.50								46	62	49				920	62		2	0.8	60	
26055	238.80	240.30	1.50								71	83	59				1002	52		3	0.8	62	
26056	240.30	241.80	1.50								66	41	52				2723	46		9	1.0	193	
26057	241.80	243.60	1.80								14	28	60				344	30		1	0.5	22	
26058	243.60	245.30	1.70								19	25	59				1959	30		6	0.9	144	
26059	247.00	248.20	1.20								67	86	92				1357	45		3	0.9	101	
26060	248.20	249.30	1.10								167	190	122				4993	48		24	1.6	141	
26065	264.80	266.30	1.50								65	67	75				586	74		1	0.9	45	
26061	270.40	271.90	1.50								978	69	140				1039	54		33	3.8	216	
26062	271.90	273.40	1.50								123	56	147				505	82		1	1.2	40	
26063	279.10	280.50	1.40								27	18	50				189	66		1	0.9	72	

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
26044	55.40	58.40	3.00	66.41	9.32	4.80	3.17	.32	1.88	5.70	.16	0.49			19	132			5	51	0.6	72	.06		1.70	94.10	79	1
26048	90.60	93.60	3.00	42.10	9.78	11.84	6.51	.61	1.14	9.25	.42	1.21			118	2408			15	51	5.0	2161	.15		2.75	85.81	272	9
26049	130.10	133.10	3.00	45.49	9.45	7.48	9.97	.18	.89	8.68	.38	1.21			62	654			10	33	1.7	384	.17		1.32	85.26	63	5
26050	160.00	163.00	3.00	61.85	15.72	0.01	2.69	.80	3.34	6.94	.32	0.65			41	103			5	66	0.3	46	.01		1.42	93.82	54	1
26052	202.70	205.70	3.00	67.15	14.87	0.06	2.25	.49	3.34	5.02	.18	0.56			26	66			5	48	0.4	45	.01		1.21	95.19	46.1	
26064	285.50	288.50	3.00	63.90	15.20	.01	1.44	.37	4.07	6.77	.27	0.68			19	81			5	78	0.1	43	.01		2.65	95.46	192	1

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: Forward of Sam Horz.

PLOTTING COORDS GRID: Sam Survey
NORTH: 613.89N
EAST: 11792.84W
ELEV: 1022.44

ALTERNATE COORDS GRID: Estimated
NORTH: 6+ 5N
EAST: 118+ 0W
ELEV: 1038.00

COLLAR DIP: -55° 0' 0"
LENGTH OF THE HOLE: 328.30m
START DEPTH: 0.00m
FINAL DEPTH: 328.30m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: July 6, 1990
DATE COMPLETED: July 11, 1990
DATE LOGGED: July 9, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: Frontier
CASING: Pulled
CORE STORAGE: Samex Camp

PURPOSE: Part of a fence from Sam to Rea Horizons.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
102.30	-	-58° 0'	ACID	OK		-	-	-	-	-	
108.80	-	-60° 0'	ACID	OK		-	-	-	-	-	
150.40	-	0° 0'	ACID		Bad etch.	-	-	-	-	-	
244.10	-	-62° 0'	ACID	OK		-	-	-	-	-	
291.70	-	-60° 0'	ACID	OK		-	-	-	-	-	
328.30	-	-60° 0'	ACID	OK		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 76.20	«Csg»					
76.20 TO 90.00	«Arg»	Black. Fine. Black argillite contains 15% massive qtz veins and 10% qtz stringers/patches. Stringers are locally contorted and boudined. Cleavage offests at Locally banded/brx core. {83 - 83.9} «Qv» {85 - 85.25} «Qv» {78.1 - 78.6} «flt gou, bx» {81.5 - 81.8} «flt bx and qv» {82.85 - 83.7} « flt'd rubbled core» {88.7 - 90} «flt zone»	70	Black argillites are locally weakly silicified; graphitic in faulted interals, 25% of interval grades in to/out of intensely altered arg as indicated below: Alt. mineralogy is 45% qtz, 45% yell ser, 10% dol. Altered intervals occur between: 84 - 84.7 m., 85.8 - 88 m. 88.6 - 88.9 m.	1% med. grained py blebs.	The first bit of core at the top of the hole consists of fault gouge. Hole was cased through a fault zone.
90.00 TO 127.70	«Qtz/Ser Alt Seds»	Gray, yellow, green, white. Fine. Original rock textures and mineralogy has largely been replaced by alteration. 5% massive white qtz veins which contain minor gray dolomite and pink 1<spar? Principal vein locations: {99.9 - 101.4} «60% patchy qtz vns» {102.2 - 103.2} «qv» {113.75 - 114.25} «qv» The interval contains numerous faulted intervals: 90 - 90.2: flt gouge 92.3 - 92.5: flt bx 94.2 - 95.2: intense flt bx gou 101.5 - 102.3: Weak to mod. flt bx zone. 103.8 - 104: flt bx. 108.2 - 108.8: rubbled core. 113.6 - 116.4: intense flt bx, gou.		Original mineralogy has been replaced by silica, yellow to olive green sericite and minor dolomite. These minerals generally occur in irregular banding.	< 5% fine grained py which generally occurs in blebs/bands and local coarse dissem. {109.9 - 111.15} «15% py» f.g. bands and blebs.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		{90 - 116.41} «flt bx zone» in addition to these openly faulted intervals core locally exhibits haudins, folded laminae and minor tectonic breccia. Some laminae (remnant bedding?) are offset by cleavage and are slightly drag folded along the cleavage planes. Cleavage plane	60 70			
127.70 TO 136.10	«Sil Arg»	Black, white, brown. Fine. Black arg contain 20 - 40% qtz (70%) dol (30%) veining. 2% dol altered mafics interbedded with arg. {133.95 - 134.25} «ribbon chert» gives bedding orientation. {128.05 - 128.9} «flt bx zone»	70	Arg is weakly silicified locally from qtz flooding associated with veins. Minor sericite alteration towards top of interval. Mafics are dolomitically altered and contain 2% fuchsite.	3% pyrite in f.g. patches and bands. {130.5 - 133.95} «10 - 40% py» in f - med grained coarse dissem, and semi-massive patches /bands.	
136.10 TO 143.20	«Arg Maf Tr an Zone»	Black, buff, white. Fine. 20% of interval is intensely altered, buff colored mafics which are interfingered with argillite. Arg contains 40% qtz stockwork.		Mafics are intensely dolomitized and mod to intensely sericitized (yellow to green). Argillites are moderately to silicified, locally sericitically altered. Minor fuchsite in the mafics. Weak graphitic alt. of arg. 141.1 - 143.2: String qtz veining, increasing sericite alt'n downhole.	2 - 10% f.g. pyrite dissem and massive blebs.	
143.20 TO 146.30	«Dol Maf»	Green, buff. Fine. Original texture destroyed by alteration; matrix is non-descriptive in appearance with brown pyrite patches.		Pervasive mod. to int. dolomite alt. Weak to mod. brown sericite alt. with minor fuchsite. 145.4 - 146.3: Alt'n decreasing downhole.	4 - 7% f - med. grained py occurs in in patches and streaks.	
146.30 TO 162.00	«Maft»	Green. fine med. green matrix with grain < 2mm. supports < 45% pale yellow green clasts to 15 cm. Clasts are unflattened. 3% white coarse grained calcite/dolomite veining veins are oriented at	20	Matrix is chloritic clasts weakly sericite altered.	Minor pyrite.	Core is blocky.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
162.00 TO 163.50	«Dol Maf»	Buff. Fine. Gradational contacts 5% sericitically altered clasts <1 cm. long in a non-descript and buff matrix, 2% white qtz stringers. Several stringers are offset along cleavage plane at	60 70	Intense pervasive dolomite alteration. Minor talc.	5% py in coarse dissem, stringers.	162.5 - 167.2: Blocky core.
163.50 TO 204.30	«Maf Tuff»	Green. Fine to 1 mm. Matrix is aphanitic to granular in appearance. Matrix locally contains 1 - 2% sericitically altered clasts <2 cm, number of clasts, 10% between 200.3 - 204.3. Core contains <5% intervals of dolomitic, bleached core. Foliation at 182 m. at <1% qtz/carb stringers. Core is calcareous. 195.6 - 201.4: 20% qtz carb veining.	55	Core is chloritically altered, weak to moderately dolomite altered interval.	<=1% fine grained coarsely dissem py.	Core doesn't contain any good flow top breccias but interval may contain some interbedded lava flows.
204.30 TO 328.30	«Maf Flows? »	Green. Fine to med. 204.3 - 237.7: Matrix is fine grained to aphanific, core is relatively massive, crosscut by 2 - 5% qtz carb stringers. Minor auto brecciated? clasts. 236 - 237: 70% patchy massice, white qtz veining. 237.7 - 242.4: Flow top bx? Weakly bleached clasts of mafic volc of some comp as matrix makes up 25% of volume. Clasts are subrounded. {238.4 - 238.7} «wk flt bx» 238.7 - 271.2: Chloritic volcanics spotted with abundant fine grained white carbonates (calcite Fe-calcite, Fedol, and Fe poor dol). Core is foliated throughout interval and locally veinlets are baudined parallel to foliation at approx. at 265 m. cleavage foliation at {268.3 - 268.5} «wk flt bx» at 270.5 m. foliation	65 80 65	Pervasive chlorite alteration, core is calcareous throughout. {206 - 209.3} « dol, ser, py alt.» pervasive mod. to intense dol alt, patchy mod. brown sericite alt'n.	206 - 209.3: 3 - 10% f.g. coarsely dissem py.	229 - 236: Some broad clastic textures, rims are paler than the core of the clasts - possibly related to pillow basalt or brecc pillows? Foliation due to pervasive ductile shear which enhances chlorite, carb alt'n.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		271.2 - 305.1: Core appears to be coarser grained due to 35% white Fe-poor calcite grains /spots - alt'n after feldspar?? - feldspar porphery? max grain size 1 mm. 305.1 - 309.9: Carb spotting absent, slightly grayer color, 5% subrounded clasts, possible flow breccia. 309.9 - 314.7: Chloritic, calcareous mafic volc as between 271.2 - 305.1 m.				
		314.7 - 325: Patchy bleaching flow top breccia? <30 % subrounded clasts. Clasts are vesculated. 325 - 328.3: Mafic volc. as between 271.2-305.1 m. END OF HOLE		314.70 - 325: Patchy mod. to intense dolomite alteration.	314.7 - 325: 3% f.g. coarsely dissem py.	316 - 328: Broken core.

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
26067	109.90	111.15	1.25								36	62	61				112	66		1	0.1	3	
26068	130.50	131.70	1.20								68	94	76				830	98		5	0.3	63	
26069	131.70	132.70	1.00								59	87	88				255	129		3	0.4	10	
26070	132.70	133.95	1.25								76	300	195				636	127		11	0.8	63	
26074	136.30	137.80	1.50								62	133	110				144	105		1	0.8	2	
26075	137.80	139.00	1.20								110	195	59				504	85		1	0.7	20	
26071	139.00	140.20	1.20								73	234	91				795	111		10	1.1	7	
26072	140.20	141.70	1.50								61	108	113				323	118		6	1.1	5	
26073	141.70	143.20	1.50								51	44	79				89	190		1	0.9	89	
26076	143.20	144.70	1.50								110	195	59				504	85		1	0.7	20	
26079	207.60	209.30	1.70								89	49	65				51	189		3	1.5	44	

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
26066	78.40	81.40	3.00	69.48	12.01	.01	1.81	.45	2.84	5.10	.13	.46			22	35			5	62	0.1	35	.01		.17	92.53	65	1
26077	150.40	153.40	3.00	39.21	11.19	10.84	9.87	2.15	.07	8.93	.15	.95			75	52			15	7	1.1	23	.09		.01	83.47	41	1
26078	191.10	194.10	3.00	38.21	11.91	14.25	9.38	1.99	.06	8.94	.15	1.59			58	51			5	15	1.4	18	.37		.03	86.88	1	1
26080	238.60	241.60	3.00	41.63	12.20	8.62	13.19	1.49	.09	10.07	.15	1.04			91	56			5	51	1.4	14	.10		.14	88.73	1	1
26081	288.60	291.60	3.00	39.53	12.36	11.60	10.45	2.48	.14	10.05	.16	1.38			78	54			5	541	1.3	14	.18		.01	88.39	1	1
26082	352.20	328.20	-24.00	37.55	11.39	11.81	9.95	.50	1.22	10.16	.13	1.30			72	47			5	43	1.3	19	.17		.09	84.12	1	1

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: Rea Horizon

PLOTTING COORDS GRID: Sam Survey
NORTH: 411.11N
EAST: 11774.90W
ELEV: 1025.63

ALTERNATE COORDS GRID: Estimated
NORTH: 4+ 0N
EAST: 118+ 0W
ELEV: 1025.00

COLLAR DIP: -55° 0' 0"
LENGTH OF THE HOLE: 261.20m
START DEPTH: 0.00m
FINAL DEPTH: 261.20m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: July 11, 1990
DATE COMPLETED: July 15, 1990
DATE LOGGED: July 13, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: Frontier
CASING: Pulled
CORE STORAGE: Samex Camp

PURPOSE: Part of Fence between Sam & Rea horizons.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
57.00	-	-54° 0'	ACID	OK		-	-	-	-	-	
108.80	-	-53° 0'	ACID	OK		-	-	-	-	-	
160.60	-	-53° 0'	ACID	OK		-	-	-	-	-	
265.50	-	-55° 0'	ACID	OK		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 27.40	«Csg»					
27.40 TO 129.60	«Maf Volc F lows»	Green to gray. Fine med. Matrix is aphanitic to fine grained. Core is weakly to moderately foliated at 45 - 60 degrees through to 75 m. Predominant foliation plane. Minor clasts; 5 - 20% patches, stringers - veins of Fe-calcite which are generally oriented sub-parallel to foliation. {37.1 - 37.5} «wk flt bx» {55.1 - 55.6} «wk flt bx» {78 - 78.3} «wk flt bx» {108.6 - 124.8} : Grades into calcareous feldspar porphyry, up to 35% phenocrysts; phenocrysts average 1 mm., max length 2 mm. porph texture locally washed out. «feld porp» 124.8 - 129.6: Weak to non-porphyritic gray color, weak , fine clastic texture.	60	Pervasive chlorite alteration. Core is calcareous. 84 - 106.6: Patchy bleaching assoc. with intense carbonate veining and flooding and weak sericite alteration. {124.8 - 129.6} «Mod dol alt» pervasive throughout minor chl alt'n.	Minor v.f.g. pyrite. 84 - 106.6: 3 - 15% f.g. patches and dissem of py.	Core is relatively blocky from 27.4 - 55.5 m. and 70 - 81 m. The interval 84 - 106.6 may be indicative of a flow boundary.
129.60 TO 148.90	«Arg/Maf Tr an Zone»	Gray, Black, Green. Fine. 60% of the interval is fine grained, non-descript green gray altered mafic volcanics interbedded with 40% black argillite. Argillite are laminated with silty beds, 10% qtz/dol veining in the argillites. Argillite content increases downhole, breccia textures present locally, laminae are contorted. {129.6 - 130} «wk flt bx» 137.4 - 148.9: 60% green gray altered volc? Beds and fine laminae with/in arg; volc? are finer grained than above, intervals of strongly contorted bedding due to movement along cleavage and bedding planes, small scale folding present apparent movement direction along cleavage planes		Mafic volcanics are pervasively dolomitically altered, argillite is weakly graphitic. 137.4 - 148.9: The volcs? are only weakly dolomitized, moderately sericite alt'n.	1 - 2% med. grained py, coarsely dissem.	Much of the sericite altered rock may actually be derived from silty seds/arg in part rather than volcanics.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		- uphole portions move upwards. Axial cleavage plane at 148.9 m. Where non deformed bedding angles vary between 65 - 90 degrees to C.A., 2% qtz veining. {137.4 - 138.3} «flt bx» {143.3 - 146.5} «wk flt bx zone»	60			
148.90 TO 153.80	«Arg/Alt Silt»	Black, Green, Gray, White. Fine. Laminated black argillite laminations comprised of silty material. Bedding is locally contorted and or disrupted; general sense of bedding 60 - 70 degrees to C.A. Sense of movement along cleavage planes; uphole portions move up. 20% qtz/dol veining (70/30% respectively) Veins are preferentially oriented parallel to bedding, gradational contacts. Cleavage plane at 150.7 m.	80	Some silty laminae have been silicified others are sericitically altered.	<1% of f. med. grained coarsely dissem py. Minor sp in veins.	
153.80 TO 164.95	«Ser Seds/Arg»	Yellow, Black, White. Fine. 75% black argillite grades into/out of 70% yellow sericitically altered seds, 15% white to gray qtz veining. Veins to 20 cm. Argillite is laminated with sericitic altered material. Laminae are locally contorted - tectonic flame structures at 162.6 cleavage plane	75	Gradational intense yellow sericite alt.	1 - 2% f. med. grained py.	
164.95 TO 181.20	«Arg»	Black, White. Fine. Black argillites contain 25% white to gray qtz stringers and veins. Veins are subparallel to bedding? Veins are locally deformed, folded, local tectonic breccias. Cleavage and axial cleavage range from 45 - 60 degrees.		Patchy weak to moderate silicification. Minor sericite alt'n. {177.1 - 181.2} «mod. silic»	1 - 2% med. to v. coarse grains of py; coarsely dissem. 5% py locally.	Strong, healed fault movement likely to have occurred within this interval. Core is somewhat blocky.
181.20 TO 182.90	«Arg/Tuff? Tran Zone»	Yellow, Green, Black, Gray, White. Fine. Gradational contacts. 20% white to gray qtz veins in black argillites, yellow sericitically alt. seds and greenish volc. 10% of interval is altered volc. remainder is arg and alt. seds.		10% mod. to intense yellow sericite alt of seds (arg?). Mafic volc are mod. dolomite altered.	<1% f. med. grained py, coarsely dissem.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
182.90 TO 198.60	«Dol Tuff?»	Gray-green. Fine. Ashy Tuff? Core is fine grained with chloritic spots to 1 mm. - altered glassy clasts? Core is weakly brecciated locally by gray dolomitic stringers < 1 cm. gradational lower contact.		Pervasive mod. to intense dolomite alteration.	Minor to 1% coarsely dissem py.	
198.60 TO 218.00	«Qtz Ser Py Alt Tuff?»	Gray. Fine to med. Original rock textures have been completely altered, rock has a non-descript green - gray color in gradational contact with tuffs? Minor clastic textures locally, minor argillite clast? (Chlorite altered mafic?) Sharp basel contact with flt. brecc. arg. {204.0 - 204.1} minor «wk flt bx»		Rock is pervasively weak to moderately silicified with minor dolomite. Original grained mass is in difficult to distinguish but appears to have been altered to sericite up to 15% of a light chocolate brown irregular, mineral present - Hard (due to silica intergrowths?) - Sericite? (sphalerite?) Local intense sil. (white qtz) gives core near graphic texture. {210 - 218} silica content decreaes sericite alt'n, intensifies downhole «mod. - int. yel ser.»	Pyrite is ubiquitous throughout the interval content ranges from 5 - 30%, generally fine to med. grained. Minor very coarse xtals occurs as dissem through to mesh - like textures. Overall py content 15%.	
218.00 TO 219.30	«Sil Arg»	Black, white. Fine. Argillites are strongly silicified. {218 - 218.3} «flt bx, gou» at contact with overlying unit. Starts in gouge (10 cm wide) and goes into breccia - clasts of qtz vein, argillite on argilliceous matrix.		Extensive intense silicification of argillite. Non-silic. argillite is strongly graphitic.	5 - 10% med. grained to coarsely xtalline, coarsely dissem py.	
219.30 TO 261.20	«Arg/Silt»	Black, gray. Fine. Interbedded/laminated arg and silt with <5% wacke beds. Bedding is relatively consistent but locally are contorted or offset. General bedding orientation. 60 - 70 degrees sed tops downhole? 219.3 - 220.7: White qtz veining, oriented subparallel to C.A. END OF HOLE			Minor py.	

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
26085	105.00	106.60	1.60								117	46	20				1	49		1	.8	1	
26087	154.75	156.10	1.35								31	61	66				1	51		1	.2	2	
26088	160.50	162.20	1.70								52	57	59				1	47		1	.4	1	
26089	167.90	169.40	1.50								67	66	44				1	99		1	.9	3	
26090	171.10	173.10	2.00								52	56	53				1	144		1	.7	1	
26091	181.20	182.90	1.70								54	44	41				1	66		1	1.0	2	
26093	198.60	200.10	1.50								139	19	36				1	31		1	.7	60	
26094	200.10	201.60	1.50								111	30	39				1	18		1	1.0	65	
26095	201.60	203.10	1.50								84	21	31				1	17		1	.9	18	
26096	203.10	204.60	1.50								124	78	30				1	53		1	1.1	10	
26097	204.60	206.10	1.50								168	58	21				1	20		1	.3	61	
26098	206.10	207.60	1.50								112	70	29				1	26		1	.8	62	
26099	207.60	209.10	1.50								109	47	27				1	29		1	.9	40	
26100	209.10	210.60	1.50								121	50	26				1	31		1	.6	86	
26101	210.60	212.10	1.50								93	73	24				1	25		1	1.4	22	
26102	212.10	213.60	1.50								122	97	31				1	34		1	1.0	39	
26103	213.60	215.10	1.50	.013	.01	.01	1.0	.11			127	112	36				1	38		1	.5	111	
26104	215.10	216.60	1.50	.013	.01	.01	.5	.13			130	110	37				1	35		2	.9	134	
26105	216.60	218.00	1.40	.013	.01	.01	.9	.06			131	89	47				16	45		1	.5	64	
26106	218.00	219.30	1.30	.010	.01	.01	.7	.21			95	65	43				118	97		5	.7	214	

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
26083	29.70	32.70	3.00	45.95	13.98	5.70	10.69	2.08	.80	10.04	.15	1.51			93	65			5	22	0.9	16	.63		.18	91.70	1	1
26084	78.30	81.30	3.00	40.86	14.27	11.76	6.27	2.83	.98	10.42	.13	1.56			95	65			5	23	1.2	30	.71		.75	90.54	1	2
26086	124.00	127.00	3.00	44.87	11.65	7.45	9.15	2.62	.48	8.90	.20	1.32			66	54			5	14	0.9	20	.64		.25	87.54	1	1
26092	184.80	187.80	3.00	42.25	14.82	7.15	8.20	3.20	.73	10.64	.22	1.23			87	56			5	19	0.8	30	.59		.40	89.46	1	1
26107	246.00	249.00	3.00	59.32	17.59	.36	3.11	1.22	3.33	6.92	.05	.94			51	132			10	50	0.4	53	.51		.86	94.28	28	1

MINNOVA INC.

HOLE NUMBER: RG333 | DRILL HOLE RECORD | IMPERIAL UNITS: | METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: Sam Horizon

PLOTTING COORDS GRID: Sam Survey
NORTH: 863.75N
EAST: 11895.54W
ELEV: 1031.82

ALTERNATE COORDS GRID: Estimated
NORTH: 8+69N
EAST: 119+ 0W
ELEV: 1031.00

COLLAR DIP: -55° 0' 0"
LENGTH OF THE HOLE: 236.80m
START DEPTH: 0.00m
FINAL DEPTH: 236.80m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: July 15, 1990
DATE COMPLETED: July 18, 1990
DATE LOGGED: July 17, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: Frontier
CASING: Pulled
CORE STORAGE: Samex Camp

PURPOSE: Test for Sam Horizon extension in front of (grid south of) RG68

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
33.80	-	-56° 0'	ACID	OK		-	-	-	-	-	
102.70	-	-55° 0'	ACID	OK		-	-	-	-	-	
173.70	-	-55° 0'	ACID	OK		-	-	-	-	-	
236.80	-	-56° 0'	ACID	OK		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 21.30	«Csg»					
21.30 TO 28.50	«Het Frag F lt Bx»	Black, gray. Fine. Intensely fault brecciated zone. Clasts comprise 40 - 70% of the core, clasts are subangular, clast size varies, increases downhole. Clasts are comprised of qtz, sericite, sericitic altered chips, black chert? and pyrite. Matrix is black argillite, not graphitic. Gouge developed locally; with depth clasts become predominantly qtz +/- dol tect. brx'd.		26.5 - 28.5: Core is more competent patchy bleaching caused by moderate to intense green/gray sericite alteration, minor calcite.	2 - 3% v.f.g. py dissem in argillite matrix. 1% py clasts, bands. 26.5 - 28.5: 5% py bands/coarse in the sericitically altered core.	Possibly protolith was a sedimentary breccia. Becomes more of a tectonic breccia with depth. 23.4 - 26.5: 45% recovery.
28.50 TO 32.60	«Sil Arg»	Gray, Black, White. Massive, non-descript. Minor zones of weaker alteration.		Core is pervasively, intensely silicified. Minor patches of green sericite along fractures, minor graphite.	5% f.g. pyrite patches and bands.	
32.60 TO 45.60	«Sil/Ser Ar g Flt Bx»	Black. White. Fine. Black argillite contains 40% laminations of qtz/dol (65/35%). Throughout most of the interval the qtz/dol is brecciated or boudined. Minor recent open fault gouge.		Arg contains patchy weak to mod. silicification - primarily in laminations. - veins. 32.6 - 35.6: Patchy weak to mod. sericite alt'n, minor intense silicification. {42.3 - 44} patchy «mod. ser» Alteration associated with boudined qtz veins.	1 - 5% f.g. dissem py.	Core is healed tectonite from 34.5 m. 32.6 - 34.5: Blocky core.
45.60 TO 52.25	«Ser Qtz Al t Arg»	White, Black, Olive green, Yellow green. Fine. Gradations into and out of black argillite, 30% white qtz veining, minor clasts and in ground mass, clasts are rounded to subrounded 2% narrow zones of fault gouge.		Interval is intensely sericitically altered. Gray, yellow and olive sericite, minor fuchsite.	5 - 15% dissem py. {51.35 - 51.45} «5% comb. gn, cp, sp» 20% py, sx are fine grained, v. coarsely dissem.	
52.25 TO 53.80	«Sil/Ser Ar g»	Black. Fine. Argillite with 50% qtz veining, patches and flooding/silic gradational contact with underlying cherty arg.		Argillite is weak to moderately gray sericite altered. patchy sil. of the arg.	About 15% f.g. py in fine dissem. Stringers and coarse dissem.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
53.80 TO 71.10	«Cherty Arg »	Black, Gray, White. Fine. 10% white, massive qtz veining, 70% of interval is chert or cherty argillite the remainder of the interval is variably siliceous argillite. Cherts contain fine argilliceous laminations, which are generally contorted.		Minor silicification of argillite, locally graphite developed - predominantly near basal contact. 60.55 - 61.77: Silicified, veined chert.	2% f.g. dissem py. On margins of sil. chert between 60.5 - 60.55 m. and 61.77 - 61.83 m. there 10 - 20% f.- med. grained, coarsely dissem py. <5% cp.	
71.10 TO 75.30	«Alt Maf?/S ed Tran»	Gray, Green, Black, White. Fine. Original textures intensely altered, minor remnant arg. present. 10% gray qtz/dol (60/40%) veining. Veins frequently contain altered wallrock fragments, interval contains zone of weak to moderate fault gouge.		Moderate patchy dol. alt, pervasive mod. - intense gray - brown sericite alt, fuchsite present between 71.1 - 71.85 m.	2 - 5% py in f.g. dissem and pyrite bands.	The presence of altered mafics is inferred from the presence of fuchsite and brown sericite. (after chlorite?)
75.30 TO 95.10	«Qtz/Ser/Py Alt Seds»	Gray. Black. White. Fine. Protolith was primarily argillite with 30% wacke? 10% white - gray qtz veining dolomite along fractures. 3% of the interval is weak to mod. flt bx, gouged. Cleavage plane at 95 m.	70	Pervasive moderate gray sericite alteration. Minor talc, minor silicification assoc. with 75.3 - 76.3 - Patchy intervals of brown sericite and dol alt'n.	Py content 2 - 10% with intervals to 30%. Xtals are fine to med. grained, minor very coarse xtals, dissem - semi massive. 87.6 - 91.5 averaging «20% py»	
95.10 TO 106.15	«Arg Flt Bx »	Black. Gray. Fine. Black argillite are intensely fault brecc, core becomes less brec. with depth. 10% qtz veining and breccia, minor dolomite.		Abundant black graphite. Weak sericite alt'n locally within arg. Patchy weak to mod. silicification associated with some veins.	3% fine grained py dissem throughout flt. bx. arg. <15% py, coarse dissem assoc with veining/silic.	
106.15 TO 111.00	«Alt Wacke»	Gray. Black. Fine. Fine grained alt. wackes with 10% interbedded black argillite. 3% qtz/dol (30/70%) veining, minor breccia clasts.		Weak dol alt'n, patchy brown sericite. Patchy weak silic. (qtzite?) Rock has bleached appearance.	3 - 5% f.g. py in fine - coarse dissem.	
111.00 TO 118.35	«Flt Bx Alt . Sed»	Gray. Black. White. Fine. Altered bedded arg and silt/wackes have been tectonically brecciated subangular clasts to 1 cm. Core is generally healed but 20% of interval is gouge alt ad rubbled. 3% white qtz/dol veining. Some veins are folded. Foliation at 112.5 m. at	75	Patchy weak to mod. silic, coarser seds are locally alt. to brown sericite and weakly dol alt.	2 - 10% fine - coarse grained py in fine - coarse dissem.	114.2 - 114.3: Possibly an interval of HKT FRG clasts <5 mm. of qtz/dol and ser.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
118.35 TO 122.60	«Flt Bx Met Frg»	Gray. Fine. Silty matrix supports <40% rounded to angular clasts of qtz/dol, arg, sericite alt mafics? Interval has subsequently been strongly tectonically brecciated.		Pervasive mod. to intense dolomitization of matrix clay/sericite alt'n in gouged intervals. Patchy mod. silic.	5% med. grained dissem py.	
122.60 TO 129.60	«Sil/Chrty? Arg»	Black, Gray. White. Fine. Black argillite hosts 25% white to gray qtz veining with no preferred orient. Veins are locally fractured. Core is rubbled, weak fault brecciation. {126.5 - 128.2} interval contains «80% qtz/dol vn» Vein is brecciated and recemented 60% dol, 40% qtz.		Arg is patchy, intensely silic. Patchy brown sericite alteration.	5% dissem py.	Some of the siliceous Arg may be original textures - chert.
129.60 TO 131.60	«Dol Maf?»	Gray. Fine. Non-descript, uniform gray. low angle basal fault contact. 10% white dol veining.		Pervasive mod-int dol alt'n, patchy brown sericite.	1% py.	
131.60 TO 138.00	«Chert/Arg»	Gray. Black. Fine. Finely laminated, siliceous argillite and chert. Laminations are highly contorted. Cleavage plane at 10% qtz/dol (70/30%) veining, some bladed, open boxwork textures indicative of boiling point solutions present. 131.6 - 132.5: Fault bx.	80	Minor graphite.	1% py.	
138.00 TO 146.60	«Dol/Ser Maf Vol»	Gray. Brown. Fine. Non-descript altered mafic volc with minor argillite interbeds. 5% gray qtz/dol veining. Minor intervals of fault gouge/breccia.		Pervasive mod. to intense dol alt'n patchy brown sericite. Minor talc.	2 - 5% f.g. dissem py.	
146.60 TO 152.60	«Met Frag?»	Gray. Brown. Black. Fine. Clasts <3 cm. long comprised of qtz/dol arg, sericite alt. mafics are supported by argilliceous to silty matrix. Core is also locally tectonically brecciated and boudined. Minor qtz/dol veining. 10% subintervals of argillite.		Argillites are weakly silicified, patchy brown to limonitic alteration of mafic and coarser silts. Minor dol. alt'n.	5 - 10% f.g. py in dissem and semi-massive bands to 2 cm.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
152.60 TO 155.60	«Dol Maf Volc»	Gray. Brown. Fine. Non-descript gray altered mafic vol. Sharp lower contact.	65	Intense dol. alt. volc. with patchy brown - limonitic sericite alt'n. 1% fuchsite/talc.	3% dissem med. gr. py.	
155.60 TO 156.55	«Arg»	Black. Fine. Black argillite with 20% contorted white/gray qtz/dol stringers, small intervals of fault gouge/breccia. {156.37 - 156.55} «flt gouge»			5 % fine - med. grained py.	
156.55 TO 209.80	«Dol Maf Vol»	Gray. Buff. Brown. Fine. Non-descript, gray alt. mafic volc. 2% qtz/dol veining. {156.55 - 156.7} weak «flt gouge» 168.6 - 170.7: Minor flt. gouge intervals. {170.8 - 173.55} «qtz vn, 50% py» 10% sil, ser. altered volcs. {182.3 - 187.9} 70% veining. 30% altered volcs. Qtz vein contains 20 - 60% py. «patchy qv, 40% py» 10% dol as fracture filling and v.f.g. xtals within qtz. 173.7 - 190.1: Buff to brown altered volc. - retains a spotty/crystalline? texture - may be a tuff. {193.4 - 193.7} «wk flt bx» {195.1 - 196.8} patchy «q.v. with 40% py» qtz veining/py makes up 70% of interval, 30% sericitic, dol alt'n volc. {196.9 - 197.55} «flt bx»		Mod-intense dol alt'n pervasive throughout patchy brown ser. alt'n, minor fuchsite. 173.7 - 190.1: Minor dol alt'n dol. primarily within veins, pervasive v.f.g. sericite - weak phyllitic texture.	2% py 170.8 - 173.55: 50% py in qtz vein, py is med. to very coarse grained semi-massive. 182.3 - 187.9: 20 - 60% med - coarse gr py, semi-massive. 189.1: 1 cm. wide qtz veinlet contains 1% galena. 192.5: 3 cm. wide qtz vein containing <1% galena. 190.1 - 193.3: 5 - 10% diss py fine - fine - coarse grained. 195.1 - 196.8: 40% py in qtz veining py is semi-massive to massive. Massive py between 195.87 - 195.98 m.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
209.80 TO 213.65	«Sil/Py Arg »	Black. Fine to coarse. Massive black argillite, local minor bleaching {209.8 - 210.1} «transition zone» with contacts at Weak breccia textures, clasts are subrounded mafic in argillite matrix. 210.15 - 210.65: White qtz/vein with 10% wall rock inclusions. 212.6 - 213.65: Gradational lower contact zone.	50	Argillite is mod. silicified, locally intense. 212.6 - 213.65: Patchy mod. to intense yellow - brown sericite alt'n. Alt'n increases downhole.	Argillite is strongly pyritiferous - content varies from 5% py coasely dissem to bands of 50% semi-massive py to 7 cm. in width. Fine - coarse crystals.	
213.65 TO 236.80	«Qtz/Ser/Py Alt Sed»	Yellow. White. Gray. Fine. Sediments have been completely altered. Foliation orientation varies between 50 - 70 degr. 20% white patches, veinlets and veins. 213.65 - 216.9: Weak intermittent fault gouge. END OF HOLE		Intense, pervasive pale yellow sericite alteration.	2 - 10% fine grained py in irregular patches and stringers and fine dissem. Py content decreases downhole.	

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
26119	21.30	23.40	2.10								124	272	63				200	47		2	0.8	28	
26120	23.40	27.00	3.60								91	189	44				167	43		1	0.7	4	
26108	27.00	28.50	1.50								212	113	39				286	64		1	0.1	2	
26109	28.50	30.00	1.50								29	623	86				395	44		1	0.2	3	
26110	30.00	31.50	1.50								13	62	42				182	13		1	0.1	1	
26111	31.50	33.00	1.50								25	156	57				309	19		3	0.6	2	
26113	47.80	49.50	1.70								38	110	37				117	51		1	0.1	2	
26114	49.50	51.00	1.50								64	72	102				196	62		1	0.1	1	
26115	51.00	52.50	1.50								161	1284	704				285	53		3	2.2	64	
26116	52.50	53.80	1.30								172	342	172				203	56		7	1.3	10	
26117	59.10	61.20	1.50	.115	.36	.22	3.1	.01			1146	3622	2199				126	50		46	3.1	2	
26118	61.20	62.70	1.50								463	1218	604				67	56		16	1.5	1	
26121	66.60	68.10	1.50								35	116	56				85	74		12	0.3	9	
26122	68.10	69.60	1.50								53	64	56				88	75		23	0.9	2	
26123	69.60	71.10	1.50								60	487	163				143	84		15	1.3	7	
26124	71.10	72.60	1.50								52	670	222				339	74		8	0.7	1	
26136	87.60	88.90	1.30	.146	.09	.03	2.2	.01			54	1460	943				286	50		14	2.2	3	
26137	88.80	90.20	1.30								110	113	397				455	58		39	2.9	27	
26138	90.20	91.50	1.30								113	583	282				579	52		48	3.1	1	
26139	93.30	94.80	1.50								79	73	61				379	89		30	1.3	2	
26140	103.40	104.90	1.50								53	101	200				164	130		2	0.6	8	
26141	115.40	116.90	1.50								47	66	72				83	48		1	.7	2	
26142	116.80	118.35	1.45								91	123	119				129	48		2	1.5	4	
26143	118.35	119.60	1.25								38	125	116				112	39		2	.9	2	
26144	119.80	121.10	1.50								116	509	217				159	54		18	3.6	1	
26145	121.10	122.60	1.50								58	255	336				171	62		3	1.6	2	
26146	135.60	137.10	1.50								16	30	54				64	71		1	.6	2	
26147	115.10	146.60	1.50								38	228	203				176	71		3	1.3	1	
26148	146.60	148.10	1.50								56	139	289				224	134		4	1.8	49	
26149	148.10	149.60	1.50	.074	.12	.07	2.4	.02			74	1174	737				158	66		3	2.4	18	
26150	149.60	151.10	1.50								31	175	91				125	86		1	.5	3	
26151	151.10	152.60	1.50								51	123	103				137	62		1	.9	2	
26152	152.60	154.10	1.50	.004	.01	.01	1.2	.01			44	77	97				243	69		3	1.2	1	
26154	169.20	170.80	1.60	.005	.01	.01	0.9	.22			45	56	90				233	233		2	.9	220	
26155	170.80	172.30	1.50	.008	.05	.07	2.8	.17			79	469	650				238	118		5	2.8	168	
26156	172.80	173.60	1.30	.008	.01	.01	0.8	.05			24	75	93				173	118		2	.8	52	
26157	182.30	183.60	1.30	.004	.01	.01	0.6	.04			36	43	101				180	41		7	.6	40	
26158	183.60	185.10	1.50	.008	.01	.01	0.6	.02			63	73	75				175	144		2	.6	22	
26159	185.10	186.70	1.60	.063	.21	.06	25.9	1.29			629	2067	611				680	52		146	25.9	1190	
26160	186.70	188.20	1.50	.006	.02	.02	1.7	.09			61	163	231				237	62		8	1.7	90	

Sample	From (m)	To (m)	Length (m)	CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB
26161	188.80	190.30	1.50	.003	.01	.01	0.9	.05			31	83	133				227	114		4	0.9	45
26162	190.30	191.80	1.50	.005	.10	.01	1.1	.02			53	975	116				141	95		2	1.1	18
26163	191.80	193.30	1.50	.001	.34	.11	4.3	.04			101	3411	1125				199	98		9	4.3	42
26164	195.10	196.80	1.70	.029	.17	.08	11.7	1.27			291	1664	821				834	45		72	11.7	1140
26165	196.80	198.20	1.40	.013	.07	.05	3.6	.20			127	745	763				531	102		14	3.6	198
26167	208.60	210.10	1.50	.004	.01	.01	1.1	.04			40	119	72				524	102		6	1.1	44
26168	210.10	211.60	1.50	.007	.02	.03	2.1	.66			68	248	314				1713	93		21	2.1	655
26169	211.60	213.20	1.60	.008	.01	.01	1.4	.42			81	37	104				2728	142		32	1.4	415
26170	213.20	214.70	1.50	.002	.01	.01	0.5	.26			18	43	43				3691	76		27	0.5	258
26171	217.00	218.50	1.50	.002	.01	.01	0.1	.04			19	105	29				1463	69		10	0.1	42
26172	221.60	223.10	1.50	.003	.01	.01	0.3	.01			28	47	26				229	51		4	0.3	3
26173	223.10	224.60	1.50								26	62	21				561	99		6	0.2	4

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
26112	36.90	39.90	3.00	47.18	11.70	2.63	10.24	.34	.83	11.74	.39	1.11			191	6205			10	37	2.6	1334	.19		4.31	90.71	143	5
26115	78.30	81.30	3.00	65.61	12.75	1.01	3.73	.64	2.71	4.83	.17	0.53			8	67			5	64	0.1	36	.16		0.68	92.93	64	1
26153	157.60	160.60	3.00	33.92	11.75	11.02	9.01	.63	2.25	9.58	.41	1.13			89	82			5	67	0.9	37	.29		1.36	81.43	159	5
26166	200.20	203.20	3.00	54.00	11.14	4.13	8.16	.59	.68	8.52	.28	1.42			47	613			5	60	1.2	299	.29		1.85	91.13	172	3
26174	230.70	233.70	3.00	47.88	13.00	6.01	6.34	1.31	1.07	.73	.47	1.35			169	326			50	63	2.6	188	.34		1.71	87.00	414	20

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: Sam Horizon

PLOTTING COORDS GRID: Surveyed
NORTH: 989.70N
EAST: 11997.67W
ELEV: 1044.43

ALTERNATE COORDS GRID: Estimated
NORTH: 10+ 0
EAST: 120+ 0W
ELEV: 1032.00

COLLAR DIP: -55° 0' 0"
LENGTH OF THE HOLE: 310.00m
START DEPTH: 0.00m
FINAL DEPTH: 310.00m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: July 18, 1990
DATE COMPLETED: July 22, 1990
DATE LOGGED: July 20, 1990

COLLAR SURVEY: NO
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: Frontier
CASING: Pulled
CORE STORAGE: Samex Camp

PURPOSE: Infill drilling between RG-68 and RG-69 to test Sam horizon.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
46.60	-	-56° 0'	ACID	OK		-	-	-	-	-	
125.90	-	0° 0'	ACID		Bad Etch	-	-	-	-	-	
172.80	-	-54° 0'	ACID	OK		-	-	-	-	-	
221.60	-	0° 0'	ACID		Bad Etch	-	-	-	-	-	
246.00	-	-52° 0'	ACID	OK		-	-	-	-	-	
282.50	-	-53° 0'	ACID	OK		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 15.80	«Casing»					
15.80 TO 28.40	«Flt Zone/Dol Maf?»	Gray, buff. Fine. Original rock textures destroyed, core is very blocky throughout. Strongly fault brecc/gouged zones throughout. 3% white to gray qtz/dol veining.		Pervasive intense dol alt'n throughout minor talc alt'n. 5% patch brown sericite alt'n. 16.4 - 19.5: Moderate brown to limonitic sericite alt'n.	2% dissem py. 16.4 - 19.5: 5% f-med. gr. dissem.	Present textures and style of alt'n indicates that protolith was a calcareous volcanic. 17.4 - 21.6: 85% recovery.
28.40 TO 29.60	«Flt & Sed/Maf Zones»	Black, buff. Fine. Interval is strongly fault brecciated and gouge altered. 40% of interval consists of altered volc and 55% argillite and 5% qtz vein.		Mafics are dol/ser altered. Argililte is moderately graphitic.	3% f.g. f - c dissem py.	
29.60 TO 52.10	«Arg/Silt/Wacke»	Black, gray. Fine, med. 50% of interval is gray wacke which contains grains to 2 mm. The large grains are elongate chips of argillite. Remaining rock is dark gray silt - black argillite. 5% qtz/dol (80/20%) veins to 20 cm. Veinlets are weakly contorted bedding orientation are contorted/variable direction of tops indeterminant at 50.5 m. sericite foliation while bedding at Core is blocky throughout but becomes more competent downhole. 29.6 - 37.5: Zones of strong fault brecciation and gouge alt'n, intensity decreases downhole.	55 80	Minor sones of graphite arg. Weak gray sericite.	Minor pyrite. 51.5 m.: Minor cp and v.f.g. gray metallic - gn? coarsely diss in margin of qtz vein.	
52.10 TO 53.80	«Arg Tectonite»	Black. Fine. Argillite matrix supports 60% rounded (minor) to angular clasts of qtz/dol (35/65%) clasts <1 mm. to 4 cm. foliation plane Coarse cleavage plane	75 30	Argillite is weak to moderately graphitic.	Minor py.	
53.80 TO 68.10	«Arg/Silt/Wackes»	Black, gray. Fine. 70% of interval consists of arg/silt, 30% gray wackes, bedding is locally contorted, general orientation 70 - 80 degrees. 2% white qtz/gray dol veining. Intermittant zones of fault brecc/gouge. Cleavage at 64.2 m.	60	Argillite is graphitic.	Minor py.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
68.10 TO 69.20	«Ser/Py Seds»	Gray, black. Fine to med. Med grained to silty pyritic seds, graded bedding indicates tops uphole, coarse beds contain angular to roundod clasts of argillite qtz, dol and sericitically altered clasts. 68.8 - 69.15: Qtz/dol flooding alter sers seds 5% py.		Rock has been intensely gray sericite altered.	v.f. - med. grained py makes up to 60% of the interval.	Very similar to HEY FRAG except that these seds are conformable and hiterogenous frags make up <2% of the interval. - Similar genesis. Pyrite is exhalitive.
69.20 TO 70.30	«Arg»	Black. Fine. Massive argillite with silty interbeds. Interval is locally fault brecciated. Basel contact is conformable.			3% med. gr. py in coarse dissem. Py is found primarily at top of interval.	
70.30 TO 74.60	«Het Frag»	Black, brown and gray. Coarse. Matrix supported heterolithic conglomerate, moderately flattened clasts comprised of chert, argillite, mafics? and pyrite. Matrix is pyritic brown to grey sericitic material. Poorly sorted with angular clasts. Foliation	75	Brown to gray sericite alteration of matrix, but it appears more "phyllite - like" than "mutlike".	15% pyrite as 1 - 2 mm. dissem. euhedra, and minor fine grained lithoclasts. «15% py»	Minor friable fault breccia throughout this interval.
74.60 TO 80.50	«Sil Trans Frag»	Gray. Fine to coarse. Pervasively siliceous interval with gradational upper and sharp lower contacts. Minor Het. Frag. relict textures, and also minor brown sericitic mafic portions. Intraformational breccia texture well healed.		Pervasive silicification with lesser late Fe-Dol along fractures. Minor brown sericite.	5 - 10% fracture filling pyrite.	Interval has only 15% white qtz veinlets. Perhaps some original cherty portions, but no good ribbon chert.
80.50 TO 159.70	«Dol Mafics»	Brown and gray. Fine. Strongly altered rock, now comprised of brown sericite and gray "nodular" ferrodolomite. Very contorted and boudined veinlets. Traces of relict lapilli textures.		Intense destructive carbonatization and brown sericitization. {123.0 - 126.7} «flt. bx + gou» From 144.5 - 155.5 is distinctly orange - brown.	3 - 4% pyrite.	Thin pyritic argillite seam from 83.9 - 84.0 notably not altered.
159.70 TO 185.20	«Chty Arg Bx»	Black, gray, and white. Fine. Highly contorted, boudined and locally fault brecciated cherty argillite. Faulted portions graphitic. {169.0 - 169.5} «fold hinge»		Minor qtz veinlets and related silicification.	1% pyrite.	Essentially a tectonite or intraformational breccia, with contorted intervals.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		{172.0 - 172.8} «flt. bx» Structurally chaotic but most prominent cleavage at	70			
185.20 TO 189.50	«Dol Maf Tuff?»	Gray. Fine to med. Gradational unit with relict fragmental and massive textures. Strongly altered but appears volcaniclastic with traces of talc and brown sericite.		Strong pervasive ferrodolomitization with much nodular Fe-dol porphyroblasts.	1% accessory pyrite.	Gradational interfingering and brecciated contacts.
189.50 TO 206.80	«Ser/Qtz Seds»	Yellow and white. Gradational contacts with interfingering. Unit is a yellow sericite schist cut by boudined bull qtz veinlets. Minor argillite "windows" present that have escaped alteration.		Strongly sericite and local silicification. {189.7 - 189.9} «flt. gou.»	2% wispy py.	Still contorted relict laminated textures.
206.80 TO 210.50	«Chert & Arg»	Black and gray. Fine. Laminated with lesser brecciation. Black carbonaceous argillite interbedded with definite ribbon chert.	70	Minor silicification. {206.8 - 207.1} «flt. bx.»	3% pg in fractures.	
210.50 TO 211.50	«Het Frag»	Black, white and brown. Coarse. Angular clasts of chert, argillite, and pyrite litho clasts in siliceous matrix.		Minor qtz veinlets and fault breccia throughout.	«10% py»	
211.50 TO 212.90	«Ribbon Chert»	Light gray. Apanitic. Very delicately laminated microcrystalline ribbon chert. Fine pyrite occupies fractures and some laminae. Laminations	75	Very little white qtz veinlets appear to be "sweats". Some partings are stylolitic.	5% pg.	Best definite chert seen by this logger to date.
212.90 TO 216.50	«Dol Mafics»	Gray and brown. Fine. Upper contact is a thin fault gouge. Banded interval of brown sericite and gray granular. Ferrodolomite. Banding is warped from 75 - 90 degrees.		Pervasive carbonatization, with 15% brown sericite, and traces of talc. {212.9 - 213.0} «flt. gou» Also trace fuchsite near lower contact.	Tr. pg.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
216.50 TO 237.60	«Sil Arg Bx »	Black and white. Fine. Contorted and brecciated laminated argillite. Contains numerous deformed and broken qtz and/or dol veinlets. Minor mafic? component apparent in some brown sericitic/fuchsitic beds. Cleavage random.		Patchy silicification and dol. Numerous zones of friable fault breccia.	1 - 2% py fracture fillings except ‡216.5 - 217.1‡ «10% py»	
237.60 TO 238.30	«Qtz - Dol Vn»	White. Very coarse. Bully white quartz vein with 20% coarse ferrodolomite blades and 10% coarse pyrite. Sharp contacts at Clearly crosscutting and late.	35		10% pyrite as euhedral pyritohedrons up to 2 cm.	
238.30 TO 242.20	«Sil Arg/Silt»	Black and white. Fine. Laminated and contorted sediments with spaced cleavage Minor fold hinge at 239.5.	85	Silicification about deformed conformable and crosscutting veinlets. Minor dol.	5% py dissem.	
242.20 TO 246.70	«Dol Mafics »	Gray and brown. Conformable contact. Fairly massive, granular appearance. Interfingered lower contact.	80 70	Intense pervasive Fe-dol with minor wispy brown sericite.	1% py only.	
246.70 TO 250.80	«Py Arg & Cht»	Gray to black. Fine. Contorted ribbon chert and argillite with minor laminae of pyrite. Cut by deformed qtz veinlets. 249.2 - 249.4: Flt bx. Cleavage	75	Moderate sil. and lesser dol of selected laminae.	«5% py»	
250.80 TO 253.10	«Het Frag»	Black, white, gray and brown. Coarse. Subrounded to angular clasts from sand size up to 5 cm. (avg. 1 cm.) in a poorly sorted, matrix supported fragmental (conglomerate). Chert and argillite lithoclasts predominant, but minor mafics present.		Weak pervasive silicification and minor dol. centered about mafic fragments.	«5% py» as euhedral disseminations and a few possible lithoclasts.	Crude grading shows tops uphole.
253.10 TO 255.70	«Cht & Arg»	Black and gray. Aphanitic. Thinly bedded to laminated at Cut by abundant subparallel qtz veinlets.	70	Patchy sil.	3% possibly primary pyrite as dissem and laminae.	
255.70 TO 261.00	«Qtz-Dol Vn »	White. Coarse. Low angle, irregular contact with white bully and barren pegmatitic qtz/dolomite vein.	20	Minor wallrock inclusions completely dolomitized.	Tr. py.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
261.00 TO 280.80	«Alt Maf/Arg»	Mixed interval containing about equal portions of dol. mafics and contorted cherty argillite. Several hinge areas, and a strong spaced cleavage at 264.2 - 264.7: Met. Frag.	60	Moderate sil. and dol. of argillites and mafics, respectively.	2% dissem py.	Probably the "furry" nose of a major structure.
280.80 TO 295.80	«Met Frag»	Black, gray and brown. Angular mixed lithoclasts from 1 - 10 cm. (avg 2 cm.) in a poorly sorted conglomerate. Weak flattening hole: Notably low in sulphide content with only a few pyrite lithoclasts.	70	Minor sil. of argillaceous matrix.	3% pyrite in matrix decreasing down-hole. Notably mafic clasts increase in numbers downhole.	Crude bedding suggests tops uphole.
295.80 TO 310.00	«Dol Mafic Volc»	Gray, green and brown. Intensely altered, with internal breccia textures. Gradational contact with above unit. Possible relict lapilli tuff textures. END OF HOLE		Pervasive strong Fe-dol, strong brown sericite. Trace fuchsite.	5% py dissem and in patches, with traces of base metal sulphides locally associated with dol. veining.	

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
26176	66.60	68.10	1.50								95	289	121				92	54		1	0.3	2	
26177	68.10	69.20	1.10								195	603	371				117	79		4	2.2	50	
26178	69.20	70.30	1.10								71	180	44				70	74		1	0.8	8	
26179	70.30	71.10	0.80	.032	.07	.06	3.1	.05			322	703	588				191	106		3	3.1	50	
26180	71.10	72.60	1.50	.032	.08	.04	2.6	.02			322	776	439				205	102		3	2.6	16	
26181	72.60	73.60	1.00	.030	.08	.04	2.5	.11			304	836	429				203	90		7	2.5	114	
26182	73.60	74.60	1.00	.015	.04	.03	2.5	.08			152	379	287				142	102		8	2.5	83	
26183	74.60	76.00	1.40								98	37	70				253	163		4	0.8	90	
26184	76.00	77.50	1.50								55	37	52				130	32		2	0.4	24	
26185	77.50	79.00	1.50								128	732	285				346	42		6	1.1	117	
26186	79.00	80.50	1.50	.055	.17	.04	5.5	.08			553	1656	368				301	117		6	5.5	82	
26187	80.50	82.00	1.50								74	65	21				282	49		1	0.9	8	
26188	82.00	85.00	3.00								55	58	38				255	49		1	0.8	35	
26190	209.50	210.50	1.00								20	74	50				281	237		8	0.6	2	
26191	210.50	211.50	1.00								70	346	198				550	32		27	0.8	42	
26192	211.50	212.90	1.40								7	460	57				87	21		4	0.1	1	
26193	216.50	217.10	0.60								40	230	236				295	41		30	1.7	23	
26194	236.50	237.60	1.10								43	144	48				373	61		3	1.4	143	
26195	237.80	238.30	0.70								79	40	75				287	24		32	1.5	90	
26196	238.30	239.30	1.00								95	56	44				141	123		1	0.5	6	
26197	246.70	248.20	1.50								39	76	160				64	206		1	1.6	37	
26198	248.20	249.70	1.50								112	93	78				90	54		1	1.1	28	
26199	249.70	250.80	1.10								72	58	131				130	94		1	0.5	29	
26200	250.80	252.30	1.50								143	639	313				175	51		1	1.2	20	
26251	252.30	253.10	0.80	.015	.07	.05	4.0	.04			153	655	540				284	73		3	4.0	39	
26252	253.10	254.20	1.10								52	113	98				129	71		1	0.7	40	
26253	254.20	255.70	1.50								173	182	137				95	194		1	1.2	26	
26254	255.70	256.70	1.00								7	44	69				1	10		1	0.9	1	
26255	280.80	282.30	1.50								62	164	264				118	67		9	1.0	18	
26256	282.30	283.80	1.50								72	747	303				165	56		8	1.0	6	
26258	308.60	309.60	1.00	.065	.41	.21	3.0	.02			652	4080	2075				263	75		3	3.0	20	

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
26175	17.40	20.40	3.00	41.77	10.58	9.70	8.48	.91	1.15	9.49	.32	1.29			64	61			5	36	1.6	13	.30		2.49	86.51	182	1
21189	194.00	197.00	3.00	68.15	15.03	0.01	1.50	.79	3.25	4.35	.25	0.66			8	42			5	68	0.4	18	.11		.93	95.09	106	1
26257	304.00	307.00	3.00	53.45	11.79	3.86	4.85	1.22	1.02	10.82	.35	1.23			288	3471			5	74	3.6	1890	.26		4.42	93.34	191	1

MINNOVA INC.

HOLE NUMBER: RG-335 | DRILL HOLE RECORD | IMPERIAL UNITS: | METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: San Horizon

PLOTTING COORDS GRID: Surveyed
NORTH: 1111.64N
EAST: 12104.47W
ELEV: 1057.29

ALTERNATE COORDS GRID: Estimated
NORTH: 10+90N
EAST: 121+ 0W
ELEV: 1035.00

COLLAR DIP: -55° 0' 0"
LENGTH OF THE HOLE: 462.40m
START DEPTH: 0.00m
FINAL DEPTH: 462.40m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: July 22, 1990
DATE COMPLETED: July 29, 1990
DATE LOGGED: July 23, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: Frontier
CASING: Left in hole
CORE STORAGE: Samex Camp

PURPOSE: Test the north western extension of the San horizon.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
37.20	-	-55° 0'	ACID	OK		-	-	-	-	-	
87.50	-	-56° 0'	ACID	OK		-	-	-	-	-	
135.40	-	-56° 0'	ACID	OK		-	-	-	-	-	
172.80	-	-55° 0'	ACID	OK		-	-	-	-	-	
212.30	-	-54° 0'	ACID	OK		-	-	-	-	-	
249.00	-	-55° 0'	ACID	OK		-	-	-	-	-	
309.10	-	-54° 0'	ACID	OK		-	-	-	-	-	
355.70	-	-55° 0'	ACID	OK		-	-	-	-	-	
389.20	-	-54° 0'	ACID	OK		-	-	-	-	-	
410.60	-	-54° 0'	ACID	OK		-	-	-	-	-	
438.00	-	-54° 0'	ACID	OK		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 6.10	«CSG»					
6.10 TO 11.10	«Alt Maf Tuff?»	Green. Fine. Very fine grained original minerals altered, banded texture - bands at some fine qtz stringers are folded, 2% qtz vn. Gradational lower contact. {8.1 - 10.9} intense «flt gou/bx»	80	Pervasive weak to mod. carbonatization mafic minerals alt. to green sericites/chlorite, local glassy appearance - patchy silicification where core is not faulted; minor limonite. 6.1 - 6.4: Intense silicification.	< 1% py.	Core is blocky. 8.1 - 11.3: 80% recovery.
11.10 TO 13.00	«Trans Frag»	Green. Fine. Core is very similar to the overlying interval but contains 5% fragments and disrupted arg. beds, narrow zones of fault gouge.		Moderate, patchy yellow sericite alt'n.	Minor py.	Core is very blocky. 90% recovery.
13.00 TO 21.60	«Arg/Maf Tran Zone»	Black, gray, green. Fine to med. 25% green mafic tuff and/or volcanic clastic seds, grain size < = 1 mm. 40% black argillite with laminae of silty seds, tuff, volcaniclastics. 35% altered core - origin could be either volc. or sed. Laminae are frequently weakly deformed/offset, general sense of bedding > 70 degrees to C.A. Approx. 20% of interval is strongly altered to fault gouge, faulting locally creates cleavage plane offsetting bedding at 19.3 m. cleavage plane. 5% white qtz veining.	90	Minor graphite mod. to strongly greenish sericite/chlorite alt'n bleaches core, minor silicification adjacent to qtz veins.	Minor py.	Core is blocky. Approx. 90% recovery.
21.60 TO 46.00	«Sil, Chty Arg»	Black. Fine. Black arg ore locally silicified and interbedded with ribbon cherts/cherty arg. Ribbon chert beds to 15 cm. Cherty arg. beds to 20 cm. General bedding orient. Slaty cleavage along bedding. 21.6 - 32.3: Fault zone intervals of intense fault bx and/or gouge.	70	Arg. is locally weak to intensely graphitic. 25% of the interval is weak to mod. silic. {32.9 - 39.3} «int sil, qv» subinterval contains 25% massive white qtz veining.	Minor dissem py to 30 m. From 30 m. there is 1 - 3% fine grained blebs of pyrite in the argillites and veins.	Core is blocky throughout. 21.6 - 29.2: Extremely blocky core, 85% recovery. 34 m. - Cherty/sil/arg with stylolites - possible hinge zone.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
46.00 TO 80.70	«Arg/Maf Tr an Zone»	Black , gray and green. Fine. Core is comprised of 55% arg, 45% altered mafic volcanics, upper and lower contacts are flt. gouge altered, arg/maf vol are finely interbedded to massive beds: argillite beds to 6 m., volc beds to 2.4 m. Mafic volc. are fine grained non-descript, minor qtz veining in the mafics. Argillites contains 20% white to gray qtz/dol (70/30%) stringers and veins. Veins/stringers/ beds within the argillite are frequently warped, stretched, boudined and brecc. General sense of bedding Narrow zones of fault brx/gou intermittant throughout - principal faulted intervals: 62.2 - 64.9 m. intermit weak flt. bx zones. 72.7 - 80.2 m. intermit weak to mod. flt. bx. zones.	70	Mafics are pervasively mod. carbonitized, patchy brown sericite alt'n.	Generally < - 1% dissem py: Some intervals contain < 5% coarsely dissem py blebs.	Local presence of fine argillite beds indicates a volcaniclastic origin or epiclastic sed. origin. Dolomite with veins tends to be late stage mineralization - fills fractures - derived from volc?
80.70 TO 105.70	«Qtz/Ser/Do l Atl Maf»	White, yellow, green and gray. Fine. Mafic volcanics are strongly altered, contain 5 - 10% white qtz veining and patches, minor intervals of fault gouge. 92.97 - 93.3: q.v.		Core is moderately to intensely dolomitized. Abundant patchy yellow sericite alt'n. Alteration bleaches core. Local intervals of chloritic altered mafics.	< 2% fine - med gr. coarsely dissem py local interval contain 5% py.	
105.70 TO 143.95	«Mflt»	Green, yellow. Dark green chloritic, fine grained matrix supports up to 40% lapilli sized clasts to 23 cm: Clasts are unflatteded, 2% white qtz veining. 140.6 - 142.9: Weakly fault bx and rubbled core.		Matrix is chloritically altered. Clasts are preferentially yellow sericitically altered.	1 - 3% f - coarsely dissem py.	Typical SAM mafic volc.
143.95 TO 147.80	«Sil Arg»	Black. Fine. Sharp fault gouged upper contact, gouge zone 13 cm. wide. Interval consists of massive black argillite cut by 5 - 10% white qtz veins/stringers - locally weak stockwork. Some tectonic movement within arg. locally boudins/offsets qtz veins. Minor fault gouge zones.		Argillite is intensely silicified. 146 - 149.9: Arg. is mod. graphitic. 147 - 147.5: Interval of intense yellow sericite and qtz alt'n, top of interval is flt. gouge altered.	2 - 3% fine - med. grained py dissem, stringers and lenses through-out, < 20% py locally.	146 - 146.9: Blocky core, 30% recovery.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
147.80 TO 176.85	«Arg/Silt/Wacke»	Fine to med. 35% fine to med. grained gray wackes interbedded with 65% argillites and siltstone. Tectonic folding, flame structures, brecciation and offsets common throughout interval where bedding appears to be undisrupted the orientation is {147.8 - 150.3} weak to mod. intermittant «flt bx zone» {157.3 - 162.1} intermittant «flt bx zone» {164.6 - 164.7} «flt gouge» {171.1 - 171.6} «flt bx» 1% qtz/dol veining at 172 m. bedding at sericite foliation at	 70 80 50	Argillite in some faulted zones is weakly graphitic, gray sericite is weakly developed throughout interval. 148.9 - 151.7: Carbonatized wacke bed.	Minor py.	
176.85 TO 178.00	«Ser/Dol/Py Alt Arg» Tect. bx arg alt'd to ser/dol/py.	Black, gray and brown. Fine. Interval comprised of altered argillite, 5% weak to unaltered argillite remnant; minor qtz stringers, core locally contains strong tect. bx qdv/py clasts (angular to rounded) in argillite matrix.		Argillite has been int. carbonitized, 20%, med patchy gray to brown sericite alteration. Dol. alt locally strongly bleaches core.	15 - 25% fine grained pyrite - semi massive bands/patches to stringers.	Ser/dol/py alteration appears to precede tectonism.
178.00 TO 180.60	«Arg/Silt»	Black, gray. Fine. Argillite contains 20% interbedded siltstone, bedding is tectonically disrupted. Cleavage plane at 60 - 70 degrees to C.A.. Sharp upper contact at Lower contact is fault gouge. 10% white qtz/dol (90/10%) veining.	 75		Minor py.	
180.60 TO 185.50	«Dol/Ser/Py Alt Arg» Tect. bx arg alt to dol/ser py.	Gray, black. Fine. Intensely altered arg. comprises 85% of interval; relatively unaltered tectonically brecciated argillite with a 7 cm. wide sandstone bed comprise 15% of interval. Unaltered argillite content increases downhole. Local replacement textures of argillite by dol/py: gradational lower contact.		Alteration mineralogy consists of pervasive, mod. to int. dol. in ground mass and veinlets, < 30% patchy brownish sericite. Minor weak to moderate silicification.	5 - 20% fine - med. grained py dissem, stringers blebs, coarsely dissem. 183.3 - 184.3: Minor coarsely dissem cp, trace sp?.	Tectonic breccia is pervasive through the unaltered argillites and appears to be present in much of the altered arg.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		182.4 - 183: Unaltered argillite remnant. 183 - 183.1: Pyritic sandstone. {180.6 - 181.2} «flt bx»			182.4 - 183: 15% py blebs, concretions, stringers - primarily at top of interval.	
185.50 TO 189.40	«Alt Arg»	Black, gray. Fine. Black argillite has been variably altered. 185.5 - 186.2: Some tectonic brecciation. 186.85 - 187.4: Cataclastic textures - rounded qtz /dol frags/eyes and boudins with pressure shadows. 10% nodular growths of dol/qtz in bands foliation at 187.4 - 189.4: Narrow intervals of tectonical brecciated material.	70	185.5 - 186.2: Patchy growths of nodular dol/qtz. Mod. gray sericite alt'n. 186.2 - 186.85: 60% of interval consists of nodular dol/qtz growths. 186.85 - 187.4: Weak to mod. v.f.g. gray sericite. 187.4 - 189.4: Mod. sil. black arg. comprised 35% of interval, 65% intensely silicified gray bleached rock derived from argillite. Intensely altered rock contains 5 - 10% brown sericite, 3% black arg. remnants. At 187.9 m. there is a 5 cm. wide band of dol/qtz derived from intergrown nodules.	186.2 - 186.85: 5% f.g. pyrite in argillite matrix. 186.85 - 187.4: 5% v.f.g. py. 187.4 - 189.4: 5 - 15% v.f.g. - minor med. grained py. Largest concentrations occur within the black argillites; Coarse diss to stringers, lenses and bands.	The nodular dolomite grow around a seed parphyrioblasts.
189.40 TO 192.00	«Qtz/Ser Alt Sed»	Gray, yellow. Fine. Intense alteration of sediments (arg?) completely replace original textures. Core is weakly banded at 60 - 70 degrees to C.A.		Alteration mineralogy consistn of 5% dol, < 1% talc, 5 - 10% py, 40% yellow sericite, 47% qtz.	Py is fine grained and occurs in coarse dissem, bands, patches.	
192.00 TO 193.50	«Sil Arg»	Black. Fine. Black argillite which has been silicified by a weak qtz stockwork. Minor breccia clasts at base of interval.		Intense silicification, weak dol and bleaching as well as silicification from 193.3 - 193.5 m. Minor massive green sericite.	15% med. to coarse grained patches, bands and semi-massive of.	
193.50 TO 198.40	«Dol Maf?»	Gray, brown. Fine. Intense alteration has replaced original mineralogy and textures. 195.2 m. - 2 cm. wide fault gouge zone oriented	40	Intense dol. alteration with 20% patchy, yellow brown sericite alteration.	5 - 10% v.f.g. dissem py.	The interval may have originally consisted of sediments.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
198.40 TO 211.20	«Qtz/Ser Alt Seds»	White, yellow. Fine. Original mineralogy is completely replaced. Interval contains abundant qtz which occurs as veins, folded veins, boudins and irregular patches. Core is weakly blocky with minor gouge developed along fractures.		55% of interval is qtz, 3% py, 42% yellow sericite, <5% dolomite present.	3% py is f.g. and dissem.	
211.20 TO 272.90	«Dol Maf Vo l»	Gray. Fine. Non-descript gray altered mafic volcanics. Locally minor breccia texture caused by dol veining. Minor altered seds? present/		Intense dolomite alt'n. Patchy brown sericite alteration; dol occurs throughout ground mass and as veins with < 5% qtz.	< 2% f.g. fine - coarsely dissem py.	
272.90 TO 304.60	«Qtz/Ser Al t Sed»	Yellow, black and white. Fine. Interval consists of intensely altered seds which contain < 5% black, unaltered argillite remnant beds. Beds generally oriented at Interval contains 20% white qtz veinlets/veins minor pale green cherty qtz. Bedding is locally tect. disrupted (minor) angular to subrounded clasts. {274.5 - 276.9} intermittant «flt gouge zone» well developed but limited in extent. {294.23 - 294.43} weak «flt gou» at 302.4 m. weak cleavage plane Gradational lower contact.	80 50	Intense yellow sericite alteration hosts qtz and remnant argillite.	1 - 5% f - med. grained py, dissem.	
304.60 TO 317.90	«Sil Chrty Arg»	Black, white. Fine. Black argillite hosts < 30% white qtz veins and stockwork, 50% of the qtz occurs in irregular and discontineous patches, sweats lenses, veins which are brecc. 30% of interval consists fine to med. laminated, siliceous cherty argillite/ribbon chert. Tectonic brecciation is locallized. Clasts are generally < 1/2 cm. long, subangular, well developed breccia zones are < 20 cm. wide. Pervasive weak cleavage plane oriented at 80 - 90 degrees to C.A. 316.5 - 316.6: Rubbled core.		Argillite is weakly graphitic. Core is moderately silicified/siliceous throughout with intervals of very intense bleached, silicified arg. minor mod. alteration of arg. to gray sericite.	2 - 10% very fine grained to coarse pyrite. Py occurs in coarse dissem - semi-massive intervals. Locally intervals contain 10 - 40 % py.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		Lower contact is altered to fault gouge, Minor v.f.g. feldspar crystals present in some qtz veins.				
317.90 TO 332.30	«Dol Maf?»	Gray, brown. Fine. Non-descript gray altered mafic volcanics which contain minor brecciated textures (qtz/dol clasts) 3% white qtz/dol veining (80/20%) distinct from alteration. Minor remnant argillite beds? < 5 mm. thick present. {317.9 - 319.5} intermittant narrow «flt gou zones» with 1% interbedded arg. remnant. 331.3 - 332.3: Very blocky core, minor gouge, interval consists of interbedded arg. and mafic volc. gradation transition zone.		Intense pervasive dol. alteration with patchy bands of green-brown sericite alteration. 317.9 - 319.5: Weak to moderate gray sericite alt'n. 1% talc.	< 5% v.f. - fine grained dissem py. {317.9 - 319.5} «20% py» 331.15 m.: Minor coarsely dissem cp which appears to be associated with a qdv.	
332.30 TO 342.50	«Arg Flt Bx »	Black, white. Fine. Black argillite and minor cherty argillite host , = 20% white qtz veins/stringers. Minor stockwork; minor altered mafic volc? Interval is pervasively fault brecciated - disrupts bedding/veins.		Graphitic is well developed in faulted argillite intervals. Mafics are dol. altered. {338.1 - 338.95} «wk to mod. sil.»	3 - 5% coarsely dissem py. Minor f. grained sp, gn, cp (in order of decre abund) at 338.4 m.	Core is very blocky.
342.50 TO 347.60	«Flt Bx Int b Arg/Maf?»	Black, gray. Fine. Interval is locally intensely fault brecciated and contains 50% interbedded altered maf volc? within argillites similar to those overlying, 10% white qtz veining within argillite.		Argillites are mod. graphitic on fault surfaces. Intensely dol alt'n of mafics, minor talc.	3 - 10% f. grained dissem py. Py concentrations are largest in the volcanics.	
347.60 TO 361.30	«Arg Flt Bx »	Black, white. Fine. Black argillite and minor cherty argillites host < = 20% white qtz veins and stringers and minor stockwork. Interval is strongly but intermittantly fault brecciated to 358.8 m. 348.7 - 349.4: Hinge zone.		Arg is graphitic in fault zones, patchy weak to mod. gray sericite developed locally, minor talc. {358 - 358.22} «mod. silic» {358.9 - 359.15} «mod. silic» {360.48 - 361.18} «mod. silic»	< 5% f.g. py in coarse dissem/bands/ patches - locally 10% interval contains minor amounts of pale sphalerite associated with qtz veinings. Locally sphalerite content < 4%, sphalerite recognized at 352.6 m., 355.5 - 355.7 m. 356.45 m.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
361.30 TO 364.60	«Met Frag»	Gray, black. Gradational contacts interval consiste of 70% clasts in a silty matrix interspersed with thin argillite or mafic volc. beds? Clasts are fromework supported, clasts can exeeed 3 x 5 cm. and range down to 1 mm. Clast composition, argillite, qtz/dol, dol mafics?, ser alt. mafics, clasts are angular to subrounded Matrix is locally argillite. Weak sense of foliation 70 - 80 degrees. 363.6 - 364.05: Interbedded argillite and altered mafic volcanics.		Mod. dol alteration is pervasive throughout mafic volc, patchy brown sericite.	< 10% f. coarse grained py in dissem, stringers.	
364.60 TO 385.00	«Arg/Cht/Ma f Tran Zone »	Black, gray. Fine. 65% of interval is comprised of gray altered mafic volcanics which are interbedded with argillite and ribbon chert. Volcanics are predominant throughout center section of the intervl - decrease in quantity towards ends of interval. Arg beds frequently contorted, offset, folded. {364.7 - 364.84} «chert» {382.7 - 383.47} «chert» {384.37 - 384.54} «chert» {371.9 - 372.3} «weak flt gou» 372.3 - 373.9: Qtz/dol vein (65/35%).		Mafic volcanics are strongly dol. altared with minor brown sericite. Minor patchy silicification of argillite.	< 5% f. grained py, dissem. Pale brown, minor red brown sphalerite at: 365.4 m. Minor sp in qtz. {366.3 - 366.45} «< 5% sp» coarsely dissem in bands. 367.2 m.: Minor sp.	
385.00 TO 402.40	«Chert/Arg»	Black, gray, white. Fine. Chert, cherty argillite comprises 90% of interval 10% non siliceous argillite. Much of interval contains finely laminated. Laminae are variably oriented with pre-ference for orientations between 70 - 90 degrees to C.A. 392.2 - 299.6: Laminations are frequently at low angles to C.A. - Hinge zone. Predominant cleavage plane at {385 - 386.4} intermittant «flt bx zone» {388.3 - 388.8} weak «flt gou zone» with local bx of rock. {400.9 - 401.4} «qdv» 85% dol, 15% qtz.	 90	Minor sericite present in fault zones. Argillitw is weakly graphitic.	< 3% py overall, concentrated in the argillite. Minor amounts of sp and galena in qtz (+/- dol) veins within chert at: 398 - 398.1 m, 398.5 m, and 400.9 m.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
402.40 TO 403.40	«Dol Maf»	Green, gray. Fine to med. Non-descript alt. mafic volcanics, 2% gray qtz stringers within bleached intensely altered rock. 403.2 - 403.4: 50% white to gray stretched/ boudined qtz vein material.		Intense dol. alt. of volc. patchy brown sericite alt'n, minor fuchsite.	402.4 - 403.15: 5% med. grained py in dissem/bands. {403.15 - 403.3} «<40% py» semi massive to banded.	
403.40 TO 404.75	«Qtz Dol Vein»	White. Coarse. Qtz/dol (80/20%) Vein with minor amounts of altered volc. Vein texture varies from massive qtz with dol intergrowths to a brecciated and recemented qtz vein (over a 10 cm. width).		Mafics are fuchsite and brown sericite altered.	Vein is barren, mafics are pyritiferous.	Core is blocky.
404.75 TO 411.05	«Het Frag»	Gray, white and brown. Fine to med. Mafic volcaniclastic? Matrix hosts clast composition and content varies with depth. Clasts are predominantly mafics and sericitically altered mafics except between 405.9 - 410.25 m. where the predom. clast is chert and/or qtz/dol. Locally core appears to be only weakly clastic clast content ranges up tp 60%; 407.8 - 408.4: very weak fault bx; 5 - 10% white qtz veining; largest qtz vein occurs between 407.05 - 407.28 meters. 408.4 - 409.15: Sx bearing dol (qtz) vein oriented at	55	Mafic volc. are moderately dol. altered streaked with patchy brown sericite. 4% fuchsite between 404.75 - 405.3.	404.75 - 408.4: 5% f. grained dissem py locally occurs as bands; {408.4 - 409.15} «20% sp, 5% gn, 5% py» associated with dol (minor qtz) vein Sx are concentrated between 409.12 - 409.5 m. in massive sulphide bands; Sx are fine to med. grained. Sphalerite is a moderate red brown color. 409.15 - 410: <1% sp, Minor gn, 5% py. 410 - 411.05: 5% fine to coarse grained py dissem.	
411.05 TO 411.80	«Qtz/Dol Vein»	White. Fine Coarse. Qtz comprises 85% of interval; 15% dol as fracture lining and minor altered coarse intergrowths. Qtz contains some open fractures/ fissures, minor altered mafics.		Carbonate is locally weathering out. Dol/ser alt. of mafics.	Vein is barren.	
411.80 TO 412.60	«Dol Maf Vol»	Gray. Fine. Mafic volc. are pervasively altered, original textures destroyed. 411.93 - 412.09: Dol vein in fault bx maf. vol. {411.8 - 412.3} «flt bx»		1% fuchsite at base of interval; pervasive dol alt'n, patchy streaks of brown sericite alt'n.	10% fine grained py - coarsely dissem and patches.	

408.4

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
412.60 TO 413.60	«Qtz/Dol Vein»	White. Coarse. Vein is comprised of coarse grained intergrowths of dol (60%) and qtz (40%). Vein contains minor open fractures.			Vein is barren.	
413.60 TO 414.65	«Dol/Ser Alt Maf»	Brown, gray. Fine. Intensely altered mafic volc. host 15% white qtz/dol (50/50%) veins and stringers. Alteration destroys original textures.		The interval contains patchy mod. silicification pervasive mod - intense dol. Brown sericite alteration is common. Up to 5% fuchsite locally.	1% combined sp, gn, minor cp. The base metal are fine to med. grained, coarsely disseminated in veins 5% fine grained pyrite as coarse dissem selvages. Trace tetrahedrite (?).	
414.65 TO 416.40	«Qtz/Dol/Feldspar Vein»	White. Coarse. Vein is comprised of qtz (60%) dol (36%) and feldspar (4%). Two stages of qtz veining - narrow qtz stringers crosscut primary vein. Some open fractures present. 3% altered wallrock.		Feldspar is altered to white clay - kaolinite?	1% dissem py. Minor gn - coarsely dissem.	Vein is 50% rubble with approx. 90% recovery.
416.40 TO 429.00	«Dol/Ser Alt Maf»	Gray, brown. Fine. Intensely altered mafic volcanics host 10% white to grat qtz/dol veins, stringers and patches. 3% boudins/breccia fragments present locally. Minor folding of stringers. Clasts comprised of qtz/dol and sericitically alt. maf. Lower contact at gradational. {416.4 - 417.05} «flt bx gou»		Intense pervasive dol. alteration with abundant brown ser. alt. and local limonitic carbonate (siderite?) Minor fuchsite and talc.	<1% combined fine grained sp and gn, associated as single grains and as coarse dissem/stringers. {424.9 - 427.7} «2% sp, gn» py content varies from 5 - 15% fine to coarse grained, dissem - bands. {425.8 - 426.4} «20% py» {428.3 - 428.48} «50% py»	
429.00 TO 432.40	«Het Frag?»	Gray. Gradational contacts. Fine grained matrix supports 10 - 40% clastic material. Clasts are subrounded, and range in size from 1 mm to 2 cm. Clasts consist of qtz, dol, pyrite? and sericitically altered mafics. Minor qtz/dol veining, weak sense of foliation.	75	Pervasive mod. to intense dol. alt'n bleaches core; patchy streaks of brown sericite, minor massive sericite.	5% dissem py. 431.9 m. 5% fine grained galena in a 3 cm. wide vein.	
432.40 TO 462.40	«Dol/Ser Alt Maf»	Gray, green, buff. Fine. Original textures/mineralogy replaced by altered. Local fragmental textures where sericitic alt'n cuts bleached dol. alt'n, 2% gray qtz/dol veining.		Pervasive mod. to very intense dol. alt'n with abundant brown to limonitic sericite (+/- Fe carb) which locally gives brecc. textures; minor fuchsite and talc.	5 - 10% fine grained pyrite dissem with local concentrations to 20% over narrow widths. {432.65 - 433.2} «30% py»	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
				Minor patchy weak silicification.		
		455.3 - 453.48; Qtz/dol vein.			‡437.9 - 438.57‡ «30% py»	
		‡459.3 - 462.3‡ pervasive «flt bx» throughout interval.			‡442.15 - 442.35‡ «25% py»	
		END OF HOLE			432.4 - 434.8 : <1% combined sp, gn in qtz/dol veins.	
					446.75 - 446.85: 2% fine grained gn.	

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
26202	36.40	37.90	1.50								29	51	16				78	49		1	0.4	24	
26203	57.25	58.75	1.50								53	54	25				131	80		1	0.7	29	
26205	100.30	101.80	1.50								49	70	6				287	26		1	1.2	20	
26206	143.95	145.45	1.50								48	29	40				177	48		7	1.3	26	
26207	145.45	147.80	2.35								71	51	34				163	48		5	1.1	18	
26209	175.35	176.85	1.50								51	88	17				1	44		1	0.8	4	
26210	176.85	178.00	1.15								91	82	17				98	32		1	1.5	56	
26211	178.00	179.30	1.30								38	102	6				1	40		1	0.8	3	
26212	179.30	180.60	1.30								66	108	11				1	41		1	1.0	2	
26213	180.60	182.10	1.50								204	185	65				345	40		1	1.9	106	
26214	182.10	183.60	1.50								356	354	136				158	62		1	2.2	89	
26215	183.60	185.10	1.50								304	601	368				312	59		2	3.1	121	
26216	185.10	186.60	1.50								137	216	46				93	67		2	2.5	90	
26217	186.60	188.10	1.50								79	204	56				65	65		1	2.2	66	
26218	188.10	189.40	1.30								147	223	176				386	39		5	2.1	252	
26219	189.40	190.70	1.30								117	81	72				798	45		1	1.6	156	
26220	190.70	192.00	1.30								108	160	116				999	58		2	1.4	104	
26221	192.00	193.50	1.50	.031	.09	.03	3.6	.15			311	903	325				944	33		7	3.6	150	
26222	193.60	195.00	1.50								49	89	11				335	37		1	1.6	23	
26225	272.90	274.40	1.50								36	50	10				12	34		1	0.8	1	
26226	278.00	279.50	1.50								36	37	29				11	41		1	0.6	2	
26227	284.00	286.30	1.50								42	48	22				18	80		1	0.5	2	
26228	290.80	292.30	1.50								30	75	30				24	40		1	0.7	1	
26229	295.20	296.70	1.50								74	59	26				77	43		1	1.1	4	
26231	303.10	304.60	1.50	.006	.01	.01	1.1	.07			60	73	52				1916	60		14	1.1	68	
26232	304.60	306.10	1.50								31	41	67				388	57		12	1.0	16	
26233	306.10	307.60	1.50								72	163	64				269	50		16	1.2	4	
26234	307.60	309.10	1.50								50	113	37				393	86		12	1.0	30	
26235	309.10	310.60	1.50								40	85	34				511	75		13	0.8	38	
26236	310.60	312.10	1.50								39	132	27				255	91		6	0.6	12	
26237	312.10	313.60	1.50								63	484	87				463	86		10	0.5	40	
26238	313.60	315.10	1.50								65	114	67				200	110		3	0.6	11	
26239	315.10	316.60	1.50								37	84	83				126	93		2	0.4	3	
26240	316.60	317.90	1.30								24	68	35				114	89		2	0.5	2	
26241	317.90	319.50	1.60								57	313	185				1008	56		5	2.6	46	
26242	329.30	330.80	1.50								36	583	124				225	25		1	1.6	3	
26243	330.80	332.30	1.50	.017	.05	.02	2.6	.04			174	469	179				141	37		1	2.6	43	
26244	337.70	339.20	1.50	.028	.53	.19	17.4	.02			275	5300	1883				207	123		58	17.4	24	
26246	346.00	347.60	1.60								79	167	56				252	54		1	1.7	1	
26247	352.60	354.10	1.50								51	806	253				208	63		1	1.2	70	

Sample	From (m)	To (m)	Length (m)	CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB
26248	355.50	357.00	1.50	.005	.11	.02	3.0	.05			46	1145	186				106	59		2	3.0	49
26249	359.80	361.30	1.50								61	585	290				75	33		8	1.8	12
26250	361.30	362.40	1.10								36	315	368				93	53		1	1.8	36
26259	362.40	363.60	1.20								49	419	278				78	52		1	1.7	25
26260	363.60	364.60	1.00	.080	.41	.38	5.5	.01			795	4101	3776				105	34		6	5.5	7
26261	365.30	366.80	1.50	.011	.27	.18	2.8	.03			108	2693	1794				197	53		1	2.8	28
26262	366.80	368.30	1.50	.010	.43	.21	2.7	.01			97	4295	2083				146	39		1	2.7	12
26263	382.10	383.60	1.50								122	264	240				162	80		1	1.5	32
26265	396.80	398.30	1.50								21	756	764				39	38		1	1.3	19
26266	398.30	399.90	1.60	.002	.16	.16	2.4	.01			24	1575	1568				63	39		1	2.4	1
26267	399.90	401.40	1.50	.003	.07	.25	4.0	.04			28	709	2548				94	22		3	4.0	35
26268	401.40	402.40	1.00								17	35	70				18	35		1	1.3	6
26269	402.40	403.90	1.50								62	190	144				114	22		1	1.9	1
26270	403.40	405.40	1.50								49	132	184				36	32		1	2.1	2
26271	405.40	406.90	1.50								64	433	139				2	32		1	1.8	30
26272	406.90	408.40	1.50								39	166	77				19	32		1	1.5	14
26273	408.40	409.15	0.75	.027		3.46	43.8	.06														
26274	409.15	410.50	1.35	.006		.15	3.8	.02														
26275	410.50	412.00	1.50								58	129	62				32	212		1	1.6	5
26276	412.00	413.60	1.60								33	98	33				1	29		1	2.2	16
26277	413.60	414.65	1.05	.008	.10	.05	3.6	.01			82	1040	541				1	26		1	3.6	2
26278	414.65	416.40	1.75	.002	.01	.15	3.7	.01			15	58	1504				1	15		1	3.7	1
26279	416.40	418.10	1.70								71	763	385				119	48		1	1.5	4
26280	418.10	419.60	1.50								71	763	513				81	35		1	1.5	17
26281	419.60	421.10	1.50	.011	.14	.09	1.9	.01			106	1385	944				186	39		1	1.9	13
26282	421.10	422.60	1.50								24	410	273				34	43		1	0.9	2
26283	422.60	424.10	1.50	.003	.14	.06	1.2	.01			31	1366	582				39	31		1	1.2	6
26284	424.10	425.60	1.50	.005	.13	.05	1.6	.01			49	1300	540				50	30		1	1.6	14
26285	425.60	427.30	1.70	.004	.15	.10	1.8	.01			36	1509	1007				40	34		1	1.8	10
26286	427.30	429.00	1.70	.007	.29	.11	2.3	.05			66	2919	1127				121	40		1	2.3	50
26287	429.00	430.70	1.70	.005	.15	.11	1.8	.02			51	1536	1121				135	32		1	1.8	16
26288	430.70	432.40	1.70	.005	.11	.08	1.6	.02			53	1119	820				131	30		1	1.6	22
26289	432.40	433.90	1.50	.006	.17	.11	1.9	.01			64	1681	1086				151	33		1	1.9	1
26290	433.90	435.40	1.50	.001	.17	.15	2.8	.02			115	1729	1458				271	32		4	2.8	15
26291	435.40	436.90	1.50								94	165	78				198	64		1	1.3	2
26292	438.00	439.50	1.50								74	169	76				97	48		1	1.2	7
26293	441.00	442.50	1.50								48	39	44				58	58		1	0.7	1
26294	446.30	447.80	1.50								47	528	607				102	79		1	1.6	2

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
26201	25.90	29.20	3.30	80.05	7.87	.45	.60	.01	2.15	3.48	.02	.38			57	88			5	75	0.2	25	.02		2.12	97.25	32	1
26204	87.50	90.50	3.00	46.43	13.03	9.03	7.72	.01	1.71	9.04	.26	1.47			94	82			15	27	0.8	4	.15		.87	89.75	18	1
26208	153.30	156.30	3.00	59.30	15.18	2.25	2.85	.85	3.61	7.39	.07	.84			44	96			10	65	0.4	21	.05		.32	92.80	20	1
26223	203.00	206.00	3.00	65.24	14.53	.01	2.09	.79	3.04	6.30	.31	.61			62	54			5	63	.1	22	.01		1.85	94.82	50	1
26224	249.00	252.00	3.00	38.58	11.92	8.63	9.65	.94	1.40	9.71	.22	.72			105	63			5	45	1.1	4	.03		1.48	83.32	22	1
26230	297.80	300.80	3.00	63.16	16.97	0.01	1.11	.40	4.23	6.28	.20	.74			30	53			5	60	0.1	41	.01		3.09	96.28	384	1
26245	349.60	352.60	3.00	66.01	10.38	4.11	2.90	.17	2.45	4.50	.24	.54			41	62			5	91	0.9	55	.20		1.09	92.71	164	3
26264	392.20	395.20	3.00	74.21	6.31	5.12	2.03	.33	1.22	4.45	.13	.28			24	625			5	52	1.4	373	.01		2.68	26.82	71	2
26295	450.20	453.20	3.00	45.16	15.04	6.06	4.10	1.11	2.61	10.99	.24	1.63			106	90			5	59	0.6	50	.15		4.72	91.94	188	1

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: Sam Horizon

PLOTTING COORDS GRID: Surveyed
NORTH: 1144.26N
EAST: 12301.97W
ELEV: 1087.48

ALTERNATE COORDS GRID: Estimated
NORTH: 11+50N
EAST: 123+ 0W
ELEV: 1065.00

COLLAR DIP: -55° 0' 0"
LENGTH OF THE HOLE: 377.00m
START DEPTH: 0.00m
FINAL DEPTH: 377.00m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: July 29, 1990
DATE COMPLETED: August 4, 1990
DATE LOGGED: July 31, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: Frontier
CASING: Pulled
CORE STORAGE: Samex Camp

PURPOSE: Test North Western Extension of Sam Horizon.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
159.70	-	-55° 0'	ACID	OK		-	-	-	-	-	
215.50	-	-56° 0'	ACID	OK		-	-	-	-	-	
246.00	-	0° 0'	ACID		Bad Etch	-	-	-	-	-	
285.60	-	-56° 0'	ACID	OK		-	-	-	-	-	
322.10	-	-56° 0'	ACID	OK		-	-	-	-	-	
358.70	-	-56° 0'	ACID	OK		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 42.60	«Csg»					
42.60 TO 78.60	«Mafic Ash Tuff»	Green, marron. Fine. Interbedded green and maroon tuffaceous (?) beds and laminae foliation/bedding? from 50 - 70 degrees to C.A. Ranging from 1 - 25cm contain 3% carbonates. Interval is very black and contains numerous zones of fault gouge and breccia. Intensity of faulting decreases downhole. Faulted lower contact.		Core is weakly calcareous - weak sericite alt'n is present throughout giving some phyllitic surfaces. {76.45 - 76.75} «mod silic» {78.25 - 78.6} «mod silic»	Minor py.	Recovery within the interval varies between 65 - 100 %. Overall recovery is approx. 85%.
78.60 TO 102.70	«Alt Maf Flt Bx» Qtz/Ser Alt'n	Yellow. Fine. Interval contains numerous zones of fault brecciation and gouge. Some healed breccia textures present locally clasts are predom qtz/dol. Bedding is disrupted. 10% white to grey qtz veining and patches. Veins contain <15% white to pink iron carbonates. Primary qtz veined interval occurs between 90 - 95m. Interval contains 70% vein material. 70% of interval consists of intensely altered green ash tuff? core retains a greenish tint, interbedded with black siliceous rock - altered maroon tuff? interval contains some argillite/seds interbeds very similar to the alt maroon volc. {79.5 - 79.59} laminated «chert?»		Intense yellow sericite alteration developed throughout interval. Minor graphite present in argillite.	Minor to 2% coarse grained dissem py within altered arg.	Entire interval is extremely blocky between 89.5 - 97.5m. there is approx 80% recovery. Some transitions between altered volc and sediments.
102.70 TO 121.00	«Sil/Chty Arg-Flt Bx»	Black. Fine. Argillite hosts 2% cherty? arg intervals. 10% white qtz veins - massive to weakly fractured bedding plane at 108.2m gradational contacts. 109.3 - 109.85: qtz vein with 15% wallrock fragments and strongly silic. envelop. 102.7 - 107.7: Interval is a strong fault bx zone.	80	Argillite is weak to moderately silicified. Silicification is intense on margins of major qtz veins. Graphite is weak to moderately well developed. Intense silicification zones between 110.9 - 111.9m., 112.9 - 113.8m, 115.4 - 118.1m.	Minor to 3% fine - med grained py in fine - coarse dissem. {114.0 - 114.75} «20% py» Py is fine grained and is distributed in bands parallel to bedding. 118.6 - 121: <5% py.	Core is very blocky.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		116.3 - 118.3: Core is blocky to finely crushed minor fault gouge present.				
121.00 TO 123.65	«Qtz/Ser Alt Arg»	Grey, yellow, black. Fine. Black argillite has been largely altered - some reminant patches/beds remain unaltered. 3% white massive qtz veins.		Weak to intense yellow sericite alt'n of arg; minor mod silicification adjacent to qtz veins.	<2% py.	
123.65 TO 139.37	«Arg»	Black. Fine. Argillites host 15% white qtz veins and lenses; 2% white to grey dol veins and fracture fillings in qtz. Qtz content increases downhole. Intermixed argillite/volcanic sedimentory beds located between 129.45 - 130.3m., 136.05 - 136.45m., 136.65 - 136.87m.		Patchy intervals of weak to moderate silicification - about 60% of interval is silicified. Core is locally weakly phyllitic.	Pyrite content is generally <5% but there are intervals of semi-massive to massive py at the following locations: 125.3 - 125.45: 15% py. 132.97 - 133.1: 35% py. 136.46 - 136.52: 80% py.	Core is very blocky between 129.8 - 135.2m.
139.37 TO 143.47	«Qtz/Ser/Dol Alt Maf»	Grey, green, yellow, white. Fine. Intensely altered mafic volcanics or volcaniclastic sediments. Alteration destroys original textures. Contact at 142.22 - 142.6: Qtz vn. 142.7 - 143: Tectonically brx, argillite. 143 - 143.45: Intermixed mafic volcano sediments and argillite.	40	Mafics are pervasively weak to mod. carbonatized, 20% qtz/dol veining/ patches. Patchy intense yellow sericite alt'n argillite is weakly silicified.	1% pyrite.	
143.47 TO 150.40	«Sil Arg»	Black, grey. Fine. Bedded argillite, bedding is strongly disrupted throughout interval - cleavage plane Local breccia material at top of interval; clasts are predominantly qtz, 25% qtz veins and brecciated qtz clasts and minor stockwork.	80	Patchy weak to moderate silicification.	5% fine grained pyrite coarsely dissem an bands/patches.	
150.40 TO 157.80	«Chert/Chrty Arg»	Grey, black. Fine. Fine grained, very siliceous, local laminations; laminations are contorted. 5% white qtz veining.		5% fine - med grained py in semi-massive patches/bands. <1% combined sp, cp within late stage white qtz veining/patches.		
157.80 TO 246.60	«Arg/Silt/Wacke»	Black, grey. Fine. Grain size <1mm. well bedded, clean turbidite sequence, minor veining. Bedding is consistent at Interval consists of 65% argillite wacke content decreases downhole.	80		Minor py.	No clear indication of tops. 157.8 - 165.5: Very blocky core.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		157.8 - 159.7: Weak flt bx zone 170 - 180.5: : Large undifferential wacke bed. 184.3 - 184.4: Flt gouge 188.5 - 188.7: Flt gouge at 213.4m. beds are being offset by a cleavage at weak sericite foliation bedding approx	60			
		217.2 - 217.55m: Flt bx gouge 220.8 - 226.2: Broad hinge zone - a series of fold noses present. Between 222 - 223.3m. Beds are stretched and brecciated at 223.1m. bedding cross cutting cleavage.	40 40	220.8 - 226.2: Weak graphite alt'n in hinge zone	246 - 246.6: 5% very fine grained py.	
		⌈239.6 - 241.8⌋ intense «flt bx»				
		⌈246.3 - 246.45⌋ «chert»		246 - 246.6: Weak to moderate sericite alt'n, weak silicification.		
		Lower contact at Contact is distinct.	30			
246.60 TO 252.20	«Qtz/Ser Alt Seds»	Yellow, grey, black, white. Fine. 90% of the interval is intensely altered seds, 10% of interval consists of windows of weakly altered argillite altered seds contain 20% qtz vein/stringers, patches/stockwork. Some qtz veins are folded, Minor local breccia textures.		Intense, locally patchy yellow sericite alt'n.	5% very fine grained py in dissem and stringers.	
		⌈246.6 - 247.4⌋ «flt bx»				
		250.3 - 250.63: Qtz/dol (80/20%) vein.			⌈250.3 - 250.63⌋ «<1% sp, minor gn, cp» Fine - coarsely diss in qdv.	
		251.8 - 252.2: Minor intermixed mafic volc?		251.8 - 252.2: Volc are carbonitized.		
252.20 TO 254.20	«Arg Flt Bx»	Black. Fine. Black argillite contains 10 - 15% massive white qtz veining. Interval is pervasively fault brecciated, gradational contacts.		Weak patchy silicification.	<1% py.	
254.20 TO 268.50	Interbedded «Arg/Maf Zone»	Grey-green, black. Fine. 55% of interval consists of weakly altered mafic volcanic sediments? 45% argillites. Argillites contain 10% white qtz vein/stringers: Minor disrupted bedding and subrounded		Patchy weak to mod. silicification of argillite. Mafics are weak to moderately carbonitized with patchy weak brown sericite alt'n.	2- 5% py fine (minor) coarse grained, fine dissem to patches and stringers.	The mafics in this interval are not particularily distinct from the altered wackes of the undulying interval.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		clastic textures within argillites.				
268.50 TO 309.70	«Arg/Silt/ Wacke»	Black, grey. Fine. 80% of interval is black argillite with interbedded siltstone. Bedding within the argillites is commonly: offset by cleavage planes; folded - open and chevron, brecciated with subrounded to angular clasts, chaotic, - zones of fold hinges present between 292.6 - 297.1m. 3% white qtz/dol veining,wacke beds are generally somewhat washed out - lacking distinct granular textures. {286.3 - 290} «sil, cherty arg» minor pyritic beds. 285.3 - 285.45: Wk flt bx. 295.9 - 296.2: Wk flt bx. 309.45 - 309.7: Wk flt gouge.		Minor patchy silicification wacke beds are weakly carbonitized. Minor green to brown sericite streaks.	Pyrite content varies between 2 - 10% Pyrite is very fine grained to med grained. Pyrite occurs as dissem, stringers, beds. {288 - 288.85} «15% py» 299.7m: Trace gn in qv.	Presence of brown sericite may indicate a mafic component within the wackes - minor volcaniclastics?
309.70 TO 330.20	«Qtz/Ser Al t Sed»	Yellow, grey, white. Fine. Sediments are intensely altered but contain <5% subintervals of unaltered argillite. 309.7 - 316.5: Wk to mod. flt bx, gouge zones. 327.8 - 329.2: Weak flt bx, gouge zone.		Intense yellow sericite alteration of seds with 15 - 25% white qtz veins/ patches. Veins are massive to weakly fractured with dol fillings. Dolomite is very subordinate to qtz. {328.68 - 330.2} intense silicification weak to mod. yellow/green sericite alt'n «int sil, chert?»	1 - 10% very fine grained dissem py. Pyrite which occurs within qdv are slightly coarser.	328.68 - 330.2: Possibly originally a chert or cherty arg.
330.20 TO 333.50	«Chert»	Grey, black. Fine. Fine grained containing 20% irregular white qtz veins/stringers. Laminations are fine, weakly contorted. 333.25 - 333.5: Cherty/sil arg, weakly brecciated.		Chert has been resilicified locally.	Chert contains <1% fine grained, dissem py - largest concentrations at 331m, 331.65m. 2 - 5% fine grained coarsely dissem py.	
333.50 TO 334.70	«Dol/Ser Al t Maf?»	Grey. Fine. Rock has been intensely altered. Foliation at given by sericite. Slaty cleavage. Minor amounts of argillite present, 2% qtz/dol veining.	80	Rock is moderately carbonated, intense gray - brown sericite alteration.	3% py in coarse dissem and blebs throughout intervals. Contact zones contain semi-massive to massive pyrite. 335. 3 - 335.45: 15% py.	Unit may be an altered sediment.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
					{334.58 - 334.7} «70% py, 1% sp»	
334.70 TO 343.65	«Chert»	Grey, black. Fine. Massive to ribbon cherts host 5 - 15% white qtz veins/stringers. Qtz veins are weakly fractured. General sense of bedding Weak cleavage direction Qtz veins and pyrite stringers are preferentially oriented to cleavage plane. Inter - laminae argillite is graphitic - stiolytic partings present.	70 25	Chert is locally resilicified.	Minor pale, fine grained sp assoc with white qtz veins/stringers. 3% fine grained pyrite coarse dissem along fractures, as stringers parallelling cleavage, and minor pyrite beds (interlaminae in ribbon chert). 343.2,: Trace cp.	
343.65 TO 345.40	«Sil/Chty Arg»	Black. Fine. Bedding in arg/cherty argillite is disrupted/ offset by cleavage at 30% of interval is cherty {345.1 - 345.4} «flt bx»	75	Weak to moderate silicification throughout argillite is moderately graphitic.	5 - 10% fine grained py dissem, along cleavage and parallelling bedding.	
345.40 TO 348.40	«Qtz Vein»	White. Massive white qtz vein continuing 10% coarsely diss. fine grained grey dol, 5% wall rocl clasts. Two predominant fracture planes	55 65		2% py, coarse dissem, generally assoc with wallrock inclusions.	
348.40 TO 363.65	«Sil/Chty Arg»	Black, grey. Fine. Black argillite with 40% black grey cherty argillite and minor ribbon chert, bedding generally contorted predominant between 70 - 90 degrees to C.A. 5% white qtz veining which contains 15% Fe-carbonates. 361.9 - 362.7: Hinge Zone.		Argillites are weak to moderately silicified. Locally argillite is graphitic.	5%, 10% locally, fine grainedpy, coarse dissem, patches, stringers. 357m.: Pyrite beds to 5mm thick.	358.1 - 361.7: Very blocky core.
363.65 TO 377.00	«Dol Maf»	Grey, black. Fine. Mafic volcanics have been intensely altered. 5% black argillite interbedded intervals present - max width 10 cm. 3% qtz/dol veining (50/50%). {365.25 - 367.2} «flt bx»		Intense, pervasive carbonatization of mafics with patchy brown sericite alt'n.	1 - 3% dissem py except between: {363.65 - 363.95} «20% py» fine - med grained, semi-massive. 364.5 - 364.8: 7% py.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
					{366.1 - 366.2} «30% py»	
		{370.1 - 373} «flt bx zone»			Fine - coarse grained, semi-massive.	
		END OF HOLE				

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
26297	86.00	88.00	2.00								72	82	30				41	36		1	0.5	3	
26324	92.60	95.40	2.80								40	66	24				12	176		1	0.1	2	
26323	104.30	105.70	1.40								70	93	47				73	56		2	0.8	4	
26301	114.80	116.30	1.50								31	138	22				84	39		5	0.5	4	
26302	116.30	118.00	1.70								21	141	23				88	22		5	0.7	5	
26303	118.00	119.50	1.50								50	19	17				65	96		2	0.6	22	
26304	127.75	128.25	0.50								58	38	27				200	73		2	0.6	26	
26305	132.30	133.80	1.50								44	74	29				218	97		1	0.6	60	
26306	135.60	137.10	1.50	.008	.02	.01	0.4	.12			75	190	50				909	88		10	0.4	120	
26307	148.90	150.40	1.50	.012	.02	.01	0.5	.12			122	163	133				610	138		7	0.5	117	
26308	150.40	151.90	1.50	.010	.07	.01	2.0	.60			103	655	126				4700	37		30	2.0	600	
26309	151.90	153.40	1.50	.002	.01	.01	0.5	.02			19	55	30				419	25		10	0.5	16	
26310	153.40	154.90	1.50	.005	.03	.01	2.4	.07			46	279	83				1018	24		42	2.4	68	
26311	154.90	156.40	1.50	.006	.03	.01	1.1	.06			55	344	83				337	22		13	1.1	63	
26315	246.00	246.60	0.60	.005	.16	.02	2.0	.18			641	9892	486				102	38		6	1.2	244	
26316	246.60	248.10	1.50								57	81	25				81	48		1	0.4	2	
26317	250.10	251.60	1.50	.028	.09	.06	4.6	.02			280	939	647				335	81		14	4.6	20	
26318	253.80	255.30	1.50								195	607	421				170	58		5	2.0	22	
26320	259.70	261.20	1.50								109	100	209				232	51		1	1.3	2	
26321	268.50	270.00	1.50								40	87	54				209	109		2	0.8	52	
26322	287.60	289.10	1.50	.049	.22	.10	2.9	.07			490	2192	1029				463	64		9	2.9	66	
26326	299.30	300.80	1.50	.005	.01	.03	1.3	.01			48	95	281				50	55		1	1.3	10	
26328	328.60	330.10	1.50	.022	.01	.01	2.5	.01			218	91	130				298	58		15	2.5	104	
26329	330.10	331.30	1.20	.014	.04	.01	10.6	.06			138	383	116				172	75		58	10.6	64	
26330	331.30	332.50	1.20	.016	.24	.06	5.7	.08			155	2387	573				262	50		43	5.7	76	
26331	332.50	333.50	1.00	.004	.01	.01	2.3	.16			44	139	120				826	102		23	2.3	158	
26332	333.50	334.70	1.20	.006	.04	.02	1.2	.06			61	408	191				452	105		1	1.2	57	
26333	334.70	336.20	1.50								30	46	76				103	76		6	1.0	10	
26334	336.20	337.40	1.20								31	56	63				109	87		5	0.8	5	
26335	337.70	339.20	1.50								18	15	29				79	43		4	0.6	2	
26336	339.20	340.70	1.50								20	53	24				120	55		4	0.5	1	
26337	340.70	342.20	1.50								14	43	15				47	28		1	0.3	2	
26338	342.20	343.65	1.45								27	22	35				66	66		2	0.5	4	
26339	343.65	345.40	1.75								49	60	33				143	192		2	0.5	12	
26340	345.40	346.90	1.50								12	134	44				62	43		2	0.6	2	
26341	346.90	348.40	1.50								25	356	41				125	37		3	0.6	6	
26342	348.40	349.90	1.50								39	41	33				182	172		3	0.7	8	
26343	349.90	351.40	1.50								42	97	51				147	125		4	0.7	2	
26344	351.40	352.90	1.50								136	67	28				152	179		2	0.6	1	
26345	352.90	354.40	1.50								66	50	31				156	125		4	0.8	29	

Sample	From (m)	To (m)	Length (m)	CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	
26346	356.10	357.60	1.50								77	173	27				135	162		4	0.7	4	
26347	363.70	365.10	1.40								66	336	95				233	119		1	0.7	2	
26348	365.10	366.60	1.50								117	239	90				189	103		1	0.6	15	

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
26296	54.80	57.80	3.00	70.14	14.67	.12	2.17	1.06	1.58	5.82	.30	.62			61	117			10	22	1.1	47	.12		.02	96.64	139	22
26298	105.70	108.70	3.00	77.42	5.58	2.64	.74	.05	1.11	4.75	.03	.42			181	247			5	134	3.9	51	.51		2.80	96.13	264	26
26313	159.70	162.70	3.00	68.67	13.42	1.46	2.55	.12	2.48	6.47	.07	.72			42	118			5	41	1.0	41	.01		.23	96.25	58	3
26314	206.30	209.30	3.00	58.13	16.72	1.63	4.52	1.47	2.44	8.33	.11	1.14			62	113			25	39	0.9	29	.21		.24	95.00	1	1
26319	261.20	264.20	3.00	49.88	14.50	6.41	6.62	.96	1.05	10.55	.36	1.22	26		26	131			10	41	0.9	57	.37		2.21	94.18	64	1
26327	313.00	316.00	3.00	61.73	18.37	.52	1.70	.87	3.87	6.31	.22	.81			72	32			5	256	.1	38	.15		2.54	97.20	52	1
26349	370.90	373.90	3.00	36.88	11.48	12.73	7.38	1.06	.81	9.32	.25	1.03			87	57			5	27	1.2	16	.61		.78	82.36	84	1

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION:

PLOTTING COORDS GRID: Sam Survey
NORTH: 306.57N
EAST: 11889.49W
ELEV: 1043.98

ALTERNATE COORDS GRID: Estimated
NORTH: 3+10N
EAST: 119+ 0W
ELEV: 1025.00

COLLAR DIP: -70° 0' 0"
LENGTH OF THE HOLE: 166.70m
START DEPTH: 0.00m
FINAL DEPTH: 166.70m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: April 8, 1990
DATE COMPLETED: November 8, 1990
DATE LOGGED: September 8, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: Frontier
CASING: Pulled
CORE STORAGE: Samex Camp

PURPOSE: Drilled to test the extension of the Rea Horizon.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
75.20	-	-66° 0'	ACID	OK		-	-	-	-	-	
114.90	-	-65° 0'	ACID	OK		-	-	-	-	-	
157.60	-	-67° 0'	ACID	OK		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 15.20	«CSG»					
TO 87.10						
15.20 TO 78.50	«Mafic Flows»	Green. Fine to med. Massive, porphyritic flows (?) with white calcareous speckles after plagioclase (?) and dark chloritic spots after hornblende or pyroxene. Weak to moderate foliation at	45	Calcareous throughout with deformed qtz-calc. Stringers and segregations. 46 - 46.5: Flt. gou. Also chloritic throughout. From 54.5 - 58.5: Contains bleached fragments, widely spaced, up to 10 cm. of similiar material (blocky flow?) From 68 - 70 has minor brown sericite.	Tr. access py.	
78.50 TO 82.80	«Dol Maf»	Light green. Fine. Gradational alteration of foliated volcanics from 81.5 - 82.3 is compositionally banded at 1 - 10 cm. scale with chlorite bands separated by wider ferrodolomitic bands. Possibly pyroclastic. Banding	55	Strong pervasive ferrodolomitization with minor deformed and broken qtz-dol veinlets. Trace fuchsite towards end of interval.	Tr. py.	
82.80 TO 83.50	«Flt Br/Maf»	Light green. Fine. Friable, dol. Mafic breccia and fault gouge.		Strong Fe-dol and clay (?) alt.	Tr. Py.	
83.50 TO 87.60	«Arg/Maf Flt Br»	Yellow and black. Fine. Continuation of fault breccia, first appearance of carbonaceous mat'l. Thinly laminated and contorted.		Numerous hinge zones w/ laminations along C.A. Yellow sericite and qtz-dol flooding.	Tr. Py.	Fairly major brittle/ductile fault, graphitic and conductive.
87.60 TO 125.00	«Ser/Sil Arg/Tuff?»	Black, yellow, olive green. Fine. Laminated black argillite, grey siltstone, and minor ash tuff? Chaotic, contorted, with numerous hinges. Predominant bedding direction at Axial planar cleavage	60 60	Selective yellow sericite alteration of non-carbonaceous laminae (silty?) and yellow - brown to olive green sericite alt. and ferrodolomitization of thin tuffaceous (?) beds up to 20 cm. thick. Deformed boudined and broken qtz-dol veinlets common.	3% fracture filling pyrite assoc. with qtz veining.	Numerous zones of weak fault breccia and open fractures throughout interval.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
125.00 TO 129.80	«Arg Flt Gou & Bx»	Black and gray. Sandy, earthy gouge and breccia, fairly well recovered (90%). Very minor sericitic and dol. mafic fragments. Poor foliation	40	Minor qtz-dol vein fragments and healed breccia.	3% patchy dissem pyrite in arg. fault breccia.	
129.80 TO 130.60	«Py Arg Bx»	Black. Coarse. Matrix supported breccia with cherty, pyritic, and dol. frags in an argillaceous matrix.		Minor dol and sil.	10% py as clasts, dissem and fracture fillings.	Healed fault breccia?
130.60 TO 145.70	«Py/Dol Int / Tuff?» Intermediate crystal tuff?	Gray, brown. Fine to med. Fairly conformanle looking upper contact at 40 degrees to core axis. Massive, granular with faint wavy foliation at all orientations. Protolith probably an intermediate flow or cystal tuff, as individual grains are pseudomorphed by carbonate, or leucoxene (?)	40	Very intense pervasive Fe-dol, decreases downhole. Silicification and pyrite content increase downhole. Minor fuchsite at 145 m. Leucoxene (?) increases to 5% downhole.	Disseminated, fracture filling, and on "stylolite-like" partings. «5 - 10% py» increasing downhole. {144.2 - 145.7} «15% py»	Correlatable with tuff in RG-332
145.70 TO 146.40	«Flt Gou & Bx»	Friable but cored completely, contains argillite, qtz vein fragments. Foliation	60	Weak patchy silicification and dolomitization.	5% pyrite.	
146.40 TO 166.70	«Arg/Silt»	Black and gray. Fine. Typical "HW Seds". Planar laminated with minor disturbances (soft seds?) Laminations Foliation Flames and load structures show tops downhole. END OF HOLE	60 30	Minor qyz-dol veinlets. Relatively very fresh.	Tr. Py.	Tops downhole.

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
26403	110.40	111.40	1.00	.006	.01	.02	2.1	.01			57	77	50				1	44		12	2.1	2	
26404	129.80	130.60	0.80	.004	.01	.01	2.4	.02			41	34	38				2	28		16	2.4	15	
26405	130.60	131.60	1.00	.005	.01	.01	1.8	.01			51	45	33				1	30		9	1.8	6	
26407	137.40	139.90	2.50	.010	.01	.01	0.6	.05			104	107	27				35	25		8	0.6	50	
26408	139.90	141.40	1.50	.012	.01	.01	0.8	.04			123	99	25				38	24		8	0.8	36	
26409	141.40	142.70	1.30	.011	.02	.01	1.1	.04			110	191	36				5	37		8	1.1	42	
26410	142.70	144.20	1.50	.011	.01	.01	0.2	.05			111	67	29				17	40		4	0.2	50	
26411	144.20	145.70	1.50	.011	.01	.01	0.3	.07			110	38	30				5	52		5	0.3	72	
26412	145.70	146.40	0.70	.011	.03	.01	2.1	.11			109	274	119				105	82		8	2.1	111	
26413	146.40	147.90	1.50	.003	.01	.01	1.5	.02			31	94	39				29	51		3	1.5	20	

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
26401	28.00	31.00	3.00	38.4	11.83	14.96	6.74	1.22	1.25	8.26	.17	1.29			68	44			5	51	1.9	40	.31		.19	84.64	19	3
26402	98.00	100.00	2.00	56.0	11.53	5.58	3.72	.31	2.88	6.54	.56	.64			48	70			10	43	0.5	51	.44		1.08	89.32	16	2
26406	132.00	135.00	3.00	37.0	11.46	11.71	8.08	1.03	.98	11.29	.38	.83			64	59			5	63	0.7	8	.24		2.45	85.50	74	1
26414	150.00	152.00	2.00	62.11	16.24	1.04	3.21	.79	2.98	6.42	.06	.87			44	107			5	48	0.6	30	.21		.46	94.44	70	1

From (m)	To (m)	Length (L)	Sum Of Length S>= 0.00cm	RQD S/LX100	Number Of Fractures	Fractures Per Metres	Number Of Veins	Veins Per Metres	Angle	Comments
0.00	0.00	0.00	0.00	0	0	0	0	0	0	

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: Sam Horizon

PLOTTING COORDS GRID: Sam Survey
NORTH: 913.75N
EAST: 12196.00W
ELEV: 1063.93

ALTERNATE COORDS GRID: Estimated
NORTH: 9+15N
EAST: 121+95W
ELEV: 1063.70

COLLAR DIP: -55° 0' 0"
LENGTH OF THE HOLE: 419.70m
START DEPTH: 0.00m
FINAL DEPTH: 419.70m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: August 4, 1990
DATE COMPLETED: August 11, 1990
DATE LOGGED: August 6, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: Frontier
CASING: Pulled
CORE STORAGE: Samex Camp

PURPOSE: Test North West Extension of the Sam Horizon.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
66.10	-	-58° 0'	ACID	OK		-	-	-	-	-	
102.70	-	-57° 0'	ACID	OK		-	-	-	-	-	
254.80	-	-57° 0'	ACID	OK		-	-	-	-	-	
294.70	-	-55° 0'	ACID	OK		-	-	-	-	-	
333.10	-	-53° 0'	ACID	OK		-	-	-	-	-	
355.70	-	-52° 0'	ACID	OK		-	-	-	-	-	
380.10	-	-55° 0'	ACID	OK		-	-	-	-	-	
416.70	-	-49° 0'	ACID	OK		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 42.60	«CSG»					
42.60 TO 89.90	«Arg/Silt/Wacke»	Black, gray. Fine. Clean sequence of well bedded argillite, siltstone and wackes bedding is fairly consistent at Weak cleavage foliation present locally - varies between 30 - 50 degrees to C.A. (oriented opposite to bedding). Bedding appears to be tops uphole, 40% of interval is wacke. Core is frequently very blocky, minor narrow intervals of fault gouge. (<10 cm. wide). Minor qtz/dol veining. 77.7 - 78.3 m. : Hinge zone. 83.3 - 86.9: Hinge zone.	70	Argillite are locally graphitic.	<1% pyrite in dissem and patches.	Abundant core less throughout interval; recovery as follows: 53.9 - 56.9m : 80% 60.0 - 63.0m : 90% 63.0 - 66.1m : 60% 66.1 - 69.1m : 80% 69.1 - 71.3m : 36% 71.3 - 71.9m : 25% 74.9 - 77.1m : 45% 78.3 - 79.5m : 75% 81.3 - 84.4m : 85% 84.4 - 87.4m : 25% 87.4 - 89.9m : 40%
89.90 TO 93.60	«Py/Ser Het Frag»	Gray. Fine to med. Pyrite/Sericite matrix supports pyritic beds, clasts of qtz/dol and argillite, pyrite? and minor sericite altered chips. Clasts are elongate in plane of foliation. Clasts are angular. 2% white qtz/dol veining qtz/dol clasts 50% argillite (45%). {92.2 - 93.5} «flt bx»	80	Gray sericite is moderately well developed, minor graphite.	Pyrite content varies between 20 - 40% Fine to med. grained dissem to bands/beds.	Approx. 75% recovery within interval.
93.60 TO 100.00	«Sil Arg»	Black. Fine. Interval consists of 95% pyritifereous argillite with 5% wacke beds towards top of interval - primarily between 93.6 - 94.05m, general sense of foliation and bedding is between 93.6 - 96.6m. movement at low angles to bedding terminates. Some beds/stringers. 3% narrow qtz/dol stringers oriented subparallel to bedding/foliation. Qtz/dol vein between 94.3 - 94.55m. {97.65 - 98.05} «flt bx» 98.4 - 100.0: Qtz/dol stringer/stockwork gives argillite crackle breccia texture.	70	Where the interval is not faulted the argillite is weak to mod. Silicified, wackes are dolomitized. 98.4 - 100.0: Mod. qtz/dol stringers.	5% fine grained py dissem and elongate lenses paralleling bedding. 98.1 - 98.2: 10% v.f.g. py. 98.4 - 100.0: 1% py blebs, minor sphalerite in qtz/dol veins.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
100.00 TO 111.25	«Alt Arg»	Gray, black. Fine. Black argillites which have been variably altered.		100 - 101.6: Pyritiferous arg, with minor fine grained dol nodule zones. 101.6 - 102.15: Weakly silicified black arg. 102.15 - 103: Mod. gray sericite alt'n pyritiferous, 15% fine dolomitic spotting. 103 - 105.05: Interval contains abundant ferro dolomite nodules to 2 mm., locally there are only minor dol nodules and mod. gray sericite alt. (MVY) present. 105.05 - 111.25: Mod. gray sericite alt'n 3% dolomite throughout matrix, 3% dol +/- qtz, local minor graphite.	100 - 101.6: 40% fine grained uniformly dissem py. 101.6 - 102.15: 10% fine grained py, coarse dissem, patches. 102.15 - 103: 30% v.f.g. pyrite. 103 - 105.05: 15% fine grained pyrite overall content ranges 3 - 50%. 105.05 - 111.25: <40% fine grained py dissem, lenses, streaks stringers, locally semi-massive.	102.15 - 103: Would be called MUT in the mine.
111.25 TO 116.10	«Sil/Chty Arg»	Black, gray. Fine. Finely laminated argillite laminations/bedding contorted - probable hinge zone; laminations are cherty; cherty intervals between 112.9 - 113.6m and 114 - 114.4m. 10% white to gray qtz locally cherts have been weakly brecciated.		Core is mod. to int. silicified, patchy yellow sericite alt'n.	<10% fine grained pyrite in coarse dissem stringers and patches predominantly in arg. and interstial to chert fragments.	
116.10 TO 123.90	«Chert»	Gray. Fine. Massive to laminated cherts and locally cherty silicified arg, 10% white qtz veining/sweats, chert is locally fractured/brecciated.		Chert has been silicified.	5% fine - coarse grained py - concentrated in lenses, patches, stringers and interstially to brecciated chert.	116.1 - 116.9: 65% recovery.
123.90 TO 126.80	«Dol/Sil Arg?«	Gray, black. Fine. Gradational contacts. Interval contains windows of black argillite within gray altered arg? 5% silicified/cherty argillite intervals. 126.5 m: Narrow fault gouge zone.		Mod. to intense patchy dolomite alteration overprinting. 85% of interval, minor patchy silicification.	5% fine - coarse grained py - very coarsely dissem - locallized occurrences.	Interval may contain small zones of intensely altered volcanics.
126.80 TO 168.20	«Dol Maf»	Gray. Fine. Mafic volcanics have undergone intense alteration which has destroyed original textures, lower contact is faulted.		Interval has been intensely carbonatized which has bleached the rock, up to 4% white to gray dol +/- qtz veining/stringers also present patchy yellow, brown sericite	1 - 3% v.f.g. py, dissem. 149.35 - 151.4: 5% py-stringers/ coarse dissem.	Core is locally very blocky.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		136m.: 5 cm. fault bx zone. 139.2 - 139.8m. : Intermittant fault bx zone. {158.5 - 159.3} «flt bx» 148.3 - 149.35: Patchy coarse grained qtz/dol (30/70%) veining.		alteration, minor fuchsite.		
168.20 TO 172.00	«Dol Arg»	Black, gray. Fine. Black argillite hosts grayish angular to subrounded calcareous fragments. Core has a healed, tectonically brecciated appearance. Minor small intervals of altered mafic volcanics. Qtz/dol veining between 169.7 - 169.86m. 60% dol 40% qtz. 170.3 - 170.45: 80% qtz, 20% dol. {170.45 - 172} «flt bx» - faulted lower contact.		Weak to mod. patchy dol alteration, Minor silicification and graphite. 170.45 - 172: Locallized well developed gray sericite.	Minor dissem py.	Dol. Fragments may have originated from an alt siltstone or a patchy dolomite overprint on the argilite. 170.45 - 172: 20% recovery.
172.00 TO 172.70	«Dol Maf Tuff?»	Gray, green. Med. Rock has a distinct granular to crystalline texture with xtals (?) to 1mm. in a very fine grained matrix - framework supported xtals are generally calcareous (Fe-dol) - recrystallized tuff?		Interval is moderately dolomitized, patchy brown sericite alt'n.	<1% py.	
172.70 TO 176.15	«Sil Arg»	Black, white. Fine. Argillite has been pervasively silicified originally bedding/veining is strongly contorted to brecciated by tectonism.		Argillites have been intensely silicified - interval contains up to 65% white/gray qtz veining, fragments and flooding.	1% dissem py.	
176.15 TO 176.90	«Dol Alt Maf»	Gray, green. Fine. Intense alteration of volcanics destroys original textures.		Intense dol alteration of matrix and as veins with subordinate amounts of qtz, patchy brown sericite minor talc.	1% dissem py.	
176.90 TO 184.90	«Qtz/Ser Alt Seds»	Yellow, gray, black. Fine. Argillite +/- minor cherty intervals have been intensely altered except for 15% black argillite which occur as windows in the alteration, alteration zone has gradational . Contacts; 5% discrete white qtz veins principal vein between 179.3 - 179.63m. 181.4 - 182.3: Altered chert?		Core has been intensely altered to yellow sericite and silicified. Unsericitized black argillites are also silicified.	3 - 15% dissem fine to med. grained py.	Locally the core bears a very strong resemblance to a sericitically altered rhyolite.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		Black argillite exhibit some tectonic bx textures.				
184.90 TO 192.10	«Sil/Chty Arg & Chert»	Black, gray, white, yellow. Fine. 80% of interval consists of silicified or cherty arg. Principal interval of chert? occurs between 186.7 - 188.5m. at 1852m. bedding at Cleavage at Minor tectonic brecciation and offsets present. 10% white qtz stringers and veins. 190.5 - 192.2: 20% white qtz veining with assoc. sulphides. Vein contains 5% carb, vuggy. {190.8 - 191.0} «sil. bx» - clasts consist of qtz +/- dol arg and pyrite?	 75 40	Mod to intense silicification, minor patchy weak to mod. yellow sericite alt. Minor gray sericite and graphite.	184.9 - 190.8: Trace sphalerite 3 - 5% very coarsely dissem blebs and stringers. {190.8 - 192.2} «5% bm, 10% py» in order of decreasing abundance - sp, gn, cp, sx are coarse dissem - in qtz veins - predominantly within initial 80 cm. of interval. Deformed stringers, stockwork, and brecciated veinlets.	Between 189 - 192.2m : Core is very blocky. 190.8 - 192.2: Approx. 90% recovery.
192.10 TO 194.10	«Chert»	Gray, black. Fine. Fine to coarsely laminated cherts with argillite partings. Weak to mod. fracturing, 10% white qtz stringer stockwork qtz veining is most intense in top 15 cm. of interval.		Chert has been silicified.	<1% combined sp, cp, gn. Sx are generally fine grained, coarsely dissem. Sphalerite at top of interval is med. grained, coarsely dissem py.	193 - 194.1 : 36% recovery.
194.10 TO 196.70	«Sil Arg»	Black, gray. Fine. {194.1 - 195.8} «flt bx, gou» Black argillite have been altered to breccia and gouge and rubbled core. 195.8 - 196.7: Core is more competent, silicified fractured subparallel to C.A., 20% white patchy qtz veining.		194.1 - 195.8: Weakly graphitic. 195.8 - 196.7: Mod. to int. silicification, increases downhole. Weak to mod. graphite - patchy.	194.1 - 195.8: 5% fine grained py in coarse dissem. 195.8 - 196.7: <1% fine grained dissem sp, minor cp, 5% coarsely dissem and patchy py.	194.1 - 195.3: 10% recovery. 195.3 - 196.5: 90% recovery.
196.70 TO 201.30	«Chert»	Gray. Fine. Finely laminated gray cherts. Laminations are strongly contorted - strong folding, cleavage plane? at 197.8 m. - Minor fault gouge. {198.4 - 198.7} «Het frag?» tectonically brecciated chert fragments - angular to subrounded - mixed with argillite fragments and sericitically altered mafics. Largely framework supported.	 60	Cherts are silicified between 198.7 - 201.3 meters.	2 - 5% fine to medium grained patches and dissem of py. 198.7 - 201.3: Minor dissem, fine grained pyrite.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		Matrix is argilliceous. {198.2 - 198.45} «flt bx» 198.7 - 201.3: 15% white qtz veining, chert appear to locally weakly brecciated 1% brown carbonate. (siderite?)				
201.30 TO 203.70	«Qtz Vn/Cht y Arg»	White, gray and black. Fine. Massive white vein qtz containing up to 25% altered wallrock and 5% coarsely dissem pinky brown carbonate. Which locally weathered. Qtz vein intervals occur between 201.3 - 201.9m, 202.3 - 202.6m, 202.8 - 203.7m. 201.9 - 202.3: Cherty arg, 15% white qtz veining, laminae ore strongly contorted. {202.6 - 202.8} «Het frag?» angular to subrounded clasts of arg, chert and sericite alt. clasts. Clasts are supported by argillite matrix.		Intense silicification between 201.9 - 202.3m. 201.9 - 202.3: Moderate graphite.	Qtz veins contain <1% py. Pyrite is within wallrock inclusions. 201.9 - 202.3: 20% semi-massive, fine grained py. 202.6 - 202.8: 8% py.	
203.70 TO 204.50	«Chert»	Gray, black. Fine. Finely laminated cherts. Laminations are contorted. 10% white crosscutting qtz veins with brown carbonate.		Weak silicification.	5% fine grained pyrite, coarse diss, stringers and minor beds.	
204.50 TO 205.80	«Arg/Sil»	Black, gray. Fine. Bedded argillite and siltstone, locally some movement subparallel to bedding evident bedding generally at - becomes warped at edges of interval.	60	Moderat silicification at top of interval decreasing intensity downhole, weakly graphitic.	3% fine grained pyrite stringers and patches, dissem.	Core is relatively blocky.
205.80 TO 210.50	«Chert»	Gray, black. Fine. Interval has gradational contacts where the core is more interbedded. Chert arg/ribbon chert; between 206.45 - 206.9m. ther is 50% white qtz veining and flooding. 207 - 210.1m. - Dense gray chert, fine - moderate contorted laminations, few qtz veins which contain 20% brown carbonate which lines open cavities within the veins.		206.45 - 206.9m. - Intense silicification.	2% coarsely dissem py within dense cherts 3 - 10% pyrite patches in out lying rock.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
210.50 TO 217.65	«Sil Arg»	Black. Fine. Bedded argillites with minor cherty argillite frequently contorted - orientations varying from 0 - 90 degrees to C.A., weak but pervasive cleavage at (also the preferred bedding orientation) 10% white qtz stringers, fracture infilling. {212.7 - 212.9} «flt bx» 212.9 - 213.4: 25% qtz. {217.35 - 217.65} «flt gouge zone»	80	Weak to moderate silicification, weak graphite alt'n. 213.4 - 213.9: Intense silicification. 217.35 - 217.65: Intense graphite in gouge zone.	3% py, fine grained coarsely dissem. {213.4 - 213.9} «20% py» Patchy coarse grained.	Core is blocky throughtout interval.
217.65 TO 222.00	«Cherty Arg»	Black, gray. Fine. Finely laminated cherty argillite laminations are highly contorted. 15% white qtz veining/stringers. Veins are crosscutting, locally offset and folded. Veining is greatest at base of interval. 217.65 - 219.7: Weak intermittant fault zone. Basel contact consists of a 20 cm. wide qtz vein in fault contact with altered mafics. Contact oriented at	45	Argillite is faulted, interval is moderately to intensely graphitic. Local patchy mod. silicification. 221.5 - 221.8: Mod. graphite.	<5% coarsely dissem fine to med. grained pyrite - concentrated in/ around white qtz veins. 221.8m. - 2 cm. wide interval containing 50% coarse grained pyrite in qtz.	
222.00 TO 249.30	«Dol Alt Maf»	Gray. Fine. 95% of the interval consists of intensely altered mafic volc. 5% of interval is intensely altered arg with minor weakly altered argillite also present. The altered sediments are very difficult to distinguish from the volcanics. Most original textures have been destroyed by alt'n. 235.7 - 236.5: Hinge zone? cleavage approx. 1mm. wide nodules of dolomite common locally 5% irregular white to gray qtz/dol (50/50%) veining. {222 - 222.25} «flt bx» {226.1 - 227.6} «flt gou»	85	Intense dol alt'n pervasive throughout interval; patchy brown to green brwon sericite. 222 - 222.25: Moderate fuchsite. 224 - 226.1: Patchy intense silicification/qtz veining.	3% fine to medium grained py. {224 - 226.1} «25% py, <1% sp» Pyrite is fine - medium grained, occurs as patches to semi massive with 60% pyrite, Sx are associated with qtz. 234.7 - 234.95: <1% combined sp, gn, fine grained, in qtz veins.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		{228.3 - 229.1} «flt bx» {233.8 - 234.1} wk «flt bx zone»				
249.30 TO 255.60	«Sil Arg»	Black. Fine. Massive black argillites are cut by <30% white qtz veins, stringers, stockwork and flooding, qtz veining is concentrated between 249.3 - 251.8m., veining is irregular and locally are offset along, fracture/cleavage, cherty arg at 249.8 - 250.3m. {251.8 - 255.6} «flt bx gou zone»		Argillite is moderately graphitic - intensely in faulted areas. 249.3 - 251.8: Intense to moderate silicification. Intensity decreases downhole, patchy moderate silicification throughout remainder of interval. 252 - 252.18: Moderate gray/green sericite alteration.	Trace cp, sp, gn. 2% fine grained pyrite in dissem and stringers.	252 - 252.18: Possibly contains a mafic component.
255.60 TO 264.40	«Dol/Ser Alt Wacke?»	Gray. Fine. Interval has been strongly altered but some fine grained granular? textures still present, altered argillite beds present at: 256.9 - 257.2m., 258.6 - 259.1m., interval contains 5% white to gray qtz/dol (65/35%) veinlets, stringers and patches. Slaty cleavage approx.	70	Moderate gray - green sericite alteration with patchy brown sericite streaks, patchy weak to mod. dol alt'n - dol is primarily found within veins. Sericite alt'n is locally intense giving core its slaty cleavage.	<=1% sp, gn as fine to coarse grained dissem, generally within qtz/dol veins. Pyrite content is highly variable - general range is minor to <10%. Py is usually coarsely dissem, fine grained. {262.45 - 263.1} «20% py» Coarse diss - semi-massive.	Core is very similar to an intensely altered mafic volcanic but it appears to lack sufficient dol in matrix - more of a sericite alteration giving a green - gray coloration. Rock way originally have been a volcaniclastic sed rather than a clean wacke.
264.40 TO 274.35	«Sil/Chty Arg»	Black, gray. Fine. Black arg interbedded with minor cherty arg are locally intensely altered. 20% white to gray qtz/dol veins to 35 cm. wide; patchy qtz flooding, intermittant narrow zones of fault bx and gouge present, core is very rubbled between 264.4 - 269.7m. Veins are massive with local argillite inclusions and healed fractures. Stringers and cherty bands are contorted, locally brecciated. {264.4 - 264.5} «flt bx»		Patchy moderate to locally intense silicification, trace talc. local graphite. 270.5 - 271.3: Patchy gray to brown sericite alt'n. 272.35 - 272.7: Intense gray sericite alteration.	5 - 10% fine grained pyrite which occurs as fine dissem, stringers bands and thin beds? Trace amounts of sp present qtz/dol veins. {269.7 - 270.3} «35% py» in qtz sericite. {274.1 - 274.35} «3% sp, cp, gn» in coarse dissem.	264.2 - 267: 45% recovery.
274.35 TO 275.40	«Dol Maf»	Gray. Fine. Intense alteration destroys original textures, non-descript gray color, 5% white gray qtz/dol veinlets, - gradational lower contact, upper contact is sheared.		Intense dol alt'n pervasive throughout patchy sericite alt'n.	3% fine grained fine coarsely dissem py. 275.05m., 2cm. wide veinlet containing 5% cp, 1% gn, 45% py, 1% cp in envelope of vein.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
275.40 TO 283.10	«Het Frag»	Gray. Fine silty to sandy matrix supports angular to subrounded clasts of chert, argillite qtz/dol vein matrix, minor intensely sericitic altered mafics? and minor pyrite clasts. Clast content ranges from 2 - 75% and range in size from 1 mm. to 15 cm. Texturally rock varies from a coarse sandstone with minor larger clasts to a angular conglomerate. Matrix is variably pyritic. Minor shear zones presnet 15% dol flooding/stringers present throughout matrix. Local minor interbedded argillite; gradational contacts; foliation at 281.3 - 281.6: Finely laminated argillite laminations are folded and offset along cleavage.	 85 80	Patchy weak dol alt'n , minor nodular dolomite growths present; patchy streaks of green - brown sericite alt'n, weak to locally mod. gray sericite. 282.67 - 282.77: Int. nodule dol. growths.	yrite content within matrix varies between 5 - 35% and occurs as fine s dissem to bands. Pyrite is fine grained with minor coarse xtals; <1% pyrite occurs as fine grained, rounded clasts. 279.2 - 279.5: 35% semi-massive py {282.5 - 282.67} «10% gn, cp, sp» sp is very pale in color, sx are very fine grained. Minor cp in underlying nodular dol interval.	
283.10 TO 286.80	«Arg Flt Bx »	Black, gray. Fine. Black argillites which are locally altered by qtz/dol veining and fault activity. Foliation (bedding?) at Gradational contacts {283.1 - 285.35} «flt bx, gou» 283.3 - 283.4: Gray massive chert beds.	 60 30	Argillites are altered to clays in faulte zone, patchy light brown sericite alt'n trace graphite. 285.9 - 286.25: Qtz flooding and veining with 5% crosscutting dol stringers silicifies and bleaches arg.	2 - 4% fine - med. grained dissem py trace cp.	
286.80 TO 291.40	«Het Frag»	Black, gray. Largely framework supported clasts. Clasts consist of arg, cherty arg, chert, qtz, dol and variably sericite altered fragments. Clasts are angular to subrounded sense of foliation at 10% interbeds of argillite and cherty argillite, bedding 2% qtz/dol stringers/veins. Gradational contacts. Weak shearing in vicinity of lower contact. Arg interbeds between 287.5 - 287.7m., 289.4 - 289.55m.	 80 80	Interval is weakly sericitically altered throughout. Some clasts are silicified and sericitized. A function of original rock textures.	Matrix is pyritic and pyrite also occurs as dissem in some clasts. Pyrite is fine - med. grained. Overall content 5% minor brown sphalerite in late stage qtz/dol stringers.	Some tectonic brecciation may also be present.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
291.40 TO 293.40	«Sil Arg»	Black, white. Fine. Black argillites are cut by 25% white qtz/dol (97/3%). Stringers, veins and stockwork. Dol occurs primarily as fracture filling in qtz veins. Veins have a max width of 12 cm. Core is weakly gouge alt. to 291.8m. 10 cm. shear zone at 293.2m., argillites are largely massive but tectonic breccia, boudins of qtz/dol occur between 292.85 - 293m.		Patchy moderate silicification, minor talc.	5% py overall with local concentrations to 45%. Py is fine to coarse grained in coarse dissem to semi-massive zones. Trace sp, cp. {292.45 - 292.55} «45% py»	
293.40 TO 305.95	«Het Frag/Sil Arg»	Black, gray. Fine to med. Heterolithic fragmental comprises 75% of interval. Silty to fine grained matrix supports up to 60% clasts to 3 cm. Clasts comprised of argillite, sericite alt frags, pyrite, qtz and dol. Textural the unit varies from a fine gravelly sandstone to conglomeritic. Clasts vary from very angular, elongate wisps of argillite, to subrounded. 25% of the interval consists of silicified argillite/cherty argillite. Argillite intervals occur between: 294.2 - 294.95m., 295.8 - 296.05m. 298.15 - 299.55m. 299.65 - 303.35m. 303.6 - 304.55m. Argillites are silicified by 30% white qtz stkwk. Arg exhibit local tectonic brecciation, boudinage and minor folding. Argillite contains minor chert beds. {298.7 - 299.2} «flt bx»		HET FRAG intervals are moderately green brown sericite altered. Argillites are intensely silicified.	HET FRAG intervals contain up to 10% dissem/blebs/clasts of pyrite. Silicified argillite intervals contain 5 - 30% fine - medium grained py dissem. <1% combined sp, gn, (tr. cp) occur generally within or on margins of qtz veins in the arg. {296.15 - 296.3} «10% sp, 1% gn» sp is coarse grained. gn is fine grained. Sx are associated with qv/silic. {300.8 - 301.15} «20% py, <1% gn, sp» Sx are in qv.	The qtz veins hosting the sp, gn may be from a later stage of veining.
305.95 TO 307.60	«Ser Wacke?»	Gray, green. Fine. Core is strongly altered faint granular? Textures present, gradational lower contact, 10% qtz/dol veining. 306.05 - 306.55: Weak flt bx zone.		Pervasive, moderate brown sericite alteration weak, pervase Fe-calcite alteration.	5 - 10% fine - coarse grained, fine - coarse dissem py. Upper contact is a 1 cm massive py band. 306.13 - 306.23: 3% cp, 1% gn, 15% py in qtz vein.	Possibly a volcaniclastic sediment (tuff?).
307.60 TO 316.40	«Arg»	Black, white. Fine. Black argillites are introded by 20% stringers/veins of qtz and minor locallized qtz flooding, argillites contain 5% patchy alteration towards base of interval. Argillite contains fine laminations which are locally contorted as are qtz stringers.		307.6 - 310.05: Patchy weak silicification - intensenly decreases downhole and spotty there after. Patchy intervals of moderate brown sericite alt'n. 315.6 - 316.4: Moderate brown sericite	Pyrite occurs as fine - coarse grained xtals pyrtie occurs in dissem stringers, blebs, bands. 10 - 15% py overall with local concentrations to 30%; approx 1% combined sp, gn, cp. Sx are associated.	

308

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
				alt'n with 1% talc? with veins, Sx are fine grained, coarsely dissem.		
316.40 TO 344.90	«Qtz/Ser Alt. Sed/Chrt»	White, yellow and gray. Fine. Sediments are extremely altered with <5% intervals of recognizable wackes and argillite patches, 15% of the interval is weakly altered chert/ribbon chert, 15% white qtz veins (distinct from silica in matrix), veins contain 5% pink dolomite. Laminations within cherts are locally contorted, between 328.6 - 328.71m. a pyritiferous wacke has graded bedding indicating tops uphole. At 330.6m. cleavage plane at {324.2 - 324.65} strong «flt bx» 331.6 - 332.2: Rounded clastic texture - Tect Bx?	65	Intense pervasive silicification, patchy moderate yellow - brown sericite alt'n.	Overall pyrite content is 10% with a minimum of 1% and local concentrations as follows: {316.95 - 317.25} 70% fine grained massive py in qtz vein «70% py» {339.7 - 342.8} «20% py» Pyrite in general is very fine grained - fine grained and occurs as patches, bands and stringers. Trace amounts of cp, sp associated with qtz veining. {318.45 - 318.55} «4% sp, gn, cp» very fine grained, coarsely dissem. Sx include a black metallic? black sph?, chalcocite?	
344.90 TO 354.60	«Chert/Qtz»	White. Fine, coarse. Protolith was primarily a laminated chert with <10% interbedded sediments. The rock has been strongly veined and silicified by qtz/ Which locally masks laminated cherts. Qtz veins contain up to 10% gray coarse grained dolomite locally. Minor dol. stringers. Veins are lightly fractured.		Intense silicification patchy yellow to brown sericite alt'n of sedimentary component.	2 - 5% fine grained py occurs as coarse dissem and patches in qtz/chert and in fractures and altered seds. Minor amounts of very fine grained sp and (less) gn occur locally with py between 349.4 - 354.6m.	
354.60 TO 396.40	«Qtz/Ser Alt. Seds»	Gray, yellow and white. Fine. Rock is intensely altered with 10% intervals of weak to unaltered argillite - unaltered arg content increases downhole; 10 - 20% massive white qtz veins/patches with no preferred orientation, local tect., folding and bx of veins. Veins range from 1 cm. to 1.2m. Some veins are fractured with fractures subparallel to C.A. 355 - 355.7: Weak flt bx zone. 359.7 - 361.8: Wk to mod. flt bx zone. 365.4 - 365.9: Flt bx zone. 366 - 366.2: Interval is weakly brecciated and		Intense yellow sericite alt'n and silicification, minor patchy brown to limonitic sericite trace apple green sericite.	3 - 10% fine grained pyrite. Which occurs as fine dissem - patches and lenses - massive bands; minor sp, gn locally. 368.25m: 3 cm. massive fine grained py beds?	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		continues intermittantly to 366.85m.				
		367.7m: Bedding at Cleavage at	65 25			
		371.7 - 373.1: Wl intermittant flt bx.			375.6: Minor very fine grained black sp, rimming pyrite.	
		{376.05 - 376.65} «Het Frag» Subangular to subrounded clasts to 1 cm., clasts of altered argillite, varying sericite clasts and possible pyrite fragments. Matrix is siliceous.			376.05 - 376.65: 15% py, <1% sp, gn concentrated at base of interval.	
		386.2 - 386.8: Wk intermittant flt. bx.			385.1 - 385.55: 5% combined fine grained sp, gn in qtz/dol vn.	
		{395.5 - 396.4} «flt bx»			395.75m: 5cm. wide faulted qtz vein contains 20% massive py. 2% gn.	
396.40 TO 419.70	«Arg Flt Bx »	Black, white. Fine. Black arg with 10 - 25% white massive qtz veinlets and veins. Preferentially oriented subparallel to C.A. Bedding/veins are commonly contorted, folded offset and locally tectonically brecciated. Recent faulting causing brecciation is common throughout most of interval. Fault intensity is weak to intense. 30% of interval is competant/unfaulted; At 402.5m. bedding is at	80	Patchy, minor weak silicification in areas of strong veining. 10% of interval contains zones of gray-green to yellow sericite. Minor graphite in strongly faulted argillite.	Pyrite content varies between 3 - 8% Pyrite is fine grained and generally occurs as blebs within arg and qtz veins.	
		END OF HOLE				

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
26351	87.40	89.90	2.50	.005	.01	.01	.01	.01			49	108	43				1	55		1	0.1	10	
26352	89.90	91.60	1.70	.020	.07	.02	1.4	.12			204	713	242				157	76		2	1.4	121	
26353	91.60	93.60	2.00	.013	.04	.02	1.7	.04			125	369	207				167	79		3	1.7	35	
26354	93.60	95.10	1.50	.008	.03	.01	2.9	.01			77	339	108				30	113		15	2.9	4	
26355	98.50	100.00	1.50	.006	.12	.01	3.8	.01			57	1177	68				1	71		7	3.8	2	
26356	100.00	101.50	1.50	.015	.01	.01	1.4	.01			152	90	66				1	78		1	1.4	4	
26358	108.80	110.30	1.50	.003	.01	.01	0.7	.06			30	32	45				351	87		6	0.7	61	
26359	111.60	113.20	1.60	.003	.01	.01	0.8	.11			25	112	40				249	62		1	0.8	110	
26360	117.90	119.40	1.50	.045	.13	.03	2.9	.60			447	1317	329				1310	25		17	2.9	595	
26361	119.40	121.00	1.60	.013	.02	.01	1.3	.15			133	191	67				505	25		2	1.3	149	
26362	147.80	149.30	1.50	.005	.01	.01	1.5	.01			49	136	13				1	28		1	1.5	2	
26363	149.30	150.80	1.50	.005	.01	.01	1.5	.01			49	145	13				1	30		1	1.5	1	
26365	187.90	189.30	1.40	.004	.01	.01	1.8	.19			38	91	91				782	47		11	1.8	186	
26366	189.30	190.80	1.50	.004	.06	.02	1.6	.09			43	59	161				901	77		14	1.6	86	
26367	190.80	192.10	1.30	.214	1.40	.72	56.8	1.16			2142	14025	7232				948	52		573	56.8	1160	
26368	192.10	194.10	2.00	.019	.24	.15	5.0	.06			192	2385	1481				180	35		27	5.0	60	
26369	194.10	196.70	2.60	.021	.11	.03	7.0	.22			208	1104	322				347	102		37	7.0	221	
26371	198.20	199.60	1.40	.020	.07	.03	6.7	.32			201	683	326				742	93		86	6.7	325	
26372	199.60	201.30	1.70	.013	.04	.02	4.3	.18			131	390	175				438	66		47	4.3	177	
26373	201.30	202.50	1.20	.010	.02	.01	3.9	.01			101	151	139				606	45		83	3.9	5	
26374	202.50	203.70	1.30	.002	.01	.01	0.9	.01			17	88	54				79	11		5	0.9	2	
26375	212.40	213.90	1.50	.005	.04	.02	3.6	.01			53	354	198				1225	45		115	3.6	3	
26376	220.50	222.00	1.50	.006	.03	.02	2.8	.04			56	318	150				404	39		18	2.8	35	
26377	222.00	224.00	2.00	.011	.02	.01	1.9	.01			114	156	90				277	30		2	1.9	4	
26378	224.00	225.00	1.00	.007	.07	.02	3.0	.04			68	657	245				420	24		12	3.0	42	
26379	225.00	226.10	1.10	.005	.01	.02	2.8	.01			50	132	162				375	66		25	2.8	1	
26380	226.10	227.60	1.50	.005	.08	.01	.01	.01			52	256	77				225	149		1	0.1	3	
26381	227.60	229.10	1.50	.008	.01	.01	0.8	.01			75	69	58				172	42		1	0.8	6	
26382	233.80	235.30	1.50	.014	.06	.02	1.5	.06			139	573	166				97	42		1	1.5	56	
26384	254.10	255.60	1.50	.007	.05	.03	2.7	.02			72	450	303				180	59		9	2.7	17	
26385	255.60	257.10	1.50	.004	.02	.01	1.2	.02			41	169	104				187	41		1	1.2	18	
26386	257.10	258.60	1.50	.004	.07	.04	1.7	.01			44	701	405				271	73		1	1.7	6	
26387	258.60	260.10	1.50	.004	.04	.03	7.0	.01			41	358	324				95	37		1	2.0	2	
26388	260.10	261.60	1.50	.007	.02	.02	1.8	.02			66	195	232				1	49		1	1.8	24	
26389	261.60	263.10	1.50	.009	.12	.07	3.2	.01			94	1194	678				98	52		4	3.2	1	
26390	263.10	264.40	1.30	.003	.07	.03	1.6	.02			27	691	322				26	120		1	1.6	19	
26391	264.40	267.00	2.60	.009	.02	.01	1.8	.01			88	214	95				220	164		3	1.8	10	
26392	267.00	268.50	1.50	.010	.03	.01	1.3	.02			98	285	145				126	201		1	1.3	17	
26393	268.30	269.70	1.20	.004	.03	.01	1.1	.04			36	321	103				133	278		1	1.1	43	
26394	269.70	271.20	1.50	.004	.02	.01	1.0	.06			38	200	89				199	84		1	1.0	60	

Sample	From (m)	To (m)	Length (m)	CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB
26395	271.20	273.00	1.80	.007	.04	.02	2.3	.05			65	400	227				237	146		12	2.3	54
26396	273.00	274.35	1.35	.029	.12	.09	3.4	.02			287	1196	852				1	86		15	3.4	23
26397	274.35	275.40	1.05	.113	.08	.13	3.0	.03			1125	810	1345				1	63		1	3.0	30
26398	275.40	276.90	1.50	.017	.18	.19	3.2	.04			174	1837	1922				9	56		4	3.2	38
26399	276.90	278.60	1.70	.007	.06	.03	2.4	.04			65	576	319				79	142		2	2.4	36
26400	278.60	280.10	1.50	.004	.02	.04	2.2	.03			38	194	381				163	131		1	2.2	25
26426	280.10	281.60	1.50	.007	.05	.03	2.4	.03			72	487	342				180	109		8	2.4	25
26427	281.60	283.10	1.50	.094	.59	42	12.0	.04			941	5864	4214				89	173		40	12.1	42
26428	283.10	284.90	1.80	.040	.31	.17	4.6	.01			401	3132	1683				113	136		10	4.6	2
26429	288.40	289.90	1.50	.005	.03	.03	1.0	.04			47	266	312				77	155		1	1.0	35
26430	289.90	291.40	1.50	.008	.11	.09	2.5	.08			83	1088	886				271	112		1	2.5	80
26431	291.40	292.40	1.00	.006	.22	.06	2.3	.01			63	2197	634				278	134		8	2.3	1
26432	292.40	293.40	1.00	.007	.18	.06	2.3	.06			65	1797	609				182	163		4	2.3	60
26433	293.40	294.85	1.45	.011	.23	.08	3.7	.05			105	2266	818				164	136		1	3.7	45
26434	294.85	296.35	1.50	.014	.25	.10	2.9	.02			144	2465	978				150	125		1	2.9	22
26435	298.20	299.70	1.50	.007	.07	.05	2.1	.01			74	740	544				130	108		1	2.1	2
26436	299.70	301.20	1.50	.014	.11	.11	3.3	.06			143	1127	1107				192	139		2	3.3	62
26437	301.20	302.70	1.50	.009	.11	.09	3.0	.05			94	1099	886				103	136		1	3.0	50
26438	304.45	305.95	1.50	.022	.33	.18	4.7	.05			215	3250	1763				161	114		3	4.7	45
26439	305.95	307.60	1.65	.017	.12	.03	0.8	.02			172	1221	340				142	131		1	0.8	15
26440	308.90	310.40	1.60	.027	.64	.22	6.6	.12			268	6380	2156				273	154		8	6.6	120
26441	310.40	311.90	1.50	.060	.52	.34	14.3	.10			597	5182	3437				220	152		58	14.3	102
26442	311.90	313.40	1.50	.014	.08	.11	3.6	.12			136	770	1082				261	145		8	3.6	119
26443	313.40	314.90	1.50	.006	.02	.02	1.1	.05			57	188	159				180	162		3	1.1	45
26444	314.90	316.40	1.50	.012	.04	.02	2.0	.23			115	361	182				699	150		6	2.0	232
26445	316.40	317.90	1.50	.024	.15	.08	14.0	.57			243	1518	845				747	97		61	14.0	568
26446	322.40	324.00	1.60	.012	.03	.02	2.1	.28			123	256	177				574	92		10	2.1	276
26447	324.00	325.50	1.50	.016	.02	.01	2.4	.62			158	212	96				1055	81		13	2.4	621
26448	325.50	327.00	1.50	.004	.03	.02	1.5	.41			44	302	227				2311	66		50	1.5	414
26449	330.80	332.30	1.50	.004	.01	.01	0.5	.08			43	58	57				811	67		13	0.5	82
26450	333.10	334.60	1.50	.017	.02	.01	2.1	.09			168	163	75				794	73		26	2.1	87
26452	339.40	340.90	1.50	.015	.01	.01	5.8	.28			154	108	149				1909	63		86	5.8	280
26453	340.90	342.40	1.50	.028	.01	.01	10.0	23			279	76	98				1751	57		145	10.0	230
26454	342.40	343.90	1.50	.020	.03	.02	8.4	.13			198	258	209				1034	48		120	8.4	125
26455	348.60	350.10	1.50	.010	.01	.01	3.7	.10			97	112	118				372	27		43	3.7	97
26456	350.10	351.60	1.50	.002	.01	.01	0.9	.06			19	99	52				182	25		7	0.9	60
26457	351.60	353.10	1.50	.003	.01	.01	1.1	.20			25	131	146				1934	47		31	1.1	196
26458	353.10	354.60	1.50	.007	.01	.02	3.6	.06			70	96	204				965	46		43	3.6	58
26459	360.50	361.80	1.30	.006	.03	.05	2.7	.17			58	321	468				2800	88		66	2.4	172
26460	365.50	367.00	1.50	.005	.01	.01	.02	.06			47	136	104				685	54		10	0.2	63

Sample	From (m)	To (m)	Length (m)	CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB		
26461	367.60	369.10	1.50	.002	.01	.01	0.1	.06			22	70	79				815	60		9	0.1	61		
26462	375.40	377.00	1.60	.004	.07	.03	9.3	.71			437	667	310				9565	48		286	9.3	712		
26464	384.70	386.20	1.50	.008	.07	.02	3.0	.13			79	671	159				2987	39		65	3.0	128		
26465	394.90	396.40	1.50	.098	.04	.18	33.3	.33			978	426	1814				5123	56		626	33.3	330		
26466	399.80	401.20	1.40	.004	.01	.01	1.2	.04			41	45	94				485	67		18	1.2	37		
26467	401.20	402.70	1.50	.003	.01	.01	1.1	.01			26	31	70				491	73		12	1.1	10		
26468	412.10	413.60	1.50	.001	.01	.01	0.1	.02			12	39	52				57	118		1	0.1	23		

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
26350	50.90	53.90	3.00	57.74	16.32	2.30	2.97	.68	3.80	6.25	.07	.82			50	120			5	53	2.3	67	.23		.39	91.67	15	12
26357	101.50	104.50	3.00	34.80	18.55	9.31	7.73	1.54	1.85	9.87	.12	1.18			70	53			5	132	2.6	63	.27		6.49	91.97	1	4
26364	154.50	157.50	3.00	40.95	12.24	6.04	11.76	.47	1.64	9.63	.29	.69			132	102			19	62	1.8	23	.24		2.27	86.27	2	1
26370	196.70	198.20	1.50	86.94	5.83	.15	.31	.13	1.23	2.58	.01	.28			16	33			5	98	0.9	49	.06		1.58	99.20	148	8
26383	246.00	249.00	3.00	41.17	14.11	6.34	8.86	.99	1.02	10.81	.42	1.25			75	89			5	49	1.1	20	.25		1.45	86.71	1	1
26451	334.60	337.60	3.00	63.36	13.69	.15	.64	.31	3.45	4.84	.03	.63			60	103			180	54	1.7	60	.04		3.95	91.18	1605	20
26463	380.10	383.10	3.00	70.07	11.56	.26	.57	.32	3.73	4.83	.01	.43			34	113			225	48	1.1	125	.06		3.89	94.39	2826	36

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: Rea Horizon

PLOTTING COORDS GRID: Sam Survey
NORTH: 282.96N
EAST: 11985.60W
ELEV: 1051.31

ALTERNATE COORDS GRID: Estimated
NORTH: 2+82N
EAST: 119+85W
ELEV: 1050.00

COLLAR DIP: -48° 0' 0"
LENGTH OF THE HOLE: 141.90m
START DEPTH: 0.00m
FINAL DEPTH: 141.90m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: August 12, 1990
DATE COMPLETED: August 16, 1990
DATE LOGGED: August 16, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: Frontier
CASING: Pulled
CORE STORAGE: Samex Camp

PURPOSE: NW step-out along Rea Horizon.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
41.70	-	-49° 0'	ACID	OK	Double Etch	-	-	-	-	-	
102.70	-	-47° 0'	ACID	OK		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 15.20	«CSG»					
15.20 TO 48.85	«Feld. Porph Flow»	Green. Fine to med. Fine grained green matrix supports up to 20% white grains (crystals) which appear to be weakly altered feldspars, 1 - 2% qtz stringers/veinlets; Matrix also supports 1 - 2% bleached yellowish, subrounded to subangular clasts 1 - 7 cm. long - Flow breccia? Core is foliated at 19.1 - 19.2: Wk fault gouge. {22.4 - 22.6} «flt bx/gou» 25.45 - 26.5: Possible flow top breccia zone. 46.15 - 47.2: Blocky core, minor fault bx/gou.	60	Core is chlorite altered. Limonite on some fractures, core is strongly calcareous (dolomite) but appears to primary.	Minor dissem f. g. py.	
48.85 TO 50.98	«Maf Dyke»	Green. Fine. Contacts at 70 degrees to C.A. Aphanitic matrix is cut by 3% white Fe-calcite stringers.		Minor patchy bleached zone between 49.9 - 50.2m. Core is calcareous.	Minor py cubes.	
50.98 TO 78.80	«Feld Porph flow»	Green. Fine. Similar texture, structurally to the above between 15.2 - 48.84. 73.4 - 74: Bleached, aphanitic dyke with 10% white qtz/dol stringers and lenses. 74 - 75.6: Core is fractured weakly fault bx and gouged.		Chlorite alt'n of core. Core is calcareous. 74 - 75.6: Weakly bleached with weak dol style alt'n.	Minor dissem py. 74 - 75.6: 1% dissem py.	
78.80 TO 81.00	«Arg/Maf Flt Bx» Black/green Fine.	Interval has been strongly fault bx and gouge altered. Protolith appears to have been argillite/mafic volcanic sequence/transition zone, interval contains 65% argillite, 35% mafics and veining. Veins consist of qtz and dol.		Mafics are moderately altered to yellow brown sericite and are dolomitized; argillite is graphitic.	Minor py.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
81.00 TO 108.40	«Ser/Dol Alt Sed/Arg»	Gray, black, yellow and white. Fine. Interval consists of 15% black argillite, 3% mafic volc. intervals, 5% qtz/dol, veining 20% gray/yellow intensely dol/ser alt rock, 57% finely laminated arg/ser/dol/qtz; argillite contains thin pyrite beds, laminations in argillite is generally strongly tectonite textures. Laminae are locally deformed and exhibit movement along cleavage planes. Where laminae are consistent they are oriented at 60 - 70 degrees to C.A. Gradational lower contact. {84 - 84.7} strong «flt bx, gou» and broken core. {90.1 - 91.1} «flt bx» and broken core. {94.9 - 96.9} intermittant «flt bx» {99.1 - 102.0} «flt bx»		Black argillites are graphitic in faulted zones. Patchy intense gray dolomite banded by intense yellow sericite intervals, laminated argillite contains mod to intense yellow sericite, minor talc.	Pyrite content is generally <1% but with concentrations to 5%.	The gray dol/yellow sericite altered intervals maybe volcanic in origin.
108.40 TO 114.90	«Dol Int Volc?»	Brown to gray. Fine to med. Conformable upper contact, knife sharp at and marked by 10 cm. of fragmental sed. breccia within the seds. Relict porphyritic texture now pseudomorphed by carbonate. Foliation	50 45	Intense, destructive Fe-dol alteration with minor brown. Sericite in patches and on partings. Trace leucoxene development. Tr. Talc.	5% py as disseminations and fracture fillings.	
114.90 TO 120.00	«Flt Bx/Int Volc»	Brown to yellow. Fine. Friable fault breccia and strongly altered intermediate volcanics cut by highly deformed qtz/dol veinlets from 118.0 - 120.0, some containing fine pyrite along margins. Lower contact marked by 10 cm. broken qtz veinlet and abrupt colour change. Foliation	45	Very intense ferrodolomitization with increasing silicification downhole assoc. with colour change from brown to yellow from 118.0 - 120.0.	7% py as dissem and along margins of deformed qtz/dol veinlets.	
120.00 TO 141.90	«Arg/Silt/Wacke»	Black and gray. Fine to med. "Hanging Wall" sediments. Contact marked by gouge and broken barren qtz veins. Fault breccia intermittent down to 130.5. Load structures show tops downhole. Bedding at	65	Minor dol of coarser beds adjacent to widely spaced, barren qtz/dol veins up to 20 cm. wide. Minor graphite from 121.0 - 123.0.	Tr. dissem py only. {129.7 - 131.2} «congl» weakly sil and heterolithic minor mafic clasts.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		END OF HOLE				

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
26528	87.20	88.80	1.60	.007	.01	.01	0.2	.01			69	77	57				1	302		1	0.2	2	
26530	117.00	118.50	1.50	.014	.01	.01	1.1	.17			114	95	61				59	63		5	1.1	166	
26531	118.50	120.00	1.50	.009	.01	.01	0.6	.04			91	64	53				44	57		2	0.6	39	
26532	120.00	121.00	1.00	.005	.01	.01	0.9	.01			49	129	53				1	62		1	0.9	1	
26533	129.70	131.20	1.50	.001	.01	.01	1.0	.01			11	47	30				65	30		1	1.0	4	

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
26526	17.30	20.30	3.00	42.13	13.57	5.22	12.23	2.45	.32	10.5	.18	1.48			96	66			15	26	1.1	11	.25		.85	89.19	1	1
26527	75.30	78.30	3.00	39.92	13.18	8.40	8.00	.06	2.95	9.51	.16	1.45			78	58			5	53	1.2	8	.29		.69	84.65	3	1
26529	111.00	114.00	3.00	33.68	12.30	13.16	7.74	1.03	2.04	12.7	.88	1.02			79	57			30	30	0.9	29	.23		7.30	92.13	50	6

MINNOVA INC.

HOLE NUMBER: RG340 | DRILL HOLE RECORD | IMPERIAL UNITS: | METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER:
CLAIM NUMBER:
LOCATION: SOUTH PIT WALL

PLOTTING COORDS GRID: FIELD
NORTH: 520.00N
EAST: 9761.00W
ELEV: 1356.85

ALTERNATE COORDS GRID: UTM
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -90x 0' 0"
LENGTH OF THE HOLE: 47.80m
START DEPTH: 0.00m
FINAL DEPTH: 47.80m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: June 25, 1990
DATE COMPLETED: June 26, 1990
DATE LOGGED: July 2, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: FRONTIER
CASING: PULLED
CORE STORAGE: MINE SITE EXP CAMP

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
0.00	-	0x 0'	ACID			-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
6.10 TO 17.00	.ARG/	Colour - Black Grain Size - v. fine to aphanitic -Laminations of graphitic seds and Pyritic bands -Wacke sect'ns show coarsening upward (correct way up)	60		3-5% Py overall w sections up to 15% to 20%	L1 and L2 angle to each other approx. 110 deg.
17.00 TO 17.50	.BARITE/	Colour - Greyish White Grain Size - Fine -Vein w Ser.		Vein w Sert alt. 5 cm above and 15 cm below (Bleached Below)	Trace galena @ contacts above and below with 8-10% pyrite	
17.50 TO 28.70	.ARG/	Colour - Black Grain Size - Very fine to aphanitic -920.1L Minor.FLT/ gouge -920.4-21.1L.Tect gouge/ -928.3-28.7L.FLT/	60			
28.70 TO 47.80	.MUT/	Colour - grey Grain Size - Fine 930.1 - 30.2L .FLT/ very minor gouge -945.4 - 47.8L .Flt/		Core fractured with qtz veinlets, very minor fuchsite, minor dolomite	Approx 15% Py with sections up to 20% Pyrite	@ 34.6 Fault from 32.4 to 35.6 - 5-8% Dol veins 36.7 Minor gouge 38.5 Minor gouge
	EOH					

Sample	From (m)	To (m)	Length (m)	ASSAYS Cu %	Zn %	Pb %	Ag g/t	Au g/t	Sb %	As %	GEOCHEMICAL Cu ppm	Zn ppm	Pb ppm	S.G.	Ag oz/T	Au oz/T	As ppm	Ba %	Sb ppm	Ag ppm	Au ppb	COMMENTS
BCD27251	16.50	17.00	0.50	.01	0.03	.01	2	.03														
BCD27252	17.00	17.50	0.50	.09	0.14	.16	186	.17														
BCD27253	17.50	18.00	0.50	.01	0.01	.01	2	.03														
BCD27254	28.70	30.20	1.50	.01	0.43	.10	2	.07														
BCD27255	32.40	33.90	1.50	.14	1.10	.64	24	.17														
BCD27256	41.90	43.40	1.50	.01	0.01	.01	2	.03														

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER:
CLAIM NUMBER:
LOCATION: SOUTH PIT WALL

PLOTTING COORDS GRID: FIELD
NORTH: 518.00N
EAST: 9761.00W
ELEV: 1357.00

ALTERNATE COORDS GRID: UTM
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -50x 0' 0"
LENGTH OF THE HOLE: 31.30m
START DEPTH: 0.00m
FINAL DEPTH: 31.30m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: June 26, 1990
DATE COMPLETED: June 27, 1990
DATE LOGGED: July 2, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: FRONTIER
CASING: PULLED
CORE STORAGE: MINE SITE EXP CAMP

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
31.40	-	-50x 0'	ACID	OK		-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 7.30	.CASING/					
7.30 TO 23.00	.ARG/	Colour - Black Grain Size - v. fine 913.5 - 13.7L .Flt/ gouge 920.0 - 20.6L .Flt/ gouge Bottom contact faulted	90		3 - 5% Py.	
23.00 TO 31.30	.MUT/	Colour - Grey Grain Size - v. fine to aphanitic 927.5 - 27.7L .Flt/ gouge 929.5 - 29.8L .Flt/ gouge 931.1 - 31.3L .Flt/ gouge		923.0 - 23.7L .Qtz/ Flooding	Approx. 15% Py.	Qtz veining (flooding) @ upper fault contact
	EOH					

Sample	From (m)	To (m)	Length (m)	ASSAYS Cu %	Zn %	Pb %	Ag g/t	Au g/t	Sb %	As %	GEOCHEMICAL Cu ppm	Zn ppm	Pb ppm	S.G.	Ag oz/T	Au oz/T	As ppm	Ba %	Sb ppm	Ag ppm	Au ppb	COMMENTS
BCD27257	23.00	24.00	1.00	.01	.35	.09	2	.27														
BCD27258	26.50	27.00	0.50	.01	.02	.01	2	.03														

MINNOVA INC.

HOLE NUMBER: RG342 — DRILL HOLE RECORD — IMPERIAL UNITS: — METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER:
CLAIM NUMBER:
LOCATION: SOUTH PIT WALL

PLOTTING COORDS GRID: FIELD
NORTH: 522.00N
EAST: 9742.00W
ELEV: 1370.73

ALTERNATE COORDS GRID: UTM
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -90x 0' 0"
LENGTH OF THE HOLE: 78.90m
START DEPTH: 0.00m
FINAL DEPTH: 78.90m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: June 27, 1990
DATE COMPLETED: June 28, 1990
DATE LOGGED: July 5, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: FRONTIER
CASING: PULLED
CORE STORAGE: SAM EXP TRAILER

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
78.90	-	-87x 0'	ACID	OK		-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 0.00 TO 3.60	.CASING/ OB					
3.60 TO 5.10	RUBBLE.OB/					
5.10 TO 9.40	.SERT/	Colour - Yellow Grain Size - Fine 96.2 - 8.0L .Q.V. with Py, Gal, Chal./		Prevasive Sert From Yellow Sert to Limonite to Grey/ Yellow Sert @ EOI	Galena, Pyrite Chalco in Qtz. v. 6.2m to 8.0m	
9.40 TO 52.00	.ARG/	Colour - Black Grain Size - V. fine to fine 918.0 - 18.4L @ 11.5 m < .Flt with q.v./ 919.5 - 21.6L @ 22.5 m < .Flt Arg gouge min. q.v./ @ 35.6 m < 939.7 - 39.9L @ 40.2 m < .Flt Arg gouge/ 942.6 - 43.1 .Flt Arg min q.v. gouge/ 947.8 - 48.1L .Flt Arg min q.v. gouge/ 950.6 - 52.0L .Qtz dol veinlets/ Gouge at base with contact to MUT	58 60 58 75		Pyrite stringer and beds throughout ARG	Wacke sections with occasional Pyrite beds. 43.5 - 43.9 m Het frag. Small Fault 5.0 cm gouge 62.1 and 63 m
52.00 TO 78.90	.MUT/	Colour - Grey Grain Size - V. fine to aphanitic 962.8 - 64.3L .Bull q.v. and dol/ @ 68.8 < 72.1 - 73.6 mod-weak @ 72.6 < sil with increasing pyritic bands into next interval.	55 60	Dol, Grey Sert 62.8 - 64.3 white Bull q.v. 64.3 66.3 sil and dol mix 66.3 - 68.4 sil dol clasts grading in to MUT	Pyrite bands and veinlets throughout.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		973.6 - 77.0L				
		.Py banded MUT/		975.0 - 77.0L		
				.Yellow Sert/		
		977.0 - 78.9L				
		.Flt with silver grey sert/				
		78.9 E.O.H.				

Sample	From (m)	To (m)	Length (m)	ASSAYS Cu %	Zn %	Pb %	Ag g/t	Au g/t	Sb %	As %	GEOCHEMICAL Cu ppm	Zn ppm	Pb ppm	S.G.	Ag oz/T	Au oz/T	As ppm	Ba %	Sb ppm	Ag ppm	Au ppb		COMMENTS
BCD27259	6.70	8.00	1.30	.01	1.82	.21	4	.03															
BCD27260	8.00	9.40	1.40	.06	0.48	.11	6	.03															
BCD27261	13.80	15.00	1.20	.01	.01	.01	2	.03															
BCD27262	23.60	25.10	1.50	.01	.02	.01	2	.03															
BCD27263	50.50	52.00	1.50	.01	.01	.01	2	.03															
BCD27264	52.00	52.50	0.50	.01	.01	.01	2	.03															
BCD27265	62.10	62.80	0.70	.01	.01	.01	2	.03															
BCD27266	62.80	64.30	1.50	.01	.01	.01	2	.03															
BCD27267	64.30	64.80	0.50	.01	.01	.01	2	.03															
BCD27268	64.80	66.30	1.50	.01	.01	.01	2	.03															
BCD27269	73.70	75.20	1.50	.01	.01	.01	2	.03															

MINNOVA INC.

HOLE NUMBER: RG343 — DRILL HOLE RECORD — IMPERIAL UNITS: — METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER:
CLAIM NUMBER:
LOCATION: SOUTH PIT WALL

PLOTTING COORDS GRID: FIELD
NORTH: 532.00N
EAST: 9698.00W
ELEV: 1390.06

ALTERNATE COORDS GRID:
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -50x 0' 0"
LENGTH OF THE HOLE: 72.20m
START DEPTH: 0.00m
FINAL DEPTH: 72.20m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: June 29, 1990
DATE COMPLETED: June 29, 1990
DATE LOGGED: July 6, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: FRONTIER
CASING: NONE
CORE STORAGE: MINE SITE EXP. CAMP

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
72.20	-	-50x 0'	ACID	OK		-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 9.10	.OB/					Core intact
9.10 TO 12.50	.MPYRO/	Colour - Green Grain Size - Fine 10 cm CARB Veinlet @ 10.0 to 10.1 m Lapilli frags throughout		Minor sert alteration increasin towards EOI	5 - 8% Pyrite and v. minor galena assoc with carb veins.	
12.50 TO 22.20	.SERT/	Colour - Yellow Grain Size - Fine @ 15 m < 914,5 - 14,9L .Flt/ with 10 cm q.v. at top. 916.3 - 16.7L .q.v. with sph, gal, chl/ 10 cm bladed dol @ base of q.v. 917.7 - 18.7L .Flt/ 1.3 m lost core 920.4 to 21.8L .Flt/ with 0.9 m lost core	60	Yellow Serecite Minor silver grey sert @ 21.5 to 21.8 m	Pyr, sph, gal. in q veins Pyrite throughout 921.8 - 21.9L .Chl, py/	Core intact to v. broken & missing in faulted sections.
22.20 TO 51.10	.ARG/	Colour - Black Grain Size Fine to aphanitic 922.2 - 23.4L .Qtz and carb vein/ @23.5 << 934.0 - 34.1L .Flt/ 935.3 - 36.3L .Flt/ 937.2 - 37.5L .Flt/ poss. 0.2 m lost core 941.6 - 42.6L .Qts. carb veins/	85	Very minor fuchsite @ 22.3 - 22.4	Pyrite bands throughout interval	Core friable to mod. broken Graded bedding shows upright seds 32.6 - 35.6, 0.3 m lost core. Met frags 50.3 - 50.6 Base contact to MUT with qtz carb veinlets. Missing core. Probably Flt contact.
51.10 TO 72.20	.MUT/	Colour - Grey Grain Size - V. fine to aphanitic 957.9 - 58.1L .Flt/ with q.v. 954.6 - 55.8L .Flt/ 0.3 m lost core		Silver-grey sericite		

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		969.5 - 72.2L				
		.Flt/ intermittent breaks with carb veining				
		@ 71.0 - 71.1				
	EOH					

Sample	From (m)	To (m)	Length (m)	ASSAYS Cu %	Zn %	Pb %	Ag g/t	Au g/t	Sb %	As %	GEOCHEMICAL Cu ppm	Zn ppm	Pb ppm	S.G.	Ag oz/T	Au oz/T	As ppm	Ba %	Sb ppm	Ag ppm	Au ppb	COMMENTS
BCD27270	10.20	11.20	1.00	.01	.02	.02	2	.10														
BCD27271	11.20	12.50	1.30	.01	.02	.02	2	.10														
BCD27272	16.30	16.70	0.40	.01	2.82	.51	16	.03														
BCD27273	19.70	20.30	0.60	.06	.08	.04	4	.07														
BCD27274	21.40	21.90	0.50	.25	.25	.26	22	.14														
BCD27275	22.20	23.40	1.20	.01	.13	.09	6	.07														
BCD27276	29.50	30.50	1.00	.01	.01	.01	2	.03														
BCD27277	41.60	42.60	1.00	.01	.03	.01	2	.03														
BCD27278	50.10	51.10	1.00	.01	.01	.01	2	.03														
BCD27279	51.10	52.10	1.00	.01	.05	.02	2	.03														
BCD27280	53.00	54.10	1.10	.01	.01	.01	2	.03														

MINNOVA INC.

HOLE NUMBER: RG344 | DRILL HOLE RECORD | IMPERIAL UNITS: | METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER:
CLAIM NUMBER:
LOCATION: SOUTH PIT WALL

PLOTTING COORDS GRID: FIELD
NORTH: 533.00N
EAST: 9698.00W
ELEV: 1389.92

ALTERNATE COORDS GRID: UTM
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -90x 0' 0"
LENGTH OF THE HOLE: 98.10m
START DEPTH: 0.00m
FINAL DEPTH: 98.10m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: June 30, 1990
DATE COMPLETED: July 1, 1990
DATE LOGGED: July 8, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: FRONTIER
CASING: PULLED
CORE STORAGE: MINE SITE EXP. CAMP

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
98.10	-	-90x 0'	ACID	OK		-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 6.10	.CASING/					
6.10 TO 18.40	.MPYRO/ Mafic Pyro-clastic	Colour - Green Grain Size - Fine Good lapilli to 14.3 m		13.8 m - 13.9 m strong dol 14.5 m - 14.9 m strong dol 14.3 m to 18.4 m - sericitic Alt increasing down hole.	917.5 - 17.7L .G.V. py gal/ pyrite and galena in a 20 cm wide qtz. vein. 3 - 5% diss'd py.	Core blocky, broken
18.40 TO 29.10	.SERT/	Colour - Yellow Grain Size - Fine Gradational contact at top of INTERVAL (T.O.I.) @ 19 m <	65	Strongly sericitic alt. T.O.I. prob. alt. Volcanics) Some lapilli textures E.O.I. prob. alt. Seds, some graphitic /or gillaceous	920.0 - 21.3L .arg, graph, cp, gal./ Chalcopyrite and galena in qtz. vein Minor gouge @ 21.3 with 5 cm barren qtz. vein (gouge competency shear) 3 - 8% diss'd py. Qtz veinlets and py bands more intense towards EOI	Core Broken.
29.10 TO 70.60	.ARG/ Argillite	Colour - Grey/black Grain Size - Fine to aphanitic @ 30 m < @ 32.4 < @ 35.3 < 941.0 - 41.7L .Minor shearing/ 943.8 - 44.1L .Flt/ 945.1 - 46.1L .Flt/ possible hinge zone? Graded beds show way up changes. 947.7 - 47.8L .Flt/ 951.7 - 52.0L .Flt/ 966.3 - 73.7L .Flt Zone/ 66.3 - 67.6 black arg Flt gouge with fractured qtz veins. 67.6 - 68.2 Wacke 68.2 - 70.6 black arg with qtz. and carb veins	 65 60 65	 932.0 - 35.0L .Qztite/ ? pervasive silicification Very slight sericitic alt in zones	 947.4 - 47.7L .G.V. py/ Yellow sericitic, pyrite, and graphitic veinlets within 30 cm qtz. vein	 Broken @ 44.8 m graded bedding rightway up @ 47.0 m graded py bed overturned? @ 48.4 graded beds rightway up 56.7 - 57.2 graded beds overturned 66.4 - 67.6 - 60% lost core.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
70.60 TO 89.40	.MUT/ Muddy Tuff	Colour - Grey Grain Size - V. fine aphanitic 70.6 - 71.3 m pyritic MUT with qts. veins 971.3 - 72.8L .Gouge/ gouged clay/MUT 72.8 - 73.1 pyritic MUT 73.1 - 73.7 sheared contacts from pyritic MUT to MUT 78.5 - 78.6 minor shear) structural 80.2 - 80.3 minor shear) release 84.85 - 84.9 minor shear) planes 985.4 - 85.8L .Flt/ 87.0 - 89.4 Minor shearing		Minor sericite Moderate sericitic alt 90.0 m - 90.4	10 - 20% py	
89.40 TO 98.10	.CHT/ EOH	Colour - Greyish White Rubble and gouge @ TOI 991.0 - 91.2L .Gouge/		991.6 - 94.1L .Sericitic/ sericitic alt beginning @ gouged contact	94.1 - 98.1 silicified cht with pyrite veins	V. broken @ TOI 89.9 - 92.3 - 0.3m lost core 92.3 - 94.4 - 0.15 m lost core

Sample	From (m)	To (m)	Length (m)	ASSAYS Cu %	Zn %	Pb %	Ag g/t	Au g/t	Sb %	As %	GEOCHEMICAL Cu ppm	Zn ppm	Pb ppm	S.G.	Ag oz/T	Au oz/T	As ppm	Ba %	Sb ppm	Ag ppm	Au ppb		COMMENTS
BCD27281	0.00	8.50	8.50	.01	.03	.03	4	.03															
BCD27282	17.50	18.00	0.50	.01	.03	.01	2	.03															
BCD27284	33.50	35.00	1.50	.01	.01	.01	2	.03															
BCD27285	47.40	47.70	0.30	.01	.01	.01	2	.03															
BCD27286	66.40	68.30	1.90	.01	.01	.01	2	.03															
BCD27287	70.10	70.60	0.50	.01	.01	.01	2	.03															
BCD27288	70.60	71.10	0.50	.01	.01	.01	2	.03															
BCD27289	88.90	89.40	0.50	.01	.01	.01	2	.03															
BCD27290	89.40	90.40	1.00	.01	.01	.01	2	.03															
BCD27291	90.40	91.60	1.20	.01	.01	.01	2	.03															
BCD27292	91.60	93.10	1.50	.01	.01	.01	2	.03															
BCD27293	93.10	94.10	1.00	.01	.01	.01	2	.03															
BCD27294	94.10	95.60	1.50	.01	.01	.01	2	.03															
BCD27295	95.60	98.10	2.50	.01	.01	.01	2	.03															

MINNOVA INC.

HOLE NUMBER: RG345 — DRILL HOLE RECORD — IMPERIAL UNITS: — METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER:
CLAIM NUMBER:
LOCATION: SOUTH PIT WALL

PLOTTING COORDS GRID: FIELD
NORTH: 534.00N
EAST: 9701.00W
ELEV: 1389.85

ALTERNATE COORDS GRID: UTM
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -60x 0' 0"
LENGTH OF THE HOLE: 122.10m
START DEPTH: 0.00m
FINAL DEPTH: 122.10m

COLLAR GRID AZIMUTH: x ' "
COLLAR ASTRONOMIC AZIMUTH: 45x 0' 0"

DATE STARTED: July 1, 1990
DATE COMPLETED: July 3, 1990
DATE LOGGED: July 12, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: N.Q.

CONTRACTOR: FRONTIER
CASING: PULLED
CORE STORAGE: MINE SITE EXP. CAMP

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
80.50	-	-62x 0'	ACID	OK		-	-	-	-	-	
119.50	348x 0'	-66x 0'	TRO-PARI		TROPARI NOT WORKING	-	-	-	-	-	
119.51	356x 0'	-55x 0'	TRO-PARI		TROPARI NOT WORKING	-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 3.00	.CASING/					
3.00 TO 26.70	.MPYRO/	Colour - Green - grey Grain Size - Fine Occ. cut by qtz-carb veins and sulphides @10 m <	30	Dolomite throughout, with veinlets @ 7.9 - 8 to 8.9 17.1 - 19.1 more chloritic @ 19.1 chlorite decreases and sericite begins to increase	2 - 7% diss'd py 916.0 - 17.1% .Gal sph py/ in a bxed dolomitic matrix with Fe rich calcite and very minor fuchsite.	Core broken and intact.
26.70 TO 34.50	CHERT & ARGILLITE .CHT&ARG/	Colour - Black Grain Size - Aphanitic Upper contact healed bx siliceous blocky qtz v. sil. throughout with qtz and carb veinlets pervasive		Very graphitic in sections (i.e. 31.9 - 40.3)	5% diss'd py.	Core blocky and intact.
34.50 TO 35.00	.FLT&SERT/	Sericitic, gouge, minor qtz, py 10 cm lost core			5 - 8% diss'd py. occ. concentrated in very thin beds Pyrite occ. as euhedral pyrite	Blocky
35.00 TO 42.80	.SERT/	Colour - Buff Yellow Grain Size - V. fine, aphanitic Essentially seds highly sericitic with minor chert/qtz/dol. @38.1 42.8 - 43.7 m Blk chrty arg unit @44.2 As above interval (26.7 to 34.5)	22 22	Strong sericite, locally more chloritic	As above.	Blocky
42.80 TO 43.70	CHERT & ARGILLITE .CHT&ARG/	Colour - Black Grain Size - aphanitic As interval 26.7 to 34.5				

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
43.70 TO 66.00	SERT .SERT/	Colour - Buff/Yellow Grain Size - Fine to aphanitic				
		Qtz & carb veinlets throughout @ 54m SAM Ag Zone stratigraphy @ 62.5 962.7 - 62.8L .Minor shear/	25 29		949.8 - 50.3L .Qv, 8 - 10% py/ on vein edges Occ qtz veins with py, gal, sph, cl 62.6 - 62.7 10% gal, 15% py 966.0 - 67.4L .qv,gal,sph?tet/	Blocky core.
66.00 TO 67.50	.QV/ Quartz Vein	Colour - White				
		967.4 - 67.5L .Flt/ zone or lost core - approx. 1 m		Minor sert.	Gal blebs 1.3%	67.4 - 69.1 m - 1.0 m lost core.
67.50 TO 89.20	.MUT/	67.5 - 69.7 bleached 969.7 - 69.8L .Flt/ with 10 cm barren q.v. @ base				
		975.7 - 75.8L .Flt/			Starting @ 73 m (poss sed contact) Occ Py beds with 25 - 50% Py over the 5 cm bed and occ. blebs with q.v.	Core broken to rubble.
		983.8 - 84.2L .Flt/				
89.20 TO 108.50	.SERT/	Colour - Buff/Yellow Grain Size - Aph.				
		Contact gradational Bleached into MUT @89.2 990.6 - 91.8L .Flt/ gouge, qtz. sert.py.	35	Strong sericite	10% py. occ. in beds and with q.v.	
		993.7 - 93.8L .Minor shear/			992.5 - 93.5L .q.v., sph, gal?, tet/	
		995.8 - 96.6L .Flt/ intermittent Flts with q.v. and v. blocky sert. Minor fucnsite with q.v. & sert. 98.2 - 100.6 q.v. with a major flt structure. The flt continues int. into the next rock unit to 114.6 m 998.2 - 114.7L .Flt/				

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
108.50 TO 112.10	BLACK CHERT ARGILLITE .CHT&ARG/	Colour - Grayish black Grain Size - Fine to aph. Faulting continuing from upper unit. Gouge quite intense from TOI to 112.3 m. Release structures below to 114.6 m @113	40	Sericitic and minor fuchsite	Diss'd py.	Lost core throughout faulting.
112.10 TO 114.60	.MUT/	Colour - Grey Grain Size - Aph		Serecitic	5.8% py throughout	Core rubble and broken
114.60 TO 122.10	.CHT/ EOH	9114.7 - 118.8L .Cht Bx/ intense sil, healed		120.6 - 121.2 Serecitic with minor Fuchsite and graphitic 123.6 - 125.2 strong serecitic alt. 125.2 - 127.1 serecite argillaceous & py beds	5 - 8% diss'd py v rare chal, gal.	

Sample	From (m)	To (m)	Length (m)	ASSAYS Cu %	Zn %	Pb %	Ag g/t	Au g/t	Sb %	As %	GEOCHEMICAL Cu ppm	Zn ppm	Pb ppm	S.G.	Ag oz/T	Au oz/T	As ppm	Ba %	Sb ppm	Ag ppm	Au ppb		COMMENTS
BCD27296	14.00	14.50	0.50	.01	.02	.02	2																
BCD27297	14.50	16.00	1.50	.04	.34	.20	6	.17															
BCD27298	16.00	17.10	1.10	.02	.15	.06	2	.03															
BCD27299	17.10	17.60	0.50	.02	.13	.14	4	.03															
BCD27300	26.50	27.50	1.00	.01	.05	.03	4	.03															
BCD27301	31.40	31.90	0.50	.01	.19	.04	2	.03															
BCD27283	32.00	33.50	1.50	.01	.01	.01	2	.03															
BCD27302	33.50	33.80	0.30	.01	.29	.17	2	.03															
BCD27303	51.00	51.50	0.50	.01	.01	.01	2	.03															
BCD27304	62.60	66.00	3.40	.01	.01	.01	2	.03															
BCD27305	66.00	67.40	1.40	.01	.03	.03	2	.03															
BCD27306	67.40	69.70	2.30	.01	.01	.01	6	.03															
BCD27307	69.70	71.30	1.60	.01	.01	.01	2	.03															
BCD27308	71.60	73.00	1.70	.01	.01	.01	2	.03															
BCD27309	92.50	93.50	1.00	.07	1.02	.01	68	.17															
BCD27310	93.50	95.00	1.50	.01	.01	.01	2	.03															
BCD27311	95.00	96.10	1.10	.02	.01	.01	10	.03															
BCD27312	98.20	100.60	2.40	.01	.01	.01	2	.03															
BCD27313	100.60	103.10	2.50	.01	.01	.01	2	1.17															
BCD27314	103.10	105.60	2.50	.01	.01	.01	4	.03															
BCD27315	113.60	114.60	1.00	.06	.01	.01	2	.03															
BCD27316	114.60	117.00	2.40	.01	.01	.01	2	.03															
BCD27317	117.00	118.80	1.80	.01	.01	.01	2	.03															
BCD27318	118.80	120.60	1.80	.01	.01	.01	2	.03															
BCD27319	120.60	123.30	2.70	.01	.01	.01	2	.03															
BCD27320	123.30	123.60	0.30	.01	.01	.01	2	.03															
BCD27321	123.60	125.20	1.60	.01	.01	.01	2	.03															
BCD27322	125.20	127.10	1.90	.01	.01	.01	2	.03															

MINNOVA INC.

HOLE NUMBER: RG346 — DRILL HOLE RECORD — IMPERIAL UNITS: — METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER:
CLAIM NUMBER:
LOCATION: SOUTH PIT WALL

PLOTTING COORDS GRID: FIELD
NORTH: 539.00N
EAST: 9640.00W
ELEV: 1425.55

ALTERNATE COORDS GRID: UTM
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -90x 0' 0"
LENGTH OF THE HOLE: 128.30m
START DEPTH: 0.00m
FINAL DEPTH: 128.30m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: July 4, 1990
DATE COMPLETED: July 7, 1990
DATE LOGGED: July 18, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: FRONTIER
CASING: PULLED
CORE STORAGE: MINE SITE EXP. CAMP

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
128.30	-	-83x 0'	ACID	OK		-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 3.00	CASING					
3.00 TO 52.30	.MPYRO/	Colour - Green				
TO 5.23	MAFIC PROCLASTIC	Grain Size - Fine Coarsely fragmental 4.7 - 5.4 qtz carb veinlets with minor sulphides cutting core @12.5 930.1 - 30.2L @31.5 .Minor shear/ with 5 cm q.v. above and 10 cm sert. below Shear dip @ 54 deg.	 60 44	 Minor chl-sericite to approx. 9.0 m then mod to strong chloritic accompanied by qtz-carb veins 38.1 - 43.6 m - serecitic alteration begins with abundant 1.5mm carb. (with minor qtz)veinlets. 43.6 - 52.3 - lappilli serecitic still strong carb. V. minor fuchsite @ 35.3 m.	2 - 3% diss'd py. 60 m - 6.9 m, 5-8% Ga. 3% Sp. 5% Cp, 10% py in qtz vein	 Core mod. broken to slightly broken. 36.4 to 37m core broken to rubble.
52.30 TO 58.60	.SERT/ SERICITIC SEDIMENTS	Colour - Greyish yellow Grain Size - Fine Contact with MPYRO gouged & rubble over 10 cm Probable sed/vol contact Pyritic beds (fine laminations) @52.5m	 45	 Carb content dramaticly decrease at SERT/MPYRO contact	 5 - 8% py in beds	 Core very broken and intact
58.60 TO 70.20	ARGILLITE .ARG/	Colour - Greyish black Grain Size - V. fine - aphanitic Contact Flt 958.6 - 58.7L.Flt/ well bedded, graphitic, occ. Py & wacky beds rare 5 - 10 cm qtz. veins @67 m 960.6 - 61.6L .Flt/ v. broken, rubble & gouge 0.5 m lost core 968.6 - 68.7L .Flt/	 67	 First 2 m of Arg slightly bleached (Previous logs called Qtzite)	 5% py in beds	 0.5 m lost core @ TOH V. broken to rubble and intact.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
70.20 TO 71.10	.SERT/ SERICITIC ARGILLITE	Colour - Greenish yellow Grain Size - V. fine to aphanitic Minor gouge 5 cm @ (70.2 to 71.25) upper contact 972.5 - 72.6L .Flt/ sert & arg frags within gouge Bottom contact @ 5mm qtz. v. gradational		Sericitic	5% py in beds	Core v. broken
71.10 TO 75.80	.ARG/ ARGILLITE	Colour - Greyish black Grain Size - V. fine and aph. 971.6 - 71.7L .Flt/ @ 72m 72.2 - 74.6 core rubble 74.6 - 75.8 becoming sericitic & bleached (old logs as qztite).	50	Minor sericite at base of intersection	3 - 5% Py in beds.	a/a
75.80 TO 79.40	.SERT/ SERICITIC ARGILLITE	Colour - Greenish yellow Grain Size - V. fine to aph. 975.9 - 76.1L .Flt/ @78.1m Qtz veins with py. 977.7 - 78,0L .Qtz vein/ Py blebs approx 3% of vein with sections at base of vein up to 30% py over 10 cm.	46	Sericitic alt. decrease gradually down hole to argillite of next interval	1 - 3% py in qtz veins 3 - 5% py in beds	Core v. broken to rubble
79.40 TO 95.20	.ARG/	Colour - Greyish black Grain Size - V. fine to aph. Top of interval beds very distorted to 79.9 979.4 - 80.3L .Flt/ @89.3 m 980.8 - 81.0L .Flt/ 982.5 - 82.7L .Flt/ Int. fine beds to wacke	50		82.9 - 83.8 sil. wacke with diss'd py qtz veinlets and 86.5 - 88.0 sil. wacke with diss'd py.	
95.20 TO 103.70	.QTZ VEIN/ QTZ VEIN WITH SERICITE	Colour - White qtz - Yellow sert Grain Size - Fine 2 cm qtz vein at upper contact into qtz veins with sert. 997.7 - 99.0L .q.v. less than 1% tet/ 9101.7 - 102.5L .Flt/ 102.9 - 103.1 fault gouge		Sericitic, minor fuchsite 96.9 - 97.7 silver grey sericite alt. 999.2 - 101.1L .Tect. bx/ extreme dolomitic 101.1 - 103.5 sericitic qtz vein	Minor py, ch, sp, ga, @ 98.6 tet bleb with ch. Bull qtz veins generally barren of sulfides, however carb within qtz vein holds 30 - 50% py.	Some minor lost core around 95 - 97, 20 cm lost. 98.4 - 99.6 - 20 cm lost core.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		9103.5 - 104.3L .Flt/ Contact faulted				
103.70 TO 128.30	MUT	Colour - Grey Grain Size - fine MUT gouge Siliceous with minor qtz veins, foliation contourted steepins to 30 deg. at 115 @105 deg @115 deg @124 deg @128.3 deg	60 30 55 68	Silver grey sericite 110.1 Yellow sericite with occ. fuchsite	8 - 10% diss'd py throughout locally up to 20 - 25% in blebs	Core v. broken to rubble, intact.
	EOH					

Sample	From (m)	To (m)	Length (m)	ASSAYS Cu %	Zn %	Pb %	Ag g/t	Au g/t	Sb %	As %	GEOCHEMICAL Cu ppm	Zn ppm	Pb ppm	S.G.	Ag oz/T	Au oz/T	As ppm	Ba %	Sb ppm	Ag ppm	Au ppb	COMMENTS
BCD27323	6.00	6.90	0.90	.05	.55	.35	4	.03														
BCD27324	51.80	52.30	0.50	.01	.03	.03	2	.03														
BCD27325	52.30	52.80	0.50	.01	.01	.01	2	.03														
BCD27326	58.10	58.60	0.50	.01	.01	.03	2	.07														
BCD27327	58.60	60.60	2.00	.02	.07	.03	2	.03														
BCD27328	74.60	75.80	1.20	.01	.01	.01	2	.03														
BCD27329	75.80	77.30	1.50	.02	.01	.01	2	1.13														
BCD27330	77.30	78.00	0.70	.01	.01	.01	2	1.71														
BCD27331	78.00	79.40	1.40	.01	.01	.01	2	.03														
BCD27332	82.90	83.80	0.90	.01	.01	.01	4	.03														
BCD27333	86.50	88.00	1.50	.01	.01	.01	4	.03														
BCD27334	94.70	95.20	0.50	.01	.01	.01	4	.03														
BCD27335	95.20	96.80	1.60	.01	.01	.01	2	.10														
BCD27336	96.80	97.70	0.90	.01	.01	.04	2	.02														
BCD27337	97.70	99.00	1.30	.01	.01	.01	6	.07														
BCD27338	99.00	100.20	1.20	.01	.01	.01	8	.07														
BCD27339	100.20	101.60	1.40	.01	.01	.01	2	.03														
BCD27351	101.10	101.60	0.50	.01	.09	.01	2	.03														
BCD27340	101.60	102.80	1.20	.01	.01	.01	2	.03														
BCD27341	102.80	103.70	0.90	.01	.04	.01	2	.03														
BCD27342	103.70	104.30	0.60	.01	.01	.01	2	.03														
BCD27343	104.30	105.80	1.50	.01	.01	.01	2	.03														
BCD27344	105.80	107.30	1.50	.01	.01	.01	2	.03														
BCD27345	107.30	109.80	2.50	.01	.01	.01	2	.03														
BCD27346	109.80	112.30	2.50	.01	.01	.01	2	.03														
BCD23747	112.30	114.80	2.50	.01	.01	.01	2	.03														
BCD23748	114.80	117.00	2.20	.01	.01	.01	2	.03														
BCD23749	117.00	119.30	2.30	.01	.02	.01	2	.03														
BCD23750	119.30	120.80	1.50	.01	.01	.01	2	.03														

MINNOVA INC.

HOLE NUMBER: RG347 — DRILL HOLE RECORD — IMPERIAL UNITS: — METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER:
CLAIM NUMBER:
LOCATION: SOUTH PIT WALL

PLOTTING COORDS GRID: FIELD
NORTH: 539.00N
EAST: 9640.00W
ELEV: 1425.51

ALTERNATE COORDS GRID: UTM
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -60x 0' 0"
LENGTH OF THE HOLE: 99.60m
START DEPTH: 0.00m
FINAL DEPTH: 99.60m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: July 7, 1990
DATE COMPLETED: July 8, 1990
DATE LOGGED: July 16, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: FRONTIER
CASING: PULLED
CORE STORAGE: MINE SITE EXP. CAMP

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
67.90	-	-60x 0'	ACID	OK		-	-	-	-	-	
99.70	-	-58x 0'	ACID	OK		-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 3.60	.CASING/					
0.00 TO 113.30						
TO 3.60						
3.60 TO 4.80	.QTZ CARB VEIN/	Colour - White		Dolomitic with Fe rich calcite in occ. qtz veins	10% pyrite	Core broken
4.80 TO 43.40	.MPYRO/ MAFIC PYROCLASTIC	Colour - Green Grain Size - Fine 928.0 - 32.2L .Highly foliated/ stretched and flattened out carb 10 equals Variable 920.0 - 20.1L .Flt/ 927.3 - 27.4L .Flt/	 70 65 80	Carb strong to 26 m where lappilli start to become sericitic Nid serucutuc kaooukku 27.3m to EOI	2 - 3% diss'd py Occ 5 - 10 cm thick qtz veins with ga, sp, cp blebs = 3 - 5%	Broken 43 - 44.8, 0.8 m lost core
43.40 TO 48.60	.SERT&CHT/	Colour - Greyish yellow Grain Size - v. fine, aph. Contact rubble at TOI suspect gradational 946.0 - 46.5L .Cht,ga,py,cp,sp/ Top contact competency shear bottom gradational EOI contact rubble and gradational		Localized sericite	2 - 3% diss'd py in cht 10% py in beds throughout 944.8-45.3L .tet,gal,py,cp,sp/ 44.95-450 py bed with 1-2% tet 3-5% gal, 3% sp 50-60% py.	
48.60 TO 78.30	ARGILLITE .ARG/	Colour - Black Grain Size - V. fine to aph. Black graphitic argillite with wacke interbeds and occ 5 cm thick py beds. 951.5-61.3L .Minor Flt/ 962.7-62.9L .Minor Flt/	 85		2-3% diss'd py, local occ. py beds of 40-50% py.	Core v. broken

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		969.7-69.8L .Flt/ 73.2-73.5 Tectonite boudin 73.8-74.3 qtz. carb. vein 975.8-76.4L .Flt/ gradual top, from q.veinlet ending in 10 cm qtz carb vein Contact Gradational			968.1-69.7L .35% py,sil gry sert/	Core becoming more blocky to rubble towards EOI
78.30 TO 95.80	.MUT/	Altered seds 980.5-80.7L .Flt/ Steepening to 985.1-85.5L .Flt/ 994.1-95.8L.Flt/ Top 15 cm faulted in ARG then gouged MUT 94.6-94.85 qtz carb vein gouged to 95.3 95.3-95.8 qtz carb veins with py blebs in top 10 cm FAULTED CONTACT	70	Silver grey sericite	977.8-78.0L .40%py&tr tet/ 40%py,less than 1% tet, 1%cp,1%ga, 1-2%sp. 20-30% py throughout at 81.1 - 2cm py with sp rimming	
95.80 TO 99.60	.CHT&ARG/	Colour - Greyish black Grey siliceous chert blocky and broken 98.2-99.1 tect by 999.3-99.4L.Flt/		95.8-99.3 tect. v sil. 99.4-99.6 yellow sert with mod ferroan dol. ALL RUBBLE	Blebs py cp sp V. fine grained py in clasts	Core mod broken
	EOH					

Sample	From (m)	To (m)	Length (m)	ASSAYS Cu %	Zn %	Pb %	Ag g/t	Au g/t	Sb %	As %	GEOCHEMICAL Cu ppm	Zn ppm	Pb ppm	S.G.	Ag oz/T	Au oz/T	As ppm	Ba %	Sb ppm	Ag ppm	Au ppb		COMMENTS
BCD27352	3.60	4.80	1.20	0.01	0.02	0.02	32	.03															
BCD27353	38.40	39.90	1.50	0.01	0.04	0.14	3	.03															
BCD27354	39.90	41.40	1.50	0.01	0.02	0.02	2	.03															
BCD27355	41.40	43.40	2.00	0.01	0.02	0.02	2	.03															
BCD27356	43.40	44.80	1.40	0.01	0.02	0.05	1	.03															
BCD27357	44.80	45.30	0.50	0.16	0.83	0.58	30	.03															
BCD27358	45.30	46.00	0.70	0.01	0.24	0.03	1	.03															
BCD27359	46.50	46.50	0.00	0.01	0.12	0.04	1	.03															
BCD27360	46.50	48.60	2.10	0.01	0.07	0.05	20	.03															
BCD27361	48.60	49.10	0.50	0.01	0.03	0.01	1	.03															
BCD27362	67.60	68.10	0.50	0.01	0.02	0.01	1	.03															
BCD27363	68.10	69.70	1.60	0.01	0.03	0.01	2	.03															
BCD27364	69.70	70.20	0.50	0.01	0.07	0.01	1	.03															
BCD27365	77.80	78.30	0.50	0.01	0.01	0.01	1	.03															
BCD27366	78.30	78.80	0.50	0.01	0.02	0.01	1	.03															
BCD27367	78.80	80.50	1.70	0.01	0.06	0.02	1	.03															
BCD27368	91.20	93.20	1.50	0.01	0.02	0.01	1	.03															
BCD27369	93.20	94.20	1.00	0.01	0.02	0.01	2	.03															
BCD27370	94.20	95.80	1.60	0.01	0.02	0.01	1	.03															
BCD27371	95.80	96.80	1.00	0.01	0.02	0.01	1	.03															
BCD27372	96.80	99.30	2.50	0.03	0.08	0.03	11	.21															
BCD27373	99.30	99.60	0.30	0.01	0.02	0.01	1	.03															

MINNOVA INC.

HOLE NUMBER: RG348 — DRILL HOLE RECORD — IMPERIAL UNITS: — METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER:
CLAIM NUMBER:
LOCATION: SOUTH PIT WALL

PLOTTING COORDS GRID: FIELD
NORTH: 528.00N
EAST: 9664.00W
ELEV: 1410.06

ALTERNATE COORDS GRID: UTM
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -50x 0' 0"
LENGTH OF THE HOLE: 130.10m
START DEPTH: 0.00m
FINAL DEPTH: 130.10m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: July 8, 1990
DATE COMPLETED: July 10, 1990
DATE LOGGED: July 22, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: N.Q.

CONTRACTOR: FRONTIER
CASING: PULLED
CORE STORAGE: MINE SITE EXP CAMP

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
23.20	-	-52x 0'	ACID	OK		-	-	-	-	-	
101.50	-	-51x 0'	ACID	OK		-	-	-	-	-	
115.00	-	-46x 0'	ACID	OK		-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 3.00	.CASING/					
3.00 TO 24.90	.MPYRO/ MAFIC PYROCLASTIC	Grain Size - Fine 910-10.1L .Fol=85%/ Occ. cut by qtz-carb veins and veinlets @ 15.9 - 5cm gouge 916.4-16.9L .Flt/ Approx 23m to EOI tectonite CONTACT BROKEN AND GRADATIONAL	85	Lapilli become slightly sericitic @ 11.3 m and increasing down the hole. @13.5 minor fuchsite near high angle, 15 deg qtz-carb 2-3 cm vein	2-3% diss'd py	Strong carbonates throughout interval Core broken - blocky intact.
24.90 TO 32.20	SERICITIC ARG/CHERT .SERT&CHT/	Colour - Greyish yellow Grain size - V. fine to aphanitic 30.6-30.9 good gouge flt 30.9-31.1 core slightly slicked on foliation 930.6-31.5L.Flt/ 930.0-30.1L.Fol=82deg/ Contact gradational	82	Sericitic seds	@25.6 m py,cp,ga? tet? 5% diss'd py throughout py as veinlets folded Rare 3 cm py beds @32.4 py,sp?tet?	V. weaking straining on veinlets to no stain Core v. broken to rubble
32.20 TO 58.60	ARGILLITE .ARG/	Colour - Black Grain size - V. fine to aphanitic @33.5 - 5 cm gouge 33.9 - 5 cm gouge 34.5 - 5 cm gouge 935.4-35.5L.Flt/ 47.1 to 49.0 core rubble 948.5-49.6L .Flt/ 952.9-53.0L.Flt/ 953.6-53.7L.Flt/ 54.8-54.9 Flt 955.2-56.4L.Flt/ Occ qtz-carb veins up to 10 cm thick (i.e. 57.2-57.3 m) Arg tectonitic near flts Contact rubble and gradational	85		3-5% diss'd py 953.0-53.6L.50% py/ in a flt in wedge of highly pyritic arg.	Core v broken to rubble Wacke sections more comp.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE		ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
58.60 TO 88.00	.MUT/	Colour - Grey Grain size - Fine to v. fine 58.8-59.0 rubble @62.5 - 5 cm gouge 970.0-70.3L .q v w 5cm gouge/ at base 966-66.05L.Fol=60deg/ 977.9-78.1L.Minor flt/ 978.3-78.5L.Minor flt/ 981.5-81.9L.Flt/ 982.3-82.6L.Flt/ 983.5-83.7L.Minor flt/ending in 10cm q.v. 985.6-86.0L.Minor shearing/ 986.2-86.6L.Flt/	66=	60	Silver grey sericite	5-8% py throughout Locall up to 25% py TOI to 62m - 25-30% Py with qtz veinlets Occ gal,sp,cp&tet 1-3% over same interval @ 69.0 - 3cm of gal,sp,cp	Occ qtz veinlets running along core axis micro folding axial planar to cleavage
88.00 TO 91.20	.EPI-CLASTIC/ VOL/SED	Upper contact minor shearing 988.0-88.1L.Minor shear/ 991.2-91.3L.Flt/ 994-94.1L.Fol=80deg/	90=	80	Greenish yellow sericite Minor rare fuchsite associated with sericite Minor ankerite	@ 89 m seems quite volcanic Other sections have argillite wisps and minor cherty sections.	
91.20 TO 99.30	.CHT&ARG/	Colour - Greyish black Grain size - V. fine 999.0-99.1L.Minor flt/ Contact Crackle Bx	95=	80	V. minor sericite @ TOI 998.0-98.7L.Sert alt/	5-8% as blebs and veinlets.	
99.30 TO 114.90	.CHT/	Colour - Greyish white Ferroan dolomite within bx @TOI minor as veinlets throughout			V. minor sericite at TOI 113.3 - dk green fuchsite within yellow sect. 9113-114.9L.sert alt veinlets/	5-8% py ass with sert at 113 to 114.9	Axial planar cleavage @70 deg with py sert veinlets being offset.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
114.90 TO 122.60	.CHT&ARG/	Colour - Greyish black Grain Size - V. fine 9118.4-118.7L.Flt/ 9119.2-119.3L.Minor flt/ Tectonitic throughout		Minor occ sericite	10-15% py	
122.60 TO 130.10	.SERT&ARG/ SERICITIC CHTY ARGILLITE EOH	Colour - Greenish yellow Grain size - V. fine 9128.4-128.5L.Minor shear/		Yellow sert V. minor arg veinlets @ TOI V. minor rare fuchsite	1-3% py as blebs and occ veinlets	

Sample	From (m)	To (m)	Length (m)	ASSAYS Cu %	Zn %	Pb %	Ag g/t	Au g/t	Sb %	As %	GEOCHEMICAL Cu ppm	Zn ppm	Pb ppm	S.G.	Ag oz/T	Au oz/T	As ppm	Ba %	Sb ppm	Ag ppm	Au ppb	COMMENTS
BCD27374	23.90	24.90	1.00	0.01	0.01	0.01	2	.03														
BCD27375	24.90	25.90	1.00	0.01	0.01	0.01	2	.03														
BCD27376	25.90	27.40	1.50	0.01	0.01	0.01	2	.03														
BCD27377	27.40	29.40	2.00	0.01	0.02	0.01	2	.03														
BCD27378	29.40	30.90	1.50	0.01	0.01	0.01	2	.03														
BCD27379	30.90	32.20	1.30	0.01	0.01	0.01	2	.03														
BCD27380	32.20	32.70	0.50	0.04	0.31	0.16	10	.07														
BCD27381	32.70	34.20	1.50	0.01	0.03	0.01	2	.03														
BCD27382	52.50	53.00	0.50	0.01	0.01	0.01	2	.03														
BCD27383	53.00	53.60	0.60	0.01	0.01	0.01	2	.03														
BCD27384	53.60	54.10	0.50	0.01	0.03	0.01	2	.03														
BCD27385	57.60	58.60	1.00	0.01	0.01	0.01	2	.03														
BCD27386	58.60	60.60	2.00	0.01	0.14	0.07	2	.21														
BCD27387	60.60	61.70	1.10	0.01	0.22	0.09	2	.24														
BCD27388	61.70	62.20	0.50	0.01	0.01	0.01	2	.03														
BCD27389	68.80	69.30	0.50	0.02	0.10	0.66	16	.03														
BCD27390	84.00	86.10	2.10	0.01	0.05	0.01	2	.03														
BCD27391	86.10	86.60	0.50	0.01	0.03	0.01	2	.03														
BCD27392	86.60	88.00	1.40	0.02	0.01	0.01	2	.03														
BCD27393	88.00	89.50	1.50	0.01	0.01	0.01	2	.03														
BCD27394	98.40	99.40	1.00	0.01	0.01	0.01	2	.03														
BCD27395	99.40	100.90	1.50	0.01	0.01	0.01	2	.03														
BCD27396	100.90	103.40	2.50	0.01	0.01	0.01	2	.03														
BCD27397	103.40	106.00	2.60	0.01	0.01	0.01	2	.03														
BCD27398	106.00	108.50	2.50	0.01	0.01	0.01	2	.03														
BCD27399	108.50	111.00	2.50	0.01	0.01	0.01	2	.03														
BCD27400	111.00	113.00	2.00	0.01	0.01	0.01	2	.03														
BCD27401	113.00	114.90	1.90	0.01	0.01	0.01	2	.03														
BCD27402	114.90	115.90	1.00	0.01	0.01	0.01	2	.03														
BCD27403	122.00	122.50	0.50	0.01	0.01	0.01	2	.03														
BCD27404	122.50	123.00	0.50	0.01	0.01	0.01	2	.03														

MINNOVA INC.

HOLE NUMBER: RG349 — DRILL HOLE RECORD — IMPERIAL UNITS: — METRIC UNITS: X

PROJECT NAME: SAM	PLOTTING COORDS GRID: FIELD	ALTERNATE COORDS GRID: UTM	COLLAR DIP: -50x 0' 0"
PROJECT NUMBER:	NORTH: 570.00N	NORTH: 0+ 0	LENGTH OF THE HOLE: 139.30m
CLAIM NUMBER:	EAST: 9617.00W	EAST: 0+ 0	START DEPTH: 0.00m
LOCATION: SOUTH PIT WALL	ELEV: 1450.10	ELEV: 0.00	FINAL DEPTH: 139.30m

COLLAR GRID AZIMUTH: 180x 0' 0" — COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: July 10, 1990	COLLAR SURVEY: YES	PULSE EM SURVEY: NO	CONTRACTOR: FRONTIER
DATE COMPLETED: July 12, 1990	MULTISHOT SURVEY: NO	PLUGGED: YES	CASING: PULLED
DATE LOGGED: July 25, 1990	RQD LOG: NO	HOLE SIZE: NQ	CORE STORAGE: MINE SITE EXP.CAMP

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
17.40	-	-51x 0'	ACID	OK		-	-	-	-	-	
139.30	-	-49x 0'	ACID	OK		-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 3.40	.CASING/					
3.40 TO 81.90	MAFIC PYROCLASTIC .MPYRO/	Colour - green Grain size - fine Tuffaceous to coarsely fragmental Occ cut by qtz-carb veins and minor sulphides 60= 95.8-6.1L.Flt 60 deg.dip/ 919.5-19.7L.Flt/ 934.0-34.3L.Minor Flt,Rubble/ 934.8-36.0L.Qtz crb v gal,cp,py/ Contact Flted	70	Chloritic sections decrease down hole TOI to approx 34.8 Ferroan dol with ankerite veinlets 36.0-EOI ankeritic and tectonitic @66.2 lappilli become sericitic @78.3 Mafics sericitic and dol.	2-3% diss'd py rare occ sulphides	Core v. broken to rubble to approx 10 m 10 m to EOI broken Mafics become more dol with depth.
81.90 TO 112.00	.ARG/	Colour - Black Grain Size - V. fine to aphanitic 15 cm gouge 981.9-82.1L.Flt dip 50 deg/ 982.1-85.0L.Bleached sil/ 88= 988-88.1L.bding 86 deg/ Wacke sections interbedded with v. fine graphitic arg. 99= 997.2-97.3L.v. minor flt/ 999-99.1L.bding=70,minor flt/ 9103.1-103.2L.bding=60,minor flt/ 9105.9-106.5L.two 10 cm flts/ 9108-112.0L.flts gouge&rubble/ tectonic clasts through last interval CONTACTS FLTED	86 70	Graphitic arg	1-3% diss'd py Occ qtz-py knots with 10% py 981.0-81.5L.5%sph,3%ga,1-3%cp/	
112.00 TO 112.40	.QTZCARB VEIN/	Colour - White Contact Flted			9112-112.4L.tr tet?gal?/	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
112.40	.MUT/	Colour - Grey				
TO		Grain Size - aphanitic				
139.30						
		Tectonitic 113.2-130 m				
		9112.4-113.2L.Flt,bding=80deg/		Silver grey sert		
		9116.4-116.45L.v. minor flt/		Sil in sections	3-4% py throughout	
		2 cm release structure			Occ local zones to to 20% over	
		9117.5-117.7L.minor flt/			approx 10 cm.	
		9119.04-119.07L.v. minor flt/				
		3 cm release structure				
		9122.9-123L.minor shear/				
		9129.2-129.7L.flt/				
		9130.7-130.75L.bding 40/9130.8-131.4L				
		.good flt gouge/				
		9132.5-132.55L.bding 80/				
		9137.4-138.2L.flt/				
		9139.0-139.3L.good flt gouge/				
	EOH					

Sample	From (m)	To (m)	Length (m)	ASSAYS Cu %	Zn %	Pb %	Ag g/t	Au g/t	Sb %	As %	GEOCHEMICAL Cu ppm	Zn ppm	Pb ppm	S.G.	Ag oz/T	Au oz/T	As ppm	Ba %	Sb ppm	Ag ppm	Au ppb	COMMENTS
BCD27405	34.30	34.80	0.50	0.01	0.01	0.01	2	.03														
BCD27406	34.80	36.00	1.20	0.46	0.10	0.27	4	.03														
BCD27407	36.00	36.50	0.50	0.01	0.01	0.01	2	.03														
BCD27414	36.50	37.50	1.00	0.01	0.01	0.01	2	.03														
BCD27408	81.10	81.90	0.80	0.01	0.25	0.08	4	.03														
BCD27409	81.90	85.00	3.10	0.01	0.01	0.01	2	.03														
BCD27410	108.80	110.20	1.40	0.01	0.01	0.01	2	.03														
BCD27411	110.20	112.00	1.80	0.01	0.01	0.01	2	.03														
BCD27412	112.00	112.40	0.40	0.01	0.01	0.01	2	.03														
BCD27413	112.40	114.90	2.50	0.01	0.05	0.01	2	.03														

MINNOVA INC.
DRILL HOLE RECORD

HOLE NUMBER: RG350 | IMPERIAL UNITS: | METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER:
CLAIM NUMBER:
LOCATION: SOUTH WALL

PLOTTING COORDS GRID: FIELD
NORTH: 571.00N
EAST: 9618.00W
ELEV: 1450.22

ALTERNATE COORDS GRID: UTM
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -90x 0' 0"
LENGTH OF THE HOLE: 136.20m
START DEPTH: 0.00m
FINAL DEPTH: 136.20m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: July 13, 1990
DATE COMPLETED: July 15, 1990
DATE LOGGED: July 27, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: FRONTIER
CASING: PULLED
CORE STORAGE: MINE SITE EXP. CAMP

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
56.40	-	-84x 0'	ACID	OK		-	-	-	-	-	
124.00	-	-76x 0'	ACID	OK		-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 3.00	.CASING/					
0.00 TO 131.30	ARGILLITE					
3.00 TO 96.50	MAFIC PYROCLASTIC	Grain Size - Fine 97 mL .bding = 70/ Occ cut by qtz carb viens and sulphides 915.7 - 15.85L .Flt/ @ 7 m + @ 41.4 becomes tectonitic and sil 967.4 - 67.6L .Flt/ 41 m = 996.5 - 96.55L . Min Flt/	70 70	5.3 - 5.6 crackle by with sericitic alt to section of mafics within. Dark more chloritic sections increase down hole to 41.4 m 987.0L.Lappilli sericitic/ to sert increasing with depth 95.5	Tr Base Metals throughout in qtz veins and veinlets 93.0 - 4.0L .Ga, sp.cp, qtz cal v/ 1.3% diss'd py throughout 954.4 - 55.3L .Qtz carb v. with tr sul/ 995.5 - 96.5L Rubble approx 20 cm lost core .tr gal./ 30 cm above a 30 cm q.v.	Broken to rubble
96.50 TO 97.40	.SERT & MPYRO/ SERECITIC MAFICS	Colour - Greenish yellow Grain Size - Fine TRANSITIONAL FRAGMENTAL TO SEDS Contact v broken and prob. faulted				
97.40 TO 103.70	.SERT&CHT/	Colour - Yellowish grey Grain Size - V. fine 999.5L .Bding = 80/ 99.5 = Contact Fltea over 12 cm	80	999.7 - 101L .CHTY/	2.3% diss'd py & occ 3-5 cm beds with 35% py as blebs & 5% cp 3-5% gal.	Broken to V. broken

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
103.70 TO 117.50	.ARG/ ARGILLITE & WACKE	Colour - Black Grain Size - V. fine aphanitic 9103.7 - 103.8L .Flt dip 60/ /fkted iver 12 cm with 3 gouge zones, each about 2 - 3 cm thick 105 = 9105L .bding 50/ Well bedded, locally brecciated chert and argillitic laminae. Highly contorted in zones.	50			
117.50 TO 119.90	SERICITIC ARGILLITE .SER&ARG/	Colour - Hellow Brown Grain Size - V. fine to aph. Strongly Flted throughout interval 9118.2 - 118.3L .Flt/ 9119.4 - 119.6L .Flt/ 9119.75 - 119.85L .Flt, bding & gouge = 80/ Contact sheared		Yellow sert.	5% diss'd py with beds & veins up to 50 - 60% py.	
119.90 TO 130.00	.MUT/	Colour - Grey Grain size - V. fine to aph. 9121.3 - 121.4L .Flt/ 9121.5 - 123.5L .bx stwk & min gouge/ 9123.5 - 125.9L .Flt/ 9126.0 - 126.7L .Q.v. & sert/ Simmilar to FW veining on 1327.5 Bench, Phase 2 No sulphides 9126.7 - 126.9L .Flt dip = 25/		9123.5 - 125.5L .Int. sil/ & tectonic veining 9127.1 - 127.3L .q.v. & v. min. fuchsite/ grading from yellow set to silver grey sert (MUT) to yellow sericitic arg by EDI	9119.9 - 121.3L .40% py, tr, gal/ in q.v. & shearing	
130.00 TO 136.20	.ARG/ ARGILLITE	Colour - Black Grain size - v. fine to aph. Occ wacke beds 9130.1L .bding = 65/	65		1 - 3% diss'd py.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		9131.3 - 131.35L .min shear/				
		9131.35 - 132.2L .qtz carb vein/				
		9132.7 - 133.0L .min shr & q.v./				
		9133L .bding = 55/				
		9134.3 - 134.35L .min shr/				
	EOH					

Sample	From (m)	To (m)	Length (m)	ASSAYS Cu %	Zn %	Pb %	Ag g/t	Au g/t	Sb %	As %	GEOCHEMICAL Cu ppm	Zn ppm	Pb ppm	S.G.	Ag oz/T	Au oz/T	As ppm	Ba %	Sb ppm	Ag ppm	Au ppb		COMMENTS
CD27415	54.40	55.30	0.90	0.04	0.45	0.21	9	.03															
CD27416	90.00	90.60	0.60	0.29	0.63	0.81	10	.03															
CD27417	95.50	96.50	1.00	0.01	0.02	0.05	5	.03															
CD27418	96.50	97.40	0.90	0.02	0.03	0.08	6	.07															
CD27419	97.40	99.00	1.60	0.03	0.04	0.08	4	.03															
CD27420	99.00	101.00	2.00	0.04	0.54	0.26	7	.21															
CD27421	101.00	103.70	2.70	0.01	0.06	0.05	4	.03															
CD27422	103.70	104.20	0.50	0.01	0.02	0.03	5	.03															
CD27423	117.00	117.50	0.50	0.01	0.01	0.01	2	.03															
CD27424	117.50	118.00	0.50	0.01	0.01	0.01	2	.24															
CD27426	118.50	119.00	0.50																				
CD27425	120.50	121.00	0.50	0.03	0.01	0.09	14	4.87															
CD27426	121.00	121.50	0.50	0.15	1.84	1.64	173	5.52															
CD27427	121.50	122.50	1.00	0.43	3.03	1.59	535	1.06															
CD27428	122.50	123.50	1.00	0.06	0.55	0.11	37	.03															
CD27430	123.50	125.50	2.00	0.11	0.55	0.21	48	.14															
CD27431	127.20	127.35	0.15	0.01	0.01	0.01	4	.07															
CD27432	131.40	132.20	0.80	0.01	0.01	0.01	3	.03															

MINNOVA INC.

HOLE NUMBER: RG351 | DRILL HOLE RECORD | IMPERIAL UNITS: | METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER:
CLAIM NUMBER:
LOCATION: SOUTH WALL

PLOTTING COORDS GRID: FIELD
NORTH: 570.00N
EAST: 9620.00W
ELEV: 1449.89

ALTERNATE COORDS GRID: UTM
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -70x 0' 0"
LENGTH OF THE HOLE: 192.30m
START DEPTH: 0.00m
FINAL DEPTH: 192.30m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: July 15, 1990
DATE COMPLETED: July 17, 1990
DATE LOGGED: August 1, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: FRONTIER
CASING: PULLED
CORE STORAGE: MINE SITE EXP. CAMP

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
82.30	-	72x 0'	ACID	OK		-	-	-	-	-	
171.00	-	74x 0'	ACID	OK		-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 3.00	.CASING/					
3.00 TO 152.30	.MPYRO/	Colour - Green Grain size - fine @8 m 948.2-48.8L .Qtz carb bx & sert/ 61.5 - 70.3 Qtz/Ankerite veins and veinlets, highly carboured and tectonitic. Rare fuchsite and minor sericitic alt. 979.0 - 79.4L .Minor Flt/ 976.5 - 81.0L .Ankte/Dol/Qtz Veins/ with minor sericitic alterations. 986.7 - 86.9L .Minor flt,dip=40/ 990.0 - 90.1L .Minor flt,dip=60/ 998.75 - 98.8L .Minor flt/ 9108.35 - 108.7L .Min Flt/ 105= 9150.65 - 150.7L .Minor flt/	53 45	27 - 27.9 m minor sericitic alt 32.9 - 33.1 sericitic alt in qtz carb vein @ 119.0 lappili became serecitic 115.0 Mafics v. dolomitic	913.5 - 14.1L .bs mtls in qtzcarb/ 914.8 - 15.2L .bs mtls in qtzcarb/ 2 - 3% diss'd py.	Broken and intact core
152.30 TO 160.50	.QTZDOLMAF/	Colour - greyish Essentially still volcanics but high altered 9155.5 - 155.9L .Flt/ Rubble and gouge includes fuchsite 9158.1 - 159.0L .Flt/ Contact Flted.		Intense Dol. throughout interval. Occ. fuchsite & brown to olive Yellow sericite alt.	3 - 5% py throughout Locally up to 25% over 10 cm or so.	V. broken.
160.50 TO 172.60	.QV&SERT/	Colour - white and yellowish olive green Grain size - V. fine 9160.5 - 161.8L .Flt/ Gouge includes 20 cm M.S. from 160.7 - 160.9 m and 10 cm from 161.0 to 161.1 m 9166.0 - 166.21L .Minor flt/ 9169.2 - 169.5L .Flt/ 9169.6 - 169.81L .Flt/		Dol as veins & veinlets within Bull qtz veins Olive yellow sericite from 170 to EOI	9160.7 - 160.9L <35-40% py 9161.0 - 161.1L .Tr tet, sp, cp,ga/ 169.5 - 169.6 tr tet and base metals 169.8 - 170.0 tr tet and base metals	Core v. broken to rubble and gouge.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		9171.2 - 172.2L .Flt/ 9172.55 - 172.61L .Flt/ Contact Flted				
172.60 TO 192.30	.MUT&FLTS/	Colour - grey Grain size - V. fine 9173.0 - 173.2L .Minor flt/ 9173.6 - 175.3L .Major flt/ 9177.0 - 178.2L .Flt/ 9179.6 - 181.2L .Minor flt/ Healed gouge and rubble zone 9183.4 - 183.9L .Flt/ 9184.7 - 185.4L .Flt/ 9185.8 - 187.01L .Flt/ 9189.9 - 191.1L .Flt/ 9191.3 - 191.8L .Flt/		Silver grey sericite From 187 to EOH v. cht in flts and mut.	3 - 5% throughout with local base metals and tet over 10 - 20 cm. Approx 5 - 8% Approx 180 to 183.4 9183.9 - 184.2L .tr tet & base mlts/ 9187.7 - 188.8L .tr tet/	Core broken to rubble and gouge.
	EOH					

Sample	From (m)	To (m)	Length (m)	ASSAYS Cu %	Zn %	Pb %	Ag g/t	Au g/t	Sb %	As %	GEOCHEMICAL Cu ppm	Zn ppm	Pb ppm	S.G.	Ag oz/T	Au oz/T	As ppm	Ba %	Sb ppm	Ag ppm	Au ppb	COMMENTS
BCD27500	13.50	14.10	0.60	0.02	0.47	0.40	8	.07														
BCD27501	14.80	15.20	0.40	0.06	1.56	1.02	12	.03														
BCD27502	101.20	102.40	1.20	0.20	1.19	0.66	4	.03														
BCD27503	151.80	152.30	0.50	0.01	0.01	0.01	2	.10														
BCD27504	152.30	154.10	1.80	0.01	0.02	0.01	2	.03														
BCD27505	154.10	155.50	1.40	0.01	0.01	0.01	2	.03														
BCD27506	155.50	155.90	0.40	0.01	0.01	0.01	2	.03														
BCD27507	155.90	158.10	2.20	0.01	0.02	0.01	2	.03														
BCD27508	158.10	159.00	0.90	0.01	0.01	0.01	2	.03														
BCD27509	159.00	160.50	1.50	0.01	0.01	0.01	4	.03														
BCD27510	160.50	160.90	0.40	2.80	12.8	5.40	3210	4.42														
BCD27511	160.90	161.80	0.90	2.05	3.70	1.75	2100	3.42														
BCD27512	161.80	163.20	1.40	0.01	0.01	0.01	6	.03														
BCD27513	163.20	163.80	0.60	0.01	0.02	0.01	6	.03														
BCD27514	163.80	166.30	2.50	0.01	0.04	0.02	24	.03														
BCD27515	166.30	169.20	2.90	0.01	0.05	0.04	22	.03														
BCD27516	169.20	169.80	0.60	2.10	3.84	0.82	2130	3.09														
BCD27517	169.80	170.20	0.40	0.35	1.06	0.54	352	2.85														
BCD27518	170.20	171.30	1.10	0.01	0.16	0.01	8	.07														
BCD27519	171.30	172.20	0.90	0.11	0.02	0.01	56	.21														
BCD27520	172.20	172.60	0.40	1.43	0.14	0.01	744	1.92														
BCD27521	172.60	173.00	0.40	0.04	2.22	0.62	356	1.23														
BCD27522	173.00	173.20	0.20	1.70	8.42	4.52	1636	3.08														
BCD27523	173.20	175.30	2.10	0.92	2.32	1.15	376	.93														
BCD27524	175.30	175.60	0.30	0.75	1.70	1.20	600	2.26														
BCD27525	175.60	177.00	1.40	0.01	0.37	0.26	24	.24														
BCD27526	177.00	178.20	1.20	0.27	0.62	0.41	192	.69														
BCD27527	178.20	179.60	1.40	0.03	0.72	0.78	54	.38														
BCD27528	179.60	180.20	0.60	0.13	0.79	0.59	118	.86														
BCD27529	180.20	180.70	0.50	0.55	1.50	0.60	490	.96														
BCD27530	180.70	180.80	0.10	0.01	1.25	0.60	90	.75														
BCD27531	180.80	183.40	2.60	0.20	1.30	0.70	150	.75														
BCD27532	183.40	183.90	0.50	0.05	0.70	0.35	38	.38														
BCD27533	183.90	184.70	0.80	0.04	1.26	0.73	48	.31														
BCD27534	184.70	185.40	0.70	0.04	0.33	0.20	20	.41														
BCD27535	185.40	185.80	0.40	0.01	0.21	0.08	16	.27														
BCD27536	185.80	187.00	1.20	0.02	0.34	0.06	18	.34														
BCD27537	187.00	188.70	1.70	0.01	0.04	0.02	8	.38														
BCD27538	188.70	188.80	0.10	0.16	0.42	0.20	64	.48														
BCD27539	188.80	189.90	1.10	0.01	0.03	0.02	8	.34														

Sample	From (m)	To (m)	Length (m)	Cu %	Zn %	Pb %	Ag g/t	Au g/t	Sb %	As %	Cu ppm	Zn ppm	Pb ppm	S.G.	Ag oz/T	Au oz/T	As ppm	Ba %	Sb ppm	Ag ppm	Au ppb		
BCD27540	189.90	191.30	1.40	0.01	0.04	0.01	14	.21															

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER:
CLAIM NUMBER:
LOCATION: SOUTH WALL

PLOTTING COORDS GRID: FIELD
NORTH: 525.00N
EAST: 9587.00W
ELEV: 1450.69

ALTERNATE COORDS GRID: UTM
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -50x 0' 0"
LENGTH OF THE HOLE: 124.00m
START DEPTH: 0.00m
FINAL DEPTH: 124.00m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: July 18, 1990
DATE COMPLETED: July 19, 1990
DATE LOGGED: July 28, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: FRONTIER
CASING: PULLED
CORE STORAGE: MINE SITE EXP. CAMP

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
94.80	-	-54x 0'	ACID	OK		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 4.40	.CASING/					
4.40 TO 41.70	.MPYRO/	Colour - Green Grain size - Fine V. tectonitic throughout Occ cut by qtz-carb veins +/- sulphides Qts-carb veins ox (Fe stained) to 37 m depth 941.7 - 42.1L .Flt/ Contact Flted	80	@ 30 m Lappilli are sericitic	2 - 3% diss'd py with occ. 30-40% zones	Broken to V. broken
41.70 TO 53.60	.SERT&CHT/	Colour - Greenish yellow Grain size - fine Transitional fragmental essentially volcanic, sil 953.5 - 53.8L .Rubble & Flt/ Contact Rubble	80	Sericitic	8 - 10% py with occ qtz +/- carb vein carrying 30% py +/- gal, cp, sp	Broken to rubble.
53.60 TO 75.00	.ARG/	Colour - Black Grain size - V. fine to aph. 955.2 - 56.4L .Sil, bleached/ Grading into unalt. arg & wacke 956.7L .bding = 86/ 972.1 - 72.2L .Minor Flt/ 972.5 - 75.0L .Minor Flts/ Intermittent flts from 72.1 m to EOI @ 75.0 m	86		< 3% diss'd py.	Broken to rubble.
75.00 TO 115.40	.MUT/	Colour - grey Grain size - V. fine to aph. Highly fissile 975.0 - 77.0L .Minor flts/ Sheared every 10 - 20 cm. Occ. cut by qtz carb veins. From 975 - 84L .Qtz carb v. & flts) 984 - 99.5L - sil. tectonitic no qtz carb veins .tect.sil/ veins and faults. 9105.1 - 108.9L .Flt/ Highly contorted with axial planar cleavage	80	Silver grey sert.	Approx. 3% py throughout Locally up to 25% over approx 10 cm	Blocky to broken.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		from 108.8 to 110.0 Some grading into next unit. Occ. aug. frags in MUT 0.75 m above contact Gouged @ 115.4				
115.40 TO 118.70	.ARG&CHT/	Colour - Greyish black Colour - V. fine Grey siliceous chert. Frags within arg. matrix 117.5 =	70		10 - 12% py throughout	Blocky and broken
118.70 TO 124.00	.SERT&CHT/	Colour - Greyish yellow Grey siliceous chert frags within yellow sericitic matrix. Highly contortal 123-124 cm 120.5 =	65	Yellow sericite	Approx. 10% py throughout.	
	EOH					

Sample	From (m)	To (m)	Length (m)	ASSAYS Cu %	Zn %	Pb %	Ag g/t	Au g/t	Sb %	As %	GEOCHEMICAL Cu ppm	Zn ppm	Pb ppm	S.G.	Ag oz/T	Au oz/T	As ppm	Ba %	Sb ppm	Ag ppm	Au ppb	COMMENTS
BCD27433	42.10	43.20	1.10	0.01	0.03	0.01	2	.03														
BCD27434	43.70	45.00	1.30	0.01	0.03	0.01	2	.03														
BCD27435	45.00	46.30	1.30	0.02	0.02	0.01	2	.03														
BCD27436	46.30	48.30	2.00	0.02	0.27	0.22	2	.03														
BCD27437	48.30	48.80	0.50	0.01	0.02	0.01	2	.03														
BCD27438	48.80	51.20	2.40	0.03	0.15	0.16	2	.03														
BCD27439	51.20	53.60	2.40	0.01	0.04	0.12	2	.03														
BCD27440	53.60	54.20	0.60	0.04	0.55	0.38	6	.03														
BCD27441	54.20	55.20	1.00	0.01	0.30	0.16	2	.03														
BCD27442	55.20	56.40	1.20	0.01	0.04	0.01	2	.03														
BCD27443	56.40	56.90	0.50	0.01	0.03	0.01	2	.03														
BCD27444	74.00	75.00	1.00	0.01	0.01	0.01	2	.03														
BCD27445	75.00	76.00	1.00	0.01	0.01	0.01	2	.03														
BCD27429	76.00	77.00	1.00	0.01	0.01	0.01	2	.03														
BCD27446	83.90	84.40	0.50	0.01	0.15	0.01	2	.03														
BCD27447	84.40	85.00	0.60	0.01	0.07	0.01	2	.03														
BCD27448	85.00	87.50	2.50	0.02	0.12	0.01	2	.03														
BCD27449	87.50	90.00	2.50	0.01	0.01	0.01	2	.03														
BCD27450	90.00	92.50	2.50	0.01	0.01	0.01	2	.03														
BCD27451	92.50	95.00	2.50	0.01	0.01	0.01	2	.03														
BCD27452	100.20	101.00	0.80	0.01	0.07	0.01	2	.03														
BCD27453	114.90	115.40	0.50	0.01	0.01	0.01	2	.03														
BCD27454	115.40	116.00	0.60	0.01	0.01	0.01	2	.03														
BCD27455	116.00	118.02	2.02	0.01	0.01	0.01	2	.03														
BCD27456	118.02	118.70	0.68	0.01	0.01	0.01	2	.03														
BCD27457	118.70	119.20	0.50	0.01	0.01	0.01	2	.03														
BCD27458	119.20	121.70	2.50	0.01	0.01	0.01	2	.03														
BCD27459	121.70	124.20	2.50	0.01	0.01	0.01	2	.03														

Sample	From (m)	To (m)	Length (m)	SiO2 %	Al2O3 %	CaO %	MgO %	Na2O %	K2O %	FeO %	MnO %	TiO2 %	Ba %	Zr %	Cu ppm	Zn ppm	Pb %	Total %	Au ppb	Ba ppm	Ag ppm	Pb ppm	P2O5 %	Sr %	S %	Total %	As ppm	Sb ppm
	0.00	0.00	0.00																									

MINNOVA INC.

HOLE NUMBER: RG353 | DRILL HOLE RECORD | IMPERIAL UNITS: | METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER:
CLAIM NUMBER:
LOCATION: SOUTH WALL

PLOTTING COORDS GRID: FIELD
NORTH: 526.00N
EAST: 9697.00W
ELEV: 1450.71

ALTERNATE COORDS GRID: UTM
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -70x 0' 0"
LENGTH OF THE HOLE: 141.70m
START DEPTH: 0.00m
FINAL DEPTH: 141.70m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: July 19, 1990
DATE COMPLETED: July 21, 1990
DATE LOGGED: August 4, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: FRONTIER
CASING: PULLED
CORE STORAGE: MINE SITE EXP. CAMP

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
74.40	-	-70x 0'	ACID	OK		-	-	-	-	-	
142.60	-	-70x 0'	ACID	OK		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 4.80	.CASING/					
4.80 TO 40.30	.MYPRO/	Colour - green Grain size - fine 932 - 32.1L .bding = 70/ 933.8 - 34.2L .Flt/ @32 = 936.7 - 37.0L .Flt/ below Fault tectonitic mafics 940.3 - 40.35L .Flt/	70		936.1 - 36.2L .3% ga qtzcarb vein/ 3% py throughout	Core v. broken
40.30 TO 58.20	.SERT/ VOLCANICS	Colour - yellow green Grain size - fine 954.8 - 55.1L .Flt/ 10 cm v. sil colcanic? (competence shearing)	70	Sericitic volcanics highly tectonitic, sil & chloritic on foliation	55.4 to EOI 20% py tr ga & cp. Minor sp as blebs in qtz carb veins 3.5% py throughout with intervals of 10 cm or so up to 25% py	Core broken
58.20 TO 61.40	.SERT&CHT/ SERICITIC TURBIDITES	Colour - Light yellowish green Grain size - V. fine Qts veins & veinlets through pervasive silicification occ minor carb veinlets within qtz veins	70	Sericitic	5% diss'd py throughout	Core broken
61.40 TO 81.20	.ARG/	Colour - black Grain size - v. fine to aphanitic Turbidites, argilleous wackies 962.5 - 62.6L .bding = 65%/ 967.2 - 67.3L .minor flt/ 971.2 - 71.8L .Flt/ 72.8 - 72.9 qtz ferroan dol vein 973.9 - 74L .Flt/ 974.3 - 74.6L .Major Flt/ all gouge & rubble			1-2% py as thin <1 cm beds throughout	Broken to rubble

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
81.20 TO 85.50	.MUT/	Colour - grey Grain size - v. fine 982.1 - 82.3L .Flt/ 982.5L .Flt/ Fault followed by 30 cm arg, which grades again to MUT @ 85.5 sharp 5 mm gouge competence shear	60	Silver grey sericite	5% diss'd py	Interfingering transition zone
85.50 TO 90.20	.ARG/	Colour - Black Grain size - v. fine to aph. 986 - 86.1L .bding = 70%/ @86 m= as interval 81.4 to 81.2 989.3 - 91.0L .MAJOR FLT/ Gouge includes pieces of Mut & Arg Transition Faulted	70		1 - 2% py	Interfingering transition zone
90.20 TO 118.40	.MUT/	Colour - grey Grain size - V. fine V. sil. to 95.5 m 9106.5 - 106.7L .Flt/ 9109.4 - 109.7L .Flt/ 9118.35 - 118.4L .Flt/		Silver grey sericite		
118.40 TO 141.70	.SERT&CHT/	Colour - yellow 9124.3 - 124.7L .Flt/ 9127.3 - 127.61L .Flt/ @ 130.0 m to EOI v. sil associated with qtz carb veining. Occ arg bedded stringers with graphitic surfaces 9131.9 - 132.1L .Flt/ 9135.3 - 135.6L .Flt/ 9138.1 - 138.2L .Flt/ 9139.1 - 139.3L .Flt/ 9141.6 - 141.7L .Flt/	55 70	Sericite	3 - 5% diss'd py. Rare 2 - 3 cm py beds Rare 5 - 20 cm qtz carb veins with tr cp, ga & sp.	MIXED SEDIMENTS Beddings vary 55 to 70 deg.
	EOH					

Sample	From (m)	To (m)	Length (m)	ASSAYS Cu %	Zn %	Pb %	Ag g/t	Au g/t	Sb %	As %	GEOCHEMICAL Cu ppm	Zn ppm	Pb ppm	S.G.	Ag oz/T	Au oz/T	As ppm	Ba %	Sb ppm	Ag ppm	Au ppb		COMMENTS
BCD27541	39.00	40.30	1.30	0.01	0.01	0.01	2	.03															
BCD27542	40.30	40.80	0.50	0.01	0.01	0.01	2	.03															
BCD27543	55.40	56.00	0.60	0.24	1.05	0.62	14	.58															
BCD27544	56.00	57.10	1.10	0.01	0.03	0.01	2	.03															
BCD27545	57.10	58.10	1.00	0.01	0.33	0.08	2	.03															
BCD27546	58.10	58.20	0.10	0.01	0.07	0.01	2	.03															
BCD27547	58.20	59.20	1.00	0.01	0.01	0.01	2	.03															
BCD27548	89.30	91.00	1.70	0.01	0.01	0.01	2	.03															
BCD27549	91.00	92.00	1.00	0.01	0.02	0.01	2	.03															
BCD27550	92.00	94.50	2.50	0.01	0.01	0.01	2	.03															
BCD27551	94.50	95.50	1.00	0.01	0.01	0.01	2	.03															
BCD27552	95.50	98.00	2.50	0.01	0.16	0.01	2	.03															
BCD27553	128.90	129.40	0.50	0.01	0.05	0.01	2	.03															
BCD27554	129.40	129.50	0.10	0.01	0.01	0.10	4	.03															
BCD27555	129.50	130.00	0.50	0.01	0.01	0.01	2	.03															

MINNOVA INC.

HOLE NUMBER: RG354 | DRILL HOLE RECORD | IMPERIAL UNITS: | METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER:
CLAIM NUMBER:
LOCATION: MINE AREA - SOUTH

PLOTTING COORDS GRID: FIELD
NORTH: 488.00N
EAST: 9557.00W
ELEV: 1451.06

ALTERNATE COORDS GRID: UTM
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -80x 0' 0"
LENGTH OF THE HOLE: 148.40m
START DEPTH: 0.00m
FINAL DEPTH: 148.40m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: July 22, 1990
DATE COMPLETED: July 24, 1990
DATE LOGGED: August 4, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: FRONTIER
CASING: PULLED
CORE STORAGE: MINE SITE EXP. CAMP

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
37.80	-	-79x 0'	ACID	OK		-	-	-	-	-	
139.30	-	-71x 0'	ACID	OK		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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HOLE NUMBER: RG354 | DRILL HOLE RECORD | LOGGED BY: I.G.PIWEK | PAGE: 1

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 9.70	.CASING/					
9.70 TO 35.30	.SERT/	Colour - yellow grey Grain size - fine 910.0 - 10.1L .Fol = 60 deg/ 10 m = Volcanics become tectonitic towards EOI	60	Yellow sericite and ferroan Dol to Ankerite Strong sil	3% diss'd Py	Core broken
35.30 TO 62.50	.ARG/	Colour - Black Grain Size - V. fine - aphanitic 35.3 to 38.1 m interfingers with faulted units and gradational contacts. 937.3 - 37.5L .Flt/ 38.1 to EOI Arg/wacke 38.1 to 43 Core rubble to v. broken 941 - 42L .Flt/ in lost core est. depth 952.5 - 52.6L .Flt bding=70 deg/	65 70	935.3 - 35.8L .Black Cht/ 38.6 - 39.1 Chty with v. minor Fuchsite		2.5 m lost core @ 39.3 to 42.3 Fining upwards sequence right way up @ 49.6
62.50 TO 94.50	.MUT/	Colour - grey Grain size - v. fine 964.1 - 64.3L .Flt/ 966.3 - 66.4L .Flt/ 966.6 - 66.9L .Flt/ 968.4 - 69.7L .Flt/ 972.1 - 72.8L .Flt/ 973.6 - 74.4L .Flt/ 983.8 - 85.8L .Flt w/qv at base/ Base contact GRADATIONAL	70	Silver grey sericite	5 - 8% DISS'D PY.	
94.50 TO 148.40	.SERT/CHT/ ARG/ OLD LOGS MIXED SEDS	Colour Olive & grey Colour - V. fine Inter bedded arg & sericitic seds with cherty frags. Qtz carb veins and veinlets 996.2 - 96.4L .Flt/ 9102 - 103.1L .crackle bx/ qtz and chty @ 141.9 olive green sert abruptly in contact with arg. Py bands and qtz veinlets isoclinally folded	60 70	Yellow sericite increasing down hole and loosing arg component Sil. throughout v. minor fuchsite in sericitic sections	5% py diss'd and in veinlets Sericitic sections 1-2% py Arg sections 5-8% py as blebs and veinlets	V. broken

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		(micro scale over 3 - 5 cm)				
		9149.2 - 149.3L .Flt/				
		149.5 - 149.8 QV barren with sulphides rimming top contact				
	EOH					

Sample	From (m)	To (m)	Length (m)	ASSAYS Cu %	Zn %	Pb %	Ag g/t	Au g/t	Sb %	As %	GEOCHEMICAL Cu ppm	Zn ppm	Pb ppm	S.G.	Ag oz/T	Au oz/T	As ppm	Ba %	Sb ppm	Ag ppm	Au ppb	COMMENTS
BCD27556	33.80	34.80	1.00	0.01	0.04	0.01	2	.03														
BCD27557	34.80	35.30	0.50	0.01	0.01	0.01	2	.03														
BCD27558	35.30	35.80	0.50	0.01	0.03	0.01	2	.03														
BCD27559	35.80	36.80	1.00	0.01	0.01	0.01	2	.03														
BCD27560	36.80	38.60	1.80	0.01	0.02	0.01	2	.03														
BCD27561	38.60	39.10	0.50	0.01	0.01	0.01	2	.03														
BCD27562	61.50	62.50	1.00	0.01	0.01	0.01	2	.03														
BCD27563	62.50	63.50	1.00	0.01	0.01	0.01	2	.03														
BCD27564	67.90	69.40	1.50	0.01	0.01	0.01	2	.03														
BCD27565	85.40	85.60	0.20	0.01	0.01	0.01	2	.03														
BCD27566	85.80	86.60	0.80	0.01	0.01	0.01	2	.03														
BCD27567	92.40	92.80	0.40	0.01	0.01	0.01	2	.03														
BCD27568	92.80	94.00	1.20	0.01	0.01	0.01	2	.03														
BCD27569	94.00	94.50	0.50	0.01	0.01	0.01	2	.03														
BCD27570	94.50	95.00	0.50	0.01	0.01	0.01	2	.03														
BCD27571	95.00	96.50	1.50	0.01	0.01	0.01	2	.03														
BCD27572	101.30	102.00	0.50	0.01	0.11	0.04	6	.03														
BCD27573	102.00	103.10	1.10	0.01	0.01	0.01	2	.03														
BCD27574	103.10	103.60	0.50	0.01	0.06	0.01	2	.03														
BCD27575	149.40	149.50	0.10	0.01	0.01	0.01	2	.03														

MINNOVA INC.

HOLE NUMBER: RG355 | DRILL HOLE RECORD | IMPERIAL UNITS: | METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER:
CLAIM NUMBER:
LOCATION: MINE AREA - SOUTH

PLOTTING COORDS GRID: FIELD
NORTH: 453.00N
EAST: 9524.00W
ELEV: 1438.01

ALTERNATE COORDS GRID: UTM
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -90x 0' 0"
LENGTH OF THE HOLE: 148.80m
START DEPTH: 0.00m
FINAL DEPTH: 148.80m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: July 24, 1990
DATE COMPLETED: July 26, 1990
DATE LOGGED: August 4, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: FRONTIER
CASING: PULLED
CORE STORAGE: MINE SITE EXP. CAMP

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
38.70	-	-88x 0'	ACID	OK		-	-	-	-	-	
121.00	-	-85x 0'	ACID	OK		-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 24.30	.MYPRO/	Colour - Green Grain size - fine 95.8 - 6.7L .Flt/ @ 8 m = Rubble @ 23.8 to 24.0 probable flt 24.0 to 24.3 v. sil tect vol 2 cm Blk cht @ contact	55	Lappilli slightly sericitic iron stained to 24 m	Approx 3% diss'd py	Core broken to v. broken
24.30 TO 32.70	.ARG/	Colour - Black Grain size - V. fine to aph. Inter bedded arg/wacke Lower contact rubble and interbedded MUT/ARG 2.6 m missing core between 32.6 to 35.6 suspected fault contact	60 70		1 - 3% py.	
32.70 TO 70.80	.MUT/	Colour - grey Grain size - V. fine to aph. 35.6 - 35.7 arg remnant 935.7 - 36.2L .Flt/ 0.7 m lost core 938.7 - 39.0L .Flt/ 939.4 - 39.5L .Minor Flt.dip=45 deg/ 940.2 - 40.5L .Rubble flt/ 940.7 - 45.3L .Py Mut/Arg/ Minor fuchsite v sil. minor Flt at 45.3 m 948.4 - 48.6L .Flt/ 949.3 - 49.5L .Flt w/10 cm qv at top/ 950.2 - 50.4L .Flt/ 951.7 - 52.7L .Flt/ 953.8 - 54.4L .flt/ 956.3 - 56.5L .flt/ 957.6 - 57.8L .Minor flt/ 63 = 961.3 - 62.3L .Flt/ 962.5 - 63.1L .Flt/ 963.3 - 63.6L .Flt dip=55 deg/ 970.7 - 70.8L .Flt/ Contact begins gradational is faulted @ EOI	50 70 55	Silver grey serecite @ 70.2 m MUT grading to yellow sericite w/qtz carb veins which ends in a fault @ 70.7m	8-10% diss'd py throughout 40.7 - 45.3 30% py Tr tet, cp,ga,sp in qtz veinlets	Core broken to rubble.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
70.80	.ARG/SERT/	Colour - Olive green to black				
TO	MIXED SEDS	Grain size - Fine to v. fine				
148.80	WITH MINOR					
	CHT	Mixed sediments well bedded to highly contorted	20			
		tectonitic in localized zones.	60	Yellow sericite	Approx 1% py in veinlets	Core broken
		984.5 - 84.6L .bx/		Sericitic alt overall increases with		
		993.9 - 94.1L .Flt/		depth.		
		9106.7 - 108.7L .Major Flt/		Arg remnants also more prevalent at		
		9123.4 - 123.5L .Minor Flt/		TOI		
				Minor qtz veining throughout with		
		138 - 144 m Black Chty Arg with qtz veinlets		v. minor fuchsite		
		throughout				
		Parallel and X-cutting bedding			142 m to (148.8 m) EOH 3 - 5% py	
		144 - 147 SERT & CHT				
		9145.9 - 146.3L .Flt/				
		147 to EOH Blk Cht to v. minor fuchsite				
	EOH					

Sample	From (m)	To (m)	Length (m)	ASSAYS Cu %	Zn %	Pb %	Ag g/t	Au g/t	Sb %	As %	GEOCHEMICAL Cu ppm	Zn ppm	Pb ppm	S.G.	Ag oz/T	Au oz/T	As ppm	Ba %	Sb ppm	Ag ppm	Au ppb	COMMENTS
BCD27576	23.80	24.30	0.50	0.01	0.04	0.01	2	.03														
BCD27577	24.30	24.80	0.50	0.01	0.01	0.01	2	.03														
BCD27578	24.80	25.60	0.80	0.01	0.01	0.01	2	.03														
BCD27579	25.60	26.60	1.00	0.01	0.01	0.01	2	.03														
BCD27580	32.20	32.70	0.50	0.01	0.02	0.01	2	.03														
BCD27581	35.30	35.70	0.40	0.01	0.01	0.01	2	.03														
BCD27582	35.70	37.20	1.50	0.01	0.01	0.01	2	.03														
BCD27583	37.20	37.50	0.30	0.01	0.01	0.01	2	.03														
BCD27584	37.50	38.60	1.10	0.01	0.01	0.01	2	.03														
BCD27585	38.10	38.60	0.50	0.01	0.01	0.01	2	.03														
BCD27586	38.60	40.70	2.10	0.01	0.01	0.01	2	.03														
BCD27587	40.70	42.80	2.10	0.01	0.01	0.08	2	.03														
BCD27588	42.80	43.80	1.00	0.01	0.06	0.04	2	.10														
BCD27589	43.80	45.30	1.50	0.01	0.61	0.88	2	.14														
BCD27590	45.30	45.80	0.50	0.01	0.07	0.08	2	.31														
BCD27591	45.80	47.80	2.00	0.01	0.10	0.03	2	.03														
BCD27592	47.80	49.30	1.50	0.01	0.49	0.36	2	.03														
BCD27593	70.30	70.80	0.50	0.01	0.01	0.01	2	.03														
BCD27594	70.80	71.30	0.50	0.01	0.01	0.01	2	.03														
BCD27595	71.30	72.20	0.90	0.01	0.01	0.01	2	.03														
BCD27596	146.50	147.00	0.50	0.01	0.01	0.01	2	.03														
BCD27597	147.00	148.70	1.70	0.01	0.01	0.01	2	.03														

MINNOVA INC.

HOLE NUMBER: RG356 — DRILL HOLE RECORD — IMPERIAL UNITS: — METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER:
CLAIM NUMBER:
LOCATION: NORTH RAMP 1290

PLOTTING COORDS GRID: FIELD
NORTH: 701.00N
EAST: 9940.00W
ELEV: 1294.28

ALTERNATE COORDS GRID: UTM
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -73x 0' 0"
LENGTH OF THE HOLE: 84.40m
START DEPTH: 0.00m
FINAL DEPTH: 84.40m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: July 27, 1990
DATE COMPLETED: July 28, 1990
DATE LOGGED: July 29, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: FRONTIER
CASING: PULLED
CORE STORAGE: MINE SITE EXP. CAMP

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
84.40	-	-63x 0'	ACID	OK	WEAK	-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 18.00	.CHT&ARG/	Colour - greyish black Grain size - v. fine Highly contortal highly sil Chert frags with arg wisps 917.9 - 18.05L .Flt/ Contact Flted		Occ. yellow sericitic wisps over 10 to 20 cm	3 - 5% diss'd py. Locally up to 30% over 10 cm or so.	Broken core.
18.00 TO 75.30	.MUT/	Colour - grey Grain size - V. fine to aph. 18 - 21.7 Frag/tect 924.0 - 24.15L .Flt/ 43 m = 925.0 - 25.2L .Flt&5cm q/carb v/ 927.4 - 27.8L .Flts/ Two 10 cm gouge zone separated by approx 20 cm 929.2 - 29.4L .Flt/ 53.65 - 53.7 Minor Flt 53.85 - 53.9 Minor Flt 56.4 - 56.55 Minor Flt 58.45 - 58.6 - Minor Flt 64.9 - 65.0 Minor Flt Contact Gradational	60	Silver grey sert	Approx 3% diss'd py throughout Locally 3 - 10 cm beds w/10 - 25% py gal, sph, cp, tet 932.5 - 32.8L two 3 cm beds .8%sp,3%ga,tr.tet/ 936.3 - 75.3L .tet,sp,ga qv/ Mineralization in qtz veins and veinlets within sil MUT	Broken
75.30 TO 76.30	.ARG/	Colour - greyish black Grain size - V. fine to aph. Well inter bedded arg (MUD)CHT v. sil 75.5 =	65			
76.30 TO 78.20	.MUT/	Colour - grey Grain size - v. fine V. sil & frag cut by q.v.w/tet,sph,cp 77 m = Contact gradational	65	V. minor silver grey sericite	977.0 - 77.3L .tr.tet,sp,cp/ in qtz veins & veinlets	Broken core
78.20 TO 80.50	.ARG/	Colour - Greyish black Grain size - v. fine to aphanitic Well interbedded arg (MUD)CHT V. sil 79 m = 979.9 - 80.5L .Flt/ Contact Flted	65			

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
80.50 TO 84.40	.CHT/QITE & SERT/	Colour - Yellowish grey Grain size - V. fine				
		Highly contorted v. sil with qtz vein with carb veinlets 84 = 83.35 - 83.4 Minor Flt	60	V. sil		
	EOH					

Sample	From (m)	To (m)	Length (m)	ASSAYS Cu %	Zn %	Pb %	Ag g/t	Au g/t	Sb %	As %	GEOCHEMICAL Cu ppm	Zn ppm	Pb ppm	S.G.	Ag oz/T	Au oz/T	As ppm	Ba %	Sb ppm	Ag ppm	Au ppb		COMMENTS
BCD27460	13.00	14.50	1.50	0.01	0.01	0.02	2	.14															
BCD27461	14.50	17.50	3.00	0.01	0.01	0.01	2	0.7															
BCD27462	17.50	18.00	0.50	0.01	0.01	0.01	1	.03															
BCD27463	18.00	18.50	0.50	0.01	0.01	0.01	1	.03															
BCD27464	31.50	32.50	1.00	0.02	0.07	0.05	10	.17															
BCD27465	32.50	32.80	0.30	0.47	1.88	0.98	144	.55															
BCD27466	32.80	33.80	1.00	0.01	0.10	0.05	7	.10															
BCD27476	33.80	35.80	2.00	0.01	0.05	0.05	5	.07															
BCD27477	35.80	36.30	0.50	0.02	0.16	0.04	12	.21															
BCD27467	36.30	38.70	2.40	0.01	0.05	0.01	2	.24															
BCD27468	38.70	39.70	1.00	0.01	0.01	0.02	2	.10															
BCD27469	39.70	40.20	0.50	0.30	0.31	0.29	140	.38															
BCD27470	40.20	41.20	1.00	0.27	0.35	0.48	120	.41															
BCD27471	41.20	42.20	1.00	0.34	0.48	0.32	154	0.21															
BCD27472	42.20	44.50	2.30	0.01	0.02	0.01	2	.14															
BCD27473	44.90	45.90	1.00	0.01	0.38	0.25	5	.48															
BCD27474	45.90	47.50	1.60	0.01	0.30	0.21	4	.48															
BCD27475	47.50	49.30	1.80	0.02	0.47	0.28	18	.89															
BCD27478	49.30	50.30	1.00	0.21	0.49	0.80	127	1.85															
BCD27479	50.30	50.70	0.40	0.02	0.04	0.15	11	.38															
BCD27480	50.70	51.20	0.50	0.57	2.15	1.53	227	1.30															
BCD27481	51.20	53.70	2.50	0.19	0.54	0.37	100	.65															
BCD27482	53.70	53.90	0.20	0.01	0.49	0.16	2	.41															
BCD27483	53.90	56.40	2.50	0.01	0.01	0.01	2	.21															
BCD27484	56.40	58.90	2.50	0.01	0.05	0.09	4	.17															
BCD27485	58.90	61.40	2.50	0.01	0.02	0.04	2	.07															
BCD27486	61.40	61.90	0.50	0.11	0.25	0.03	20	.14															
BCD27487	61.90	63.90	2.00	0.01	0.03	0.05	2	.24															
BCD27488	63.90	64.90	1.00	0.01	0.01	0.05	1	.03															
BCD27489	64.90	66.40	1.50	0.01	0.24	0.14	3	.21															
BCD27490	66.40	67.80	1.40	0.08	0.10	0.20	16	.21															
BCD27491	67.80	68.30	0.50	0.11	1.77	0.39	18	.21															
BCD27492	68.30	70.80	2.50	0.08	0.09	0.03	16	.17															
BCD27493	70.80	73.30	2.50	0.03	0.32	0.08	60	.21															
BCD27494	73.30	74.70	1.40	0.01	0.01	0.02	1	.03															
BCD27495	74.70	75.20	0.50	0.30	0.68	0.87	250	.27															
BCD27496	75.20	76.30	1.10	0.01	0.07	0.02	1	.03															
BCD27497	76.30	78.20	1.90	0.02	0.25	0.20	12	.24															
BCD27498	78.20	80.50	2.30	0.01	0.02	0.01	1	.03															
BCD27499	80.50	81.00	0.50	0.01	0.01	0.03	1	.03															

Sample	From (m)	To (m)	Length (m)	Cu %	Zn %	Pb %	Ag g/t	Au g/t	Sb %	As %	Cu ppm	Zn ppm	Pb ppm	S.G.	Ag oz/T	Au oz/T	As ppm	Ba %	Sb ppm	Ag ppm	Au ppb		
AVE.	39.70	42.20	2.50	0.30	0.39	0.38	137.60	0.32															
AVE.	49.30	53.70	4.40	0.22	0.67	0.58	112.48	0.97															

MINNOVA INC.

HOLE NUMBER: RG357 — DRILL HOLE RECORD — IMPERIAL UNITS: — METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER:
CLAIM NUMBER:
LOCATION: NORTH RAMP 1290

PLOTTING COORDS GRID: FIELD
NORTH: 701.00N
EAST: 9940.00W
ELEV: 1294.32

ALTERNATE COORDS GRID: UTM
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -90x 0' 0"
LENGTH OF THE HOLE: 72.30m
START DEPTH: 0.00m
FINAL DEPTH: 72.30m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: July 29, 1990
DATE COMPLETED: July 29, 1990
DATE LOGGED: August 11, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: FRONTIER
CASING: PULLED
CORE STORAGE: MINE SITE EXP. CAMP

PURPOSE: TEST QTZ BULGE

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
72.30	-	-87x 0'	ACID	OK	WEAK	-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 1.80	.CASING/					
1.80 TO 26.30	.ARG/CHT/	Colour - greyish black Grain size - V. fine to aph. Mixed seds, grey dolomitic and fairly massive with yellow sericite wisps to 2.5 m then quite argillitic with a potted appearance from qtz-py knots to 17.3 13.6 - 13.8 minor flt 923.7 - 25.7L .Cht with q.v./ 925.7 - 25.9L .ARG/ well laminated py beds 925.9 - 26.1L .Flt/ 926.1 - 26.3L .Cht/ contact to MUT Faulted over 1 - 2 cm	 60	 Arg locally altered by qtz/dol veining and fauiting	 8 - 10% py as qtz-py knots occ. diss'd and veinlets 97.9 - 8.7L .tr.tet ars.py?/	
26.30 TO 72.30	.MUT/	Colour - Grey Grain size - V. fine to aph. 928.2 - 28.5L .Flt/ 28.5 - 30.2 conglomerate size tectonitic zones up to 10 cm 930.2 - 30.3L .Flt/ 30.3 - 31.9 20 cm Argillitic remnants bounding Cht with silver grey sericite wisps 931.9 - 32.7L .Flted zone/ 941.2 - 41.7L .Flt dip 15/ to core axis 950.4 - 50.6L . Minor flt/ 951.3 - 52.4L .Flted zone/ 953.8 - 54.7L .Tect. chty tet frag/ 959.9 - 60.2L .Flt/ 965.7 - 65.8L .Flt/	 50	 Silver grey sericite	 V. pyritic from TOI to 28.2 15% py 957.8 - 57.9L .ap in qv/ 958.4 - 58.5L .sp tet in qv/ 969.7 - 69.8L .sp tet in qv/	
	EOH					

Sample	From (m)	To (m)	Length (m)	ASSAYS Cu %	Zn %	Pb %	Ag g/t	Au g/t	Sb %	As %	GEOCHEMICAL Cu ppm	Zn ppm	Pb ppm	S.G.	Ag oz/T	Au oz/T	As ppm	Ba %	Sb ppm	Ag ppm	Au ppb		COMMENTS
BCD27598	6.90	7.90	1.00	0.01	0.01	0.03	2																
BCD27599	7.90	8.70	0.80	0.42	0.65	0.31	40																
BCD27600	8.70	9.80	1.10	0.31	0.98	0.43	34																
BCD27601	9.80	10.80	1.00	0.17	0.77	0.20	18																
BCD27602	10.80	11.80	1.00	0.01	0.01	0.01	2																
BCD27603	11.80	14.30	2.50	0.01	0.01	0.02	2																
BCD27604	14.30	16.80	2.50	0.01	0.01	0.03	2																
BCD27605	16.80	19.20	2.40	0.01	0.01	0.03	2																
BCD27606	19.30	19.80	0.50	0.02	0.02	0.02	2																
BCD27607	19.80	20.40	0.60	0.01	0.01	0.05	2																
BCD27608	20.40	21.20	0.80	0.06	0.38	0.18	2																
BCD27609	21.20	22.10	0.90	0.10	0.10	0.07	2																
BCD27610	22.10	23.10	1.00	0.01	0.01	0.01	2																
BCD27611	23.10	24.60	1.50	0.03	0.24	0.02	2																
BCD27612	24.60	25.70	1.10	0.11	0.70	0.28	10																
BCD27613	25.70	25.90	0.20	0.01	0.01	0.01	2																
BCD27614	25.90	26.10	0.20	0.01	0.01	0.01	2																
BCD27615	26.10	26.30	0.20	0.01	0.01	0.01	2																
BCD27616	26.30	26.80	0.50	0.01	0.01	0.01	2																
BCD27617	26.80	28.20	1.40	0.01	0.01	0.01	2																
BCD27618	53.30	53.80	0.50	0.01	0.01	0.01	2																
BCD27619	53.80	54.70	0.90	0.01	0.13	0.01	4																
BCD27620	57.80	58.30	0.50	0.01	0.10	0.08	2																
BCD27621	58.30	58.40	0.10	0.01	0.10	0.10	2																
BCD27622	58.40	58.70	0.30	0.01	0.02	0.10	2																
BCD27623	58.70	59.90	1.20	0.04	0.01	0.04	10																
BCD27624	69.60	70.10	0.50	0.04	0.01	0.01	8																
BCD27625	70.10	70.40	0.30	0.01	0.01	0.01	2																

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER:
CLAIM NUMBER:
LOCATION: NORTH RAMP 1290

PLOTTING COORDS GRID: FIELD
NORTH: 681.00N
EAST: 9962.00W
ELEV: 1293.39

ALTERNATE COORDS GRID: UTM
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -60x 0' 0"
LENGTH OF THE HOLE: 66.70m
START DEPTH: 0.00m
FINAL DEPTH: 66.70m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: July 30, 1990
DATE COMPLETED: July 30, 1990
DATE LOGGED: August 11, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: FRONTIER
CASING: PULLED
CORE STORAGE: MINE SITE EXP. CAMP

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
66.70	-	-57x 0'	ACID	OK	WEAK	-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 6.10	.CASING/					
6.10 TO 12.00	.ARG/	Colour - Black Grain size - aph.				
		Black graphitic arg with occ py knots	65	Black arg locally altered @	Approx 3 py as qtz - py knots	Core blocky and broken
			70	910.1 - 10.4L .bleached/		
		Contact gradational		by qtz/dol veins		
12.00 TO 21.50	.MUT/	Colour - grey Grain size - V. fine to aph.				
		914.0 - 14.6L .Flt zone/	75	Silver grey sert	5 - 8% py	
			80			
		919.5 - 19.8L .Flt zone/				
		920.2 - 21.5L .Flt zone/				
		Contact flted				
21.50 TO 53.00	.QV&SERT/ SAM HORIZON	Colour - White to olive & grey Grain size - V. fine in Sert				
		927.7 - 28.7L .Sert/	80	922.4 - 25.2L .fuchsite in qv/	921.5 - 53.0L .qv,tet,cp,sp,ga/	
		933.0 - 34.2L .Sert/			with sericitic seds as outlined	Core v. broken to rubble
		947.7 - 47.8L .Flt/				
		950.3 - 50.7L .diss'd sul/		947.3 - 48.5L .fuchsite in qv/		
		951.4 - 52.2L .diss'd sul/				
		952.2 - 52.7L .Flt/				
		952.7 - 53.0L .Flt/				
		Contact Flted				
53.00 TO 64.40	.SERT/ SERICITIC ARGILLITE	Colour - Yellow grey Grain size - V. fine				
		956.4 - 57.1L .Major Flt/	75	62 - 64.4 sil with brown sericite		57.1 to EOI basically all faulted
		957.1 - 58.5L .QV/dol healed bx/		and leucoxine		with v. broken intersections.
		958.5 - 59.7L .Flt/				
		961.5 - 61.8L .Flt/				
		61.7 - 62.0 Arg remnant				
		964.0 - 64.5L .Flt/				
		Contact flted				

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
64.40	.BLK CHT/	Colour - black to grey				
TO		Grain size -				
66.70						
		Black argillitic locally			Tr. cp blebs	
		Cherty				
	EOH					

Sample	From (m)	To (m)	Length (m)	ASSAYS Cu %	Zn %	Pb %	Ag g/t	Au g/t	Sb %	As %	GEOCHEMICAL Cu ppm	Zn ppm	Pb ppm	S.G.	Ag oz/T	Au oz/T	As ppm	Ba %	Sb ppm	Ag ppm	Au ppb	COMMENTS
BCD27626	20.00	21.50	1.50	0.02	0.16	0.09	20	1.23														
BCD27627	21.50	22.20	0.70	0.01	0.09	0.01	6	.21														
BCD27628	22.20	22.40	0.20	0.05	0.05	0.08	60	.58														
BCD27629	22.40	25.20	2.80	0.01	0.01	0.01	2	.03														
BCD27630	25.20	27.70	2.50	0.02	0.01	0.04	22	.10														
BCD27631	27.70	28.70	1.00	0.01	0.01	0.01	4	.14														
BCD27632	28.70	31.30	2.60	0.03	0.02	0.03	22	.03														
BCD27633	31.30	33.00	1.70	0.40	0.44	0.08	432	1.03														
BCD27634	33.00	34.20	1.20	0.02	0.01	0.01	2	.03														
BCD27635	34.20	35.10	0.90	0.01	0.01	0.01	2	.03														
BCD27636	35.10	37.60	2.50	0.05	0.03	0.07	40	.07														
BCD27637	37.60	39.10	1.50	0.02	0.29	0.06	10	.07														
BCD27638	39.10	41.10	2.00	0.53	0.53	0.85	260	.34														
BCD27639	41.10	42.60	1.50	1.20	2.38	0.45	325	.31														
BCD27640	42.60	44.20	1.60	0.01	0.15	0.02	18	.03														
BCD27641	44.20	45.10	0.90	0.02	0.08	0.04	4	.03														
BCD27642	45.10	45.80	0.70	0.01	0.01	0.01	2	.03														
BCD27643	45.80	46.50	0.70	0.75	0.22	0.20	805	.75														
BCD27644	46.50	48.50	2.00	0.08	0.04	0.01	19	.03														
BCD27645	48.50	49.60	1.10	0.60	0.33	0.23	320	.27														
BCD27646	49.60	50.30	0.70	1.03	2.18	1.10	1105	2.19														
BCD27647	50.30	50.70	0.40	0.90	13.9	9.25	1110	2.37														
BCD27648	50.70	51.90	1.20	0.38	2.83	2.00	338	.93														
BCD27649	51.90	52.20	0.30	0.94	7.21	4.33	2615	1.95														
BCD27650	52.20	52.60	0.40	2.95	3.10	2.16	2275	3.53														
BCD27651	52.60	53.00	0.40	0.60	0.15	0.07	248	.14														
BCD27652	53.00	53.50	0.50	0.04	0.03	0.03	16	.14														
BCD27653	53.50	54.50	1.00	0.01	0.01	0.01	2	.03														
BCD27654	57.50	58.50	1.00	0.01	0.01	0.02	2	.03														
BCD27655	62.90	63.90	1.00	0.01	0.02	0.01	6	.03														
BCD27656	65.20	65.50	0.30	0.01	0.01	0.01	2	.03														
AVE.	39.10	42.60	3.50	0.82	1.32	0.68	287.86	0.33														
AVE.	45.80	53.00	7.20	0.64	2.02	1.32	606.99	0.91														
AVE.	48.50	53.00	4.50	0.87	3.18	2.07	837.51	1.32														

MINNOVA INC.

HOLE NUMBER: RG359 | DRILL HOLE RECORD | IMPERIAL UNITS: | METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER:
CLAIM NUMBER:
LOCATION: NORTH RAMP 1290

PLOTTING COORDS GRID: FIELD
NORTH: 682.00N
EAST: 9962.00W
ELEV: 1293.44

ALTERNATE COORDS GRID: UTM
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -90x 0' 0"
LENGTH OF THE HOLE: 78.30m
START DEPTH: 0.00m
FINAL DEPTH: 78.30m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: July 31, 1990
DATE COMPLETED: August 1, 1990
DATE LOGGED: August 12, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: FRONTIER
CASING: PULLED
CORE STORAGE: MINE SITE EXP. CAMP

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
72.20	-	-87x 0'	ACID	OK		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 6.00	.CASING/					
6.00 TO 14.00	.ARG&MUT/	Colour - Black & Greyish brown Grain size - V. fine Pyritic MUT interbedded with black graphitic argillite Arg with qtz-py knots	 55 60	 Silver grey sert	 Pyritic beds - 40% py.	
14.00 TO 39.20	.MUT/	Colour - grey Grain size - v. fine Tectonic at TOI becoming sheared and flt. 920.1 - 20.4L .Flt/ 923.8 - 25.4L .Shearing & flts/ 925.4 - 39.2L .SILMUT/ tect. @ EOI; 10-20 cm sections of semi massive sulphides	 60	 Dolomitic	 Traace tet;trace cp;sp,ga in qtz veinlets throughout interval. 925.4 - 39.2L .Sil tet cp sp ga qvs/	
39.20 TO 46.80	.QV/MS/	Colour - mottled grey & white Mottled q.v. MS Silver grey sericite		 Dolomitic 942.4 - 44.8L.Fuchsite/	 939.2 - 46.8L .15%py3%ga1%tet/ in qtz veins & diss'd.	
46.80 TO 74.20	.MUT/	Colour - grey Grain size - V. fine 951.8 - 52.1L .Minor Flt/ 958.8 - 60L .Shear zone/ 970.9 - 71.1L .Flt/ with 10 cm qtz veins above and below. Top qv tet,sp,ga cp py Bottom qv tr py tr ga	 55 60		 Tr tet, cp, ga, approx 3-5% sp in qv throughout interval 967.7 - 70.3L .3-5%sp;tet,cp,ga/	
74.20 TO 76.20	.SERT&QV/	Colour - Yellow Grain size - v. fine Tectonitic 976.1 - 76.2L .Flt/ Contact faulted.	 50	 Arg quite graphitic	 974.9 - 75.1L .cp,sp,tet,ga,in qv/	
76.20 TO 78.30	.ARG/	Colour - Black Grain size - aphanitic Well bedded, structurely contorted	 52	 Arg quite graphitic		

MINNOVA INC.

HOLE NUMBER: RG359 | DRILL HOLE RECORD | DATE: 30-October-1990

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
	EOH					

Sample	From (m)	To (m)	Length (m)	ASSAYS Cu %	Zn %	Pb %	Ag g/t	Au g/t	Sb %	As %	GEOCHEMICAL Cu ppm	Zn ppm	Pb ppm	S.G.	Ag oz/T	Au oz/T	As ppm	Ba %	Sb ppm	Ag ppm	Au ppb	COMMENTS
BCD27657	13.00	14.00	1.00	0.02	0.05	0.01	4	.07														
BCD27658	14.00	15.00	1.00	0.03	0.01	0.01	4	.10														
BCD27659	15.00	17.40	2.40	0.01	0.01	0.01	2	.10														
BCD27660	17.40	19.00	1.60	0.05	0.33	0.15	20	.21														
BCD27661	19.00	20.10	1.10	0.10	0.30	0.23	30	.69														
BCD27662	20.10	20.40	0.30	0.01	0.06	0.05	6	.27														
BCD27663	20.40	23.70	3.30	0.02	0.02	0.01	4	.17														
BCD27664	23.70	25.40	1.70	0.03	0.22	0.08	22	.82														
BCD27665	25.40	26.40	1.00	0.09	0.65	0.34	32	.79														
BCD27666	26.40	29.40	3.00	0.06	0.56	0.23	20	.27														
BCD27667	29.40	29.70	0.30	0.90	3.13	1.28	150	1.06														
BCD27668	29.70	30.40	0.70	0.13	0.18	0.28	25	.17														
BCD27669	30.40	30.80	0.40	0.01	0.30	0.18	10	.34														
BCD27670	30.80	31.80	1.00	0.09	0.09	1.18	24	.24														
BCD27671	31.80	33.90	2.10	0.01	0.06	0.04	4	.10														
BCD27672	33.90	35.90	2.00	0.03	0.75	0.46	30	.51														
BCD27673	35.90	37.30	1.40	0.23	2.93	1.83	215	1.03														
BCD27674	37.30	38.50	1.20	0.15	4.85	2.53	125	.51														
BCD27675	38.50	39.20	0.70	0.15	8.23	4.65	230	.58														
BCD27676	39.20	39.80	0.60	0.98	11.7	5.98	1040	1.99														
BCD27677	39.80	40.60	0.80	1.08	3.35	1.23	705	.99														
BCD27678	40.60	41.00	0.40	1.38	10.1	2.95	1460	3.08														
BCD27679	41.00	41.70	0.70	0.45	0.70	0.40	420	.75														
BCD27680	41.70	42.70	1.00	1.50	6.93	3.08	1540	1.75														
BCD27681	42.70	44.70	2.00	0.37	0.40	0.02	320	.55														
BCD27682	44.70	46.80	2.10	1.01	5.74	2.57	978	1.37														
BCD27683	46.80	48.30	1.50	0.02	1.50	0.98	52	.27														
BCD27684	48.30	50.80	2.50	0.16	0.81	0.71	100	1.34														
BCD27685	50.80	51.70	0.90	0.01	0.07	0.03	8	5.49														
BCD27686	51.70	51.80	0.10	0.01	0.07	0.16	8	.21														
BCD27687	51.80	52.80	1.00	0.07	0.90	0.42	28	.58														
BCD27688	52.80	53.20	0.40	0.05	0.79	0.34	22	.38														
BCD27689	53.20	54.20	1.00	0.04	0.15	0.10	18	.27														
BCD27690	54.20	54.70	0.50	0.02	1.61	0.33	14	.17														
BCD27691	54.70	57.20	2.50	0.01	0.12	0.07	4	.21														
BCD27692	57.20	59.70	2.50	0.03	0.20	0.15	10	.10														
BCD27693	65.90	66.90	1.00	0.01	0.03	0.06	5	.21														
BCD27694	66.90	67.70	0.80	0.01	0.02	0.04	2	.38														
BCD27695	67.70	69.50	1.80	0.13	2.62	2.66	50	.34														
BCD27696	69.50	70.10	0.60	0.05	0.09	0.06	16	.17														

Sample	From (m)	To (m)	Length (m)	Cu %	Zn %	Pb %	Ag g/t	Au g/t	Sb %	As %	Cu ppm	Zn ppm	Pb ppm	S.G.	Ag oz/T	Au oz/T	As ppm	Ba %	Sb ppm	Ag ppm	Au ppb		
BCD27697	70.10	70.50	0.40	0.65	4.30	1.23	245	.69															
BCD27698	70.50	70.80	0.30	0.01	0.02	0.01	2	.21															
BCD27699	70.80	71.00	0.20	0.65	0.13	0.10	130	.58															
BCD27700	71.00	71.20	0.20	0.01	0.02	0.01	2	.14															
BCD27701	73.20	74.20	1.00	0.02	0.16	0.03	2	.10															
BCD27702	74.20	74.80	0.60	0.01	0.02	0.01	2	.03															
BCD27703	74.80	75.10	0.30	0.34	0.02	0.02	80	.07															
BCD27704	75.10	76.10	1.00	0.01	0.01	0.01	2	.03															
BCD27705	76.10	76.60	0.50	0.02	0.04	0.01	2	.03															
AVE.	35.30	46.80	10.90	0.67	4.56	2.15	634.11	1.09															
AVE.	38.50	46.80	8.30	0.82	4.79	2.15	778.41	1.19															

MINNOVA INC.

HOLE NUMBER: RG360 — DRILL HOLE RECORD — IMPERIAL UNITS: — METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER:
CLAIM NUMBER:
LOCATION: NORTH RAMP 1290

PLOTTING COORDS GRID: FIELD
NORTH: 692.00N
EAST: 9979.00W
ELEV: 1291.65

ALTERNATE COORDS GRID: UTM
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -50x 0' 0"
LENGTH OF THE HOLE: 81.30m
START DEPTH: 0.00m
FINAL DEPTH: 81.30m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: August 1, 1990
DATE COMPLETED: August 2, 1990
DATE LOGGED: August 12, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: FRONTIER
CASING: PULLED
CORE STORAGE: MINE SITE EXP. CAMP

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
49.40	-	-51x 0'	ACID	OK		-	-	-	-	-	
81.40	-	-51x 0'	ACID	OK		-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 6.00	.CASING/					
6.00 TO 16.60	.ARG&MUT/	Colour - Black Grain size - aph. Gradational inter bedding of black graphitic arg & mut Mut slightly tectonitic and arg graphitic 96.5 - 6.6L .Flt/ Contact flted	82	Silver grey sericite with mut	3% py through diss'd in Mut Knots in arg	Core rubble to v. broken
16.60 TO 27.60	.MUT/	Colour - grey Grain size - aph. 916.6 - 17.1L .Flt/ 921.1 - 21.2L .Minor flt/ 922.0 - 22.3L .Minor flt/ Three 5 cm faults over 30 cm 925.1 - 25.2L	75 80	Silver grey sert	3 - 5% py throughout	Broken
27.60 TO 31.00	.MUT&SMS/	Colour - grey Grain size - V. fine 928.0 - 28.9L .Flt zone/ Gouged, sheared and v. broken to rubble over interval		Minor silver grey sericite	10 - 15% Py) 4 - 6% Sp) 3 - 5% Cp) throughout 3 - 4% Ga) 2% Tet)	Broken
31.00 TO 59.30	.QV&SERT AG ZONE/	Colour - White and yellow Grain size - V. fine 931.0 - 32.0L .Cht&QV/ 933.5 - 33.6L .Min Flt/ 933.7 - 34.8L .Sericite/ 950.7 - 50.9L .Flt/ contact conformable @ base		Rare fuchsite Sericitic wedges throughout Cherty frags prominent in top 1.3 m and 35.7 to 36.6 m and bottom 4.5	10-15% py) 3% cp) 3-5% sp) Throughout 5-6% ga) 3-5% tet)	Broken to v. broken Occ rubble 933.8 - 41.4L 50% lost core all .rubble/

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
59.30 TO 65.80	.SERT SEDS/ SERICITIC SEDIMENTS	Colour - Olive yellow Grain size - aph.				
		Sericitic seds, well bedded 960.3 - 60.6L .qtz carb vein/	70	Yellow sericite	1% py as knots in qv	v. broken to broken
		960.6 - 60.7L .Flt/ 965.7 - 66.1L .Flt/ @ contact with MUT Qtz/carb veining within flt	75			
65.80 TO 66.90	.MUT/	Colour - grey Grain size - V. fine to aph.				
		Flted MUT wedge Banded at top by sericitic seds and a tectonitic sheared ARG below 966.8 - 66.9L .Flt/	70	Siver grey sericite	5-8% diss'd py	Broken
66.90 TO 69.50	.CHT/ARG/	Colour - black Grain size - aph.				
		Tectonic, sheared, cherty argillite sheared over whole interval with gouge at 968.0 - 68.3L .flt/	55		3% py as knots in q.v.	v. broken to rubble
		965.1 - 69.5L .flt/	60			
69.50 TO 78.30	.DOL VOLC/	Colour - greyish green				
		Dolomitic non-discript, fuchsitic volcanics (?MAFIC?) 973.2 - 74.1L .ARG FLTED/ Sheared from 73.5 - 73.7 & 73.8 - 74.1 978.1 - 78.3L .flt/		V. minor fuchsite Approx 5% yellow brown sericitic alt diss'd possibly leucoxene	2-3% py, 1% ga, 1% cp 1% sph, tr tet? over intervai in qtz carb veinlets	1-2 cm gouge zones over whole interval average approx 0.5 m spacing Broken
78.30 TO 81.30	.CHT/ARG/	Colour - black Grain size - aph.				
		V. sil high contorted tectonitic graphitic argillite 979.8 - 81.1L .Flt/			3-5% py as knots in qtz veins	V. broken to rubble
	EOH					

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
BCD27706	26.60	27.60	1.00	0.06	0.26	0.13	52	.86															
BCD27707	27.60	28.60	1.00	1.26	0.41	0.14	950	2.06															
BCD27708	28.60	28.90	0.30	0.71	2.16	0.98	710	1.61															
BCD27709	28.90	31.00	2.10	0.94	2.05	1.12	930	1.71															
BCD27710	31.00	32.30	1.30	0.15	0.06	0.04	172	0.34															
BCD27711	32.30	33.50	1.20	0.01	0.01	0.02	10	0.03															
BCD27712	33.50	34.80	1.30	0.01	0.01	0.01	2	0.10															
BCD27713	34.80	36.60	1.80	0.03	0.02	0.02	18	0.03															
BCD27714	36.60	38.60	2.00	0.01	0.08	0.01	4	0.03															
BCD27715	38.60	39.80	1.20	0.24	0.33	0.22	260	0.45															
BCD27716	39.80	41.40	1.60	0.11	0.04	0.29	176	0.03															
BCD27717	41.40	43.40	2.00	0.09	0.05	0.05	10	0.03															
BCD27718	43.40	45.40	2.00	0.28	0.28	1.23	360	0.34															
BCD27719	45.40	47.40	2.00	0.50	0.12	0.90	610	0.38															
BCD27720	47.40	49.40	2.00	0.20	0.54	0.91	196	0.27															
BCD27721	49.40	51.40	2.00	0.30	0.43	1.28	260	0.55															
BCD27722	51.40	53.40	2.00	0.18	0.10	0.19	20	0.03															
BCD27723	53.40	54.30	0.90	0.02	0.01	0.14	16	0.03															
BCD27724	54.30	56.30	2.00	0.32	0.73	0.33	84	0.17															
BCD27725	56.30	58.00	1.70	0.06	0.01	0.02	44	0.03															
BCD27726	58.00	59.30	1.30	0.01	0.01	0.02	2	0.03															
BCD27727	59.30	59.90	0.60	0.01	0.01	0.01	2	0.03															
BCD27728	69.50	71.50	2.00	0.01	0.03	0.05	2	0.03															
BCD27729	71.50	71.80	0.30	0.01	0.19	0.06	2	0.03															
BCD27730	71.80	73.20	1.40	0.01	0.05	0.04	2	0.03															
BCD27731	73.20	74.10	0.90	0.01	0.13	0.08	2	0.03															
BCD27732	77.40	78.00	0.60	0.01	0.02	0.02	2	0.03															
AVE.	27.60	31.00	3.40	1.01	1.58	0.82	916.47	1.80															
AVE.	27.60	32.30	4.70	0.77	1.16	0.60	710.55	1.40															
AVE.	27.60	51.40	23.80	0.29	0.38	0.52	288.24	0.44															
AVE.	38.60	51.40	12.80	0.25	0.26	0.74	270.75	0.29															
AVE.	43.40	47.40	4.00	0.39	0.20	1.06	485.00	0.36															
AVE.	43.40	51.40	8.00	0.32	0.34	1.08	356.50	0.39															

MINNOVA INC.

HOLE NUMBER: RG361 — DRILL HOLE RECORD — IMPERIAL UNITS: — METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER:
CLAIM NUMBER:
LOCATION: SOUTH WALL

PLOTTING COORDS GRID: FIELD
NORTH: 693.00N
EAST: 9979.00W
ELEV: 1291.59

ALTERNATE COORDS GRID: UTM
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -83x 0' 0"
LENGTH OF THE HOLE: 84.40m
START DEPTH: 0.00m
FINAL DEPTH: 84.40m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: August 3, 1990
DATE COMPLETED: August 3, 1990
DATE LOGGED: August 15, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: FRONTIER
CASING: PULLED
CORE STORAGE: MINE SITE EXP. CAMP

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
84.40	-	-83x 0'	ACID	OK		-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 3.60	.CASING/					
3.60 TO 18.50	.ARG&MUT/	Colour - grey and black Grain size - V. fine to aph. Inter fingered graphitic arg and pyritic siltite 98.3 - 8.9L .Flt/ Minor flt @ 10.4 m 5 cm 911.0 - 11.1L .Flt/ 5 cm bx (?het frag)@ 12.0 m 912.5 - 13.0L .Flts/ 13.8 5 cm shearing @ sil Arg MUT contact 915.8 - 17.3L .Flts/ 917.5 - 18.3L .bx? het frag/ Contact faulted	14 = 60	Silver grey sericite on MUT sections 3.6 - 5.5 arg 5.5 - 12.2 Mut 12.2 - 13.5 Arg 13.5 - 15.8 Mut	Arg - 3-5% py Mut - 30-40% py	3.6 - 5.1 m - 20 cm core returned 7.0 - 8.2 30 cm core returned
18.50 TO 44.80	.MUT/	Colour - grey Grain size - V. fine to aph. Typical MUT 918.5-18.6L .flt/ 919.1-20.3L .flts/ 921.2-21.3L .flt/ 921.3 - 21.5L .two 5 cm flts/ Minor 3 cm flt @ 22.5 926.0-26.1L.Flt/ 930.6-30.8L .Flt/ 933.1-33.2L .Shear/ 938.9 - 39.0L .Flt/	44 = 45	@33.2 becoming sil with sph blebs in greyish cherty veinlets	5% diss'd py 933.2-33.3L .tr sph/ begins to appear	
44.80 TO 52.10	.SILMUT/CHT &QV/	Colour - light grey Grain size - V. fine to aph. Tectonitic @ TOI more bleached in center of interval	47 = 40	Dol, silver grey sericite	948.0-49.6L .3%sp2%ga5%py2%tet/	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
52.10 TO 74.20	.MUT/	Colour - grey Grain size - V. fine to aph.				
		Pyritic siltite, well bedded occ qtz carb vein			8% py throughout	
		953.0-53.1L .Flt/ 56 =	35		954.2-54.7L .4%sp3%ga3%py2%tet/	
		953.6-53.7L .QtzCarb Vein Barren/			Contact broken at top & conformable	
		953.9-54.0L .QC vein tr sp ga/			@ base	
		957.8-57.9L .Flt/			961.6 - 62.5L .chty tr sp,tet,ga/	
		961.4-61.5L .Flt/ 64 =	50		968.6-69.2L .chty tr sp,tet,ga/	
		63.5-64.0 qt			4-5% py,3% sph,1% ga,1%tet	
		967.1-67.4L .Flt/				
		970.0-70.7L .rubble flt/				
		Contact transitional				
74.20 TO 80.40	.ARG CHT & QV/	Colour - black & white				
		Black graphitic arg, wacke interbeds qtz carb veining throughout				
		Heavily faulted	50 55			
		974.5-74.6L .flt/				
		975.1-75.3L .flt/				
		975.7-80.4L .flts/				
80.40 TO 83.00	.MUT/	Colour - grey Grain size - aph.				
		Faulted upper contact. Highly contorted, qtz carb veinlets to 81.3 m. Fairly well bedded thereafter		Silver grey sericite	2-3% py	
		981.2-81.3L .Flt dip=60/ 3cm gouge 82.7-83.0 qtz carb vein	25 50			
83.00 TO 84.40	.DOL VOL/	Colour - green				
		As base of RG360		Strong dol		
	EOH					

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
BCD27733	33.20	34.20	1.00	0.05	0.15	0.08	12	.14															
BCD27734	34.20	36.80	2.60	0.06	0.18	0.06	14	.14															
BCD27735	36.80	39.30	2.50	0.01	0.26	0.21	6	.21															
BCD27736	39.30	41.80	2.50	0.01	0.15	0.05	2	.03															
BCD27737	41.80	43.80	2.00	0.01	0.01	0.01	2	.03															
BCD27738	43.80	44.80	1.00	0.01	0.01	0.04	2	.03															
BCD27739	44.80	45.80	1.00	0.01	0.35	0.27	4	.03															
BCD27740	45.80	48.00	2.20	0.05	0.89	0.88	38	.17															
BCD27741	48.00	49.60	1.60	0.79	3.07	1.21	420	1.23															
BCD27742	49.60	51.00	1.40	0.02	0.56	0.52	32	.03															
BCD27743	51.00	52.10	1.10	0.30	1.45	0.81	200	.96															
BCD27744	52.10	53.60	1.50	0.01	0.85	0.54	26	.45															
BCD27745	53.60	53.70	0.10	0.01	0.17	0.14	8	.03															
BCD27746	53.70	54.00	0.30	0.01	0.56	0.38	12	.21															
BCD27747	54.20	54.70	0.50	0.02	3.12	1.50	36	.03															
BCD27748	54.70	56.70	2.00	0.06	0.21	0.14	28	.34															
BCD27749	56.70	59.20	2.50	0.15	0.43	0.33	62	.73															
BCD27750	59.20	61.60	2.40	0.01	0.02	0.04	2	.07															
BCD27751	61.60	62.50	0.90	0.11	0.79	0.47	46	.21															
BCD27752	62.50	63.50	1.00	0.01	0.01	0.04	2	.03															
BCD27753	63.50	64.00	0.50	0.02	0.03	0.05	2	.03															
BCD27754	64.00	66.40	2.40	0.03	0.27	0.03	8	.31															
BCD27755	66.40	68.60	2.20	0.02	0.06	0.10	10	.51															
BCD27756	68.60	69.20	0.60	0.37	2.75	1.25	120	.14															
BCD27757	69.20	71.20	2.00	0.01	0.06	0.09	8	.03															
BCD27758	71.20	74.20	3.00	0.05	0.37	0.34	14	.03															
BCD27759	74.20	74.70	0.50	0.01	0.01	0.01	2	.03															
BCD27760	75.40	75.70	0.30	0.01	0.01	0.01	2	.03															
BCD27761	82.70	83.00	0.30	0.01	0.01	0.01	2	.03															
BCD27762	83.00	83.50	0.50	0.01	0.05	0.12	4	.03															
AVE.	48.00	52.10	4.10	0.40	1.78	0.87	228.49	0.75															

MINNOVA INC.

HOLE NUMBER: R6362 — DRILL HOLE RECORD — IMPERIAL UNITS: — METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER:
CLAIM NUMBER:
LOCATION: NORTH WALL

PLOTTING COORDS GRID: FIELD
NORTH: 701.00N
EAST: 10000.00W
ELEV: 1289.57

ALTERNATE COORDS GRID: UTM
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -70x 0' 0"
LENGTH OF THE HOLE: 78.30m
START DEPTH: 0.00m
FINAL DEPTH: 78.30m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: August 4, 1990
DATE COMPLETED: August 4, 1990
DATE LOGGED: August 17, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
ROD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: FRONTIER
CASING: PULLED
CORE STORAGE: MINE SITE EXP CAMP

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
78.30	-	-70x 0'	ACID	OK		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 3.60	.CASING/					
3.60 TO 12.30	ARGILLITE/ MUT .ARG+MUT/	Colour - black-brown Grain size - medium to fine				
		Banded, frag'd f.g. pyritization of arg producing interbeds of MUT Approx 30% Mut - 70% Arg Also a m.g. diss py component	80	Pyritization	Py f.g. 30-40% m.g. 10%	
12.30 TO 46.00	.MUT/	Colour - medium grey brown Grain size - m.g.				
		A pyritic MUT w/significant "cherty" component as disrupted "beds" v frags @ 10m 28.2 - 30.2 increasing q. veining 30.2 - 30.5 - grey qtz barren 30.5 - 31.1 qtz, qtz bx & MUT	70	Cherty & qtz flooding Pyritization	f.g. pyrite 30-40% 3-5% Diss sph, tet, ga @ 27.2 - 27.4 Cpy 1-2% ga 1-2% & poss minor tet	918.8-19.5L .shear/ 921.4-22.0L .shear/
46.00 TO 48.80	QTZ FLOODED WALLROCK (MUT) .QTZ FLOODING/	Colour - White grey Mottled py'c, wallrock remnants in highly qtz flooded zone		Qtz flooding	10% diss sph throughout 946.0 - 48.8L .10% diss sph/ Tr 1% galena	931.6 - 31.7L .shear/
TO 50.00	MUT? .SIL'D MUT/	Grain size - fine to med Mottled sil'd wallrock (old QITE) Last 40 cm is heavily q.v'd		Si sericitization	3-5% diss tet Tr minor sp, ga	948.8 - 50.0L .3-5% tet/
48.80 TO 50.00	SILICIFIED	Colour - grey				
50.00 TO 52.90	.QTZ VEIN/	Colour - White Grain size - mass Predominately qtz vein 50.9 - 51.5 sil'd wallrock		Qtz veining	3-5% cpy,sph & tet as c.g. blebs 5-8% tet,sp,ga	950.0 - 52.9L .3-5% cpy,sph,tet/

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
52.90	SIL'D	Colour - grey white				
TO	WALLROCK	Grain size - medium grain				
59.90	.MUT?/					
	+ Q.V.	Zone of silicified wallrock		Silicification	@ 53.1 - 3-5% cm Mass cpy stringers	
	.SIL'D MUT	(old QTZ)		56.2-56.4 fuchsitic	55.1 - 55.8 8-10% tet	
	+ QV/	and qtz veining			Overall 3-5%	
					locally 8-10%	
					tet,cpy,sph,ga	
59.90	.SERT/	Colour - grey-brown				
TO		Grain size - fine - med grain				
78.30						
		Banded, deformed (isoclinal) very well			73.1-73.5 SMS py (m.g.)in q.v.	
		developed SERT				NOTE: NO DOLO
		59.9 - 72.7 - 20-25% intruded by qtz dolo veins				
		locally pyritic (m -c.g. xls)				
		75.5-78.3 - more "cherty" SERT				
	EOH					

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
BCD27763	26.80	27.20	0.40	0.01	0.40	0.08	6	.07															
BCD27764	27.20	27.40	0.20	0.07	0.78	0.51	22	.10															
BCD27765	27.40	27.90	0.50	0.05	0.15	0.16	8	.03															
BCD27766	30.20	30.50	0.30	0.01	0.01	0.01	6	.07															
BCD27767	30.50	31.10	0.60	0.61	0.78	0.42	116	.58															
BCD27768	31.10	31.60	0.50	0.30	1.09	0.81	182	.62															
BCD27769	45.70	46.00	0.30	0.01	0.85	0.39	16	.31															
BCD27770	46.00	47.50	1.50	0.06	1.32	0.66	70	.10															
BCD27771	47.50	48.80	1.30	0.18	0.84	0.47	136	.07															
BCD27772	48.80	50.00	1.20	1.95	5.15	2.65	1765	2.95															
BCD27773	50.00	50.90	0.90	1.00	1.38	0.05	925	1.54															
BCD27774	50.90	51.50	0.60	5.13	1.75	0.75	6300	10.6															
BCD27775	51.50	52.90	1.40	1.00	0.20	0.02	465	.14															
BCD27776	52.90	54.20	1.30	2.21	0.46	0.23	120	.18															
BCD27777	54.20	54.70	0.50	1.33	9.75	6.30	1046	1.41															
BCD27778	54.70	55.10	0.40	0.75	1.63	0.25	795	.48															
BCD27779	55.10	55.80	0.70	2.53	6.75	1.14	2820	4.35															
BCD27780	55.80	57.00	1.20	0.54	4.70	2.28	454	.72															
BCD27781	57.00	58.00	1.00	0.52	3.63	1.75	426	.51															
BCD27782	58.00	59.00	1.00	0.21	6.92	3.95	198	.41															
BCD27783	59.00	59.90	0.90	0.63	3.00	1.84	444	.48															
BCD27784	59.90	60.40	0.50	0.01	0.02	0.01	4	.03															
BCD27785	73.10	73.50	0.40	0.01	0.03	0.13	20	1.10															
AVE.	30.50	31.60	1.10	0.47	0.92	0.60	146.00	0.60															
AVE.	47.50	59.90	12.40	1.25	3.19	1.51	975.62	1.45															
AVE.	48.80	59.90	11.10	1.38	3.47	1.63	1074.0	1.61															

MINNOVA INC.

HOLE NUMBER: R6363 — DRILL HOLE RECORD — IMPERIAL UNITS: — METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER:
CLAIM NUMBER:
LOCATION: NORTH WALL

PLOTTING COORDS GRID: FIELD
NORTH: 696.00N
EAST: 10020.00W
ELEV: 1288.27

ALTERNATE COORDS GRID: UTM
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -58x 0' 0"
LENGTH OF THE HOLE: 87.40m
START DEPTH: 0.00m
FINAL DEPTH: 87.40m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: August 5, 1990
DATE COMPLETED: August 5, 1990
DATE LOGGED: August 20, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: FRONTIER
CASING: PULLED
CORE STORAGE: MINE SITE EXP CAMP

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
87.40	-	-56x 0'	ACID	OK		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 0.00 TO 3.60	.CASING/					
3.60 TO 8.90	.ARG/MUT/	Colour - black - brown Grain size - fine grain Banded pyritization (MUT) of arg	80	Pyritization	V. f. g. py (40%?) in MUT intervals	95.0-5.3L .FLT/ gougey
8.90 TO 19.80	.SERT-MUT/	Colour - Light brown - grey Grain size - fine-med grain Interbanded yellowish sert to 20 cm with sil'd or cherty py MUT; folded Fold hinge @ 13.5 locally 5-10 @ hinge	 70 80	Sericite pyritization		
19.80 TO 28.30	CHERTY MUT .CHTY MUT/	Colour - grey Grain size - med grain Upper contact gradational approx. Chty component bx'd by penetration cleavage and pyritization process 27.1 - 27.6 q.v. py'c @ contact (80 deg)	 70	Silicification pyritization		21.1 - 21.3 shear
28.30 TO 38.40	.ARG+WACKE/	Colour - black-grey Grain size - fine-med grain Interbedded argillites and sil'd wackes (?) 28.3 - 30.5 f.g'd bx'd bedding 20'to c.a. 35.9 - 38.4: sil'd wacke(?) w/occ arg frag to 3cm @35.6	 20	Silicification	Tr py as f.g. dissemination and veinlets	
38.40 TO 69.90	.SERT+QV/	Colour - lite brown-white Grain size - fine-med grad Zone of mixed intervals of sert w/SMS py and q.v's plus massive white q.v. to 1.8 m All of massive qtz veining between 44.9 - 64.0	 	Sericite	10-15% py as SMS remnants (?) of beds in orig sed. Minor - 1% cpy,ga,tet. Best interval	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		@ 38.6	20		52.4 - 54.0: 3-5% cpy,ga,tet	
		@ 49.0	75			
		@ 66.9	45			
		Upper contact @ 38.4 is deformed				
69.90 TO 73.40	.DOLO MPYRO?/	Colour - green-grey Grain size - med - course grain				
		Very heavily dolomitized sericified (?) and fuchsitic mafic? Poss lapilli remnants from 71.9		Intense dolomite, fuchsite	15-20% py as c.g. clots and xls	
73.40 TO 76.20	.DOLO SEDS/	Colour - grey-brown Grain size - fine - med grain				
		Heavily dolo arg? Sed shows occ remnant arg clot no vis lapilli		Strong dolo	10% py as c.g. clots	
76.20 TO 87.40	.ARG MIXED SEDS/	Colour - black-lite brown Grain size - fine-med grain				
		Tectonized arg seds w/qtz and chert component Mixed seds Frags generally flattened and aligned	70 80	50% altered by sericite locally to 1.5 m thick zones	10-20% py as f.g. diss.	
	EOH					

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
BCD27786	38.40	39.90	1.50	0.01	0.04	0.01	2	.03															
BCD27787	39.90	41.40	1.50	0.01	0.05	0.01	2	.03															
BCD27788	41.40	42.90	1.50	0.01	0.03	0.01	2	.03															
BCD27789	42.90	44.90	2.00	0.01	0.02	0.01	12	.03															
BCD27790	44.90	45.50	0.60	0.04	0.01	0.01	10	.03															
BCD27791	45.50	46.80	1.30	0.08	0.02	0.01	36	.03															
BCD27792	46.80	47.00	0.20	1.93	9.90	0.29	938	1.92															
BCD27793	47.00	48.50	1.50	0.10	0.05	0.10	70	.17															
BCD27794	48.50	48.90	0.40	0.06	0.03	0.01	86	.03															
BCD27795	48.90	49.40	0.50	0.01	0.03	0.10	5	.03															
BCD27796	49.40	50.60	1.20	0.02	0.02	0.02	36	.03															
BCD27797	50.60	51.80	1.20	0.04	0.16	0.01	54	.03															
BCD27798	51.80	52.40	0.60	0.02	0.03	0.03	20	.03															
BCD27799	52.40	54.00	1.60	0.56	0.20	0.40	252	.24															
BCD27800	54.00	55.50	1.50	0.01	0.02	0.02	4	.03															
BCD27801	55.50	56.60	1.10	0.17	0.14	0.06	186	.27															
BCD27802	56.60	57.50	0.90	0.01	0.03	0.01	2	.03															
BCD27803	57.50	58.60	1.10	0.17	0.04	0.06	52	.14															
BCD27804	58.60	60.10	1.50	0.13	0.01	0.01	4	.03															
BCD27805	60.10	61.60	1.50	0.01	0.01	0.01	2	.21															
BCD27806	61.60	62.20	0.60	0.02	0.01	0.32	12	.10															
BCD27807	62.20	64.00	1.80	0.01	0.01	0.05	6	.17															
BCD27808	64.00	65.50	1.50	0.01	0.01	0.02	2	.03															
BCD27809	65.50	66.90	1.40	0.01	0.02	0.01	2	.03															
BCD27810	66.90	68.40	1.50	0.01	0.02	0.01	2	.03															
BCD27811	68.40	69.90	1.50	0.01	0.01	0.01	2	.03															
BCD27812	69.90	71.40	1.50	0.04	0.14	0.06	6	.03															
BCD27853	71.40	73.40	2.00	0.01	0.04	0.01	2	.03															
BCD27813	72.90	73.40	0.50	0.01	0.06	0.01	2	.03															
BCD27814	73.40	74.80	1.40	0.01	0.03	0.01	2	.03															
BCD27815	74.80	76.20	1.40	0.01	0.03	0.03	2	.03															

MINNOVA INC.

HOLE NUMBER: RG364 | DRILL HOLE RECORD | IMPERIAL UNITS: | METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER:
CLAIM NUMBER:
LOCATION: NORTH WALL

PLOTTING COORDS GRID: FIELD
NORTH: 696.00N
EAST: 10020.00W
ELEV: 1288.27

ALTERNATE COORDS GRID: UTM
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -74x 0' 0"
LENGTH OF THE HOLE: 99.60m
START DEPTH: 0.00m
FINAL DEPTH: 99.60m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: August 6, 1990
DATE COMPLETED: August 6, 1990
DATE LOGGED: August 20, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: FRONTIER
CASING: PULLED
CORE STORAGE: MINE SITE EXP CAMP

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
72.20	-	-78x 0'	ACID	OK		-	-	-	-	-	
99.60	-	-74x 0'	ACID	OK		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 3.60	.CASING/					
3.60 TO 9.40	.ARG/MUT/	Colour - Black-grey-brown Grain size - fine-med grain Banded pyritization of orig arg horizon core badly broken some core loss		 Pyritization sericite and minor q.v'ing		 95.1 - 5.3L .FLT Gouge/
9.40 TO 22.80	.SERT/	Colour - lite brown-yellowish Well dev'd SERT heavily intruded by qtz dolo veins at: 11.4 - 12.1 13.6 - 15.2 and: 920.5 - 22.8L .Barite Zone/	 50	 Sericite Barite has dolo/qtz alt. Alt at margins	 10-15% py as m-c.g. x'ls & disseminations 1-3% diss tet, cpy,ga,sph As above	
22.80 TO 30.10	.CHERTY MUT/	Colour - grey Grain size - med grain Upper contact "sert" very py'c Cherty component bx'd by penetration cleavage Bedding orig contorted locally subparallel core axis Penetration fabric. now 65-70 deg		 Pyritization some local sericitization	 20-30% locally occ SMS med-c. g py in qtz to 20 cm	
30.10 TO 40.50	ALTERED .ARG-WACKE/	Colour - Grey-brown Grain size - fine grain Altered by sericite and dolo partially bleached From 38-40.5 grades into py'c SERT locally contorted	 60	 Sericite/dolomite	 38.0-40.5 - 10-20% py in SERT bands	
40.50 TO 69.10	.QTZ VEIN +SERT/	Colour - white-grey Grain size - med grain From 40.5 - 52.4: abund alt'd wallrock (grey, dolo patches) 52.4 - 62.7 pred qtz vein 66.1-67.7 Bedding	 5	 Ser. dolo.	 Poss up to 10% f.g.tet and v. minor sph, cpy SMS py w/3% tet @ 59.4 - 60.0 V. f.g. SMS w/ 5-8% tet,10% sph	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
			10		@ 60.8 - 61.3	
69.10 TO 72.00	.DOLO MPYRD?/	Colour - grey-green Grain size - med grain Very dolo and fuchsitic zone w/qtz veining local SERT zones to 10 cm		Fuchsite, dolomite	5-8% diss py	
72.00 TO 85.20	.DOLO SEDS/	Colour - brown-grey Grain size - med grain V. dolomitized Bedding texture almost lost Grades into mixed seds below		Dolomite - intense		972.2 - 72.6L .FLT/
85.20 TO 91.30	.ARG MIXED SEDS/	Colour - black-grey Mixed arg/cht/qtz vein sed bx. Frags flattened and aligned 65 deg to ca		Minor Ser dolo		
91.30 TO 97.50	.DOLO MIXED SEDS/	Colour - brown Dolo/sericitic altered equiv. of unit above Last 20 cm py'c sl fuchsitic	65	Dolomite, sericite	Minor 1% f.g. py 20% py; tr cpy	
97.50 TO 99.60	.ARG CHERT/	Colour - black-grey Grain size - fine grain Poss sil'd arg looks pred. cherty contorted bed & intruded by 1-2 cm qtz veinlets	70	Qtz veining	Tr minor f.g. diss py	
	EOH					

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
BCD27816	11.00	11.40	0.40	0.01	0.02	0.01	2	.03															
BCD27817	11.40	12.10	0.70	0.08	0.17	0.78	248	.03															
BCD27818	12.10	13.60	1.50	0.01	0.03	0.01	2	.24															
BCD27819	13.60	15.20	1.60	0.13	0.46	0.36	180	.27															
BCD27820	15.20	17.20	2.00	0.01	0.01	0.01	2	.07															
BCD27821	17.20	19.20	2.00	0.01	0.01	0.01	2	.14															
BCD27822	19.20	20.50	1.30	0.01	0.02	0.01	2	.14															
BCD27823	20.50	21.50	1.00	0.01	0.03	0.05	66	.15															
BCD27824	21.50	22.80	1.30	0.16	0.22	0.29	290	1.13															
BCD27825	22.80	23.40	0.60	0.06	0.56	0.26	94	1.03															
BCD27826	40.50	42.40	1.90	0.01	0.05	0.04	10	.03															
BCD27827	42.40	43.10	0.70	0.11	0.40	0.08	24	.03															
BCD27828	43.10	45.00	1.90	0.06	0.22	0.10	40	.48															
BCD27829	45.00	45.50	0.50	0.39	2.31	0.67	408	.86															
BCD27830	45.50	45.90	0.40	1.36	9.10	5.25	1780	2.26															
BCD27831	45.90	47.40	1.50	0.65	1.30	0.42	784	1.37															
BCD27832	47.40	48.20	0.80	0.24	2.11	0.60	360	.34															
BCD27833	48.20	49.70	1.50	0.59	4.42	1.35	524	.68															
BCD27834	49.70	50.90	1.20	0.72	2.10	0.66	230	.31															
BCD27835	50.90	52.30	1.40	0.73	1.44	0.41	758	1.10															
BCD27836	52.30	53.00	0.70	1.60	3.87	1.15	2040	2.40															
BCD27837	53.00	53.90	0.90	0.08	0.13	0.03	46	.03															
BCD27838	53.90	55.40	1.50	0.19	0.27	0.03	78	.03															
BCD27839	55.40	56.90	1.50	0.01	0.09	0.01	18	.03															
BCD27840	56.90	58.40	1.50	0.17	0.25	0.13	136	.03															
BCD27841	58.40	59.40	1.00	0.63	2.36	0.99	108	.41															
BCD27842	59.40	60.00	0.60	0.39	5.39	3.20	334	2.91															
BCD27843	60.00	60.80	0.80	0.14	0.87	0.41	80	.27															
BCD27844	60.80	61.30	0.50	1.14	11.3	7.50	1260	2.50															
BCD27845	61.30	62.10	0.80	0.41	1.65	1.18	504	.89															
BCD27846	62.10	63.00	0.90	0.02	0.04	0.02	6	.03															
BCD27847	63.00	64.10	1.10	0.01	0.02	0.01	2	.07															
BCD27848	64.10	64.60	0.50	0.01	0.04	0.01	8	2.37															
BCD27849	64.60	66.10	1.50	0.01	0.03	0.01	2	.10															
BCD27850	66.10	67.70	1.60	0.01	0.01	0.01	2	.03															
BCD27851	67.70	69.10	1.40	0.01	0.01	0.01	2	.03															
BCD27852	69.10	72.00	2.90	0.01	0.02	0.01	2	.03															
AVE.	45.00	53.00	8.00	0.72	2.79	0.97	741.40	1.03															
AVE.	45.00	62.10	17.10	0.49	2.14	0.93	451.82	0.75															
AVE.	56.90	62.10	5.20	0.41	2.62	1.56	309.54	0.84															

Sample	From (m)	To (m)	Length (m)	CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB		
AVE.	60.80	62.10	1.30	0.69	5.36	3.61	794.77	1.51																

MINNOVA INC.

HOLE NUMBER: RG365 | DRILL HOLE RECORD | IMPERIAL UNITS: | METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER:
CLAIM NUMBER:
LOCATION: NORTH WALL

PLOTTING COORDS GRID: FIELD
NORTH: 697.00N
EAST: 10020.00W
ELEV: 1288.27

ALTERNATE COORDS GRID: UTM
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -90x 0' 0"
LENGTH OF THE HOLE: 105.10m
START DEPTH: 0.00m
FINAL DEPTH: 105.10m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: August 7, 1990
DATE COMPLETED: August 8, 1990
DATE LOGGED: August 22, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: FRONTIER
CASING: PULLED
CORE STORAGE: MINE SITE EXP CAMP

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
50.90	-	-90x 0'	ACID	OK		-	-	-	-	-	
74.70	-	-90x 0'	ACID	OK		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 3.60	.CASING/					
3.60 TO 11.00	.ARG MUT/	Colour - grey & black Grain size - V fine Faulted interfingering of graphitic argillite with MUT 94.0-6.7L .FLT/ 60% lost core 97.5 - 8.7L .FLT/ 40% lost core 99.3-9.6L .FLT/ Bottom contact broken	 60 65	 MUT sections silver grey sericite V minor pyritization of MUT	 1% py in ARG 1-3% py & trace sp in MUT	
11.00 TO 12.30	.BARITE/	Colour - greyish white Grain size - med grain Massive with faint banding V. thin (< 1mm) sericitic wisps within Faulted bottom contact	 50	 V. minor sericite tr fuchsite? Dol/qtz alt @ margins	 Tr py	
12.30 TO 15.80	.MUT/	Colour - grey Grain size - V. fine to aph. 912.3 - 12.4L .FLT/ V. sil. semi bleached MUT 12.5 - 13.1 v. broken 20 cm lost core 913.4 - 13.5L .shear/ 15-15.3 v. broken & qtz dol vein	 60	 Occ yellow sericitic		
15.80 TO 17.20	.BARITE/	As above 917.0 - 17.2L .Bx/ barite qtz carb tr. ga py Contact faulted				
17.20 TO 50.90	.SERT WACKE & QV/	Colour - Yellowish green Grain size - V. fine to aph. 917.2 - 17.6L .Flt/ Mixed intervals of sert qv and SMS py highly contorted, structurally strained in zones 21.5 - 24.3 q.v. 923.3 - 23.4L .Flt/ 926.7 - 28.0L .Bx/ qtz in sil wacke 30 - 30.4 barren qtz carb vein 3 cm shear at top fringed at base		 Yellow green sericite 21.5 - 23.0 tr fuchsite Occ fuchsite takes on a meta basite appearance	 3% py over all diss'd locally up to 10-15% over approx 15 cm Occ tr ga & v. tr sp in q.v 924.0 - 25.3L .tr tet ga/	 Tr. fuchsite in fault gouge

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		934.0 - 34.3L .Flt/				
		934.7 - 34.8L .Flt/ Steepens to	30	33.7 - 36.6 MUT w/ three 10 cm q.v.	37.1 - 37.7 30% py SMS	
		935.2 - 35.9L .Flts/				
		940.8 - 41.0L .Flt/		@ 39 m tr fuchsite		
		941.3 - 41.9L .Flt/				
		942.2 - 42.9L .Flts/		42 - 42.9 fuchsite	942.9 - 44.8L .40% py/	
					SMS faulted above and below	
		944.8 - 45.0L .Flt/ with core v. broken to 45.9				
		950.6 - 50.9L .Flt/				51 to 51.15 flt subparallel to core
		951.0 - 51.2L .Flt/				folds in and out of core from one side
						folded flt
50.90 TO 75.00	.MUT/	Colour - grey				
		Grain size - v. fine				
		V. sil				
		952.2 - 53.2L .Flt/			Tr. sph throughout with occ 10 cm	
		956.6 - 56.9L .Flt/			intervals up to 8% sph. 3% gal within	
		957.9 - 58.0L .Flt/			qtz veins & veinlets	
					38.7 - 58.9	
		63.9 - 65.0 minor shearing			8% sph, 5% gal in q.v.	
		965.2 - 65.1L .Flt/				
		966.8 - 66.9L .Flt/				
		967.3 - 67.9L .Flt/				
		973.5 - 73.6L .Flt/				
		Contact flted - Broken with 20 cm qtz vein				
75.00 TO 89.40	.ARG WACKE & QV/	Colour - greyish green				
		Grain size - V. fine				
		Well bedded arg and wackes	35	Weak sericite	1% py as knots in beds & qtz veins	
		axial planer cleavage in sections	50		with dol veinlets	
		QV contain 1-3% py and dol veinlets				
		975.6-75.7L .shear/				
		76.2 - 76.3 shear				
		76.3 - 77.0 q.v.				
		976.8 - 77.9L .Flt dip=50deg/				
		978.9-79.7L .Flt/				
		Minor flt 79.9 @ 81.3 m				
		84.7 - 85.7 qv with dol veinlets & shears				
		987.3 - 87.5L .flt/				
		988.7 - 89.4L .bx/		@ 88.7 sil & dol begin to increase		

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
89.40 TO 105.10	.DOL SEDS/	Colour - grey Grain size - v. fine				
		Gradational increase in dolomite down hole massive 998.2 - 98.4(.bx/		Dolomite		
	EOH	101.3 - 101.7 & 102.5 - 102.6 mod to weak tectonic				

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
BCD27854	10.50	11.00	0.50	0.01	0.16	0.01	16																
BCD27855	11.00	12.30	1.30	0.01	0.01	0.01	14																
BCD27856	12.30	15.80	3.50	0.03	0.10	0.02	54																
BCD27857	15.80	17.00	1.20	0.04	0.08	0.01	108																
BCD27858	17.00	17.20	0.20	0.10	0.33	0.19	154																
BCD27859	17.20	18.00	0.80	0.01	0.03	0.01	8																
BCD27860	20.50	21.50	1.00	0.09	0.05	0.35	136																
BCD27861	21.50	23.00	1.50	0.01	0.13	0.06	16																
BCD27862	23.00	24.00	1.00	0.03	0.35	0.21	58																
BCD27863	24.00	25.30	1.30	0.09	0.66	0.30	126																
BCD27864	25.30	26.70	1.40	0.01	0.07	0.02	16																
BCD27865	26.70	28.00	1.30	0.01	0.07	0.01	2																
BCD27866	36.10	37.10	1.00	0.26	2.06	1.42	74																
BCD27867	37.10	37.70	0.60	0.01	0.01	0.01	2																
BCD27868	37.70	40.00	2.30	0.01	0.01	0.01	2																
BCD27869	40.00	40.80	0.80	0.01	0.01	0.01	2																
BCD27870	40.80	42.90	2.10	0.01	0.01	0.01	4																
BCD27871	42.90	44.80	1.90	0.01	0.01	0.95	50																
BCD27872	44.80	46.00	1.20	0.01	0.12	0.11	4																
BCD27873	46.00	47.90	1.90	0.01	0.01	0.01	4																
BCD27874	47.90	49.30	1.40	0.64	2.48	1.51	764																
BCD27875	49.30	50.50	1.20	0.65	1.85	0.60	750																
BCD27876	50.50	50.90	0.40	0.01	0.01	0.01	2																
BCD27877	50.90	52.20	1.30	0.01	0.20	0.10	4																
BCD27878	52.20	53.20	1.00	0.09	1.44	1.24	180																
BCD27879	53.20	55.20	2.00	0.01	0.53	0.37	34																
BCD27880	55.20	57.70	2.50	0.06	0.11	0.12	52																
BCD27881	57.70	58.70	1.00	0.14	0.32	0.28	112																
BCD27882	58.70	59.30	0.60	0.02	4.27	0.57	40																
BCD27883	59.30	60.30	1.00	0.16	0.53	0.24	96																
BCD27884	60.30	62.80	2.50	0.27	0.44	0.55	158																
BCD27885	62.80	63.90	1.10	0.09	1.58	0.95	56																
BCD27886	63.90	65.00	1.10	0.01	0.41	0.27	14																
BCD27887	65.00	67.30	2.30	0.01	0.06	0.09	12																
BCD27888	67.30	68.40	1.10	0.01	0.09	0.07	20																
BCD27889	68.40	71.00	2.60	0.01	0.06	0.16	8																
BCD27890	71.00	73.50	2.50	0.01	0.09	0.02	2																
BCD27891	73.50	75.00	1.50	0.02	0.19	0.09	22																
BCD27892	75.00	76.00	1.00	0.01	0.01	0.02	2																
BCD27956	88.70	89.40	0.70	0.01	0.01	0.01	2																

Sample	From (m)	To (m)	Length (m)	CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB		
AVE.	15.80	21.50	5.70	0.03	0.04	0.07	53.123																	
AVE.	47.90	50.50	2.60	0.64	2.19	1.09	757.54																	

MINNOVA INC.

HOLE NUMBER: RG366 | DRILL HOLE RECORD | IMPERIAL UNITS: | METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER:
CLAIM NUMBER:
LOCATION: NORTH WALL

PLOTTING COORDS GRID: FIELD
NORTH: 690.00N
EAST: 10040.00W
ELEV: 1286.39

ALTERNATE COORDS GRID: UTM
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -90x 0' 0"
LENGTH OF THE HOLE: 87.40m
START DEPTH: 0.00m
FINAL DEPTH: 87.40m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: August 8, 1990
DATE COMPLETED: August 9, 1990
DATE LOGGED: August 23, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: FRONTIER
CASING: PULLED
CORE STORAGE: MINE SITE EXP CAMP

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
14.30	-	-90x 0'	ACID	OK		-	-	-	-	-	
87.40	-	-90x 0'	ACID	OK		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 3.60	.CASING/					
3.60 TO 3.80	.SERT/	Colour - yellow Grain size - V. fine 20 cm broken core - strongly sericitic		Dol		
3.80 TO 4.80	.MUT&FLT/	Colour - grey Grain size - gouge 1 m lost core in flt zone of gouged MUT				
4.80 TO 11.10	.ARG/	Colour - black Grain size - aph. Black graphitic arg highly contorted veinlets TOI to 6.5 m Contact broken	65	Weak silicification	Tr diss'd py	V. broken to rubble
11.10 TO 50.20	.ARG&WACKE/	Colour - black grey Grain size - med to v. fine grain Interbedded non-graphitic arg and sil'd wackes. v. slightly tectonic in intervals surrounding flts 911.2 - 11.3L .Flt/ 912.7 - 12.8L .Flt/ TOI to 16.5 mainly wackes 16.5 to EOI interbedded arg and fine gr wackes 926.0 - 35.5L .Flted/ gouged to v. broken over whole interval 48.8 - 49.0 sheared 949.5 - 50.2L .Flt/	60 75	Weak to mod silicification @ 48 m foliation @ 80 deg to original bedding	Tr diss'd py	
50.20 TO 74.40	.SERT ARG/ WACKE & QV/ SERICITIC SEDS	Colour - greenish yellow Grain size - med grain to v. fine As above interval but sericitic Qtz veins - Bull qtz w/dol veinlets 51.5 - 52 qtz dol vein Flted top & bottom Bedding highly variable		Yellow sericites and silicification	Tr py as veins and distinct beds @ 51.5 py xstals @ top of bull qtz vein	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		Sub parallel to core to 80 deg	50			
		54.0 - 54.5 bedding steepens to 14 deg where				
		core becomes broken		58.1 - 58.7 v. sil with dol veinlets		
				bleaching rock		
		961.7 - 62.0L .sheared/				
		Isoclinally folded 2-3 cm q.v.				
		64.6 - 64.9 sheared				
		967.3 - 67.7L .Flt/		V. minor fuchsite @ 68.9 m as thin		
				1-3 mm wisps		
		71.4 - 72.1 core v. broken				
		972.1 - 72.4L .Flt/ above qtz dol vein				
		w/fuchsite to				
		973.0 - 74.4L .Flt/ gouged q.v. MUT to 73.6				
		73.6 - 73.7 bx				
		73.7 - 74.4 gouged yellow sert & q.v.				
74.40 TO 76.40	.SERT OV CHT & FUCH/	Colour - Yellow				
		As above, contorted tectonic	50 70			
				Fuchsite & yellow sericite		
				973.4 - 75.5L strong		
				.fuchsite/		
				976.2 - 76.4L .fuchsite/		
76.40 TO 87.40	.DOL SEDS/	Colour - green grey				
		Very dolomitized bedding textures lost		Intense dol		
		982.2 - 82.6L .Flt dip=40 deg/				
	EOH					

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
BCD27893	49.20	50.20	1.00	0.01	0.01	0.01	2																
BCD27894	50.20	51.40	1.20	0.01	0.01	0.01	2																
BCD27895	51.40	52.00	0.60	0.01	0.01	0.01	4																
BCD27896	54.60	54.80	0.20	0.01	0.01	0.01	8																
BCD27897	67.30	67.70	0.40	0.01	0.01	0.01	2																
BCD27898	72.40	73.00	0.60	0.01	0.01	0.01	2																
BCD27899	73.00	74.00	1.00	0.01	0.01	0.01	2																
BCD27900	75.40	75.50	0.10	0.01	0.01	0.01	2																

MINNOVA INC.

HOLE NUMBER: RG367 — DRILL HOLE RECORD — IMPERIAL UNITS: — METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER:
CLAIM NUMBER:
LOCATION: PH 1 PIT FLOOR

PLOTTING COORDS GRID: FIELD
NORTH: 635.00N
EAST: 9960.00W
ELEV: 1280.00

ALTERNATE COORDS GRID: UTM
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -90x 0' 0"
LENGTH OF THE HOLE: 41.70m
START DEPTH: 0.00m
FINAL DEPTH: 41.70m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: August 10, 1990
DATE COMPLETED: August 10, 1990
DATE LOGGED: August 23, 1990

COLLAR SURVEY: NO
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: FRONTIER
CASING: PULLED
CORE STORAGE: MINE SITE EXP CAMP

PURPOSE: RE: SURVEY - Layout of Hole surveyed but pick-up of actual hole lost.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
41.70	-	-90x 0'	ACID	OK		-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 1.80	.CASING/					
1.80 TO 6.10	.ARG/	Colour - black Grain size - aph Non-graphitic argillite	60	Silicification @ 5.6m bleaching sericitic alt begins	Tr diss'd py	2.0 - 3.6 1.4 lost core
6.10 TO 11.30	SILICIFIED SEDS & QTZ VEINS .SIL'D ARG & QV/	Colour - Olive - grey Grain size - fine to v. fine Mottled sil'd arg Remnant bedding visible in sections Qtz veins begin at 8.7 m	57	Silicification Weak sericite	1-3% py overall w/sections over 10 cm up to 7% py	
11.30 TO 29.20	.SERT&QV/	Colour - yellow & white Grain size - v. fine Mixed zone of sert w/py beds 912.0 - 13.6L .Flts/ & gouge qv's and v. broken core 912.2 - 12.3L .Flt/ 915.9 - 16.2L .Flt 5% tet/ gouge, q.v. tet, sph, py mineralization 10 - 20 cm to each side of fault @ 18.0 3-5 cm gouge 21.8 - 21.9 flted 926.2 - 26.3L .Flt/ 928.4 - 28.7L .Flt/ EOI faulted	45 60	Sericitic (yellow predominate rare silver grey	Sericitic zones 1-3% py as beds @ Veins tr to 3% tet tr to 5% cp 1-3% sph tr to 2% ga tr to 7% py 922.1 - 22.4L .5% tet,8% cp,1%sp & ga/	
29.20 TO 36.40	.MUT/	Colour - grey Grain size - v. fine Gouged MUT qtz vein 929.2 - 32.2L .Flt/ 32.2 - 34.0 tectonic & broken to v. broken @ 34.0 - 5cm gouge 34.3-34.8 - pink qtz dol vein		Minor fuchsite in gouge @ 29.2 ti 29.3 & 30.1 - 30.3 & 30.5 & 30.6 & 31.4 - 31.7	3-5% diss'd py 34.3 - 34.8 1-3% py fringing MUT @ qtz vein	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
36.40 TO 39.20	.QTZ DOL VEIN/	Colour - Pinkish white Qtz w/ dol. pink ferroan dol throughout in sections MUT in filling fractures		Dol	37.8 - 38.4 wedge of dol seds(?) as next interval	
39.20 TO 41.70	.DOL SEDS/	Colour - olive Grain size - Med gr to fine Occ arg remnants in a weakly tectonic dolomitic rock py as blebs & beds 941.0 - 41.2L .Flt/		Dolomitic veins & blebs Leucoxine wisps fuchsitic blebs	3-5% py w/10 cm sections up to 30% py Tr cp	
	EOH					

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
BCD27901	5.60	6.10	0.50	0.01	0.01	0.01	2	.10															
BCD27902	6.10	6.60	0.50	0.01	0.01	0.01	2	.86															
BCD27903	10.30	11.30	1.00	0.01	0.01	0.01	8	.03															
BCD27904	11.30	12.20	0.90	0.03	0.19	0.01	46	.03															
BCD27905	12.20	13.40	1.20	0.16	0.21	0.27	206	.27															
BCD27906	13.40	14.40	1.00	0.01	0.01	0.01	2	.03															
BCD27907	14.40	15.80	1.40	0.01	0.01	0.02	4	.03															
BCD27908	15.80	16.30	0.50	4.20	8.85	12.2	4840																
BCD27909	16.30	17.30	1.00	0.01	0.01	0.10	18	.03															
BCD27910	17.30	18.00	0.70	2.00	0.65	3.92	2226																
BCD27911	18.00	19.80	1.80	0.42	0.19	0.27	26	.27															
BCD27912	19.80	21.30	1.50	0.06	0.64	0.38	16	.27															
BCD27913	21.30	22.10	0.80	0.26	0.18	0.17	18	.24															
BCD27914	22.10	22.40	0.30	9.60	0.40	0.15	1070																
BCD27915	22.40	22.70	0.30	0.04	0.01	0.01	6																
BCD27916	22.70	24.30	1.60	0.19	0.03	0.01	24	1.41															
BCD27917	24.30	25.30	1.00	0.17	0.01	0.01	8	.07															
BCD27918	25.30	27.00	1.70	0.01	0.01	0.01	2	.03															
BCD27919	27.00	28.40	1.40	0.01	0.01	0.10	4	.03															
BCD27920	28.40	29.20	0.80	0.07	0.01	0.01	44	.03															
BCD27921	29.20	30.70	1.50	0.01	0.01	0.01	4	.03															
BCD27922	30.70	32.20	1.50	0.01	0.37	0.01	2	.03															
BCD27923	32.20	34.30	2.10	0.01	0.01	0.01	2	.03															
BCD27924	34.30	34.80	0.50	0.01	0.05	0.01	6	.03															
BCD27925	34.80	35.60	0.80	0.01	0.01	0.01	2	.03															
BCD27926	35.60	36.40	0.80	0.01	0.01	0.01	2	.03															
BCD27927	36.40	37.80	1.40	0.01	0.01	0.01	2	.03															
BCD27928	37.80	38.40	0.60	0.01	0.01	0.01	2	.03															
BCD27929	38.40	39.20	0.80	0.01	0.01	0.01	2	.03															
BCD27930	39.50	40.00	0.50	0.01	0.01	0.01	2	.03															

MINNOVA INC.

HOLE NUMBER: RG368 | DRILL HOLE RECORD | IMPERIAL UNITS: | METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER:
CLAIM NUMBER:
LOCATION: PH 1 PIT FLOOR

PLOTTING COORDS GRID: FIELD
NORTH: 655.00N
EAST: 9980.00W
ELEV: 1280.10

ALTERNATE COORDS GRID: UTM
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -90x10' 0"
LENGTH OF THE HOLE: 50.90m
START DEPTH: 0.00m
FINAL DEPTH: 50.90m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: August 11, 1990
DATE COMPLETED: August 11, 1990
DATE LOGGED: August 23, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: FRONTIER
CASING: PULLED
CORE STORAGE: MINE SITE EXP CAMP

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
50.90	-	-87x 0'	ACID	OK	Faint	-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 3.00	.CASING/					
3.00 12.50	.SERT/ SERICITIC ARG	Colour - Olive yellow Grain size - V. fine to aph. Sericitic seds remnant bedding well banded Occ isoclinally folded qtz veinlets 6.8 m - 7.7 m highly contorted 910.5-12.5L .Flted/ gouged to v. broken over interval	 35 40	Yellow sericite & weak sil.	3% diss'd py 95.95 - 6.0L .1-3%tet sp&cp/ in qtz vein broken core in either end of 5 cm vein	
12.50 TO 31.30	.SERT&QV/	Colour - White & Yellow Grain size - V. fine (sericite) Mixed intervals of sert with tr py and qts veins contain tet & bas metals Foliation variable but average =	 60	Yellow sericite	 912.5 - 22.0L .tet cp ga sp/ 1-2% tet 2-3 % cp 2% ga 2% sp 3-5% py	
31.30 TO 40.90	.SERT/ SERICITIC ARG	Colour - Olive yellow Grain size - V. fine to aph. As interval 3.0 - 12.5 m Flattening to 932.8 - 32.9L .Flt/ @ 35.7 to EOI qtz veins 5-15 cm thick 939.7 - 43.1L .Flted/ Gouge rubble & very broken core Contact flted	 70 60	 Yellow sert Weak sil		
40.90 TO 44.50	.CHTY ARG/	Colour - black Grain size - V. fine Sil arg cherty Core v. broken to rubble intruded by 0.5 to 2 cm qtz veinlets 41.7 =	 15	 Silicification	 Tr diss'd py	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		Both contact sharp but broken				
44.50 TO 47.20	.DOL SEDS/	Colour - olive Grain size - Med gr to fine Bedding textures almost lost at 45.2 - 40 deg dip=	40	Dolomite Possible leucoxene as thin wisps	Tr py	
47.20 TD 50.90	.CHT/SERT/ MIXED SEDS	Colour - greyish white Tectonic chert; arg remnants Grey dolomitic patches Frags generally flattened & aligned to foliation of 40 - 45 deg. 5 cm flt @ 48.0 m 948.6 - 48.8L .Flt/	40 45	Minor yellow sert Dolomitic in veins 47.2 - 47.5 fuchsite	Tr py in veins	
	EOH					

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
BCD27980	5.40	5.95	0.55	0.01	0.01	0.01	2	.03															
BCD27981	5.95	6.00	0.05	2.55	0.85	0.01	320	.14															
BCD27982	6.00	6.50	0.50	0.01	0.01	0.01	4	.03															
BCD27931	12.00	12.50	0.50	0.01	0.01	0.01	12	.03															
BCD27932	12.50	14.00	1.50	0.01	0.01	0.01	2	.03															
BCD27933	14.00	15.20	1.20	0.16	0.01	0.01	166	.34															
BCD27934	15.20	16.00	0.80	5.55	1.60	0.01	5480																
BCD27935	16.00	18.00	2.00	0.04	0.01	0.03	54	.03															
BCD27936	18.00	19.00	1.00	0.83	0.10	1.09	246	.31															
BCD27937	19.00	19.50	0.50	0.10	0.07	0.45	132	.21															
BCD27938	19.50	20.50	1.00	1.25	0.85	3.25	970	2.19															
BCD27939	20.50	21.00	0.50	0.08	0.06	0.21	64	.03															
BCD27940	21.00	21.50	0.50	0.70	0.25	1.70	305	.99															
BCD27941	21.50	22.00	0.50	0.11	0.11	0.30	24	.27															
BCD27942	22.00	23.50	1.50	0.01	0.01	0.03	10	.03															
BCD27943	23.50	25.00	1.50	0.01	0.01	0.06		.03															
BCD27944	25.00	25.60	0.60	0.01	0.01	0.04	2	.03															
BCD27945	25.60	27.40	1.80	0.01	0.01	0.01	2	.03															
BCD27946	27.40	29.30	1.90	0.01	0.01	0.01	2	.03															
BCD27947	29.30	31.30	2.00	0.01	0.01	0.03	2	.03															
BCD27948	31.30	32.30	1.00	0.01	0.01	0.01	2	.03															
BCD27949	39.70	40.90	1.20	0.01	0.03	0.01	2	.07															
BCD27950	40.90	42.00	1.10	0.01	0.01	0.01	2	.21															
BCD27951	44.00	44.50	0.50	0.01	0.01	0.01	2	.03															
BCD27952	44.50	45.00	0.50	0.01	0.01	0.01	2	.03															
BCD27953	46.70	47.20	0.50	0.01	0.01	0.02	2	.03															
BCD27954	47.20	47.40	0.20	0.01	0.01	0.03	2	.03															
BCD27955	47.40	47.90	0.50	0.01	0.01	0.01	2	.03															

MINNOVA INC.

HOLE NUMBER: R6369 — DRILL HOLE RECORD — IMPERIAL UNITS: — METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER:
CLAIM NUMBER:
LOCATION: PH 1 PIT FLOOR

PLOTTING COORDS GRID: FIELD
NORTH: 665.00N
EAST: 10000.00W
ELEV: 1280.13

ALTERNATE COORDS GRID: UTM
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -63x 0' 0"
LENGTH OF THE HOLE: 66.20m
START DEPTH: 0.00m
FINAL DEPTH: 66.20m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: August 11, 1990
DATE COMPLETED: August 13, 1990
DATE LOGGED: August 24, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: FRONTIER
CASING: PULLED
CORE STORAGE: MINE SITE EXP CAMP

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
26.20	-	-62x 0'	ACID	OK		-	-	-	-	-	
50.90	-	-63x 0'	ACID	OK		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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-	-	-	-	-		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 4.20	.CASING/					
4.20 TO 8.80	.CHTY SERT & QV/	Colour - greyish olive Grain size - fine to v. fine Tectonic sericitic cherty qtz veins Core contorted w/cherty frags showing no preferred alignment Contact faulted 98.6 - 8.8L .flt/		Yellow sericite & brown sericite ?leucoxene frags dolomitic 6.8 - 7.1 fuchsitic w/leucoxene	Approx 3% py in beds & qtz veins up to 15% py in qtz veins over 10-15cm	4.1 - 5.1 m - 50% Core loss
8.80 TO 26.00	.SERT/	Colour - yellow Grain size - V. fine to aph. Well banded to deformed Arg banding & wacke beds easily distinguishable Minor qtz veining with Ferroan dolomite veinlets	60	Very well developed SERT Weakly silicified but increasing TOWARDS EOI		
26.00 TO 39.80	.SERT&QV/	Colour - greyish yellow & white Grain size - V. fine in sert As above, with abundant qtz veins and stronger silicification 929.9 - 30.5L .Flt/ 35.7 - 35.8 Minor Flt 36.9 - 37.0 Minor flt 937.4 - 37.7L .Flt/ with massive ga, tet,sp & cp in qtz vein 38.2 - 38.3 minor flt 939.2 - 39.8L .Flt/	60	Sil	Qtz veins contain tr. tet,ga,cp 1-3% sph 931.0 - 31.3L .QV 1%tet,1%sp,1%ga/	
39.80 TO 53.80	.DOLMAFIC/	Colour - olive grey Grain size - med grain Mod-strong dolomitized, possible silicification? Highly contorted & stained to 42.0 m From 42.0 - 4.8 m possible remnant lappilli? Alteration quite intense 48.2 - 48.5 qtz carb vein 50.0 - 50.5 qtz carb vein 50.9 - 51.0 minor rubble gouge 953.2 - 53.4L .Flt/		Mod - strong dolomite, increasing in intensity with depth	1-3 diss'd py throughout	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
53.80 TO 59.10	.DOL SEDS, ARG MUT/	Colour - Brownish olive Grain size - V. fine				
		Contact gradational to graphitic arg & dol possible part of former interval sed? 54.1 - 54.3 minor shearing 955.0 - 59.1L .Flted to v. broken/ 55.0 - 55.2 gouge arg 55.2 - 57.1 MUT gouged & rubble & broken 57.1 - 57.2 gouge w/fuchsite 57.2 - 57.3 Flted & folded CHTY ARG 57.3 - 58.2 Flted CHTY ARG 58.2 - 58.7 Flted MUT V. PYRITIC 58.7 - 59.1 Sheared to v. broken py MUT	50	Occ fuchsite & silver grey sert.	Tr to 5% py	@ 53.8 graphitic arg present mixed with dol
		Contact Flted				
59.10 TO 66.20	.CHTY ARG/	Colour - black Grain size - v. fine to aph.				
		Black chrty arg. Occ graphitic. Highly contorted to bx'ed 59.1 - 59.85 - chrty arg 59.85 - 61.1 well banded highly pyritic to "grass" green fuchsite @ 60.1-60.2 & 61.06-61.1 61.1 - 62.5 Chty arg 62.5 - 63.0 Phylitic? Rubble chty 63.0 - 66.2 EOI Chty arg			959.9 - 61.1L .10-15% py/ tr. sph as blebs in chty arg	
	EOH			963.0 - 63.3L .bx/		

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
BCD27957	25.00	26.00	1.00	0.01	0.01	0.01	2	.03															
BCD27958	26.00	27.00	1.00	0.01	0.01	0.01	2	.03															
BCD27959	27.00	28.20	1.20	0.01	0.01	0.01	2	.03															
BCD27960	28.20	28.70	0.50	0.01	0.03	0.01	4	.03															
BCD27961	28.70	30.50	1.80	0.02	0.01	0.01	2	.03															
BCD27962	30.50	31.00	0.50	0.01	0.20	0.06	4	.03															
BCD27963	31.00	31.30	0.30	0.06	1.10	0.26	72	.10															
BCD27964	31.30	33.80	2.50	0.01	0.01	0.01	2	.03															
BCD27965	33.80	35.80	2.00	0.02	0.07	0.08	2	.03															
BCD27966	35.80	36.50	0.70	0.01	0.02	0.12	2	.03															
BCD27967	36.50	36.80	0.30	0.13	1.87	0.89	44	.05															
BCD27968	36.80	37.30	0.50	0.01	0.02	0.04	2	.03															
BCD27969	37.80	38.10	0.80	0.01	0.12	0.55	8	.10															
BCD27970	38.10	39.20	1.10	0.01	0.02	0.01	2	.07															
BCD27971	39.20	39.80	0.60	0.01	0.05	0.01	2	.03															
BCD27972	39.80	40.30	0.50	0.01	0.02	0.01	2	.03															
BCD27973	48.20	48.50	0.30	0.01	0.01	0.01	2	.03															
BCD27974	50.00	50.50	0.50	0.01	0.01	0.01	2																
BCD27975	51.50	52.00	0.50	0.01	0.02	0.01	2	.03															
BCD27976	56.60	57.10	0.50	0.09	0.03	0.01	2	.03															
BCD27977	57.10	58.20	1.10	0.01	0.01	0.01	2	.03															
BCD28069	59.10	59.80	0.70	0.01	0.06	0.07	2	.03															
BCD27978	59.80	60.30	0.50	0.20	3.25	2.40	30	.21															
BCD27979	65.20	65.80	0.60	0.01	0.06	0.02	2	.03															

MINNOVA INC.

HOLE NUMBER: RG370 | DRILL HOLE RECORD | IMPERIAL UNITS: | METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER:
CLAIM NUMBER:
LOCATION: PH 1 PIT FLOOR

PLOTTING COORDS GRID: FIELD
NORTH: 665.00N
EAST: 10000.00W
ELEV: 1280.13

ALTERNATE COORDS GRID: UTM
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -90x 0' 0"
LENGTH OF THE HOLE: 61.50m
START DEPTH: 0.00m
FINAL DEPTH: 61.50m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: August 12, 1990
DATE COMPLETED: August 12, 1990
DATE LOGGED: August 24, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: FRONTIER
CASING: PULLED
CORE STORAGE: MINE SITE EXP CAMP

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
48.80	-	-90x 0'	ACID	OK		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 3.00	.CASING/					
3.00 TO 27.70	.SERT/	Colour - Olive & grey Grain size - V. fine to aph. Well developed sert & minor pyritic MUT? Highly contorted. Bedding & foliation highly variable @ 10 m = 8.0 - 8.25 Dol 16.6 - 16.7 Minor flt Alt of silver grey sert @ 10 - 15 deg to core Occ qtz/dol veins. Occ bxed Contact is an increase in qtz veining	60	Silicified Sert - yellow & silver grey	1-3% py diss'd & bedded	
27.70 TO 49.60	.SERT&QV/	Colour - yellow & white Grain size - V. fine to aph sert Sert as above, qtz veining increasing and contains base metals & tet. Mixed intervals of SERT w/diss'd py & qv & bull qtz veins 36.0 - 36.2 Rubble gouge 37.0 - 37.5 Rubble gouge @ 48.2 - 5cm gouge bedding 4.3 m = Faulted contact	60	Yellow sericite	1.3% diss'd py in sert 932.8-34.6L .QV tet,sph,ga,cp&py/ as blebs in qtz veins Make up as much as 5-8% 942.5 - 42.6L .MS/ in qtz vein 25% gal cp py	Core rubble to intact over 1.5m
49.60 TO 61.30	.DOL MAFIC/	Colour - Olive grey As base of RG369 949.6 - 49.8L .Flt dip=40deg/ 5 cm carb clay gouge @ TOI Then 25 cm gouge of DOL VOL? Fol =	45	Yellow sericite and occ. fuchsite	1-3% diss'd py	
61.30 TO 61.50	.CHTY ARG/	Colour - black Grain size - V. fine to aph. Black chty highly contorted & tectonic Sheared @ contact @ dip of =	50			
	EOH					

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
BCD27983	7.50	8.00	0.50	0.01	0.01	0.01	2	.14															
BCD27984	8.00	8.20	0.20	0.01	0.06	0.06	20	.10															
BCD27985	8.20	8.70	0.50	0.01	0.01	0.01	2	.03															
BCD27986	27.20	27.70	0.50	0.01	0.03	0.04	2	.03															
BCD27987	27.70	28.20	0.50	0.01	0.01	0.01	4	.03															
BCD27988	28.20	29.70	1.50	0.02	0.04	0.05	18	.03															
BCD27989	29.70	31.60	1.90	0.01	0.01	0.06	2	.07															
BCD27990	31.60	32.30	0.70	0.01	0.01	0.04	2	.03															
BCD27991	32.30	32.80	0.50	0.01	0.01	0.01	2	.03															
BCD27992	32.80	33.70	0.90	0.59	0.13	2.57	796																
BCD27993	33.70	34.30	0.60	0.01	0.07	0.06	4	.03															
BCD27994	34.30	34.90	0.60	0.34	0.32	0.55	190	.24															
BCD27995	34.90	36.20	1.30	0.01	0.17	0.03	2	.03															
BCD27996	36.20	37.60	1.40	0.05	1.15	0.04	38	.03															
BCD27997	37.60	39.10	1.50	0.14	0.02	0.03	112	.07															
BCD27998	39.10	41.40	2.30	0.01	0.01	0.01	2	.03															
BCD27999	41.40	42.00	0.60	0.08	0.01	0.02	2	.03															
BCD28000	42.00	42.60	0.60	1.90	0.10	3.75	520	1.51															
BCD28001	42.60	43.10	0.50	0.01	0.01	0.01	2	.03															
BCD28002	43.10	45.60	2.50	0.01	0.01	0.01	2	.03															
BCD28003	45.60	48.10	2.50	0.01	0.01	0.01	2	.03															
BCD28004	48.10	48.70	0.60	0.01	0.10	2.00	30																
BCD28005	48.70	49.60	0.90	0.01	0.01	0.08	2	.03															
BCD28006	49.60	49.80	0.20	0.01	0.06	0.06	2	.03															
BCD28007	49.80	50.30	0.50	0.01	0.08	0.11	2	.03															

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER:
CLAIM NUMBER:
LOCATION: NORTH OF PIT

PLOTTING COORDS GRID: FIELD
NORTH: 671.00N
EAST: 10079.00W
ELEV: 1275.90

ALTERNATE COORDS GRID: UTM
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -90x 0' 0"
LENGTH OF THE HOLE: 76.50m
START DEPTH: 0.00m
FINAL DEPTH: 76.50m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: August 13, 1990
DATE COMPLETED: August 14, 1990
DATE LOGGED: August 25, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: FRONTIER
CASING: PULLED
CORE STORAGE: MINE SITE EXP CAMP

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
75.30	-	-89x 0'	ACID	OK		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 4.20	.CASING/					
4.20 TO 43.60	.ARG&WACKE/	Colour - grey black Grain size - v. fine to aph.				
		Interbedded arg-silts&wackes well bedded; locally contorted to rare isoclinal folds becomes tectonic towards EOI 95.5 - 6.2L .Rubble to gouge/ Occ graphitic section in arg from 18.0m to EOI	75 80	Silicification Wacke beds well sil & intact ARG & APH silts broken to rubble		
		bedding steepening @ 30 m = @ 27.7 to EOI arg become chty @ 40.0 to EOI wacke beds yellow sericitic alt 940.0 - 40.1L .flt/ 943.2 - 43.6L .Rubble & gouge/ Contact rubble & gouge	50	Sericitic towards EOI		
43.60 TO 44.90	.QTZ W/DOL VEIN/	Massive qtz vein with Dol veinlets. Very broken to rubble Faulted base		@ 43.9 fuchsite	Tr py poss sph	
44.90 TO 48.00	.MUT/	Colour - grey Grain size - V. fine				
		44.9 - 45.0 Minor flt Pyritic siltite tectonic sections Occ qtz carb veins Approx	50	Silver grey sericite Dol veins & veinlets	3% py throughout	
		46.2 - 46.3 Minor flt 946.4 - 46.8L .Flt/ 46.8 - 47.3 tectonic				
		Contact gradational			947.5 - 47.8L .1% tet ga sp/ in qtz dol veins	
48.00 TO 52.50	.DOL SEDS?/	Colour - olive grey Grain size - v. fine				
		Strongly dolomitic seds?		Dolomite TOI to 50.2 orange yellow sericite @ 50.2 one-1 mm spec fuchsite 50.2 to 51.8 minor orange-yellow sericite 51.8 - 52.5 chloritic? volcanic?	Tr to 2% py as beds	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
				Contact sharp w/3 cm		
52.50 TO 64.30	.ARG/	Colour - black Grain size - v. fine to aph High contorted, tectonic arg Cherty? Foliation 55.5 - 55.6 Flt 958.4 - 58.8L .Tr. tet;1Zsph ga/ in a qtz Dol vein 60.2 - 60.3 Minor flt	30 50	59.7 - 60.1 Fuchsite within qtz dol vein.		
64.30 TO 76.50	.CHTY ARG/	Colour - black As above v. sil? chrty Graphitic Highly fractured with ferroan dol alt veinlets		Dolomitic	Tr. py.	
	EOH					

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
BCD28008	43.10	43.60	0.50	0.01	0.01	0.01	2	.07															
BCD28009	43.60	44.90	1.30	0.01	0.01	0.01	2	.03															
BCD28010	44.90	46.70	1.80	0.01	0.05	0.01	2	.10															
BCD28011	46.70	47.50	0.80	0.01	0.01	0.01	2	.03															
BCD28012	47.50	47.80	0.30	0.12	0.19	0.15	102	.10															
BCD28013	47.80	48.00	0.20	0.01	0.01	0.01	2	.10															
BCD28014	48.00	49.00	1.00	0.01	0.01	0.02	2	.03															
BCD28015	51.30	51.80	0.50	0.01	0.01	0.01	2	.03															
BCD28016	51.80	52.50	0.70	0.01	0.01	0.01	2	.03															
BCD28017	52.50	53.00	0.50	0.01	0.01	0.01	2	.03															
BCD28018	58.40	58.80	0.40	0.16	0.85	0.34	162	.31															
BCD28019	59.70	60.10	0.40	0.01	0.01	0.02	2	.03															
BCD28020	73.20	73.70	0.50	0.01	0.12	0.44	2	.03															

MINNOVA INC.

HOLE NUMBER: R6372 — DRILL HOLE RECORD — IMPERIAL UNITS: — METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER:
CLAIM NUMBER:
LOCATION: PHASE 1 PIT FLOOR

PLOTTING COORDS GRID: FIELD
NORTH: 728.00N
EAST: 10058.00W
ELEV: 1298.78

ALTERNATE COORDS GRID: UTM
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -60x 0' 0"
LENGTH OF THE HOLE: 110.60m
START DEPTH: 0.00m
FINAL DEPTH: 110.60m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: August 15, 1990
DATE COMPLETED: August 17, 1990
DATE LOGGED: August 25, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: FRONTIER
CASING: PULLED
CORE STORAGE: MINE SITE EXP CAMP

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
86.30	-	-60x 0'	ACID	OK	ACID LEFT IN TUBE	-	-	-	-	-	
110.60	-	-62x 0'	ACID	OK	PARTIALLY OBSURED	-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 9.10	.CASING/					
9.10 TO 28.90	.ARG MIXED SEDS/	Colour - black-light olive Grain size - Fine to v. fine Highly contorted, occ isoclinal to tectonitic arg sed with a qtz & cherty component @ 20.4 v. silicified bleached mixed intervals begin w/mixed seds of strongly sericitic seds 923.7 - 28.9L .str.sil?/cht?tr.sph/ Rubble contact	75 85	Yellow sericitic alt over 30% of interval. Locally up to 2 m thick zones Ferroan dol. alt. of veinlets	5% diss'd py	
28.90 TO 89.00	.ARG&WACKE/	Colour - black & grey Grain size - v. fine to aph. Interbedded argillites & waches contorted @ TOI @ 30.5 - 5 cm gouge 931.8 - 32.0L .Flt/ 33.5 - 33.8 Rubble & gouge @33 m graphitic arg;bedding = @ 41.5 m = 943.7 - 44.0L .Flt/ 44.0 - 44.6 bedding highly disturbed to 15 deg dip. @ 48.3 m - 3 cm gouge @ 54 m bedding dip = 70 foliation X-cutting bedding dip 50 deg. opposite direction 59.9 - 60.1 flted @60.8 - 3 cm gouge 61.2 - 61.4 gouged & flted 62.0 - 70.5 highly variable & contorted bedding Generally flattening to subparallel to core. 77 m= @ 73 - 3 cm gouge 73.15 - 73.3 - Minor flt @77.65 - - 5 cm gouge @78.0 minor shearing 978.3 - 78.4L .Flt/ 79.4 - 79.5 Qtz Dol vein 81.3 - 81.4 Qtz Dol Vein w/arg wisps	60 70 60	28.9 - 29.9 sericitic alt. grades into highly contorted pyritic arg. Dol veinlet in Qtz Veins		

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		82.4 - 82.9 qtz dol vein with arg wisps @ 84 m 83.6 - 83.9 m Qtz Dol vein with arg gougy wisps 84.3 - 84.6 Qtz Dol veins 15 cm ARG remnant within 88.0 - 89.0 Qtz Dol vein	60	start @ 79.4		
89.00 TO 93.10	.SERT ARG/	Colour - Olive Grain size - fine to aph. As unit above, weakly tectonic in zones and strongly sericitic Flattening to 91.35 - 91.4 gouge 91.4 - 91.5 Qtz Dol vein 91.5 - 91.55 gouge 91.55 - 91.7 tectonic SERT ARG 91.7 - 91.75 gouge tectonic to 92.7 92.7 - 92.9 gouge 92.9 - 93.1 Qtz Dol vein 93.1 - 93.3 Flt 992.7 - 93.3L .Flt/	70 85	Yellow sericite		
93.10 TO 96.50	.DOL SEDS?/	Colour - olive Grain size - fine Contact flted Mod Dol. (possible) seds No visible lapilli		Mod Dolomite increasing with depth Yellow sert @ 96.5 sharp contact where yellow sericite stops and green chloritic begin. Possible? volcanic contact	Tr py	
96.50 TO 102.50	.DOLMAFICS/	Colour - green Grain size - fine Tuffaceous texture 101.0 - 101.5 Qtz Dol vein with Fuchsite		Strong dolomite 96.6 - 96.7 Fuchsite leucoxene? blebs	Tr py	
102.50 TO 110.60	.ARG/	101.4 - 101.6 gouged and flted Highly contorted as base RG371 Highly fractured Contact faulted 102.5 - 3.5 cm gouge in CHTY ARG		Dolomitic veinlets		

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		102.5 - 102.6 CHT ARG				
		102.6 - 103.7 Sericitic seds			3% py in beds	
		103.7 - EOH CHTY ARG				
	EOH					

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
BCD28021	20.40	21.40	1.00	0.01	0.01	0.01	2	.03															
BCD28022	23.70	25.90	2.20	0.01	0.05	0.06	2	.03															
BCD28023	25.90	27.40	1.50	0.04	0.12	0.06	2	.03															
BCD28024	27.40	28.90	1.50	0.01	0.06	0.04	2	.03															
BCD28025	28.90	29.90	1.00	0.01	0.01	0.01	2	.07															
BCD28026	88.00	89.00	1.00	0.01	0.01	0.01	2	.03															
BCD28027	92.20	92.70	0.50	0.01	0.01	0.01	2	.03															
BCD28028	92.70	92.90	0.20	0.01	0.01	0.01	2	.03															
BCD28029	92.90	93.10	0.20	0.01	0.01	0.01	2	.03															
BCD28030	93.10	93.30	0.20	0.03	0.01	0.01	4	.03															
BCD28031	93.30	94.30	1.00	0.01	0.01	0.01	2	.03															
BCD28032	94.30	94.60	0.30	0.01	0.01	0.01	2	.58															
BCD28033	96.00	96.50	0.50	0.01	0.01	0.01	2	.03															
BCD28034	96.50	97.00	0.50	0.01	0.02	0.01	2	.03															
BCD28035	101.00	101.50	0.50	0.01	0.01	0.01	2	.03															
BCD28036	103.90	104.40	0.50	0.01	0.01	0.01	2	.03															

MINNOVA INC.

HOLE NUMBER: RG373 — DRILL HOLE RECORD — IMPERIAL UNITS: — METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER:
CLAIM NUMBER:
LOCATION: PHASE 1 PIT FLOOR

PLOTTING COORDS GRID: FIELD
NORTH: 729.00N
EAST: 10058.00W
ELEV: 1298.71

ALTERNATE COORDS GRID: UTM
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -90x 0' 0"
LENGTH OF THE HOLE: 140.80m
START DEPTH: 0.00m
FINAL DEPTH: 140.80m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: August 17, 1990
DATE COMPLETED: August 18, 1990
DATE LOGGED: August 25, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: FRONTIER
CASING: PULLED
CORE STORAGE: MINE SITE EXP. CAMP

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
63.10	-	-87x 0'	ACID	OK		-	-	-	-	-	
140.20	-	-85x 0'	ACID	OK		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 9.10	.CASING/					
9.10 TO 38.30	.ARG MIXED SEDS/	Colour - black to light olive Grain size - fine to v. fine Highly contorted tectonitic faulted arg sed (sericitic in zones) with an overall cherty component 11.4 - 11.5 flt 916.5 - 17.4L .flt/ 18.5 - 18.6 flt 923.9 - 24.6L .flt/ 24.4 - 25.8 v. sil? bleached chty? 26.2 - 26.4 flted 926.3 - 28.8L .str.sil?chty,tr py/ 30.5 m = 31.0 - 35.0 isoclinal folding tectonic highly contorted 936.7 - 37.7L .str.sil?/cht,tr sph/ as interval 23.7 - 28.9 RG372	 75 80 55	 Yellow sericite over 25% of interval locally up to 2.5 m thick 10.3 - 10.5 qtz dol vein with tr. fuchsite 21.6 - 24.4 strong sericite	 3% diss'd py	
38.30 TO 49.40	.MUT&ARG/	Colour - grey Grain size - v. fine Contact gradational Pyritic MUT interbedded graphitic arg 42.5 m 39.0 - 39.1 minor flt 939.7 - 41.0L .flted/ 43.0 - 43.1 flt 43.3 - 43.6 flted interbedded arg & mut 43.9 - 44.1 gouge 946.0 - 46.5L . flted/ 947.3 - 48.1L .flted/	 45		 3% diss'd py occ py beds of 20% py over 5-10 cm	
49.40 TO 99.10	.ARG&WACKE/	Colour - black and grey Grain size - v. fine to aphanitic Interbedded arg silts & wackes locally isoclinal folds @ 50.8 m occ 10-15 cm qtz carb veins to 59.5 962.6 - 62.8L .flt/ 71.8 - 72.2 slightly tectonic @ 74 m= 76.8 - 76.9 minor flt 81.0 - 88.1 minor flt 82 m=	 60 80	 @ 92.5 waches become slightly sericitic		

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		91.6 m qtz carb veining begins 95 m=	50	intermixed with unaltered seds		
99.10 TO 102.90	.QTZ DOL &ARG WAK/	Grain size - v. fine (ARG) veining X-cutting bedding bed dip=50 vein dip=25 @ 99.2 - 5 cm gouge competence shearing Intermixed weakly sericite wackes Argil & qtz dol veining Veins up to 2 m thick 99.9 - 100.1 flt		Weak sericite and occ fuchsite in qtz dol veins	Locally pyrite content 3-5% over 10 cm bottom vein contact has 1-2 cm py blebs	
102.90 TO 120.60	.SIL'D ARG &SERT/	Colour - grey olive Grain size - v. fine to aph. Highly contorted silts & arg TOI to 104 m 9114.5 - 116.3L .Flt/ 116.3 - 120.6 sericitic arg, qtz stockwork 9119.8 - 120.6L .flted/		9104 - 109.5L .Sil'd/ very weak dol stain 109.5 - 130 m sericitic		
120.60 TO 130.00	.DOL SEDS?/	Colour - olive Grain size - fine Strong dol arg? seds? remnant py beds highly contorted v. stretched @ 1300 m gradational contact to greenish-(chloritic) possible MAFICS	50	Stray dolomite Yellow sericite	Tr py in highly contorted beds	
130.00 TO 140.80	.DOL MAFIC?/	Colour - green Grain size - fine @ 1300 m gradational contact to greenish (chloritic) possible MAFICS Strong green (chlorite) lightens down hole		Strong dolomite No visible fuchsite		
	EOH					

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
BCD28037	26.30	28.80	2.50	0.01	0.03	0.01	2	.03															
BCD28038	36.20	36.70	0.50	0.01	0.01	0.01	2	.03															
BCD28039	36.70	37.70	1.00	0.01	0.02	0.01	2	.03															
BCD28040	37.70	38.30	0.60	0.01	0.03	0.01	2	.03															
BCD28041	38.30	40.30	2.00	0.01	0.01	0.01	2	.03															
BCD28042	40.30	41.10	0.80	0.01	0.01	0.01	2	.07															
BCD28043	41.10	42.60	1.50	0.01	0.01	0.01	2	.07															
BCD28044	48.90	49.40	0.50	0.01	0.03	0.01	2	.03															
BCD28045	49.40	49.90	0.50	0.01	0.04	0.01	2	.03															
BCD28046	98.60	99.10	0.50	0.01	0.01	0.01	2	.03															
BCD28047	99.10	99.60	0.50	0.01	0.01	0.01	2	.03															
BCD28048	100.20	102.90	2.70	0.01	0.01	0.01	2	.03															
BCD28049	114.50	115.30	0.80	0.01	0.05	0.02	2	.21															
BCD28050	115.30	118.00	2.70	0.01	0.01	0.01	2	.24															
BCD28051	118.00	119.70	1.70	0.01	0.01	0.01	2	.03															
BCD28052	119.70	120.60	0.90	0.01	0.01	0.01	2	.03															
BCD28053	120.60	121.60	1.00	0.01	0.01	0.01	2	.03															
BCD28054	129.50	130.00	0.50	0.01	0.01	0.01	2	.03															
BCD28055	130.00	130.50	0.50	0.01	0.01	0.01	2	.03															

MINNOVA INC.

HOLE NUMBER: RG374 | DRILL HOLE RECORD | IMPERIAL UNITS: | METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER:
CLAIM NUMBER:
LOCATION: SOUTH OF PIT

PLOTTING COORDS GRID: FIELD
NORTH: 688.00N
EAST: 9560.00W
ELEV: 1497.24

ALTERNATE COORDS GRID: UTM
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -85x 0' 0"
LENGTH OF THE HOLE: 262.70m
START DEPTH: 0.00m
FINAL DEPTH: 262.70m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: August 19, 1990
DATE COMPLETED: August 25, 1990
DATE LOGGED: August 26, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: FRONTIER
CASING: PULLED
CORE STORAGE: MINE SITE EXP CAMP

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
35.70	-	-86x 0'	ACID	OK		-	-	-	-	-	
175.90	-	-81x 0'	ACID	OK		-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE		ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 3.60	.CASING/						
3.60 TO 221.90	.MYPRO/	Colour - green Grain size - fine Tuffaceous to coarsely fragmental Occ cut by qtz carb veins +/- sulphides	@12m =	70	Tr fuchsite @ 31.0 Darker more chloritic sections increase from 44m to 127m bleached as around q.v. 127 - 131.0 131 - 168 - chloritic @168 weak sericitic alt & slightly tectonitic	2 - 3% diss'd py 31.1 - 32.6 - qtz carb vein 1% cp, 5% py, tr gal Tr fuchsite @ 127 - 131.0 qtz vein Tr base metals	Core broken to intact.
		69.0 - 69.1 minor flt. 75.8 - 76.0 minor flt. 76.4 - 76.5 minor flt. 978.8 - 79.2L .flt/ 81.1 - 81.3 flted			Yellow sericite as veinlets near and within qtz carb veins		
			84m	55			
		132.6 - 132.7 flt. 139.4 - 139.6 flted & sheared 140.4 - - 2cm gouge			@218.6 m To End of Interval Mod. Sericitization of the Mafics		
			189m =	70			
221.90 TO 227.70	.ARG MIXED SEDS & QV/	Colour - Black to light olive Grain size - Fine to aph. Highly contorted. Tectonitic arg seds. Sericitic in zones Overall chrty componant Occ qtz chrty intervals 221.9 - 222.7 ARG 222.7 - 223.9 SERT 223.9 - 224.7 Chrty v. sil'd minor qtz veining 224.7 - 227.7 - Sert			Yellow sericite over 70% of interval Silicification Tr fuchsite	3% diss'd py 9223.9 - 224.7L .tr sph in QV/	
227.70 TO 262.70	.MUT/	Colour - Grey Grain size - V. fine to aph. Contact faulted Minor pyrite. Highly contorted in zones. Cherty component in intervals			Silver grey sericite Weak silicification	1-3% Pyrite through Occ tr. sph	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		Occ rare arg frags & remnant sed beds				
		227.7 - 227.8 Flt				
		230.0 - 230.2 Flt	55			
			60			
		9236.1 - 236.7L .Flt/				
		240.9 - 250.1 Flt.			260.6 - 260.7 Qtz vein with tr sph.	
					near minor shearing.	
	EOH				255.4 - 255.9 tr. sph & py.	

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
BCD28056	31.00	32.00	1.00	.31	0.60	0.43	10	.10															
BCD28070	127.70	128.20	0.50	0.01	0.03	0.01	2	.03															
BCD28057	128.20	130.00	1.80	0.03	0.40	0.20	2	.03															
BCD28071	130.00	130.50	0.50	0.01	0.01	0.01	2	.03															
BCD28058	218.10	218.60	0.50	0.01	0.01	0.01	2	.03															
BCD28059	218.60	219.10	0.50	0.01	0.01	0.01	2	.03															
BCD28060	221.40	221.90	0.50	0.01	0.01	0.01	2	.03															
BCD28061	221.90	222.70	0.80	0.01	0.01	0.01	2	.03															
BCD28062	222.70	224.00	1.30	0.01	0.04	0.02	2	.03															
BCD28063	224.00	224.70	0.70	0.04	0.60	0.20	6	.03															
BCD28064	224.70	226.20	1.50	0.01	0.01	0.02	2	.03															
BCD28065	226.20	227.70	1.50	0.01	0.01	0.01	2	.03															
BCD28066	227.70	228.70	1.00	0.01	0.01	0.01	2	.03															
BCD28067	246.50	247.00	0.50	0.01	0.07	0.01	2	.03															
BCD28068	255.40	255.90	0.50	0.05	0.52	0.24	2	.03															

MINNOVA INC.

HOLE NUMBER: RG375 — DRILL HOLE RECORD — IMPERIAL UNITS: — METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER:
CLAIM NUMBER:
LOCATION: SOUTH OF PIT

PLOTTING COORDS GRID: FIELD
NORTH: 799.00N
EAST: 9519.00W
ELEV: 1491.56

ALTERNATE COORDS GRID: UTM
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -90x 0' 0"
LENGTH OF THE HOLE: 355.70m
START DEPTH: 0.00m
FINAL DEPTH: 355.70m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: August 26, 1990
DATE COMPLETED: September 7, 1990
DATE LOGGED: September 8, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: FRONTIER
CASING: PULLED
CORE STORAGE: MINE SITE EXP CAMP

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
29.60	-	-89x 0'	ACID	OK		-	-	-	-	-	
118.00	-	-88x 0'	ACID	OK		-	-	-	-	-	
178.90	-	-76x 0'	ACID	OK		-	-	-	-	-	
212.50	-	-79x 0'	ACID		POOR-ACID LEFT IN TUBE	-	-	-	-	-	
334.40	-	-79x 0'	ACID	OK		-	-	-	-	-	
80.80	158x 0'	-87x 0'	TRO-PARI	OK		-	-	-	-	-	
172.30	153x 0'	-82x 0'	TRO-PARI	OK		-	-	-	-	-	
348.20	159x 0'	-82x 0'	TRO-PARI	OK		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 3.60	.CASING/					
3.60 TO 295.50	.MYPRO/	Colour - Green Grain size - fine Coarsely fragmental to tuffaceous Occ cut by qtz carb veins Plus or minus base metal sulphides 912.0-12.1L .Flt dip = 65 deg/ 12 m= 24.0 - 33.6 Mod. Tectonitic 38.0 - 44.8 Mod. weak Tectonitic qtz veining with approx 3% py 66.6 - 67.1 highly fractured with qtz carb veinlets 67.1 - 67.2 Minor Flt 978.3 - 82.1L .Healed Flt Zone/ gouged over last 15 cm 985.0 - 85.1L .dip = 52 deg/ 85 m = 995.2 - 104.5L Core .Rubble/ to gouge to very broken. 105.3 - 105.7 Rubble 108.7 - 109.3 Rubble to v. broken 9109.3 - 109.5L .gouge, flt/ 116.0 - 116.1 Flt 9112.3 - 112.4L .bxed flt/ 112.3 - 114.6 flted, rubble, gouge and v. broken core. 9119 - 119.1L .dip = 55 deg/ 119 m = @ 122.3 - 2 cm gouge 143.0 - 145.0 m v broken to rubble minor gouge 9147 - 147.1L .dip =60 deg/ 9164.0 - 164.3L .flt/ 9167.0 - 167.7L .flted/ 9169.2 - 169.8L .flted/ 170.8 - 174.7 core v. broken 176.5 - 176.7 flted with broken core to 187.5 @ 191.3 m - 5 cm gouge 207 m = 213.0 - 213.3 bxd 9226.4 - 227.6L .flted/ gouge to rubble below fault darker more chloritic mafics,	65 52 55 60 65	Darker, more chloritic sections near top of hole and decrease downwards 41.7 to 57.0 lappilli weak sericitic After rubble core 95.2 to 104.5 m darker and more chloritic throughout to 207 - Bx 37	1-3% diss'd py Occ qtz veins with 5 - 8% Py over 5 - 10 cm. 47.55 - 47.6 qtz - carb vein 5% ga, 3% py, 1% cp 2% py 53/6 - 54/2 - 2% py 1% ga 1% sph & 1% cp 67.2 - 71.2 qtz carb vein (Bull qtz) fuchsite in micro contorted veinlets 3-5% py tr ga (occ blebs 1 cm wide) tr cp & sph. @ 208.5 - 10 cm qtz carb vein w/ base metals concentracted near top of intersection 9209.8 - 213.0L .qtzcarb w/base mtls/	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		becoming lighter down the hole. Occ 10 to 20 cm veins as above to 253.3 9253.3 - 253.7L .flted/ gouge and rubble core.		@ 263.5 Lappilli begin to become sericitic and @ approx 288 silicification is strong to EOI	1% cp, 1-2%ga, 1% sp, 2%py 219.3 - 220.6 as above qtz veining and bx to 221.8	
295.50 TO 339.00	.CHT,QV & SERT MIXED SEDS/	Colour - buff, grey Grain size - v. fine 3 cm gouge at contact Interbedded sericitic and cherty seds Tectonized with frags generally flattened and aligned with occ qtz veins 10 - 15 cm thick @ 308 m = 9309.3 - 310.6L .flted/ @ 315.7 - 2 cm gouge 9321.0 - 321.5L .flted/ 326 = 335 = 338.1 - 338.3 minor flting contact abrupt & broken	58 60 55	Very sil'd Strong sericitic alt'n Remnant seds @ 297.5 & 297.7 1 cm veinlets w/ v. light green ? fuchsite? Micaceous mineral. 311.0 - 311.3 light greed micaceous? cuchsite in qtz vein @335.9 to EOI ARG component prominent	Trace - 2% sph, & tr ga as blebs within qtz veinlets throughout 1-3% py in veinlets & beds	Core v. intact
339.00 TO 340.30	.MUT/	Colour - Grey Grain size - v. fine Pyritic throughout Minor gouge approx 339.5 - 339.8 minor flts @ 340.3 5 cm gouge basal contact flted	55	Mod silicification Sericite & pyritization	Tr. tet 1-2 % sph, tr. gal, tr 1% cp 2 - 3% py throughout in qtz veining	Core intact to mod broken
340.30 TO 345.10	.CHTY ARG/	Colour - Black Grain size - V. fine to aph. Highly fractured probable sil'd arg Contorted beds highly freactured by qtz veinlets 1.2 cm thick Occ py beds towards EOI Bottom contact highly fractured and faulted. Fault runs into MUT			Tr py throughout 30% py in beds from 343.5 to EOI in 3 - 5 cm widths	Core v. intact

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		unit below 9344.8 - 345.8L .flted/				
345.10 TO 355.70	.MUT/	Colour - grey Grain size - v. fine				
		Highly contorted pyritic MUT as about unit without qtz veining & visible sulphides	60	As above MUT unit	3 - 5 py throughout	Core v. intact
	EOH					

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
BCD28076	53.60	54.20	0.60	0.01	0.19	0.08	4	.03															
BCD28077	66.60	67.60	1.00	0.01	0.01	0.02	2	.03															
BCD28078	67.60	71.20	3.60	0.01	0.02	0.07	2	.03															
BCD28079	78.30	80.80	2.50	0.01	0.01	0.01	2	.03															
BCD28080	80.80	82.10	1.30	0.01	0.01	0.01	2	.03															
BCD28081	209.80	213.00	3.20	0.07	0.77	0.32	4	.03															
BCD28082	219.50	220.30	0.80	0.01	0.21	0.14	2	.03															
BCD28083	295.00	295.50	0.50	0.01	0.03	0.01	2	.03															
BCD28084	295.50	296.30	0.80	0.01	0.03	0.02	2	.03															
BCD28085	296.30	296.60	0.30	0.04	0.88	1.10	28	.10															
BCD28086	296.60	299.60	3.00	0.06	0.19	0.19	10	.07															
BCD28087	299.60	301.60	2.00	0.01	0.01	0.02	2	.03															
BCD28088	303.70	304.30	0.60	0.17	2.28	0.26	40	.07															
BCD28089	307.00	308.00	1.00	0.01	0.01	0.03	2	.03															
BCD28090	308.00	309.30	1.30	0.11	3.03	0.83	26	.10															
BCD28091	309.30	310.60	1.30	0.01	0.09	0.04	2	.03															
BCD28092	310.60	311.70	1.10	0.01	0.05	0.03	2	.03															
BCD28093	316.10	316.80	0.70	0.07	1.19	0.52	20	.07															
BCD28094	320.30	321.30	1.00	0.10	0.10	0.13	8	.03															
BCD28095	321.30	321.50	0.20	0.30	2.45	2.20	20	.21															
BCD28096	321.50	323.00	1.50	0.01	0.02	0.01	2	.03															
BCD28097	323.00	325.50	2.50	0.01	0.15	0.02	2	.03															
BCD28098	325.50	326.10	0.60	0.01	0.02	0.03	2	.03															
BCD28099	326.10	327.40	1.30	0.38	0.89	0.72	32	.14															
BCD28100	327.40	328.60	1.20	0.14	0.75	0.33	12	.03															
BCD28101	328.60	329.60	1.00	0.03	0.52	0.35	10	.17															
BCD28102	329.60	330.10	0.50	0.01	0.03	0.01	2	.03															
BCD28103	330.10	330.60	0.50	0.01	0.01	0.01	2	.03															
BCD28104	333.80	335.40	1.60	0.03	0.83	0.39	8	.07															
BCD28105	335.40	335.90	0.50	0.01	0.06	0.02	2	.03															
BCD28106	335.90	336.40	0.50	0.01	0.49	0.06	2	.03															
BCD28107	336.40	337.90	1.50	0.01	0.15	0.01	2	.03															
BCD28108	337.90	339.00	1.10	0.01	0.41	0.14	6	.03															
BCD28109	339.00	340.30	1.30	0.02	0.60	0.26	8	.03															
BCD28110	344.60	345.10	0.50	0.01	0.05	0.01	2	.03															
BCD28111	345.10	345.80	0.70	0.01	0.02	0.02	2	.07															
BCD28112	345.80	346.30	0.50	0.01	0.01	0.01	4	.03															

MINNOVA INC.

HOLE NUMBER: R6376 — DRILL HOLE RECORD — IMPERIAL UNITS: — METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER:
CLAIM NUMBER:
LOCATION: SOUTH OF PIT

PLOTTING COORDS GRID: FIELD
NORTH: 748.00N
EAST: 9401.00W
ELEV: 1484.28

ALTERNATE COORDS GRID: UTM
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -90x 0' 0"
LENGTH OF THE HOLE: 385.00m
START DEPTH: 0.00m
FINAL DEPTH: 385.00m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: September 7, 1990
DATE COMPLETED: September 14, 1990
DATE LOGGED: September 14, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
ROD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: FRONTIER
CASING: IN HOLE
CORE STORAGE: MINE SITE EXP CAMP

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
92.70	-	-86x 0'	ACID	OK		-	-	-	-	-	
185.00	-	-85x 0'	ACID	OK		-	-	-	-	-	
246.00	-	-82x 0'	ACID	OK		-	-	-	-	-	
294.70	-	-80x 0'	ACID	OK		-	-	-	-	-	
322.20	-	-80x 0'	ACID	OK		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 15.20	.CASING/					
15.20 TO 258.10	.MYPRO/	Colour - green Grain size - fine				
		Coarsely frag to tuff Occ cut by qtz carb veins + or - base metals			2 - 3% diss'd py.	
		915.2 - 17.3L .Flt/ 17.3 - 18.8 v. broken to rubble and gouge			18.9 - 19.6 qtz carb vein with 2 - 3% py.	
		918.8 - 19.2L .Flt/ 18.9 - 19.6 qtz				
		929.1 - 29.4L .Flted/				
		31.0 - 31.3 Minor Flt	60			
		33.9 - 38.2 broken core to rubble with occ 2.5 cm gouge zones				
		46.7 - 46.8 minor gouge		From 60.0 m downward increasing chlorite and increasing qtz carb veining (3 mm to 10 cm veins)		
		65.6 - 65.7 Minor Flt 67.4 - 74.9 v. broken to rubble				
		971.4 - 72.3L .Flted/ 74.7 - 74.9 rubble and gouge				
		983.7 - 83.9L .Flted dip=55 deg/ 85.1 - 85.25 flted dip = 60 deg. 92.5 - 94.2 Flted and sheared interval				
		99.4 - 104.0 Tectonitic and flted 103.5 - 103.9 flted 106.0 - 106.6 Rubble to v. broken 106.6 - 106.9 Flted qtz/carb veining 9108.3 - 108.7L .flted dip = 35 deg/ 110.1 - 110.3 gouged and flted 114.0 - 114.3 gouged and flted 118.5 - 119.0 rubble and flted		@ 123.0 Lappilli becoming sericitic near a qtz carb veining section and 1 - 5 mm blebs fuchsite @ 131.7 losing sericitic alteration of lappilli	9128.5 - 131.2L qtz/carb veining with .8% py,1%ga,1-3% sph/ flted throughout interval	
					130.1 - 130.3 Rubble qtz veining w/ 10% ga, 3 % sph 5% sph - Prob lost core of approx 30%	
		132.1 - 132.5 gouged 132.5 - 149.0 tectonitic with occ flted				

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		157 m	55			
		164.5 - 164.9 flted w/qtz carb veining 9166.4 - 167.0L .flted dip=15 deg/ 168.7 - 169.0 flted 170.0 - 170.5 flted with dips ranging from 15 deg on ends			9164.6 - 164.7L .Tr. ga, py, sph/ in qtz/carb vein in flt zone	
				173.5 - 174.0 slight sericitic alt of lappilli. Then back to darker chloritic mafics. Core still slightly tectonitic to 215 m		
		205 m =	60	@215 m lappilli become sericitic		
		9234.1 - 234.2L .isoclinal fold/ tight fold 25 cm above the start of a major flt zone. 9234.4 - 261.5L .flted zone/				
				237.2 - 237.6 dark chloritic mypro		
		256.6 - 258.1 strongest gouged zone in interval. Top dip 50 deg Bottom dip 20 deg				
258.10 TO 265.80	.SERT,CHT &SIL'D ARG/	Colour - olive and black Grain size - v. fine to aph.				
		TOI flted with occ flted wedges of remnant MYPRO within interbedded arg and sert with cherty frags. Unit becomes more cherty with depth.		Sericite trace fuchsite within qtz veining	1 - 3% py throughout 25% pyrite in occ 2 - 5 cm qtz veins Rare trace ga, tr. cp, tr sph in qtz veining.	
265.80 TO 285.10	.SIL'D ARG/	Colour - black Grain size - v. fine				
		Well banded to contorted sil'd and predominently cherty arg. Intruded by qtz veining 1-5 cm thick 9274.4 - 285.2L .Flted zones/ with tectonitic, v. broken to rubble between flts. 274.4 - 275.0 flted 275.0 - 275.5 tectonitic 275.5 - 276.1 flted 276.1 - 277.7 tectonitic 277.7 - 279.0 flted and rubble 279.5 - 279.8 1 m lost core flted 283.5 - 283.9 gouged qtz vein 284.6 - 285.1 strong gouge contact faulted		Silicification	3% py	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
285.10 TO 296.00	.DOL VOL/	Colour - greyish green Grain size - fine Dolomitic, Volcanics. prob. MYPRO 289.3 - 289.4 - Flt 291.3 - 291.4 - Flt 9293.2 - 293.8L .Flt/ 9294.4 - 295.2L .Flt/ 295.7 - 295.9 gouged EOI gouged and @ 295.9 sharp broken to a 10 cm qtz carb vein 5% py; 3 - 5% sph; 2% cp; 1% ga; tr. tet?		 Tr. fuchsite with zones of 10 - 20 cm with approx 10% fuchsite Leucoxine @ TOI	 2 - 3% py throughout Tr to 1% cp, ga, and sph	
296.00 TO 297.80	.SIL'D ARG & SMS QV/	Colour - grey & py. Grain size - v. fine As above chty Arg units with SMS veins 296.3 - 296.9 flted 297.1 - 297.2 chrty arg Upper contact sharp vein Bottom contact 2 cm gouge 9297.7 - 298.8L .Flt/			 9296.9 - 297.1L .SMS/ 4% py; 3% cp; tr. tet?; tr. ga?; vein @ 90 deg to core axis 9297.2 - 297.7L SMS 40% py; 3% cp; tr. sp; 3% ga; tr.tet.	
297.80 TO 307.50	.MIXED SEDS/ HETEROLITH IC FRAGMENTAL &SIL'D WACKE	Colour - grey Grain size - med to fine Strongly altered dolomitic, sericitic course sediments. Heterolithic fragmental from 298 to 298.5 m 301.9 - 302.0 flted dip = 50 deg up hole & dip = 70 deg down hole @303.7 - 3 cm gouge dip approx -90% 304.2 - 304.5 Highly broken minor flt 305.1 - 305.4 Highly broken minor flt @ 306 - 2-3 cm gouge dip approx 90 9306.1 - 311.2L .Flt Zone/	 60	 Mod. Dolomite Silicification 301.1 - 301.5 Dol vein Dip = 50 deg Flted @ base = 55 deg	 5% py in beds and diss'd Tr. diss'd tet gal, py & cp in qtz veinlets	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
307.50 TO 317.20	.MUT/	Colour - grey Grain size - v. fine to aph. Typical highly fissile Mut As indicated above TOI highly faulted and @ 311.9 - 312.2 - flted 9312.7 - 313.3L major .flt dip=80 deg/ Barren 10 cm qtz/carb vein @ 310.9 m and within most gouge zones in 2-5 cm thickness. 314.3 - 314.7 flted 9315.4 - 315.5L .flt dip = 60 deg/ with minor flts starting @ 310.1 m and major gouge in last 10 cm	50	Silver grey sericite	3 - 4% py throughout 9315.5 - 317.2L .Tr 1% tet, ga,&cp/	
317.20 TO 321.60	.CARB/DOL VEIN/	Colour - Greyish white Stockwork to crackle bx over first 10 cm Vein contact @ Top = 70 deg. @ base dol overprinting approx 60 deg. 319.2 - 319.45 Remnant sed? MUT with 1-2% tet,ga,cp and 1% sph.		Ferroan Dol.	Tr 1% tet, cp, ga & sph overall with zones up to 20 cm with values to 5% of each	Absence of qtz.
321.60 TO 327.60	.SMS,MUT& QTZ/CARB VEINS/	Colour - greyish & white Grain size - v. fine Highly pyritic SMS @ TOI grading with minopr flts to altered MUT/ARG with qtz/carb veins up to 1 m thick. 324.3 - 324.4 flt. 325.3 - 325.6 flted MUT and broken qtz carb vein			9321.6 - 322.7L .SMS 30% py tr. tet/ Tr. sph, gal & cp 323.4 - 323.7 qtz carb vein sampled	
327.60 TO 332.60	.MUT/	Colour - grey Grain size - v. fine to aph. Typical highly fossile MUT Occ qtz carb veinlet to 10 cm vein moderately faulted and flt fractured 328.3 - 328.5 flted @TOI @EOI 329.5 - 329.9 Qtz carb vein and flted gouge Contact gradational dip = 332.1 - 332.6 ARG	30 60 60		3 - 5% py throughout diss'd & as beds.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
332.60 TO 370.70	.MIXED SEDS/ IN HETEROL-ITIC FRAGS &SIL'D WACKE	Colour - grey Grain size - med to fine Interbanded arg & chty seds moderately dolomitic. Heterolithic fragmental flow Highly contorted	50 55	Mod dol.	Tr. tet throughout 3% py throughout Tr sph & ga & cp within vein and veinlets & diss'd 347.85 - 347.95 2% tet; 3-5% sph; 5% py tr. - 1% ga in qtz vein 9349.0 - 349.7L .3% py,sph,1%tet,ga/ 9350.8 - 351.1L .2% tet,sph,1%ga/ tr cp 9357.2 - 358.3L .1%tet,ga,cp,3%sph/ in qtz veinlets	
		@350.6 - 3cm gouge dip 55 deg up hole opposite to 55 deg dip of foliation down hole @360.3 - 3 cm f;t dol = 35 deg 362.2 - 363.1 minor flts 9365.5 - 366L .Flt/ cht, qtz carb & tr. fuchsite in gouge		9354.2 - 363.9L .MUT/ Sil'd MUT texture prominent with numerous qtz veinlets 9363.8 - 370.7L .CHT/ @368.8 - 369.0 qtz carb vein dip =25deg X-cutting foliation with 1% ga, cp, 2% py.		
370.70 TO 377.00	.SIL'D ARG/	Colour - Black Grain size - v. fine to aph. Sil'd tectonic argillite	45	Graphitic	2-3% py in beds	
377.00 TO 384.90	.SERT&CHT/ MIXED SEDS	Colour - Olive grey Grain size - v. fine to aph Interbanded sericitic chert Occ py bands @ TOI @ 384.2 - 384.5 high angle approx 10 deg qtz carb vein EOI broken w/fuchsite Over 2 cm - dip = 50 deg	50	10% sericite to 331.5 m Mod Dolomitic Tr Fuchsite in veinlets @EOI Leucoxine	Tr. - 2% v. fine diss'd py throughout	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
384.90 TO 385.00	.SIL'D ARG/	Colour - Black Grain size - v. fine to aph. As above sil'd arg unit				
	EOH					

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
BCD28113	18.90	19.70	0.80	0.01	0.46	0.07	4	.03															
BCD28114	128.50	130.10	1.60	0.01	0.02	0.01	4	.03															
BCD28115	130.10	130.30	0.20	0.95	10.3	4.45	59	.51															
BCD28116	130.30	131.20	0.90	0.03	0.10	0.14	6	.03															
BCD28117	164.60	164.70	0.10	0.01	0.11	0.31	2	.03															
BCD28118	237.50	237.60	0.10	0.10	0.76	0.59	12	.03															
BCD28119	249.00	250.00	1.00	0.01	0.05	0.04	2	.03															
BCD28120	256.60	258.10	1.50	0.01	0.01	0.01	2	.03															
BCD28121	258.10	259.40	1.30	0.01	0.01	0.01	2	.03															
BCD28122	259.40	261.00	1.60	0.01	0.01	0.01	2	.03															
BCD28123	278.50	279.50	1.00	0.01	0.55	0.15	4	.03															
BCD28124	283.10	284.60	1.50	0.01	0.01	0.02	2	.03															
BCD28125	284.60	295.10	0.50	0.01	0.09	0.07	2	.03															
BCD28126	285.10	286.10	1.00	0.01	0.01	0.01	2	.03															
BCD28127	291.10	293.60	2.50	0.01	0.07	0.02	2	.03															
BCD28128	293.60	295.40	1.80	0.01	0.07	0.03	2	.03															
BCD28129	295.40	295.90	0.50	0.01	0.09	0.16	6	.03															
BCD28130	295.90	296.00	0.10	0.44	1.31	0.35	34	.03															
BCD28131	296.00	296.90	0.90	0.01	0.05	0.05	4	.03															
BCD28132	296.90	297.10	0.20	0.60	3.85	3.40	70	.07															
BCD28133	297.20	297.70	0.50	0.65	2.60	3.10	40	.03															
BCD28134	297.70	297.80	0.10	0.11	1.56	0.88	12	.03															
BCD28135	297.80	298.50	0.70	0.01	0.01	0.02	2	.03															
BCD28136	298.50	300.00	1.50	0.01	0.10	0.13	2	.03															
BCD28137	300.00	301.10	1.10	0.01	0.03	0.01	2	.03															
BCD28138	301.10	301.50	0.40	0.01	0.11	0.09	4	.03															
BCD28139	301.50	303.00	1.50	0.01	0.36	0.18	6	.03															
BCD28140	303.00	304.50	1.50	0.01	0.10	0.08	2	.03															
BCD28145	304.50	306.00	1.50	0.01	0.07	0.05	2	.03															
BCD28146	306.00	307.00	1.00	0.01	0.04	0.01	2	.03															
BCD28147	307.00	307.50	0.50	0.01	0.08	0.01	2	.03															
BCD28148	307.50	308.00	0.50	0.02	0.12	0.01	12	.03															
BCD28149	308.00	309.50	1.50	0.01	0.01	0.01	2	.03															
BCD28150	309.50	312.00	2.50	0.01	0.01	0.01	2	.03															
BCD28151	312.00	314.50	2.50	0.01	0.01	0.01	2	.03															
BCD28152	314.50	315.50	1.00	0.01	0.01	0.01	2	.03															
BCD28153	315.50	316.90	1.40	0.01	0.05	0.02	2	.03															
BCD28154	316.90	317.20	0.30	0.60	3.32	2.09	38	.38															
BCD28155	317.20	319.20	2.00	0.24	0.88	0.42	24	.03															
BCD28156	319.20	319.50	0.30	2.10	7.45	4.55	170	.27															

Sample	From (m)	To (m)	Length (m)	CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB		
BCD28157	319.50	320.60	1.10	0.25	1.00	0.69	36	.03																
BCD28158	320.60	321.60	1.00	0.05	0.38	0.16	8	.03																
BCD28159	321.60	322.70	1.10	0.08	0.49	0.21	22	.27																
BCD28160	322.70	323.40	0.70	0.02	0.41	0.19	6	.07																
BCD28161	323.40	323.70	0.30	0.01	0.19	0.15	2	.03																
BCD28162	323.70	324.80	1.10	0.02	0.39	0.20	6	.03																
BCD28163	324.80	325.00	0.20	0.09	1.33	0.31	12	.24																
BCD28164	325.00	326.50	1.50	0.07	0.68	0.19	8	.07																
BCD28165	326.50	326.70	0.20	0.01	0.14	0.04	4	.03																
BCD28166	326.70	327.60	0.90	0.01	0.02	0.01	2	.03																
BCD28167	327.60	328.60	1.00	0.01	0.04	0.01	2	.21																
BCD28168	328.60	331.60	3.00	0.01	0.08	0.01	2	.17																
BCD28169	331.60	332.60	1.00	0.01	0.02	0.01	2	.03																
BCD28170	332.60	333.10	0.50	0.010.	0.08	0.09	8	.03																
BCD28171	333.10	335.10	2.00	0.01	0.17	0.13	6	.03																
BCD28172	335.10	337.10	2.00	0.01	0.09	0.10	4	.03																
BCD28173	337.10	338.00	0.90	0.01	0.02	0.05	2	.03																
BCD28174	338.00	339.00	1.00	0.03	0.50	0.31	10	.03																
BCD28175	339.00	340.50	1.50	0.09	0.61	0.35	16	.07																
BCD28176	340.50	342.50	2.00	0.01	0.03	0.05	2	.03																
BCD28177	342.50	344.00	1.50	0.01	0.01	0.10	2	.03																
BCD28178	344.00	346.00	2.00	0.01	0.02	0.08	2	.03																
BCD28179	346.00	347.80	1.80	0.01	0.01	0.09	2	.03																
BCD28180	347.80	348.00	0.20	0.68	2.27	1.26	140	.24																
BCD28181	348.00	349.00	1.00	0.04	0.21	0.16	12	.14																
BCD28182	349.00	349.70	0.70	0.80	1.60	0.75	170	.38																
BCD28183	349.70	350.80	1.10	0.01	0.20	0.10	2	.14																
BCD28184	350.80	351.10	0.30	0.35	1.70	1.90	40	.21																
BCD28185	351.10	353.10	2.00	0.05	0.60	0.50	10	.10																
BCD28186	353.10	353.90	0.80	0.01	0.12	0.11	2	.14																
BCD28187	353.90	354.20	0.30	0.01	3.12	1.36	16	.07																
BCD28188	354.20	354.70	0.50	0.05	0.57	0.38	18	.07																
BCD28189	354.70	357.20	2.30	0.01	0.03	0.02	2	.14																
BCD28190	357.20	358.30	1.10	0.22	0.72	0.86	40	.31																
BCD28191	358.30	360.80	2.50	0.01	0.01	0.01	2	.10																
BCD28192	360.30	363.10	2.30	0.01	0.12	0.05	6	.34																
BCD28193	363.10	363.80	0.70	0.01	0.01	0.04	4	.38																
BCD28194	363.80	365.50	1.70	0.01	0.08	0.01	2	.10																
BCD28195	365.50	366.00	0.50	0.02	0.13	0.06	2	.03																
BCD28196	366.00	368.80	2.80	0.01	0.01	0.05	2	.03																

Sample	From (m)	To (m)	Length (m)	CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	
BCD28197	368.80	369.20	0.40	0.01	0.05	0.14	4	.03															
BCD28198	369.20	370.70	1.50	0.01	0.01	0.01	2	.03															
BCD28199	370.70	371.70	1.00	0.01	0.01	0.01	2	.21															

MINNOVA INC.

HOLE NUMBER: RG377 — DRILL HOLE RECORD — IMPERIAL UNITS: — METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER:
CLAIM NUMBER:
LOCATION: SOUTH OF PIT

PLOTTING COORDS GRID: FIELD
NORTH: 648.00N
EAST: 9298.00W
ELEV: 1479.15

ALTERNATE COORDS GRID: UTM
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -90x 0' 0"
LENGTH OF THE HOLE: 161.20m
START DEPTH: 0.00m
FINAL DEPTH: 161.20m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: September 9, 1990
DATE COMPLETED: September 15, 1990
DATE LOGGED: September 10, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: FRONTIER
CASING: IN HOLE
CORE STORAGE: MINE SITE EXP. CAMP

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
108.80	-	-84x 0'	ACID	OK		-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 9.10	.CASING/					
9.10 TO 161.20	.MYPRO/	Colour - green Grain size - fine				
		Coarsely fragmental to tuff Occ cut by qtz carb veins + or - base metals		Darker more chloritic towards TOI	2 - 3% diss'd py	Core rubble to intact overall v. broken
		916.5 - 19.0L .Flted to v. broken/ 924.0 - 27.4L .Flted to v. broken/ 941.5 - 52.0L .Flt/rubble/v.broken/	55			
				lappilli become sericitic @50.5	59.9 - 60.6 - 5% ga;3%sp;2-3% cp in Qtz carb vein 66.7 - 67.6 qtz/carb vein with 1-2% ga, tr sp, rubble & gouge to 68.3	
		69.4 - 71.9 flted to v. broken over mafics & qtz/carb veining 976.1 - 78.5L .flted to v. broken/		77.5 - 80.0 fuchsite along qtz & sericitic veinlets		
				82.6 - 83.2 bull qtz & carb vein 89.7 - 90.5 fuchsite along qtz & sert veinlets		
				92.6 - 93.7 Bull qtz carb veining		
		92.5 - 92.6 flt 94.6 - 95.0 flted with fuchsite to 97.0				
		97.0 - 97.3 flted 97.9 - 99.5 qtz carb veining 99.5 - 100.4 flted & v broken 100.4 - 122.1 fairly intact & broken cire icc, nubir fkt lappilli sericitic 122.1 - 122.3 gouge & rubble				
			60			
				@122.3 darker more chloritic lost sericitic lappillies 137 - 138 qtz carb veining & slightly sericitic lappillies		
		9139.0 - 140.5L .flted to v.broken/ 140.5 - 150.1 v. broken core 150.1 - 154.9 rubble to v. broken 9154.9 - 161.2L .flt. all gouge/				Flt made hole impassable tryed B.Q. rods but unable to get through.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
						Hole abandoned & moved 65 m north along section
	EOH					

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
BCD28141	59.90	60.00	0.10	0.16	1.09	1.00	12	.07															
BCD28142	66.70	67.60	0.90	0.02	0.07	0.06	2	.03															
BCD28143	71.00	72.30	1.30	0.01	0.08	0.06	2	.03															
BCD28144	74.60	74.80	0.20	0.09	0.36	0.82	6	.24															

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: Sam Horizon

PLOTTING COORDS GRID: Sam Survey
NORTH: 758.68N
EAST: 12287.90W
ELEV: 1058.77

ALTERNATE COORDS GRID: Estimated
NORTH: 7+65N
EAST: 123+ 0W
ELEV: 1060.00

COLLAR DIP: -55° 0' 0"
LENGTH OF THE HOLE: 310.00m
START DEPTH: 0.00m
FINAL DEPTH: 310.00m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: August 11, 1990
DATE COMPLETED: August 16, 1990
DATE LOGGED: August 13, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: Frontier
CASING: Pulled
CORE STORAGE: Sam Exp. Camp

PURPOSE: Continuation of step out drilling on Sam Horizon NW.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
57.00	-	-55° 0'	ACID	OK		-	-	-	-	-	
105.70	-	-55° 0'	ACID	OK		-	-	-	-	-	
169.80	-	-55° 0'	ACID	OK		-	-	-	-	-	
267.30	-	-53° 0'	ACID	OK		-	-	-	-	-	
307.00	-	-53° 0'	ACID	OK		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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-	-	-	-	-		-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 36.50	«CSG»					
36.50 TO 58.90	«Sil Arg Bx »	Gray. Fine to very fine. Deformed argillite, weak to moderate foliation, phyllitic. Quartz veining varying in size from 1 mm. stringers to 10 mm. Some silicified fragments broken-up, tectonite (bx). Occasional sericitic alt in deformed clasts? and parallel to foliation. eg at 39.4m and 41.2m. Medium. 44.3 - 45.3m: Coarser grained, light coloured unit also showing phyllitic texture. Unit continues to vary in grain size and degree of brecciation. Minor fault at 46.9m. Gradational contact 49.4m. from tectonite into more consistent med. grained phyllitic rock (tuff?) which ends at 51.0m. grading into silicified cherty arg bx. At 53.9m. Gradational change into black tect. with greater arg. content. {56.9 - 57.9} «flt arg bx» zone within deformed qtz arg.		Intense silicification throughout, v. minor sericite alteration. Where silicification lers intense, ser present. Degree of silic. less intense.	Pyrite parallel to foliation, occurs as streaks or blebs of fine grained pyrite. Fine py blebs unrelated to cleavage up to 3 mm. diameter. Pyrite varies 1 - 10%.	Core generally competent owing to silicification. Unit characterized by gradational changes in tectonite to a well bedded structure. Possible preferential faulting along less silic. argillite.
58.90 TO 60.80	«Ser Arg»	Green. Fine - v. fine. Green fine grained phyllitic arg, deformed laminations. Minor interbeds of black arg.		Sericite alt and more dominant silic.	Py occurs in random single grains; fine bands exhibiting same deformation pattern as arg and in blebs with no orientation.	
60.80 TO 67.60	«Sil Arg Bx »	Gray, black. Fine. Grades downhole into fine good silic. arg siltstone and arg bx.			Py random gains, bands and blebs.	
67.60 TO 79.70	«Ser Chty Arg Bx»	Gray, black. Fine xalline. Above grades into lithologies exhibiting ribbon cherts. Deformed interbeds of arg and py seds. Occasional sericite following foliations. At 75.5m: Minor fault displacing qtz-carbonate vein. {76.2 - 77.3} «flt ser chty arg»	45	From 77.3 gradual increase in presence of sericite within laminated alt arg.	Disseminated py bands and blebs. No visible sulphide. From 77.5 - 77.6m: Py 1 - 5%. Py uneven distributions occuring in fine grained blebs and locally in	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		Fault zone in chty sericitized arg. 4 zones within 1 - 1m. Principal fault at 76.9m. 78.7m. Well laminated black arg. (9 cm. thick)	72		laminations.	
79.70 TO 91.90	«Sil/Ser Ch ty Arg»	Grey, green. Fine xalline. Laminated sericite chert. Laminations/foliation occasionally deformed. Foliation sheared around more competent qtz vein clasts. {90.6 - 91.2} intermittent «flt bx zone»	66	Sericitization in laminations. Local silic associated qtz veining.	V. fine py disseminated along laminations parallel to sericite and along qtz vein stringers. Py 5% locally up to 10%.	
91.90 TO 105.50	«Ser/Sil Ar g Cht Bx»	Grey, green, black. Fine to xalline. 91.9 - 92.1m.: Minor fault gouge. Laminated chert and pyritiferous argillite. Minor fault at 92.7. Grey cherty argillite grades into black cherty argillite with local brecciation (tectonite). 93.3 - 94.2: Intermittent fault bx zone with minor development graphitic argillite. 96.8 - 97.1: Laminated cherty arg, bedding at {97.6 - 98.0} «Het Frag» 103.4 - 105.1 Cht arg flt bx zone.	85	Silicification, Sericitization. Silicification associated with qtz veining. 101.5 - 102: Locally more abundant qtz ser alt.	Fine grained pyrite disseminated along laminations. Average 5% py locally 10 - 15%. {97.5 - 98.4} «5% gn + sp + te» Fine grained base metal sulphide associated qtz vein cross cutting bx and Het Frag. Sulphides in decreasing order abundance py > gn > sp > te. Pyrite disseminated through interval in stringers and blebs.	Core halved and quartered with 1/4 to Min-En and 1/4 to Sam Mine Lab. Cor base II.
105.50 TO 122.90	«Sil Chty A rg»	Grey, black. Fine xalline. Fault zone 103.4 - 105.1m. seperates lighter grey cherts from consistently darker grey black laminated ribbon cherts and graphitic argillite. Laminations locally folded and brecciated. From 116.2 - 116.4: V. fine chert, black argillite laminations. Chert beds vary between <1 - 3mm. Arg laminations generally finer averaging 1 mm. or less.	70	Pyritization and silicification associated with qtz. Minor carbonate veins. Qtz carbonate vein at 107.5m. and 108.3m.	% Py varies between sections of cherty argillite. Local concentrations 5 - 10% of disseminated blebs and fine bedded disseminated py along laminations.	Black laminated argillite is graphitic and may tie into an EM anomaly. Core section from 111.0 to 115.3 generally massive cherty argillite.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		Light grey. Fine. 117.8 - 121.0: Bleached chert argillite with cross cutting qtz vein.	30 60	Quartz dolomite veins bleaching host arg and chert.	Py 2% 1% gn + sp + te at 117.0m.	
122.90 TO 123.10	«Arg Flt Gouge»	Black. Fine. Black graphitic fault gouge.		Partly silicified.	Pyrite <1%.	
123.10 TO 126.70	«Dol/Ser Alt Maf Tuff?»	Grey, brown. Fine. Fault zone 123.1 - 124.5. 3 brecciated intercepts within dolomitized mafic tuff. Occasional interbeds of sericitic tuffaceous rock including some argillite.		Dolomitization, sericitization and alteration of a mafic component, in part, to fuchsite. Some silicification due to qtz veins.	Fien grained pyrite disseminated through interval, varying 3 - 7%. Local blebby concentrations (eg 124.7m) associated with silicification: 5 - 20%	
126.70 TO 127.10	«Alt Tuff Bx»	Grey. Fine. Fault gouge/bx zone with some silicification by cross cutting qtz veins.	60	Alteration masked by brecciation.	5% py in disseminated grains and blebs.	
127.10 TO 129.80	«Sil Chty Arg Flt Bx»	Grey, black. Fine. Poorly competent cherty, graphitic arg, in part silicified. Blocky core indicates faulting fracturing present.		Interval shows 3 broken qtz veins.	1 - 3% py stringers and blebs.	
129.80 TO 135.10	«Ser Cht Tuff Arg»	Grey, black. Fine. Laminated ribbon cherty and argillites. Qtz veins x-cutting beds. Local brecciation and deformation of chert. {131.5 - 132} «Ser Fuch Maf Tuf» Blocky fault zone 132.2m. to 132.8m. within cherty argillite.	80	Qtz-carbonate veins occupying 6% of interval.	1 - 3% fine disseminated pyrite throughout. Local blebs associated qtz-carb veins and greater % to 10% associated argillite at 131.2m.	
135.10 TO 136.20	«Dol Maf Tuf Gou/Bx»	Grey. Fault breccia/gouge zone.		Fine disseminated pyrite 1 - 2%. Local 15 - 20% concentration incompetent blocks within fault zone.		

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
136.20 TO 138.00	«Dol/Ser Ma f Tuff»	Grey, brown. Fine - med. Non descript dol mafic tuff, preferential splitting along thin sericite layers at C.A. of	70	Brown - yellow , weak - moderate sericite alteration. Moderate - intense dolomitization.	3 - 5% fine disseminated pyrite.	
138.00 TO 143.20	«Sil/Dol Ch t Arg»	Grey, black. Fine crypto crystalline. Minor flt gouge at 138.05m. Deformed - folded contorted black silicified graphitic argillite and grey ribbon cherts. Fine grained pyrite beds are contorted within argillite at 139.2m. Qtz carbonate veining approx. totals 20% of interval.		Silicification probably in relation tp qtz carbonate veining. Carbonate (dolomite) ranging from 20 - 50% of veins. Silicification moderate to pervasive throughout argillite.	5% fine disseminated pyrite with local concentrations within contorted beds and occasional blebs associated with qtz-carbonate veins.	Blocky core at 141m. and 142.2m.
143.20 TO 182.60	«Dol/Ser Ar g Wacke»	Grey, brown, black. Fine - med. Sequence of alternating argillites and arenites (wacke) with phyllitic texture. Minor faulting characterized by intervals of fault gouge 1 - 10 cm. thick. Argillite sections exhibit tectonite textures. From 143.2 - 171.3m: Qtz dolomite stringers, veining and flooding. Max width 15 cm. Dolomite greater than qtz. Within interval approx total 10 - 15%. 171.3 - 178.4m: 15 - 20% qtz dol stringers, veining and flooding with increases in silica over dolomite. 178.4 - 182.6m: Approx 5% qtz/dol veining. Within above 3 sections veins irregular with no preferred orientation. From 143.2 - 166.3m: Sediments vary from dark argillites to sandstone. From 166.3 - 182.6: Marked bedding between black argillites and grey wacke. % wacke beds increases downhole. {174.35 - 175.7} «Het Frag?» Clasts of angular - subrounded argillite, qtz dol and sericite altered clasts. Tectonic bx also present. Major zones of fault bx and gouge occur between {177.7 - 178.5} «Flt bx»		Sequence generally shows moderate dolomitization, with intense zones associated with qtz carbonate veining Weak to moderate grey brown sericitization present along planes of foliation. Dolomitization tends to occur in coarser grained lithologies.	Sulphides distributed in disseminated blebby stringers and layered texture Pyrite exhibits all of the above, with sphalerite, galena and chalco-pyrite locally occuring in association with qtz carbonate veins. Base metal sulphides occur in minor amounts except between 149.1m - 152.0m with 1 - 2% combined. Local concentrations up to 10% combined over 10 cm. Pyrite exhibits broken framboidal texture. {165.35 - 171.7} «2% gn + sp + cp» Very fine gd in coarse disseminated blebs in qtz dol veins. Veins approx 1 cm width containing up to 40% sulphide. {174.23 - 174.3} «2% cp + te + 25% sp+ gn» 15 - 20% py also present.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		180.0m - 181.1m. Fault breccia in argillite tectonite.			175.4m., 1 cm wide qtz/dol vein containing 20% py, 3% gn, 1% cp, 1% sp, 2% te. {178.4 - 179.9} «20% py»	
182.60 TO 190.00	«Arg Flt Bx »	Grey, black. Fine. Argillite fault breccia and gouge zone. Cross cutting qtz - dolomite veins have also suffered brecciation.		Dolomitization tends not to affect - argillic lithologies but where grain size coarsers, dol moderate. Minor yellow brown sericite altertion.	3 - 5% fine disseminated pyrite throughout. Locally more abundant pyrite associated with faulted tectonite 8 - 10% Very localized base metal sulphide at 185.0m. Over 23 cm. 1% sp trace cp.	
190.00 TO 212.00	«Dol Arg Bx »	Grey, black. Fine. Deformed argillite (tectonite) sections displays folding (hinge zones ay 196.8m) and cleavage with angle to C.A. of Qyz dol veins also exhibit deformation within sequence. Veins generally <1 cm., but largest 2 cm. Faulting of sequence taken place; zones gou/bx at bollowing intervals: 200.2 - 200.6m. 202.35 - 202.5m. 205.2 - 205.4m. At 209.3m. - 209.5: Fine (1 mm.) lamination argillite.	85 67	Intense qtz dolomte veining occupying 40 - 50% of interval.	3 - 5% fine disseminated pyrite. Locally more abundant 10 - 15% associated with qtz/dol veins. Base metal sulphides <1% sp + cp betwee n 202.1 - 204. Within this interval local concentrations associated with qtz/dol veining eg. at 202.8m, over 12 cm. 25% py, 1% cp, 1% sp.	Core breaking easily along planes of foliation and generally blocky due to faulting.
212.00 TO 223.50	«Het Frag»	Grey, black, brown. Fine coarse. Gradational change from tectonite above into Heterolithic fragmental. At 212.0m, subangular - subrounded argillite, sericite and qtz dolomite clasts of sand to large pebble size in fine argillite qtz dolomite matrix. 212.5 - 212.7: White qtz dolomite vein. Interval varies from dark argillite Het Frag to light grey sericitic/qtz dol Het Frag. 216.5 - 216.9: Fault gouge within more arenaceous bed (wacke). Section from 216.0 onwards punctuated with faults.		Interval displays abundant qtz/dol veining and alteration. Dolomitization prevalent over silicification. Green talc present.	Pyrite dispersed throughout interval averaging 10 - 15% with local concentrations up to 20%. The pyrite textures vary from fine individual disseminated grains, to granular blebs and layered grains parallel to bedding/ foliation. Base metal sulphides were observed over a minor part interval. At 212.95m, 1% sp and trace gn over 4 cm associated with qtz dol veining. At 213.9 : Trace galena and sphalerite.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
223.50 TO 225.30	«Ser Cht/Het Frag»	Black, grey, green. Fine - coarse. Transitional Het Frag from a more black argillic composition to a greener sericitic cherty composition.		Minor qtz/dol veining.	Pyrite distributed throughout interval mostly occurring as fine grains or granular blebs in matrix of Het Frag. Approx. 10 - 15% Py, locally up to 20%.	
225.30 TO 230.70	«Ser Chrt Atz-Dol»	Grey, green, yellow, brown. Fine. Generally laminated chert and sericite. Directions of laminations change downhole, appear contorted. 225.8 - 226.0 Small zone of Het Frag, clast supported. 229.4 - 229.7 Argillite tectonite and qtz/dol vein including fault bx. 229.7 - 230.5 Includes 2 zones fault bx/gouge in sericitic cherts.	52	Quartz - dolomite alteration parallel to lamination.	Pyrite disseminated in fine grains parallel to sericite and chert qtz/dol. Average % pyrite over interval 10 - 15% with local concentrations up to 20%.	
230.70 TO 239.10	«Het Frag Ser Chrt»	Black, grey, green, yellow, brown. Fine to coarse. Intervals of Het Frag, sericite cherts with zones of fault brecciation/gouge. 230.7 - 231.5: Black grey argillic Het Frag. 234.15 - 236.1m : Zone of dominantly sericite chert with 3 zones fault bx/gouge. Zones of het frag are characterised by abundant dolomite nodules from coarse sand to granule size. eg 238.8m.		Qtz dolomite veining at 232.45 - 232.55 and 232.9 - 233.2.' Greenish yellow brown sericite assoc. with more cherty horizons. Sericite clasts present in Het Frag.	Pyrite distributed throughout the interval with an average of 10 - 15%. Coarser blebs of pyrite appear to be associated with the het frag and finer disseminated grains occurring in the ser chrt zones.	
239.10 TO 243.50	«Ser Chrt Arg»	Black, grey, green. Fine. Intermixed zone of deformed argillite (tectonite?) sericitic cherts and qtz dolomite veins. The interval is similar to the above unit in that extensive fault bx/gouge is present. From 241.1 - 243.5 the unit is less fault brecciated.		Qtz dolomite veining and sericitic alteration. Black argillite between 239.1 and 239.4 is graphitic.	Pyrite is less abundant than the above unit with an average of 5 - 10%.	
243.50 TO 245.40	«Arg Flt Bx»	Black. Fine coarse. Interval of dominantly argillic lithology which has been faulted to produce breccia/gouge particularly between 243.7 - 244.7. Quartz dolomite vein fragments are present in the bx.		Black argillite is graphitic.	Pyrite is not easily visible within fault bx. Pyrite 5 - 7% locally 10% associated with fragments of qtz dolomite veins.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
245.40 TO 247.90	«Arg Ser Chrt»	Black, grey, yellow, brown. Fine. Transitional zone argillites and sericitic cherts. Interval shows some evidence of deformation, fragmentation and stretching of clasts. - (tectonite?) Faulting evident but degree of brecciation is not as great as in the unit above. Ser-Arg laminations, where relatively undeformed have angle to C.A. of	55	Yellow , brown sericite and graphitic alteration. Minor qtz dolomite veining and alteration.	Pyrite 5 - 7%, locally 10 - 15% over small intervals associated with qtz dolomite veins.	
247.90 TO 250.90	«Ser Chrt Arg»	Grey, green, yellow. Fine. Interval contains dominantly sericite/chert (possibly tectonite) and minor sections of deformed argillite. (fold evident at 248.5m) Interval is faulted, small (1 - 4 cm) zone gouge.		Yellow, brown, green sericite. Minor qtz dolomite veining but some dolomitization associated with sericite foliation.	Pyrite 5 - 7%	
250.90 TO 268.80	«Cht? Qtz Dol Arg Bx»	Black, grey. Fine - pebble. Deformed qtz dol argillite breccia (tectonite). Folding of the argillite laminations is not pronounced but internal fragmentation of the qtz dol is extensive. Interval contains greener qtz sericite sections within the argillic sections: 256.2 - 256.5m. 256.6 - 256.83m. 257.0 - 257.2m. 266.1 - 266.6m. 267.0 - 267.7m. Most faulted section between 254.9 - 255.2.	70 80	Abundant dolomitization up to 50% of unit qtz dolomite. Dol >Sil. Argillite has been altered to graphite. 267.7 - 268.8: Argillite almost completely altered to graphite.	Pyrite generally less that 5% but with local concentrations up tp 10%.	Extensive graphite in interval coincident with geophysical anomaly.
268.80 TO 278.30	«Flt Bx Ser Cht Arg»	Black, grey, green, brown. Fine. Intermittently fault brecciated, graphitic argillite and sericitic cherts. Flt bx healed, in part. Some qtz dol veining, prominent veins at 270.5 - 270.6m. 272.8 - 272.9m. 278.1 - 278.3m. {277.1 - 277.2} «Dol Arg Maf Tuff?» Greenish chloritic, fine grained, phyllitic tuff?		Dolomitization less intense than in structurally overlying argillic tectonite. Graphitic alteration of argillites, subsequent faulting to gouge.	5 - 7% Pyrite. Quartz veins have up to 10% py in stringers.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
278.30 TO 282.60	«Flt Bx Ser Cht Arg»	Black, grey, green, brown. Fine coarse. Fault breccia/gouge in sericite cherts and graphitic argillite. Foliation graphite/argillite visible within section not totally brecciated.	65	Sericite and graphite alteration of protolith prior to faulting.	5% Pyrite.	
282.60 TO 282.70	«Flt Gou Ma f Tuff Volc »	Green. Fine. Thin zone of green mafic tuff fault gouge. Contact with overlying argillite gouge/bx approx.	75	Green chloritic alteration of protolith.	No pyrite visible.	
282.70 TO 310.00	«Dol Mafic Volc»	Green to greenish black. Fine coarse. Fine to lapilli sized, mafic volcanic exhibiting tuffaceous and flow characteristics. {295.4 - 296.8} «Porph volc» showing abundant dolomite/calcite resides and labilli. END OF HOLE		Green chloritic alteration of protolith. Extensive dolomitization of tuff and alteration to calcite. Staining with Ferri-cyanide shows mauve - purple calcite grains is a sea of light blue dolomite. Sections also show some degree of silicification. Green yellow brown sericite alteration, after chlorite, increases downhole.	Trace pyrite.	Hanging wall mafic tuffs. Mafic tuffs greater competence over the argillites is evidenced by the concentrations of the fault zone in the sediments. Friable - healed fault bx occurs in mafics between 286.2 and 289.8m. Possibly representing a play of the main flt in the sediments.

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
26416	40.60	41.70	1.10	.044	.16	.07	9.0	.21			435	1566	666				325	28		287	9.0	213	
26417	41.70	43.20	1.50	.018	.06	.02	3.1	.41			177	644	162				639	38		68	3.1	406	
26418	43.20	44.70	1.50	.006	.01	.01	2.1	.61			56	110	92				1066	52		44	2.1	614	
26419	44.70	46.20	1.50	.007	.01	.01	5.3	.98			67	93	74				2216	58		43	5.3	982	
26420	46.20	47.70	1.50	.031	.01	.01	3.8	.88			313	102	70				4327	70		65	3.8	882	
26479	55.10	56.60	1.50	.007	.01	.01	1.4	.26			73	46	40				3230	53		45	1.4	256	
26421	63.00	64.50	1.50	.009	.01	.01	1.8	.12			86	57	43				544	73		34	1.8	124	
26422	64.50	66.10	1.60	.012	.01	.03	2.0	.05			119	46	43				286	67		29	2.0	51	
26423	66.10	67.60	1.50	.028	.01	.01	1.7	.01			278	69	42				175	68		34	1.7	1	
26424	67.60	69.10	1.50	.004	.02	.01	0.7	.01			42	170	40				132	76		8	0.7	3	
26425	71.30	73.00	1.70	.004	.01	.01	0.7	1.2			35	71	36				337	53		8	0.7	121	
26469	73.00	74.80	1.80	.002	.01	.01	0.4	.01			19	51	34				135	59		5	0.4	31	
26470	74.80	76.30	1.50	.004	.01	.01	1.1	.01			44	89	38				205	37		15	1.1	2	
26472	96.00	97.50	1.50	.002	.01	.01	0.5	.05			22	42	53				142	47		7	0.5	53	
26473	97.50	98.40	0.90	.700	.84	.82	317.0	.29															
26474	98.40	99.90	1.50	.011	.01	.01	3.8	.08			105	141	79				178	60		60	3.8	82	
26475	105.10	106.70	1.60	.017	.05	.06	6.4	.08			168	488	582				243	54		75	6.4	78	
26476	116.20	117.70	1.50	.008	.01	.01	1.8	.02			81	90	50				126	107		15	1.8	23	
26477	117.70	119.20	1.50	.009	.02	.02	2.0	.01															
26478	119.20	120.80	1.60	.004	.01	.01	0.8	.01			36	30	32				100	52		8	0.8	1	
26480	139.20	140.80	1.60	.015	.03	.02	7.3	.04			152	282	158				278	70		79	7.3	43	
26482	148.40	149.40	1.00	.009	.04	.01	2.2	.01															
26483	149.40	150.30	0.90	.015	.03	.02	3.6	.04			153	321	202				260	33		35	3.6	35	
26484	150.30	151.80	1.50	.016	.25	.09	5.1	.13			155	2471	877				317	32		37	5.1	132	
26485	151.80	153.30	1.50	.007	.04	.03	3.6	.04			70	402	339				180	66		21	3.6	41	
26486	153.30	154.80	1.50	.006	.02	.02	1.6	.02			56	198	161				106	45		5	1.6	18	
26487	154.80	156.30	1.50	.010	.10	.15	9.0	.01			100	977	1459				92	28		12	5.0	1	
26488	156.30	157.80	1.50	.006	.08	.06	2.2	.01			57	834	553				26	35		4	2.2	1	
26489	157.80	159.30	1.50	.008	.02	.01	1.2	.01			81	174	72				1	135		1	1.2	3	
26490	159.30	160.00	0.70	.009	.01	.01	2.1	.01			85	119	28				1	62		27	2.1	12	
26491	160.00	166.50	6.50	.041	.07	.08	2.6	.17			406	695	783				169	39		17	2.6	168	
26492	166.50	168.00	1.50	.026	.26	.09	2.4	.07			262	2612	852				109	31		6	2.4	72	
26493	168.00	169.50	1.50	.076	1.07	.59	10.5	.16			760	10681	5899				239	41		29	10.5	164	
26494	169.50	171.00	1.50	.036	.15	.12	3.0	.01			359	1500	1229				117	53		9	3.0	9	
26495	171.00	172.50	1.50	.009	.09	.06	2.0	.03			87	873	623				95	37		9	2.0	31	
26496	172.50	174.00	1.50	.003	.03	.03	1.0	.01			31	267	268				1	36		1	1.0	6	
26497	174.00	175.40	1.40	.039	.50	.36	8.2	.02															
26498	175.40	176.90	1.50	.002	.02	.02	0.9	.01			17	204	224				27	63		2	0.9	2	
26499	176.90	178.40	1.50	.002	.03	.03	1.1	.01			19	284	302				61	143		4	1.1	1	
26500	178.40	179.90	1.50	.050	.37	.17	5.2	.15			499	3668	1712				256	52		13	5.2	148	

Sample	From (m)	To (m)	Length (m)	CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	
26501	179.90	181.40	1.50	.006	.08	.06	2.2	.05			58	760	647				99	72		9	2.2	46	
26502	184.30	185.80	1.50	.017	.43	.11	10.2	.04			169	4303	1055				84	65		20	10.2	44	
26503	201.10	202.60	1.50	.008	.06	.03	2.5	.09			78	635	317				162	101		8	2.5	87	
26504	202.60	204.10	1.50	.121	.13	.07	61.3	.61			1205	1257	715				393	74		250	61.3	608	
26505	204.10	205.60	1.50	.008	.02	.01	2.2	.02			80	155	88				30	98		7	2.2	24	
26506	207.00	208.50	1.50	.010	.02	.03	2.5	.04			97	212	251				1	76		1	2.5	38	
26507	212.50	214.00	1.50	.020	.07	.04	9.1	.04			203	665	361				1	67		64	9.1	41	
26508	214.00	215.50	1.50	.021	.07	.05	6.9	.17			212	717	504				150	61		20	6.9	166	
26509	218.50	220.00	1.50	.003	.01	.01	1.3	.01			30	133	81				116	85		1	1.3	12	
26510	220.00	221.50	1.50	.002	.02	.01	1.0	.04			22	173	67				58	743		1	1.0	39	
26511	229.20	230.70	1.50	.001	.01	.01	0.4	.03			10	45	48				425	128		3	.04	27	
26512	232.20	233.70	1.50	.004	.04	.02	1.5	.02			37	404	225				78	155		3	1.5	16	

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
26415	37.60	40.60	3.00	85.18	5.44	.01	.26	.08	1.05	3.53	.01	.62			51	22			185	87	1.8	85	.01		.02	96.24	854	44
26417	84.40	87.40	3.00	61.57	15.57	1.1	2.30	.70	3.08	6.59	.24	.69			30	26			5	88	0.2	43	.02		.02	91.97	95	2
26481	145.40	148.40	3.00	48.05	12.82	4.41	5.82	1.5	.43	12.97	.40	1.2			94	163			40	48	1.4	69	.11		.02	87.75	194	6
26513	249.00	252.00	3.00	62.29	14.74	1.54	3.30	.35	3.25	5.43	.20	.62			43	132			5	90	0.7	104	.07		.02	91.89	84	1
26514	303.80	306.80	3.00	40.16	13.81	6.66	10.62	3.70	.01	9.68	.18	1.76			71	58			5	13	1.0	6	.32		.02	86.91	1	1

MINNOVA INC.

HOLE NUMBER: RG-379 | DRILL HOLE RECORD | IMPERIAL UNITS: | METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: Rea Horizon

PLOTTING COORDS GRID: Sam Survey
NORTH: 237.41N
EAST: 12132.27W
ELEV: 1066.83

ALTERNATE COORDS GRID: Estimated
NORTH: 2+45N
EAST: 121+50W
ELEV: 1050.00

COLLAR DIP: -48° 0' 0"
LENGTH OF THE HOLE: 80.80m
START DEPTH: 0.00m
FINAL DEPTH: 80.80m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: August 16, 1990
DATE COMPLETED: August 18, 1990
DATE LOGGED: August 18, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: Frontier
CASING: Pulled
CORE STORAGE: Samex Camp

PURPOSE: Rea Horizon Stepout.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
28.00	-	-51° 0'	ACID	OK	To Be Broken	-	-	-	-	-	
77.70	-	-49° 0'	ACID	OK		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 12.20	«CSG»					
12.20 TO 22.30	«Dol Feld P orph»	Green. Fine. Alteration washes out some textures. Fine grained matrix supports remnant feldspar phenocrysts? 3% white qtz/dol veining (65/35%) Basel 10 cm. are fault brecciated.		Core is strongly calcareous (Fe-dol) - a mixture of original mineralogy and subsequent weak - mod. dol. Core still contains chloritic spots/streaks limonite on fracture surfaces.	<2% py, fine grained occurs in patches and stringers.	Core is relatively blocky - particularily towards top of interval.
22.30 TO 25.70	«Arg Flt Bx »	Gray, black. Fine. Intensely fault bx/gouge altered argillites. 5% white qtz/dol veining and fragments present; minor altered volc? present. 23.6 - 24.1: Semi-competant core with local weak veining. 24.9 - 25.2: Semi-competant veined core.		Minor graphite in argillites, patchy moderate silicification associated with veining, minor talc? {24.9 - 25.3} «int sil» and veining.	Pyrite content is highly variable - ranges from 1% to massive zones with >80% py. Pyrite is generally fine grained with concentrations assoc. with veining. {23.4 - 24.3} «30% py» bands, blebs. {25.0 - 25.2} «60% py»	22.3 - 23.4: 90% recovery.
25.70 TO 26.40	«Qtz/Ser/Py Alt Arg»	Brown, gray and black. Fine. Argillites have been intensely altered. Interval contains 10% weakly altered argillite, local weak fault gouge, minor dol stringers.		Pervasive, streaky yellow - brown sericite alt'n, minor silica in matrix, minor talc.	20 - 30% fine grained dissem py through out interval.	Rea Zone?
26.40 TO 27.90	«Chty Arg»	Black. Fine. Silicified/cherty argillite, some tectonic breccia textures present above fault zone. Fault occurs between 27.7 abd 27.9m. 5% white qtz veining; fault gouge contacts.		Weakly graphitic patchy weak - mod. silicification.	5% v.f.g. coarsely dissem py in argillite interstial to cherty argillite. 26.4 - 26.55: 15% py in silic. arg.	
27.90 TO 36.60	«Yel Ser/Qt z Alt Seds»	Yellow, gray and black. Fine. Intense alteration destroys/masks original textures except for 10% of interval which contains argillite remnant - primarily between 29.6 - 30.2m. Moderate to intense fault zones between {27.9 - 32.1} «flt bx zone» frequency of faulting decreases downhole. 25% white to gray qtz veining, patches locally qtz exhibits some clastic texture.		Intense yellow sericite alteration and qtz veining pervasive throughout most of interval.	5% py. v.f.g. coarsely dissem in blebs.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
36.60 TO 39.30	«Gray Ser/Dol Alt Arg»	Gray, brown. Fine. Argillite has been strongly altered but remains identifiable; gradational contacts; slaty cleavage at	75	Weak to moderate development of gray sericite, weak patchy dolomite alt'n and nodular growths, dol causes local bleaching.	Pyrite content varies between 5 - 20%. At higher concentrations core is brown in colour.	Similar, but weaker in intensity, to MUT in the pit area. 28 - 29.5: 55% recovery.
39.30 TO 80.80	«Arg/Silt/Wack»	Black, gray. Fine to med. 75% of the seds present consists of argillite and interbedded siltstone and 25% wackes/lithic wackes. Wacke beds can exceed 1 m. in thickness. Bedding throughout most of interval is oriented at At 70m. bedding is weakly contorted. Graded bedding/load clasts indicate tops are downhole. Upper contact is gradational. Massive white veining at: {12.7 - 43.3} «qtz vein» 43.7 - 44.05: Qtz vein. 57.2 - 57.5: Qtz vein {70.45 - 71.8} «qtz/dol vein» 95% qtz, 5% dol, vein is bx, contains open fractures. 72.4 - 72.8: Vein zones of fault bx at: {44.2 - 44.8} weak «flt bx» {47.8 - 53.2} intermittant narrow «fault bx, gou zones» and very blocky core. {72.1 - 74.6} «flt bx, gou» faulting is intermittant, weak to 73.1m., 73.1 - 74.6m. Fault gouge alt'n is intense and pervasive. Lithic wackes consist of a fine grained sandstone with rounded to angular chips of argillite, qtz/dol gains to 4 mm. and can make up to 40% of rock. END OF HOLE	80	Argillite is locally weakly graphitic. 41.8 - 42.7m.: Mod gray sericite, weak patchy dol alt'n on margin of qtz vein. 43.3 - 43.7: Yellow - gray sericite alt'n on qtz vein margin.	< = 1% fine to coarse grained, dissem py. 39.3 - 39.8: 10% f.g. pyrite.	Core is generally blocky particularily in the argillite intervals.

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB		COMMENTS
26535	22.70	24.20	1.50	.008	.01	.01	1.0	.04			84	80	39				88	43		10	1.0	39		
26536	24.20	25.70	1.50	.002	.01	.01	1.8	.07			24	25	16				66	11		6	1.8	73		
26537	25.70	28.00	2.30	.010	.01	.01	0.9	.10			98	59	31				40	55		9	0.9	98		
26538	28.00	29.50	1.50	.007	.01	.01	0.6	.02			66	45	42				18	39		8	0.6	20		
26539	29.50	31.00	1.50	.004	.01	.01	0.7	.01			40	71	30				39	51		5	0.7	3		
26540	37.80	39.30	1.50	.004	.01	.01	1.5	.02			35	132	46				30	45		9	1.5	17		
26541	39.30	40.80	1.50	.006	.03	.01	1.6	.04			57	306	56				48	61		15	1.6	39		
26543	70.45	71.80	1.35	.001	.01	.01	1.2	.01			6	22	28				74	20		4	1.2	10		

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
26534	14.30	17.30	3.00	39.85	12.07	7.78	8.82	2.35	1.24	9.50	.15	1.38			79	64			5	22	0.6	4	.28		.34	83.78	1	1
26542	63.10	66.10	3.00	59.47	14.62	1.70	3.34	1.06	3.04	7.25	.09	.75			43	113			5	46	0.7	34	.19		.32	91.89	47	1

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: Sam Horizon

PLOTTING COORDS GRID: Sam Survey
NORTH: 706.56N
EAST: 12288.41W
ELEV: 1056.60

ALTERNATE COORDS GRID: Estimated
NORTH: 7+13N
EAST: 123+ 0W
ELEV: 1063.00

COLLAR DIP: -55° 0' 0"
LENGTH OF THE HOLE: 178.90m
START DEPTH: 0.00m
FINAL DEPTH: 178.90m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: August 16, 1990
DATE COMPLETED: August 18, 1990
DATE LOGGED: August 17, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: Frontier
CASING: Pulled
CORE STORAGE: Samex

PURPOSE: Sam Horizon Stepout.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
66.50	-	-55° 0'	ACID	OK 225		-	-	-	-	-	
121.00	-	-55° 0'	ACID	OK 225		-	-	-	-	-	
175.90	-	-55° 0'	ACID	OK 225		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 39.60	«CSG»					
39.60 TO 43.40	«Till»	Grey. Fine - coarse. Grey stiff clayey, silty glacial till containing abundant granule to pebble size clasts of mixed lithology.				Overburden
43.40 TO 48.90	«Cht Arg Qtz Vn»	Black, grey and brown. Weathered, oxidized zone comprising soft, friable graphitic argillite, silicified argillite, broken ore qtz veins.		Orange brown oxidation rusting, concentrated near broken qtz veins. Black cherts are intensely silicified. Planes of foliation display a dark yellow green alteration (oxidation) possibly related to Arsenic.	Little visible pyrite (1%) remaining after oxidation.	At 41.3 - 41.7m. qtz vein at high, near vertical angle to core, ie. sub parallel.
48.90 TO 55.50	«Sil Ser Chrt»	Grey. Fine xalline. Slightly weathered, massive dominantly cherty unit Ribbons of chert not well developed, possibly masked by silicification. Core breaks along sericite planes showing phyllitic texture. Locally 2 thin intersections of Het Frag: 53.1 - 53.2, and 54.5 - 54.9 «Het Frag» Clast supported with fine black argillite matrix.	72	Greenish sericite alteration moderate. Dolomite alteration weak to moderate. Oxidation locally intense along planes weakness. Majority of clasts show moderate dol.	Pyrite 7%, locally 10 - 15% concentrated in stringers through chert. 5 - 7% fine disseminated py and occasional blebs.	
55.50 TO 56.70	«Sil/Ser Arg Qtz Vn»	Black, white. Fine. 52.3 - 52.8m. Black silicified arg with inter-bedded soft sericite. 52.8 - 53.2: White, broken qtz vein. 53.2 - 53.4: Minor chert and fault gouge.		Sericite shows weathering to dark yellow - green (arsenic?). V. minor dol. Graphitic alt in gouge.	3 - 5% py. 1% py. 1% py.	
56.70 TO 60.50	«Ser Arg Chrt»	Grey, yellow, green, brown. Fine. Finely laminated sericite, pyrite (1 - 2mm), chert (1 - 6mm) and minor argillite. Phyllitic texture developed on planes of sericite. Minor, wavy folding, secondary cleavage at 60.1m. in monocline fold at angle	70 82 49	Yellow brown sericite alteration after py, moderate to weakly well developed at 57.5m. Minor qtz dolomite alteration/veining.	10% fine disseminated Py in thin laminations. Locally 15% py. Occasional coarser granular blebs.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
60.50 TO 74.90	«Ser-Cht Arg»	Black, grey, green, yellow, brown. Fine. Interval contains transitional interbedded units of dominantly black argillaceous material to lighter grey yellow brown sericite and chert. Qtz, dolomite veining (5 - 6% of interval) cross cuts at angles of Minor wavy folding of laminations with occasional zones of highly folded qtz cht? in arg. Secondary cleavage present Where deformation readily apparent in argillite - probable tectonite. Fold hinge zone locally visible eg. 74.4m. Minor development Het Frag at 65.8 - 66.1m. {73.6 - 74.9} «Ser Seds» Fine to med graied arenite interbedded with yellow brown sericite. Minor faulting at intervals 65.4, 65.7, 66.6m, 73.3m.	50 85 39	Grey yellow brown sericite alteration well developed with increase downhole to 74.9m. Silicification moderate to intense (60.5 - 61.5m) in black argillite. Dolomitization minor development within interval but locally moderate to intense associated qtz-dol veining. Minor graphite alteration arg.	Py more abundant upper zone of interval 60.5 - 62.0m, 10 - 15%. {61.5 - 61.6} «15% py, 2% sp» Py overall 3 - 7% occurring in fine grains along laminations and granular blebs up to 4mm diameter.	Core breaks easily along planes of foliation.
74.90 TO 83.30	«Flt Bx Cht Arg Qt Vn»	Black, grey. Fine. Faulted interbeds. Black argillite and grey ribbon cherty with broken white qtz dol veins. Argillite zones faulted to grey graphitic gouge zone of more competent, hard grey ribbon chert from 80.4 - 81.4. White qtz (minor dol) veins occupy 20% of interval and in places display stylolite like textures.		V. minor sericite at top of interval. Graphitic alt of arg assoc. faulting. Trace talc alteration.	Sulphides show uneven distribution through interval. No py visible in flt bx/gouge, but occurs as dissem grains in bed like laminations and as scattered blebs. Average Py 5 - 7%, local concentration 30% eg. at 82.1m assoc qtz vn. V. minor base metal sulphide: {81.6 - 81.7} «5% py, 1 - 2% cp + tr gn» associated qtz vn in grey chert.	
83.30 TO 88.70	«Ser/Dol Chrt»	Grey, green brown. Fine. Deformed? sericitic chert cut by white qtz veins which occupy 6% of interval. Original chert texture masked by alteration silicification and dolomitization. Minor faulting.		Grey, yellow brown, moderate to intense sericite alteration. Dolomitization along veins and fissures.	5 - 7% py in stringers parallel to the sericite alt. Disseminated grains and granular blebs.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
88.70 TO 98.70	«Arg Cht»	Grey, Black. Fine. Interval of dominant massive dark grey ribbon cherts and interbedded/folded black argillite. Contorted chert and arg at 98.2m. Cross cutting qtz (minor dol) veins occupy 10% of interval. Veins show some deformation with arg. No set orientations.		Graphitic alteration of argillite moderate to weak.	Variable distribution of sulphide. Concentration of dissem, blebby pyrite near some qtz veins up to 40 - 50% over small (3cm) widths. Massive sections gray chert average 5 - 10% py. Two notable intersections, {91.1 - 91.3} «15% py, 10% sp, 5% cp gn tr» 92.2 - 92.4m. 20% py, 5 - 7% cp sp gn tr associated with qtz (minor dolomite) veining in black argillite chert.	
98.70 TO 100.00	«Flt Ser Dol Arg Bx»	Grey, black. Fine. Zone of fault breccia and gouge concentrated between 99 - 100 m.		Graphitic alteration argillite.	Pyrite destroyed in bx and gouge, up to 10% concentrated in bands within lens broken sections.	
100.00 TO 105.90	«Ser Dol Silt Arg»	Grey, brown. Fine - med. Core breaks easily along sericite alteration planes. Interval is faulted with bx/gouge at 100.35 - 100.85m. 102.3 - 103.0m. Interval is transitional to silicified cherty arg.	70	Moderate to intense dolomitization. Mod to intense grey brown ser.	Interval 9101 - 101.2} «20% Py, 1% cp, 1% gn» in dol argillite. Main concentration over 3 cm. with vein like form. Overall interval 5 - 7% Py. 103.75m trace Tr. with 2% Cp over 10mm width qtz vn.	
105.90 TO 108.20	«Sil Cht Arg»	Black. Fine. Black highly graphitic cherty argillite. Quartz veins display deformed features.		Unit strongly graphitic where faulting has broken up the argillite. Green talc surrounds part of deformed qtz vn.	Pyrite 5 - 7% locally concentrated up to 10% in disseminated form around qtz veins. Blebby cp and sp associated with deformed qtz vein at 106m - 106.3m. but less than 1% over interval.	Some core loss in faulted broken graphitic argillite between 107.2 - 108.2.
108.20 TO 125.90	«Ser Dol Arg Fect»	Grey, black, yellow, brown. Fine. Variable interval varying from grey brown sericite argillite to black argillite/tectonite with less sericite and minor chert. Qtz dolomite veining is moderate to intense with veins showing breakup and deformation. Possible Met Frag? at 124.0 - 124.2m. Fault zones occur at:		Qtz dolomite flooding? Silicifying some sections. Green talc alteration in association qtz dol. Grey yellow brown sericite alt mod - intense near top of interval, decreases downhole. Dolomitization is generally intense throughout the interval.	Fine grained py dissem throughout interval, appprox average 7 - 10% but are intense local conc. assoc qtz vn up to 30%. Base metal sulphides, sp, cp, gn, tr distributed through section 108.2 - 120.2m. assoc. with qtz-dol veining. {108.2 - 120.2} «10% Py <1% sp+cp+gn+tr» Overall.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		111.6 - 111.8m. gouge. 116.3 - 116.5 gouge/bx 117.7 - 118.3 gouge/bx 118.8 - 118.9 gouge/bx 124.4 - 125.9 zone broken rock, bx/gouge.			Estimated: Py 7 - 10%, less than 1% combined Sp + Cp + Gn + Tr in decreasing order abundance.	
125.90 TO 129.10	«Dol Seds?»	Grey. Fine med. Schistose dolomite sediment? with rounded to elongate dolomite nodules. Nodules elongate at White qtz (minor dol) vein cuts across lithology sub parallel to C.A.	70 80	Dolomitization intense within nodules.	5 - 7% very fine disseminated pyrite. Parallel to schistocity.	
129.10 TO 168.30	«Sil Chrt Arg»	Grey, black. Fine. Variable sequence of laminated to deformed argillite (tectonite) cherts and minor sericite. Qtz dolomite veins occupy 5% of interval and occur in laminated argillite and folds within the tectonite units. Widths commonly range 1 - 10cm. with maximum intersections of 25 cm between 154.25 - 154.5m. The latter vein does not have clear cut contact zones with cherty argillite. Fault bx/gouge occurs at the following intervals. 129.4 - 132.1 Fault zone 132.7 - 133.3 Fault bx/gouge. Intermittent gouge/bx occurs to 168.3m with notable fault zones at 139.6 - 141.8m. 143.1 - 144.7m. 160.8 - 162.0m.	60 70	Silicification present outside of cherty lithologies particularily within black fine argillite between 145.4 and 146.4m. The latter also shows fine black graphite along planes weakness. Weak to moderate grey/brown sericite alteration locally present.	Pyrite distributed in inrregular zones throughout interval occurring as fine disseminated grains, granular blebs and in stringers. Overall average estimated 10% Py. Local concentrations Py associated with qtz dolomite veins up to 20 - 25%. Base metal sulphides occur as minor percentages within the qtz dol pyrite veins. Overall estimate for interval <1% Sp + Cp + Gn.	
168.30 TO 171.60	«Ser Arg/Alt Volc?»	Grey, brown. Fine. Phyllitic grey brown argillite (minor chert) with possibly an altered volcanic component. {170.2 - 170.5} «Het Frag» minor section brecciated chert, sericite clasts in argillite matrix.	75	Brown sericitic alteration moderate to intense. Green talc alteration and fuchsite present as 1 - 2% of interval. Weak to moderate dolomitization.	5 - 7% disseminated to blebby pyrite. Trace sphalerite associated as discrete grain in qtz vein.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
171.60 TO 173.20	«Het Frag»	Grey, brown, black. Fine coarse. Matrix supported Heterolithic Fragmental. Breccia fragments tend to be elongate in direction of phyllitic foliation at angle to C.A. Ore qtz vein cross cuts the Het Frag sub parallel to the plane of foliation at 172.5m.	65 70	The Het Frag shows moderate silicification.	Approx 10% pyrite with local concentration within qtz vein 172.4 - 172.5 where blebby pyrite and occur up to 2mm.	
173.20 TO 178.90	«Ser Arg Alt Volc»	Mixed interval of generally deformed altered argillites and volcanics? + minor cherts. Sericitic/phyllitic foliation occurs at Possible minor Het Frag present too. Minor faults at intervals throughout. END OF HOLE	65	Dolomitization increases downhole. Monerate to intense at 176.7m. Moderate, localized yellow brown sericite, green talc and fuchsite.	5 - 7% disseminated and blebby pyrite throughout interval, locally 15 - 20% over 1 - 2 cm. associated with qtz dolomite vein fragments.	

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
26515	44.30	45.80	1.50	.001	.01	.01	0.3	.04			11	104	60				126	268		19	0.3	42	
26516	45.90	47.40	1.50	.007	.01	.01	1.1	.01			68	138	47				193	135		19	1.1	10	
26517	54.00	55.50	1.50	.005	.01	.01	0.5	.03			47	73	39				191	74		5	0.5	29	
26518	55.50	57.00	1.50	.004	.01	.01	1.2	.09			37	11	29				289	137		17	1.2	85	
26519	60.50	62.00	1.50	.009	.02	.01	1.5	.01			92	187	147				110	108		29	1.5	6	
26521	76.30	78.30	2.00	.021	.01	.01	5.6	.01			214	112	147				116	91		34	5.6	2	
26522	79.80	81.30	1.50	.014	.01	.02	1.6	.01			135	107	209				132	99		16	1.6	5	
26523	81.30	82.80	1.50	.027	.01	.01	2.0	.06			273	96	95				172	77		22	2.0	61	
26551	89.00	90.50	1.50	.022	.04	.06	9.8	.07			219	407	630				205	73		40	9.8	65	
26524	90.50	91.90	1.40	.089	1.32	.18	18.2	.04															
26525	91.90	93.40	1.50	.068	.06	.08	12.1	.05															
26552	97.20	98.70	1.50	.004	.02	.01	1.3	.01			35	165	61				92	112		10	1.3	4	
26553	100.25	101.75	1.50	.045	.06	.07	8.5	.06			454	640	676				215	35		17	8.5	63	
26554	101.75	103.25	1.50	.005	.03	.02	1.6	.02			47	252	236				247	29		4	1.6	22	
26555	103.25	104.75	1.50	.015	.01	.01	1.3	.02			147	118	105				125	32		5	1.3	21	
26556	104.75	106.25	1.50	.007	.01	.01	0.8	.01			65	137	60				119	45		2	0.8	12	
26557	106.25	107.75	1.50	.013	.04	.02	2.1	.03			129	418	209				167	157		14	2.1	25	
26558	108.20	109.70	1.50	.002	.01	.02	0.9	.01			23	148	188				159	55		5	0.9	8	
26559	109.70	111.20	1.50	.004	.07	.04	1.8	.03			37	738	442				197	44		9	1.8	27	
26560	111.20	112.50	1.30	.014	.17	.06	4.9	.17			141	1654	590				431	40		34	4.9	165	
26562	114.20	115.70	1.50	.002	.03	.09	1.3	.01			23	318	889				159	32		5	1.3	4	
26563	115.70	117.20	1.50	.009	.08	.06	1.3	.02			88	796	610				184	31		6	1.3	22	
26564	117.20	118.70	1.50	.033	1.00	.41	6.0	.07			326	10004	4094				219	36		16	6.0	67	
26565	118.70	120.20	1.50	.022	.24	.15	5.0	.04			216	2436	1452				399	48		25	5.0	40	
26561	122.70	114.20	-8.50	.006	.16	.11	2.0	.01			59	1592	1073				155	30		8	2.0	7	
26567	133.20	134.70	1.50	.007	.05	.02	3.1	.04			73	538	203				169	97		13	3.1	42	
26568	136.20	137.50	1.30	.002	.03	.04	1.3	.03			20	271	388				99	93		6	1.3	27	
26569	139.30	140.80	1.50	.010	.03	.04	2.2	.03			97	761	357				128	76		7	2.2	25	
26570	144.60	146.10	1.50	.013	.09	.02	2.0	.02			125	857	230				119	107		8	2.0	20	
26571	153.70	154.50	0.80	.069	.02	.10	16.2	.42			690	191	1046				333	64		42	16.2	418	
26572	165.00	166.50	1.50	.024	.05	.13	15.8	.09			244	514	130				192	87		67	15.8	85	
26573	166.50	168.00	1.50	.138	.13	.09	89.4	.10			1377	1260	879				188	115		535	89.4	97	
26574	171.60	173.10	1.50	.039	.13	.06	14.3	.03			385	1264	642				240	96		198	14.3	30	

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
26520	68.70	71.70	3.00	60.61	15.64	.85	2.05	.35	3.77	6.89	.32	.71			45	35			5	118	.4	.6	.11		3.64	95.07	64	2
26566	120.20	123.20	3.00	61.15	8.52	5.04	4.87	.83	.52	7.48	.33	.68			58	1150			5	40	2.1	7.6	.24		2.54	92.23	127	3
26575	175.90	178.90	3.00	54.87	12.31	4.77	5.02	.92	1.66	8.43	.29	1.11			122	435			80	88	3.3	277	.22		3.32	93.01	269	24

MINNOVA INC.

HOLE NUMBER: RG381 — DRILL HOLE RECORD — IMPERIAL UNITS: — METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: Rea Horizon

PLOTTING COORDS GRID: Sam Survey
NORTH: 296.87N
EAST: 12298.11W
ELEV: 1066.32

ALTERNATE COORDS GRID: Estimated
NORTH: 123+ 0W
EAST: 3+ 0N
ELEV: 1053.00

COLLAR DIP: -60x 0' 0"
LENGTH OF THE HOLE: 84.40m
START DEPTH: 0.00m
FINAL DEPTH: 84.40m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: August 18, 1990
DATE COMPLETED: August 19, 1990
DATE LOGGED: August 19, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: Frontier
CASING: Pulled
CORE STORAGE: Samex Camp

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
81.40	-	-62x 0'	ACID	OK	Bad Etch	-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 21.30	.CSG/					
21.30 TO 84.40	.Arg/Silt/Wacke/	Black, gray. Fine to med. 50% of interval consists of interbedded argillites and siltstones and 50% wackes/lithic wackes. Arg/silt are the predominant rock type to 46m., wackes predominant throughout remainder of interval. Lithic wackes consist of a fine sand matrix supporting up to 30% chips of arg, qtz/dol to 5mm. General sense of bedding is at Graded bedding and load features indicate tops are downhole; Minor QV. 21.3 - 44.5m: Core is very blocky with intermittant zones of fault bx. 957.9 - 60% strong .flt bx/ END OF HOLE	70		Minor py.	H.W. Seds to the Rea Horizon.

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
26544	23.50	26.50	3.00	62.84	14.40	1.41	2.54	1.16	3.23	5.98	2.54	.72			36	74			5	112	.6	21	.18		.17	62.84	.54	1
26545	75.30	78.30	3.00	68.73	12.45	2.08	1.56	1.55	2.70	4.10	1.56	.61			17	47			5	36	.7	21	.15		.10	68.73	.43	1

MINNOVA INC.
DRILL HOLE RECORD

HOLE NUMBER: RG382 IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: Sam Horizon

PLOTTING COORDS GRID: Sam Survey
NORTH: 795.73N
EAST: 12385.67W
ELEV: 1061.95

ALTERNATE COORDS GRID: Estimated
NORTH: 8+ 5N
EAST: 124+ 0W
ELEV: 1062.00

COLLAR DIP: -55x 0' 0"
LENGTH OF THE HOLE: 334.40m
START DEPTH: 0.00m
FINAL DEPTH: 334.40m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: August 18, 1990
DATE COMPLETED: August 23, 1990
DATE LOGGED: August 21, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NO

CONTRACTOR: Frontier
CASING: Pulled
CORE STORAGE: Samex Camp

PURPOSE: Hole in fence between Sam and Rea Horizons.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
181.90	-	-55x 0'	ACID	OK	Double Etch	-	-	-	-	-	
218.50	-	-55x 0'	ACID	OK		-	-	-	-	-	
267.30	-	-55x 0'	ACID	OK		-	-	-	-	-	
291.70	-	-56x 0'	ACID	OK		-	-	-	-	-	
304.80	-	-55x 0'	ACID	OK		-	-	-	-	-	
334.40	-	-54x 0'	ACID	OK		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 104.85	.CSG/					
104.85 TO 114.60	.Dol/Sil Arg Flt BX/	Black, gray. Fine. Black argillite have been intensely altered throughout interval; Probable chert(y) intervals between 110.5 - 110.6m. and 111.7 - 112.5m; Core is very broken, principal zones of fault brecc and gouge occur between 107.1 - 109.7m. and 112.4 - 113.4m. Core in remainder of interval is intermittantly faulted.		Weak limonite staining at tip of hole, decreases with depth. Local weak to mod. gray sericite in faulted zones; Core is variabiably mod to intensely dolomitized and mod to intensely silcified. Dolomitization is nodular to pervasive and uniform which bleaches the core to a gray color. Mod. silicified arg are black, into sil. arg is gray to white, <5% white qtz/dol veining. Dol alt zones alternate with sil. zones - approx equal amounts of dol/sil alt; Minor graphite in faulted zones.	Pyrite content 1 - 5% with minor concentrations to 10%. Py is very fine grained to coarse grained, and occurs as dissem to stringers.	104.85 - 105.7: 60% recovery. 105.7 - 109.7: 80% recovery. 111.8 - 113.6: 80% recovery.
114.60 TO 124.00	.Arg Bx/	Black, gray, white. Fine. Black argillite containing abundant tectonically brecciated qtz/dol vein clasts and minor tightly folded veins; Clasts angular to rounded (boudinq) Clasts have a max size of 2 x 4cm. Foliation at 60 - 90 degrees to C.A. Minor fault bx/gouge zones to 4cm. Gradational lower contact. 9120.6 - 121.0L weak .flt bx/ 9117.5 - 118.3L .qtz/dol vn/ (80/20%) Tectonite textures weaker at base of interval.		Minor graphite in fault intervals. 15% of interval is bleached gray-green sericitically altered argillite - increasing in frequency downhole. Sericite becomes a paler green-yellow downhole. Sericite associated with qtz +/-/dol stringers/laminations and clasts. 117.5 - 117.6: Intense fuchsite on margin of qtz/dol vn.	1 - 3% fine - med. grained dissem and blebs of pyrite. 9117.5 - 118.3L minor coarsely dissem, sp, cp, gn and tet in qdv. Sx are metallic dark gray, soft, dark reddish brown? Streak. .min gn, sp, cp, tt/	
124.00 TO 136.50	.Qtz/Ser Alt Seds/	Yellow, gray. Fine. Original textures and minerology is nearly completely replaced by alteration, minor cherty? weakly altered intervals, minor weakly altered laminated textures still present - bedding at 131.6m. is approx. (weakly warped), approx 30% of interval consists of qtz veinlets - stringers and patches. Some tectonic brecciation present. 9133.85 - 135.1L intermittant weak .flt bx/	90	Interval is intensely silicified - veining and matrix and altered to yellow sericite.	1 - 2% fine grained, fine coarsely dissem py.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		9136 - 136.35L .flt bx/				
136.50 TO 142.50	.Dol/Ser/Si l Alt Seds/	Gray. Fine. Intensely altered sediments, minor argillite, laminated textures oriented at 60 - 80 degrees to C.A. at 141.4m. weak cleavage at 20 - 30 degrees to C.A. Local healed tectonic breccia textures. Minor fault bx/gouge zones <10cm. wide. 9136.5 - 136.67L .flt gouge/		Two styles of alt'n present in the interval. The predom. alteration consists of med to intense gray dol alt'n with patchy green - brown sericite alt'n. The secondary style of alt'n is qtz/yellow sericite similar to but less than the overlying unit.	1 - 5% py - fine grained dissem and blebs.	Volc component may be present.
142.50 TO 143.20	.Het Frag?/	Gray. Fine. Silty to argillite matrix supports 50% angular clasts of qtz, dol, arg and chert; foliation	80	Interval is weakly gray - brown sericitically altered.	Matrix contains 5% very fine gra pyrite.	Interval may by strictly a tectonite.
143.20 TO 148.00	.Ser/Dol/Si l Alt Seds/	Gray, green. Fine. Sediments have been intensely altered, 30% white - gray qtz/dol patches - veins. Some folding and vein offsets present and local tectonic breccia.		Patchy intense sericite alteration - yellow, olive and gray sericites give core banded to mottled appearance dol and qtz present in matrix and in veins.	<5% fine - coarsely dissem py.	
148.00 TO 149.20	.Het Frag?/	Gray. Fine. Silty matrix supports 40 - 70% angular to subrounded clasts of qtz, dol, arg and minor sericitically altered fragments to 2 x 5cm; Het Frag? is interbedded with altered siltstone between 148.25 - 148.5m.		Interval is weakly sericitically altered - locally to moderate intensity - gray, brown to greenish sericite.	5 - 10% finely dissem py; fine - med. grains.	Interval may be a tectonite.
149.20 TO 156.35	.Ser Arg/	Gray, buff. Fine. Interval is intensely altered with 10% windows of black argillite, gradational lower contacts. Remnant black argillites are intensely qtz veined, 10% white to gray qtz veining. Core is generally laminated - laminations oriented between 65 - 90 degrees to C.A. 9153.4 - 156.2L intermittant .flt gou zone/		Intense sericite alt'n present throughout majority of interval; Sericite varies between a pale gray, yellow (laminated) to a massive nondiscript dark gray; Minor silicification in intensely veined areas.	5% fine grained py in dissem and blebs. Local concentrations to 20% associated with veins.	
156.35 TO 168.70	.Chrt/Cht/S il Arg/	Black, gray. Fine. Interval contains a mixture of cherts, cherty argillites and silicified argillites as indicated below: 156.35 - 156.7: Silicified, arg; 20% white qtz vn.		Core is weak to mod. silicified; argillite partings are moderate - intensely graphitic silic arg is locally weakly graphitic. Minor sericite alter. in fault interval and at top of interval.	<5% fine grained py dissem , blebs, stringers (beds?) Local concentrations to 10% associated with veins. Trace cp in veins. 9163.5 - 164.85L .20% py, min sp/ semi-massive py in qtz.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		156.7 - 157.05: Massive white qtz vn, minor graphitic stylolitic partings. 157.05 - 157.4: Silic arg with 25% qtz vein/ patches, minor deformation of veins. 157.4 - 158.1: Ribbon chert with argillite partings. 158.1 - 159.6: Silicified argillite and cherty argillite - 30% of interval consists of bands of cherty material, 5% white qtz veins. 159.6 - 160.1: Laminated chert. 9160.1 - 161.0% sil arg 10% white qtz veining. .flt bx/, minor gouge, core extremely rubbled. Becomes more competent at base of interval - tectonic bx of qtz in arg matrix. 162.0 - 165.2: 40% massive qtz veining and stockworked in locally silicified argillite and cherty argillite. Massive qtz vein between 163 - 163.5m. contains graphitic stylolithic partings. 165.2 - 168.7: Sil/cherty arg; 5% qtz veining, tectonic brecciation of qtz veins, ribbon cherts.			165.05 - 165.15: 25% py, minor sp. 168 - 168.7: 20% fine - med. grained, dissem py.	
168.70 TO 208.90	.Dol/Ser Seds/	Black, gray. Fine. Interval consists of altered gray to black nondescript argillite and siltstone, upper contact is altered to fault gouge between 168.7 - 169.5m. Core contains approx. 5% of small (<10cm) zones of fault bx/gouge, larger fault bx/gouge zones as follows: 177.45 - 178.1m, 193.8 - 194.4m: (intermittant). 196.6 - 197.2m. 3 - 5% white to gray qtz veinlets/veins. Which are commonly associated with py and localized base metals (sp, gn, cp); local warping and ' minor truncation/offsets of veins.		168.7 - 176.8: Intense dol alt'n of seds with patchy green - brown moderate sericite alt'n. From 176.8 - core is weak to mod. dolomitized and slightly darker than above. Sericite alt'n still present but tends to ge grayer in color; 5 - 10% of interval is weakly silicified.	The bulk of the interval contains 5 - 10% fine - med. grained py in fine dissem - blebs. Numerous zones of concentrated py +/- base metals as follows: 177.0 - 177.35: 35% semi-massive py blebs in qtz vein. 178.1 - 178.65: 40% py blebs and disseminated grains in qtz vein. 179.5 - 179.9: 1% coarsely dissem cp, minor sp, 10% Py blebs, assoc. qtz stringers stockwork. 180.65 - 181.8: 40% py in qtz vein, fine to med. grained py, possible	Mich of the pyrite has a brecciated appearance - hydro brecciation by successive pulses of silica fluids. Resembles RG-86 Qtz-Py intersections.

174

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
					vein obilization along qtz stringers. 9177.0 - 181.8L .20% py, tr, cp + sp/ 182.4 - 183.2: 15 - 20% py fine - med grained, minor py beds? Patchy dissem py in qtz. 185.2: 10cm. wide qtz dol vein, 10% sp fine grained disseminated. 189.7: 4cm. wide qtz - dol vein <1% sp dissem, 7% py. 195.3 - 195.65: 3% sp, fine - coarsely disseminated associated with qtz carbonate veinlets. 5% py. 196.1 - 196.3: 3% py disseminated. 3% sp coarsely dissem. Tr, Cp, all assoc. patchy qtz carb veins. 201.3 - 201.38: 6% combined cp, sp, gn (in roundly equal amounts) in fine med. grained coarse dissem with 30% py in silicified interval. 203.1m: 3cm. wide qdv containing 2% sp, minor gn, 10% py. 204.7 - 206.3: Min sp, gn coarsely dissem in qtz +/- dol veins and envelopes.	
208.90 TO 216.70	.Qtz/Dol Vn 'd Arg/	Black, gray, white. Fine. Black argillite has been strongly permeated by 30% qtz/dol (B5/15%) veins, stringers, stockwork. Veins are tectonically warped - folded, boudined truncated and offset locally. Dol is primarily a fracture filling within qtz veins.		Argillite have been very weakly sericitically locally. 209.4 - 209.7: Intense silicification associated with qtz veining.	Interval contains a number of zones of concentrated fine - med. grained py with <10% combined sp, gn, cp (in order of decreasing abundance); sulphides are principally within the interval 9 210.1 - 215.6L overall sx content within this zone .3% sp, 1% gn + cp, 15% py/. On the margins of the interval there is <1% sp, 5% py, Sx are very coarsely dissem to semi-massive, generally within qtz veins.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
216.70 TO 237.40	.Dol/Ser Sends/	Gray, black. Fine. Fine grained argillite to siltstone has undergone moderate to intense alteration, contains 5 - 10% gray qtz/dol veining. Stringers, minor localized remnant lamination/ bedding textures - orientations are highly variable. Between 234.2 - 235.9m. the laminations are at low angles to C.A. - Hinge zone? Local disruptions of bedding - healed tectonic bx? Numerous narrow fault gouge zones present. Principal fault bx/gouge zonev occur between: 229.85 - 230.05m and 232.4 - 233.0m.		Core has been intermittantly weakly dolomitized. Pervasive weak to local moderate gray to greenish - gray sericite alteration. Dol alt'n bleaches core. Between 227.3 - 228m and 230.5 - 231.3m a patchy ,oderate green sericite alt'n is present - rock has a weakly granular texture - possibly an altered wacke (volc tuff?).	Overall pyrite content <=10% with localized concentrations to 30%. Pyrite is fine to medium grained and occurs as fine dissem to semi-massive blebs and clasts in qtz veins. Pyrite clasts derived from late stage, hydrothermal fluids ripping up earliest xtal growths. Fine grained sphalerite is coarsely dissem in qtz throughout interval. Fine grained, coarsely dissem gn + cp, also occur within qdv - but are generally restricted to between 217.2 - 221.2m. Base metal Sx content is <=1% throughout interval. Major Sx intersections as follows: 9220.3 - 220.52L .12% sp + gn+ cp, 15% py/ 9228.0 - 228.35L .20% py, 1% sp/ 9230.25 - 230.45L .20% py, 1% sp/ 9234.05 - 234.22L .1% cp, 4% gn, 7% sp, 5% py/	
237.40 TO 241.30	.Alt Sed Flt Bx/	Black, gray. Fine Sediments consist of 80% argillites and 20% siltstone? Rock has been strongly altered, 10% qtz/dol veins and clasts present. Interval is pervasively fault bx and gouge altered. Minor cherty argillite between 240 - 2401.m.		Argillites are weak to moderately graphitic 5% of interval is weakly altered to green sericite and minor talc. Patchy weak to moderate silicification.	5% very fine - fine grained py, fine to coarse dissem throughout. local patches within qdv. Minor amounts of fine grained sp, gn and cp in qdv.	
241.30 TO 242.60	.Met Frg? Flt Bx/	Gray, Fine to coarse. Silty matrix supports up to 65% angular to subrounded clasts. Clast size reaches a max of 3cm. Average size <=1cm. Clasts composed of qtz/dol?, arg, sericite altered fragments. Interval intermittantly fault bx and gouge altered. Gradational contacts. Weak foliation at	70	Moderate, patchy gray sericite.	4% fine grained py in matrix and occasional dissem within clasts.	The variety in clast compostion suggests protolith was a sed bx/congl. rather than a tectonite.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
242.60 TO 251.20	.Flt'd Sed Tect/ Faulted Sedimentary Tectonite.	Black, gray, buff. Fine. 80% of interval is black argillite which contains 30% white to gray qtz +/- dol veining, stringers, clasts boudins. The argillite has been strongly tectonized. Minor altered ribbon chert? present. 20% of interval is buff colored intensely altered sediments. Interval is intermittantly, intensely fault bx and gouge altered. Bedding in chert? at 244.8m.	75	Minor gray sericite developed in argillites. 20% of interval is intensely altered to pale green sericite which is locally intermixed with white clay gouge.	<=1% dissem py.	
251.20 TO 271.20	.Ser Alt Sed s/	Black, gray, green - gray. Fine. Interval similar to the above but lacks the strong tectonic features. Local intervals of folding and boudinage still present. Intermittant fault breccia between 251.2 - 257.9m. Faulting intense, formation very clayey gouge. Black argillites and siltstone containing 15% white qtz veining up tp 25cm., makes up 75% of interval, 30% of interval moderately to intensely altered sediments. Bedding has variable orientations from 257.9 - 258.8m. - Moderately tectonised zone, deformation qtz veining and pyrite blebs. 270.4 - 271.2m. Qyz/dol vein material, fractured, rounded by tectonism. 270.2m. Bedding/foliation	50 80 50 70	Argillites weakly to moderate graphitic. Black argillites have phyllitic surfaces aving to fine grained sericite. 30% sediments intensely altered to pale green - white sericite.	Trace amounts of Sp and Gn associated with qtz veining. Py very fine grained, occurs as fine disseminations, blebs and stringers. Py content varies 1 - 15%. Pyritiferous zones located as followsl 255.4 - 256.3m. - 15% Py. 257.4 - 258.5m. - 10% Py. 261.5 - 262.8m. - 8% Py.	
271.20 TO 272.40	.Qtz Dol Vn /	White, black, gray. Fine. Qtz/dol (70/30%) vein supports 15% clasts of bedded argillite. Argillite is primarily towards base of interval. Qtz is fine grained with the dolomite occuring as gray to tan med. grained xtals.		Argillite clasts are weakly sericitic, moderately graphitic.	<1/2% coarsely dissem cp, <1% fine grained dissem pyrite.	
272.40 TO 277.70	.Arg Bx/	Black, white. Fine. Black argillite hosts 15 - 25% white qtz/dol (75/25%) deformed veins/stringrs and boudins. Argillites have been strongly tectonized. Minor fault gouge and bx zones.		Argillite is intensely graphitic; minor green - gray sericite.	2% fine grained blebs of pyrite.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
277.70 TO 288.40	.Trans Sed/ Volc/	Black, gray, green. Fine. Transitional zone consisting of 65% argillite siltstone interbedded with laminae/beds of fine grained volcaniclastics. Moderate to strong tectonism, local folding, disrupt sed and volcanic laminae. Local brecciation. 5% qtz veins and blens, no preffered orientation. 283.8 - 285.5m. fold hinge zone. Predominant cleavage plane Bedding cleavage angle at 282.8m. - 35 degrees. Downhole gradational contact with ashy tuff.	70	Argillites weakly graphitic. Volcaniclastics, dolomitic with moderate sericitization. Local sericitization of sediments. Local coarser seds also weakly dolomitized.	1% fine grained disseminated pyrite.	Overall chaotic appearance.
288.40 TO 291.80	.Ash Tuff/	Green. Fine. Finely laminated, moderately altered ash tuff. Minor argillite laminae. Laminae contorted. Possible hinge zone between 290.6 - 291.8. Minor qtz veining.		Chloritic alteration. Moderate dolomitization, moderate, patchy pale green sericite laminae.	1% medium grained py.	Similar in color and appearance to "Victory" volcanics.
291.80 TO 295.40	.Chty Arg/	Gray. Fine. Cherty argillites, with minor ribbon cherts. 10% irregular white qtz veining and patches. Chert ribbons and bedding? are deformed. Unit fairly massive in appearance.		Patchy weak silicification. Weak gray sericite alteration.	<1% disseminated cubic pyrite.	
295.40 TO 334.40	.Mafic Tuff /Flows/	Fine grained feld, porph flows?/xtal tuff intercalated with moderately altered mafic lapilli tuff. Feld. Porph zones occur between: 302.7 - 305.4m. 325.75 - 333.6m. Between latter intervals alteration has masked fine textures but core contains up to 20% bleached yellow sericitically altered subrounded clasts. Interflow zones contain 5% qdv. Veins locally strongly deformed and brecciated. Upper contact gradational from 295.4 - 300.5m. Core aphanitic to very fine grained - ashy tuff? 300.5 - 301.3m. Volcanic weakly foliated at This interval contains 5 - 10% boudinaged Qdv, orientedm sub-parallel to foliation.	80	Chloritic alteration, weak to moderate dolomitization and local sericitization of interflow Mflt.	<2% Pyrite disseminations stringers and blebs associated with alteration zones. 9318.2 - 318.4mL .2% gn + cp, 8% Py/ in Qdv.	Rea Mafics. Interflow zones may represent flow breccias rather than tuffs.

HOLE NUMBER: RG382 DATE: 11-October-1990

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		END OF HOLE				

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB		COMMENTS
26582	111.10	112.60	1.50	.001	.01	.01	0.5	.01			10	49	28				84	163		1	0.5	2		
26583	116.00	117.50	1.50	.004	.01	.01	0.2	.01			44	59	28				89	55		1	0.2	10		
26584	117.50	118.30	0.80	.018	.01	.01	5.4	.01																
26585	118.30	119.80	1.50	.011	.01	.02	3.1	.02			113	65	24				158	48		10	3.1	18		
26587	142.00	143.50	1.50	.003	.01	.01	0.2	.02			29	59	74				138	55		3	0.2	19		
26588	148.00	149.20	1.20	.005	.01	.01	1.0	.02			53	46	60				145	64		3	1.0	16		
26589	150.80	152.30	1.50	.005	.01	.01	1.7	.05			46	125	55				774	63		14	0.7	47		
26590	160.40	162.00	1.60	.035	.04	.01	16.1	.13			346	381	101				258	59		41	16.1	125		
26591	162.00	163.50	1.50	.006	.01	.01	1.7	.03			56	94	50				125	53		4	1.7	29		
26592	163.50	165.35	1.85	.012	.11	.08	5.8	.32			120	1065	773				332	73		26	5.8	324		
26593	165.35	167.20	1.85	.012	.01	.01	1.8	.05			41	70	60				158	92		4	1.8	46		
26594	167.20	168.70	1.50	.004	.01	.01	1.5	.04			115	55	73				192	22		6	1.5	35		
26596	175.50	177.00	1.50	.008	.01	.01	2.5	.04			75	86	111				321	48		2	2.5	36		
26597	177.00	178.50	1.50	.035	.13	.11	16.2	.26			349	1319	1084				405	18		53	16.2	264		
26598	178.50	180.20	1.70	.039	.10	.02	8.0	.10			389	963	215				182	40		25	8.0	102		
26599	180.20	181.90	1.70	.018	.01	.01	2.0	.10			118	73	106				253	34		1	2.0	96		
26600	181.90	193.40	1.50	.010	.04	.02	2.3	.13			104	394	157				364	65		2	2.3	130		
26626	184.40	186.00	1.60	.010	.18	.06	5.3	.15			95	1819	579				308	161		9	5.3	146		
26627	188.60	190.10	1.50	.020	.04	.05	3.5	.04			203	380	454				150	41		3	3.6	42		
26628	195.10	196.70	1.60	.005	.16	.04	2.5	.05			47	1615	424				208	26		1	2.5	53		
26629	196.70	198.20	1.50	.006	.05	.04	3.9	.07			64	486	399				262	24		3	3.9	65		
26630	201.20	203.00	1.80	.008	.10	.09	3.4	.06			80	1017	880				193	25		1	3.4	59		
26631	203.00	204.50	1.50	.003	.03	.02	1.3	.03			34	275	189				172	20		1	1.3	26		
26632	204.50	206.30	1.80	.003	.18	.05	1.8	.03			33	1825	547				178	19		1	1.8	31		
26633	208.90	210.40	1.50	.005	.07	.09	1.9	.06			48	659	870				109	69		1	1.9	58		
26634	210.40	211.80	1.40	.003	.09	.04	0.9	.06			29	889	379				123	48		1	0.9	60		
26635	211.90	213.40	1.50	.006	.50	.25	4.7	.14			59	4956	2502				289	50		3	4.7	136		
26636	213.40	215.00	1.60	.019	1.03	.50	8.8	.21			192	10263	5012				356	37		14	8.8	208		
26637	215.00	216.70	1.70	.057	.63	.46	10.9	.20			569	6323	4589				269	40		19	10.9	198		
26638	216.70	218.20	1.50	.033	.14	.06	3.1	.06			333	1354	636				94	57		1	1.3	58		
26639	218.20	219.70	1.50	.015	.11	.08	2.2	.04			145	1119	772				122	48		1	2.2	36		
26640	219.70	221.20	1.50	.065	.42	.35	8.8	.02			654	4173	3542				108	72		15	8.8	23		
26641	223.70	225.20	1.50	.006	.14	.06	2.7	.05			64	1355	564				167	24		3	2.7	47		
26643	227.60	229.10	1.50	.008	.09	.06	5.3	.08			78	936	643				282	27		30	5.3	79		
26644	229.10	230.60	1.50	.005	.06	.08	2.8	.09			47	633	820				240	52		4	2.8	86		
26645	233.70	235.20	1.50	.048	.97	.69	12.4	.07			481	9687	6927				172	43		18	12.4	68		
26646	237.40	238.90	1.50	.020	.16	.13	4.5	.06			202	1623	1325				161	134		19	4.5	64		
26647	238.90	240.40	1.50	.046	.06	.07	24.4	.11			458	612	677				218	101		155	24.4	111		
26648	241.30	242.60	1.30	.010	.02	.02	1.8	.06			102	230	155				157	70		4	1.8	55		
26649	255.30	256.90	1.60	.010	.02	.01	0.5	.03			101	228	132				517	159		5	0.5	32		

Sample	From (m)	To (m)	Length (m)	CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB
26650	256.90	258.60	1.70	.021	.10	.12	1.5	.04			214	963	1226				498	117		7	1.5	38
26651	261.30	262.90	1.60	.009	.01	.02	1.0	.05			90	104	182				332	175		6	1.0	53
26653	271.20	272.40	1.20	.014	.01	.01	1.5	.01			143	68	72				61	117		1	1.5	4
26654	317.60	319.10	1.50	.011	.04	.05	2.8	.02			114	418	512				22	69		1	2.8	15

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
26586	119.80	122.80	3.00	59.04	14.77	2.16	3.44	0.38	3.43	6.31	.25	0.69			56	60			5	50	1.7	57	.01		1.24	91.79	102	11
26595	168.70	171.70	3.00	52.32	12.38	4.54	4.96	1.11	1.02	9.65	.41	1.11			60	771			5	38	2.7	342	.01		2.93	90.47	277	9
26642	225.20	227.60	2.40	54.32	12.00	3.79	5.30	1.14	.59	11.11	.34	1.09			105	1847			5	36	4.4	1233	.01		3.35	93.05	241	12
26652	268.20	271.20	3.00	47.19	17.88	4.99	5.70	.12	3.56	7.68	.30	.89			36	123			5	188	1.6	43	.04		1.52	90.08	127	2
26655	325.30	328.20	2.90	37.95	12.64	9.14	12.80	1.64	.06	9.70	.16	1.77			74	86			5	14	2.2	7	.40		.44	86.71	1	1

MINNOVA INC.
DRILL HOLE RECORD

HOLE NUMBER: RG383 IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: Rea Horizon

PLOTTING COORDS GRID: Sam Survey
NORTH: 402.31N
EAST: 12404.53W
ELEV: 1059.52

ALTERNATE COORDS GRID: Estimated
NORTH: 4+ 0N
EAST: 124+ 0W
ELEV: 1050.00

COLLAR DIP: -55x 0' 0"
LENGTH OF THE HOLE: 90.50m
START DEPTH: 0.00m
FINAL DEPTH: 90.50m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: August 19, 1990
DATE COMPLETED: August 20, 1990
DATE LOGGED: August 20, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NO

CONTRACTOR: Frontier
CASING: Pulled
CORE STORAGE: Samex Camp

PURPOSE: Test NW Extension of Rea Horizon.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
81.30	-	-56x 0'	ACID	OK		-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 33.50	.CSG/					
33.50 TO 42.30	.Mflt/	Green. Fine to med. Fine to med grained, green tuffaceous matrix supports 15% subrounded preferentially ser/dol, altered and bleached clasts to 6cm. and locally 5% dark green, chloritic subangular clasts to 3mm. - altered glassy shards? Matrix is locally porphyritic/xtal tuffaceous (feldspar), gradational contact, 3% qtz/dol veining (60/40%). 33.5 - 33.9: Maf volc overburden.		Rock is calcareous chloritically altered; lapilli clasts are preferentially ser/dol altered.	Minor py.	Possibly a flow top breccia zone to the underlying feld-porph.
42.30 TO 53.70	.Feld Porph /	Green. Fine. Fine grained matrix supports up to 30% white spots - after feldspar, minor uniform aphanitic clasts <1cm. long. 5% white qtz/dol veins/patches - preferred orientation 55 - 70 degrees to C.A. Very gradational contacts. 952.1 - 53.3L .flt bx/		Core is calcareous and chloritically altered. Downhole core becomes increasingly bleached and dolomitized.	Minor 1% py fine - coarse dissem.	Unit may be a tuff/crystal tuff.
53.70 TO 64.30	.Dol/Ser/Py Alt Maf/	Gray, yellow. Fine. Mafic volc. have been intensely altered which has destroyed all original textures. Interval has been extensively weak to intensely fault brecciated - gouge alteration present locally. Minor argillite present. 953.7 - 64.7L .flt bx zone/ 53.7 - 54.1: 40% white to gray qtz patches and veining.		Pervasively gray dolomitization of core cut by patchy yellow - green sericite patches, local gray sericite. Sericite alt'n is locally intense.	Pyrite is very fine grained - fine grained coarse dissem, blebs content varies from 5 - 35% with a general increase in py downhole.	
64.30 TO 67.00	.Ser/Py Alt Arg?/	Black, yellow, gray. Fine. Arg? has been intensely altered over 80% of interval. 20% black argillite - cherty argillite. 10% qtz/dol veining. 964.3 - 65.2L .flt bx/		Intense, patchy mustard yellow sericite alt'n, patchy weak silicification and dolomite, minor talc.	10 - 30% fine med grained py in blebs and semi-massive patches associated with qtz veining/silic.	64.3 - 65.2: 11% recovery in fault gouge.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
67.00 TO 72.50	.Arg/	Black. Fine. Black, massive argillite containing 15% qtz/carb (50/50%) veining/stringers. Veins are irregular - locally weak stockwork. Some veins truncated. Foliation at 60 --70 degrees to C.A. 967 - 69.2L .flt bx zone/		Argillite is weak to moderately graphitic, minor weak, patchy silicification in areas of veining.	Up to 5% very fine grainedpy, blebs, patches and possible contorted beds.	67 - 69.2m: 80% recovery.
72.50 TO 90.50	.Arg/Silt/Wacke/	Black, gray. Fine. 70% interbedded/laminated argillites and siltstone, 30% coarser wackes. Bedding is generally consistant at 70 -85 degrees to C.A., 5 - 15% qtz veining - stockwork between 73.5 - 79.8m, veins occur primarily within wacks. Veins are locally contorted, folded, truncated. 974.6 - 76.8L .flt bx, gou zone/ 981.8 - 82.7L .flt gou zone/ 988.5 - 88.65L .flt gou/ END OF HOLE		Local weak graphite. Moderate graph between 74.6 - 76.8m.	Minor Py. 74.1 - 74.6: Minor coarsely dissem cp in qtz veins.	Core is very blocky.

HOLE NUMBER: RG383 ASSAY SHEET DATE: 11-October-1990

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
26547	60.10	61.60	1.50	.009	.01	.01	0.7	.06			92	57	13				7	37		7	0.7	62	
26548	61.60	63.10	1.50	.015	.01	.01	0.1	.07			149	78	4				1	47		5	0.1	74	
26549	63.10	65.40	2.30	.013	.01	.01	0.1	.06			126	79	4				1	50		2	0.1	62	
26550	65.40	66.80	1.40	.013	.01	.01	0.2	.02			134	83	22				88	83		3	0.2	21	
26576	66.80	69.20	2.40	.005	.02	.01	1.7	.04			48	159	44				77	71		11	1.7	44	
26577	69.20	70.70	1.50	.006	.03	.01	1.6	.02			64	287	42				80	89		7	1.6	22	
26579	70.70	72.20	1.50	.007	.03	.01	1.1	.01			71	262	46				81	81		7	1.1	14	
26578	73.70	75.30	1.60	.005	.02	.01	0.9	.01			53	154	33				70	62		3	0.9	2	
26580	78.80	80.30	1.50	.002	.01	.01	0.5	.01			21	71	18				67	51		1	0.5	2	

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
26546	35.60	38.60	3.00	42.58	11.99	6.43	11.32	.18	.01	9.39	.18	1.31			64	59			5	27	1.3	4	0.24		.07	88.38	11	1
26581	83.70	86.20	2.50	61.26	15.56	1.24	2.50	.07	3.04	5.73	.07	.80			31	85			5	46	0.5	27	.13		.41	92.21	69	1

MINNOVA INC.

HOLE NUMBER: RG384 — DRILL HOLE RECORD — IMPERIAL UNITS: — METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: Sam Horizon

PLOTTING COORDS GRID: Sam Survey
NORTH: 825.96N
EAST: 12483.23W
ELEV: 1070.75

ALTERNATE COORDS GRID: Estimated
NORTH: 840+ 0N
EAST: 125+ 0W
ELEV: 1065.00

COLLAR DIP: -55x 0' 0"
LENGTH OF THE HOLE: 361.70m
START DEPTH: 0.00m
FINAL DEPTH: 361.70m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: August 24, 1990
DATE COMPLETED: August 30, 1990
DATE LOGGED: August 26, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NO

CONTRACTOR: Frontier
CASING: Pulled
CORE STORAGE: Samex Camp

PURPOSE: Step Out to the NW along the Sam Horizon.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
121.00	-	-58x 0'	ACID	OK		-	-	-	-	-	
142.30	-	-60x 0'	ACID	OK		-	-	-	-	-	
171.90	-	-58x 0'	ACID	OK		-	-	-	-	-	
200.20	-	-58x 0'	ACID	OK		-	-	-	-	-	
242.90	-	-58x 0'	ACID	OK		-	-	-	-	-	
282.50	-	-58x 0'	ACID	OK		-	-	-	-	-	
294.70	-	-58x 0'	ACID	OK		-	-	-	-	-	
328.10	-	-58x 0'	ACID	OK		-	-	-	-	-	
361.80	-	-60x 0'	ACID	OK		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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-	-	-	-	-		-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 97.50	.CSG/					
97.50 TO 128.90	.Dol/Ser/Py Wacke/	Grey, Fine - med. Interal consists of 95% wackes and lithic wackes and 5% argillite interbeds to 5 cm and carbonaceous segregations? Bedding is locally contorted, lithic fragments include qtz, argillite, siltstone. Lithic wacke interval occur between 97.5 - 100.2m, 108.8 - 109m, 109.7 - 109.9m and 126.7 - 128.9m. Sericite alt'n gives phyllitic surfaces, Foliation at 70 - 80% to C.A. Minor brecciation present, minor qtz veining. 9107.4 - 108.8L .flt bx/ 9117.7 - 118.3L .flt bx/ 9118.8 - 119.8L intermittant .flt bx/ 127.8 - 127.9: flt bx		Weak to intense gray sericite alteration is pervasive throughout. Moderate dol alt'n/nodular growths (to 1mm) present. Sericite alt'n is most intense in vicinity of faulting.	Trace sp at 109.2m; Pyrite content varies between 1 - 10%. Py is very fine grained and occurs as dissem to blebs.	A coarser version of what is called "MUT" in the mine area. Pyrite appears to be an alteration feature rather than primary.
128.90 TO 134.50	.Alt Wacke Flt Bx/	Gray, white. Fine. Sericite and dol altered wackes similar to those of the above interval. Interval is strongly rubbled, brecciated and locally altered to gouge at base of interval. 20% white qtz/dol (65/35%) veining and stringers. Veins are crosscutting seds. Veins contain open fractures. Principal vein intersections are between 128.9 - 129.6m. and 133.6 - 133.9m.		Mod to intense gray sericite alt'n of wackes weak to mod dol alt'n.	Trce cp in qdv at 129.6m. 3% fine grained py in dissem and stringers in wackes.	
134.50 TO 136.60	.Dol/Ser Seds/	Gray, black. Fine. Sediments are intensely altered but appear to be comprised of 90% wackes. 10% argillite, minor brecciated qtz/dol veins, gradational lower contact.		Intense dol alt'n bleaches core; mod brown patchy sericite alt'n.	2% fine grained dissem pg. Local concentrations to 5%.	
136.60 TO 157.80	.Dol Arg Bx /	Gray, black. Fine. 90% of interval consists of variably altered argillite +/- siltstone, 10% altered wackes; minor cherty arg present; 2% white qtz/grey dol (60/40%) veining. Sediments have been strongly tectonized. Bedding is generally strongly disrupted to brecciated banded/foliated clasts have been rotated. Cleavage (foliation?) plane generally oriented		Argillites are weak to mod graphitic. Patchy moderate to intense dol alt'n and nodular dol porphyrablasts, intense dol alt'n zones bleach core to gray color. 148 - 148.3: Weak silicification.	1 - 3% fine grained dissem py.	Dolomitization maybe preferentially altering silty beds.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		at 50 - 70 degrees to C.A. Fine laminae locally exhibit tight small scale folding.				
157.80 TO 161.60	.Ser/Qtz Seds/Flt Bx/	Gray, greenish, yellow. Fine. Sediments have intensely altered; 5% black argillite remnants. Interval is strongly fault brecciated and altered to gouge. Intensity decreases uphole. Foliation at	60	Rock has been intensely and pervasively altered to a pale greenish yellow sericite. 5% white to gray qtz veinlet/stringers and patches/clasts present. Local strong clay gouge.	3 - 5% f - med grained dissem pyrite.	
161.60 TO 167.10	.Arg/Chty Arg Flt Bx/	Black. Fine. Black argillite are interbedded with fine - mod. laminated cherty argillites and minor cherts. 5% white qtz/minor dol veinlets and veins. Veining is distorted by faulting. Interval is intermittantly mod - intensely fault brecciated and altered to gouge; upper contact has slickers sides at 164.8 - 165.1: Intensely altered, gray interval of volcanics? interval is strongly faulted.	50	Argillites are moderately graphitic with local variations to weak and intense. 164.8 - 165.1: Intense gray - brown sericite alt'n, weak talc.	1% fine grained py occurs as stringers in argillite. Local concentrations assoc. with qtz veins. 165.8 - 166.0:10% py bands.	
167.10 TO 169.90	.Dol/Ser Volc? Flt Bx/	Gray. Fine. Rock has been intensely altered but appears to be volc in origin rather than sedimentary. Local weak breccia textures. 5% white qtz veins. Core is intermittantly weak to moderate fault brecciation and gouge alteration.		Intense dol alt'n pervasive throughout interval. 3% fine grained dol veining. Patchy, 1% talc.	1 - 2% fine grained, coarsely dissem py. Trace cp in qtz vein at 168.2m.	
169.90 TO 201.90	.Arg Flt Bx /	Black, gray. Fine. 85% of interval is intermittantly mod - intensely fault bx. 90% of interval is argillite, 10% altered silt/sandstone, 10% white/gray qtz/minor dolomite veining. Veins are locally deformed. Argillites are bedded - laminated. Bedding orientation varies between 50 - 80 degrees to C.A. Beds are commonly tectonically disrupted and contorted. Veins are conformable and crosscutting veins have a max width of approx. 40 cm.		Argilite is weak to mod graphitic. Weak, patchy zones of gray sericite and silic. present locally. 10% of interval is altered to brown green sericite.	2% fine grained dissem py with locallized concentration to 10% assoc. with qtz veins. Minor base metal sulphide occurrances at 183.3 - 183.55m Minor sp; 191.1 - 191.15m. 4% fine grained galena blebs; 201.2m; minor galena. Base metals are all found in veins.	172.8 - 174.9: 35% recovery. 176.7 - 177.3: 55% recovery. 177.3 - 177.6: 66% recovery. 200.2 - 201.1: 66% recovery.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
201.90 TO 203.70	.Alt Vol/Sed + Flt Bx/	Gray, green. Fine. Intense alteration destroys most original textures. 5% altered argillite beds present in interval at base of interval. Moderate fault brecc.		Core is mod to intense dolomitized with mod. patchy green/brown sericite alt'n, 3% talc.	2 - 5% fine grained pyrite which occurs as dissem blebs. 203.3 - 203.6: 10% pyrite.	201.9 - 203.7: 117% recovery.
203.70 TO 205.80	.Het Frag? Flt Bx/	Gray. Fine to coarse. Interval is weak to mod. fault brecciated. 20% altered seds are interbedded with het frag? Het frag consists of a py silty? matrix containing up to 80% lithic frag. Fragments are composed of argillite, qtz/dol, sericite and minor pyrite. Clasts to 3cm. Interbedded seds are altered siltstone and chert? 5% white qtz veinlets.		Patchy mod. - weak dol alt'n. Patchy brown sericite alt'n.	5% pyrite overall - locally concentrated. Py is fine to med. grained and occurs as dissem - semi massive bands.	
205.80 TO 208.20	.Dol Arg Flt Bx/	Black, gray. Fine. Interval is pervasively moderately fault brecciated. Argillites also exhibit minor healed tectonic textures. Argillite has brecc. appearance and spotty alteration; 2% qtz/dol veins, minor altered silt/wacke/het frag intervals.		Patchy weak to mod. dol alt'n, minor brown sericite and talc.	2% fine grained dissem py.	
208.20 TO 213.50	.Het Frag/	Gray. Silty - sandy matrix supports up to 70% clasts ranging up to 5cm. long. Clasts are angular to rounded. Clasts composition includes, qtz/dol, arg, silt, sericite altered fragments, and minor py clasts. Minor qtz veinlets present. Interval is fairly competant local weak fault brecc.		Patchy brown sericite alt'n of clasts. Patchy weak to mod. dol alt'n.	5% very fine grained - fine grained dissem py.	
213.50 TO 223.50	.Ser Flt Bx /	Gray, pale yellow, green. Interval is strongly fault brecciated with clasts reaching 17 cm. Clast composition includes: Argillite, chert, qtz, pyrite, and sericitically altered fragments. Clasts are angular to sub rounded. Between 219.7 - 223.5m.: core is still highly brecc. but rock is consistently an intensely qtz/ser altered sed? Gradational contacts.		Patchy mod. to intense brown sericite alt'n of clasts, between 213.5 - 219.7m Minor talc. 219.7 - 223.5: Intense yellow - brown sericite moderate patchy silicification.	213.5 - 219.7: 5% py overall, fine grained, coarsely dissem. 219.7 - 223.5: 2% py.	Clast types are generally well mixed - protolith may have been a Het Frag, between 213.5 - 219.7m. and between 219.7 - 223.5m. a qtz/ser alt sed?

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
223.50 TO 226.20	.Chert Flt Bx/	Gray. Fine. Protolith was a banded/ribbon chert. Chert has been intensely brecciated and subsequently largely healed by introduction of silica. Between 225.5 - 224.4m. core is an unhealed fault breccia. Clasts are very fine at top of interval, coarsening downhole.		Chert has been atleast weakly silicified.	2% fine grained py in coarse dissem and blebs. Cp and Py stringers located at 224.7m. and 225.0m. Cp is very fine grained and intermixed with the py.	
226.20 TO 237.10	.Alt Sed? Flt Bx/	Gray, yellow, green. Fine. Intense alteration throughout interval except between 226.7 - 226.93m. Where there is an argillite remnant. Interval is pervasively mod - intensely fault brecciated to 232.5m. between 232.5 - 237.1m. there is patchy weak to moderate fault brecciation. Basel contact is faulted.		Pervasive mod to intense yellow - brown sericite alt'n. Moderate patchy gray qtz/dol alteration/ flooding.	2% very fine grained py in fine - coarse dissem and minor blebs.	
237.10 TO 245.20	.Alt Arg Tect/	Black, gray, green. Fine. Protolith of interval appears to have been primarily argillite with possible silty and cherty interbeds. Rock was then crosscut by 10% white qtz veins/veinlets with assoc. sulphides locally. Interval was then locally tectonically brecciated and sericitically altered. Zones of healed tectonic breccia occur between: 241.1 - 242.0: Coarse angular clasts of qtz and 2% subrounded clasts of pyrite; 244.35 - 244.6: Small angular clasts of qtz, argillite and minor py. Inter tectonic breccia zones are commonly tectonically disrupted or sericitically altered. 9237.1 - 237.65L strong .fault bx/ zone. Fault contacts are oriented at 9237.65 - 237.9L .alt vol?/	40	Patchy moderate green - brown sericite alt'n.	2 - 5% fine grained py in blebs, dissem and stringers. Local sulphide concentrations: 9237.65 - 239.3L .15% py, min sp, cp, gn/ py occurs as semi-massive patches and bands up to 1% sp locally. 9243.4 - 245.1L .10% py, min apy/ py is fine grained coarse dissem blebs and patches. Aspy occurs between 245.0 - 245.1m., 4% aspy in coarse dissem.	
245.20 TO 251.60	.Arg/Silt/	Black, gray. Fine. Argillites are finely laminated with silty beds. 2% qtz/dol stringers or flooding paralleling laminations. Between 245.2 - 246.5m there is 15% white/gray qtz veining. Between 247.0 - 250.9m: Laminations are generally subparallel to C.A. - HINGE ZONE. Predominant cleavage plane in this interval is Gradational contacts.	85	Between 250.5 - 251.0m there is patchy yellow green sericite alteration of some laminae.	3% fine grained py blebs and stringers.	

237.6

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
251.60 TO 269.10	.Qtz/Ser Alt Sed/	Gray, yellow. Fine. Gradational contacts. Protolith has been intensely altered. Approx. 20% white - gray qtz veins/veinlets. Preferentially oriented to foliation. Foliation is locally contorted but at top of interval is At base of interval foliation orientation is at Max vein width is 20 cm. veins are weakly fractured and/or include altered wallrock fragments. Interval contains fault bx/gouge zones <15cm. 259.6 - 265.2: Blocky core, 10% fault bx.	70 60	Intense yellow sericite alt'n and intense qtz veining, minor talc. Alteration intensity decreases towards top of interval.	1 - 2% dissem py.	
269.10 TO 276.70	.Arg/Het Frag?/	Black, gray. Black argillites containing minor silty beds is interbedded with Het Frag beds/debris flows. The Het Frag interval generally consists of a silty to sandy matrix supports up to 70% clasts. Clasts are subrounded to angular. Clasts are comprised of argillite, qtz and sericite altered clasts. Max clast size 3cm. Major het frag intervals occur between: 271.6 - 272.05m, 274.43 - 274.49m, 274.73 - 275.34m and 275.88 - 276.7m. Laminations/bedding in argillites are locally disrupted - brecciated by early stage of tectonism. Minor fault seams present.		Interval contains patchy weak green/brown sericite alt'n intervals of mod - intense pervasive green/brown sericite alt'n occur between 220.4 - 220.76m and 274.55 - 274.73m.	5% very fine grained - fine grained occurs as coarse dissem, blebs, stringers and then deformed laminae.	
276.70 TO 279.20	.Qtz/Ser Alt Sed/	Gray, Black. Fine. Interval appears to have been primarily argillite interbedded with siltstone. 5 - 10% of interval is weakly altered to unaltered argillite remnants. Core is laminated atfer bedding? Local contortations and small scale folding present - general sense of bedding/foliation varies between 60 - 70 degrees to C.A. 15% white to gray qtz veining oriented parallel to bedding.		Patchy to pervasive moderate olive green sericite alt'n.	3 - 8% fine grained dissem py.	
279.20 TO 301.20	.Sil Arg/	Black. Fine. Argillites are massive to laminated with fine silty interbeds. Core has been tectonically bx and contorted. Local small scale folding of silty and pyritic beds.		Core contains intervals of moderate to intense silicification interspersed with unsilic core. Silic/unsilic ratio 2:1. Argilite is strongly graphitic.	5 - 10% very fine grained pyrite. Py generally occurs in semi-massive patches, blebs and some pyritiferous beds. Between 279.2 - 281.6m there is	

279

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		Contacts are gradational. There is 15 - 20% white qtz veining and flooding between 279.2 - 284.4m. Between 298.7 - 301.1m there is 25% white qtz veining. Approx. 3% veining through remainder of interval. The core between 282 and 301.2m is very blocky and contains narrow fault bx seams. 9283.6 - 283.75L .flt gouge/ 9287.1 - 287.45L .flt bx/			approx. 1/2% combined sp, cp with trace gn. Sp, cp, gn are very fine grained and generally coarsely dissem. Strongly associated with qtz veins. Between 281.6 - 284.4m there are only trace - minor amounts of sp, cp. 280.65 - 280.9m: 2% very fine grained, dissem arsenopyrite. 9291.4 - 291.8L /40% py/ semi-massive to massive - associated with qtz vein.	
301.20 TO 316.30	.Ser Alt Sends/	Gray, black. Fine. Interval consists of patchy altered argillite/siltstone. Arg/silt are finely laminated. Bedding is locally offset along cleavage plane which subparallel to bedding. Bedding is variably oriented between 50 - 75 degrees to C.A. 301.2 - 301.7: Hinge zone cleavage plane off setting bedding oriented at Minor fault bx seams to 10cm. present. 2% white qtz veins and pods.	65	Patchy weak to (minor) mod greenish sericite alteration.	2% fine grained py in coarse dissem and blebs.	
316.30 TO 324.80	.Arg/Silt/	Black, gray. Fine. 85% arg with 15% silty interbeds. 5 - 10% qtz veining. Veins are massive to vuggy, crosscutting bedding. Core is competant to moderaltey blocky. Minor fault bx zones to 15cm. width. 9317.5 - 319.7L intermittant .flt bx zone/ 9324.2 - 324.8L .flt bx/		Argillite is strongly graphitic. Patchy weak silicification.	Overall pyrite content approx. 5%. Py is very fine grained and occurs as coarse dissem to blebs and semi-massive patches. 316.3 - 317.9: 10% py with an interval from 317.5 to 317.9m. which contains 20 - 25% py.	
324.80 TO 334.30	.Ser Arg/Silt/	Black, gray, olive green. Fine. Core is banded and laminated by black argillite and green - gray altered arg and silt. Fractured white qtz veins to 10cm. comprises 5% of interval. Veins are oriented subparallel to banding. Banding at 70 - 80 degrees to C.A. Gradational contacts.		Weak to moderate greenish sericite alt'n of approx. 65% of seds. Alter. appears to favor the coarser seds. Sericite gives core phyllitic partings.	1 - 2% fine grained pyrite dissem in seds. 3% coarsely dissem py in qtz veins.	

316

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
334.30 TO 336.60	.Sil Arg/	Black. Fine. Argillite is randomly crosscut by 10 - 15% patchy, discontinuous qtz stringers - veins.		Argillite is weak to moderate silicified. Argillite has graphitic partings. Weak to moderate pale green sericite alt'n zones between 333.95 - 334.2m and 336.4 - 336.5m.	2% fine med grained dissem py.	
336.60 TO 348.90	.Qtz/Ser Alt Sed/	Yellow, gray. Fine. Original rock textures have been nearly completely altered - minor argillite remnants; 15% qtz content <40%; Qtz occurs as veins, stringers and flooding. Veins are locally contorted. 9346.5 - 347.8L .flt bx zone/ 339 - 340.4: Interval may contain up to 25% intensely altered volc?		Intense, pervasive yellow sericite alteration. 339 - 340.4: Weakly chloritic? Strongly yellow - green sericite.	1 - 5% fine grained dissem py.	
348.90 TO 352.35	.Dol Arg Flt Bx/	Black, gray. Fine. Black argillite is cut by 15% white qtz veins - stringers. Qtz veins are oriented subparallel to foliation. Bedding/foliation are locally strongly deformed - brecciated. Argillite is laminated by qtz veining and dol alteration. Interval is intermittantly fault brecciated - moderate intensity. Lower contact is intensely fault bx/gouge altered.		Patchy weak to moderate dol alt'n of argillite bleaches core to gray color.	Minor to 1% fine grained py dissem and stringers.	
352.35 TO 361.70	.Porph Flows/	Green. Fine. Matrix is aphanitic to fine grained and supports <1% rounded lapilli sized clasts - flow top bx? Between 354.3 - 359m the volc host <20% small (<1mm) whitish xtalline spots which appear to be altered feldspar and glomeroporphyritic feldspars. Below 359m feldspar spots absent but chloritic spots alter Hb/pyroxene present (5%). 3% white qtz veinlets, veins are occassionally vuggy. 9352.35 - 352.6L .flt gou/ 352.6 - 353.1: Qtz/carb vein (70/30%). END OF HOLE		Core is chloritically altered. In vicinity of veins core is bleached.	Trace cp at 358.6m. Minor very fine grained dissem py.	REA MAFICS?

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
26657	101.20	102.70	1.50								28	125	35				4	29		3	1.7	3	
26658	108.60	110.10	1.50								35	99	35				48	36		1	1.0	1	
26659	116.60	118.10	1.50								84	83	47				1	59		8	0.8	1	
26660	118.10	119.60	1.50								80	58	47				6	73		1	1.5	10	
26661	128.90	130.40	1.50								22	68	23				1	67		1	1.4	1	
26662	132.90	134.40	1.50								32	50	20				1	61		1	1.5	1	
26664	160.10	161.60	1.50								23	82	44				78	36		1	0.4	1	
26665	161.60	163.10	1.50								47	228	86				123	58		17	1.7	21	
26666	165.20	166.70	1.50								22	234	130				150	45		10	0.8	1	
26667	167.90	169.60	1.70								73	190	167				171	30		1	0.5	1	
26668	171.90	174.90	3.00								52	88	72				99	62		6	0.6	1	
26669	183.10	184.60	1.50								23	124	55				47	39		1	0.1	1	
26670	188.60	190.10	1.50								35	54	49				83	45		1	0.1	17	
26671	190.10	191.60	1.50								28	36	921				51	107		2	1.8	1	
26726	200.20	201.90	1.70								54	451	507				121	75		16	2.3	11	
26727	201.90	203.70	1.80	.012	.11	.06	0.8	.06			123	1115	647				168	20		11	0.8	62	
26728	203.70	205.20	1.50								65	422	239				134	33		1	1.4	27	
26729	205.20	206.70	1.50								53	552	285				54	40		5	0.4	1	
26730	206.70	208.20	1.50								42	342	262				106	40		1	0.8	1	
26731	208.20	209.70	1.50								72	101	141				105	27		2	2.1	70	
26732	209.70	211.20	1.50								30	113	46				73	37		1	0.3	58	
26733	211.20	212.70	1.50								13	60	28				317	36		1	0.1	48	
26734	212.70	214.20	1.50	.004	.03	.02	0.1	.07			38	266	217				1723	34		8	0.1	73	
26735	214.20	215.70	1.50	.001	.01	.01	0.1	.11			8	99	61				3012	47		10	0.1	110	
26736	215.70	217.20	1.50	.001	.01	.01	0.1	.08			13	81	81				711	42		1	0.1	80	
26737	223.50	224.90	1.40	.001	.02	.02	1.3	.07			107	245	233				1202	24		30	1.3	73	
26738	224.90	226.20	1.30	.026	.01	.02	0.6	.01			258	87	195				470	16		10	0.6	1	
26739	237.60	239.20	1.60	.053	.31	.19	12.3	.57			534	3135	1883				2101	27		119	12.3	574	
26740	239.20	240.70	1.50	.006	.04	.03	0.4	.07			64	379	299				341	37		11	0.4	65	
26741	240.70	242.20	1.50	.004	.08	.01	0.1	.06			6	79	96				391	37		2	0.1	63	
26742	242.20	243.70	1.50	.003	.01	.01	0.3	.06			25	99	118				299	39		6	0.3	64	
26743	243.70	245.20	1.50	.007	.03	.04	1.0	.16			65	292	449				2029	46		17	1.0	164	
26745	263.40	264.90	1.50								103	50	52				41	45		2	0.1	1	
26746	273.70	275.20	1.50								18	57	63				1	47		1	0.5	1	
26747	275.20	276.70	1.50								112	204	256				1	54		46	1.3	1	
26748	279.20	280.70	1.50	.011	.04	.05	2.1	.09			113	365	453				1794	62		17	2.1	92	
26749	280.70	282.20	1.50	.041	.27	.13	3.7	.08			412	2739	1281				1789	114		25	3.7	78	
26750	282.70	283.70	1.00								127	392	291				178	78		9	1.0	18	
26751	283.70	285.50	1.80								86	315	166				326	111		8	0.5	21	
26752	285.50	287.00	1.50								59	146	88				55	103		4	0.1	1	

Sample	From (m)	To (m)	Length (m)	CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB		
26753	290.40	291.90	1.50								96	118	252				597	78		68	1.8	51		
26754	291.90	293.40	1.50								127	509	336				229	83		21	1.7	38		
26755	294.80	296.30	1.50								102	85	61				104	104		8	1.4	1		
26756	298.70	300.20	1.50								56	66	61				242	82		5	0.6	41		
26757	300.20	301.70	1.50								69	62	81				378	77		6	0.3	60		
26759	316.30	319.90	3.60								92	36	100				319	108		35	1.7	20		
26760	334.30	335.80	1.50								86	69	55				1	57		14	0.6	1		
26761	340.40	341.90	1.50								32	87	48				1	59		1	0.6	1		

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
26656	98.20	101.20	3.00	62.96	14.53	5.32	3.27	1.83	1.15	3.80	.05	.42			26	50			5	56	2.0	26	.01		2.64	96.02	44	9
26663	145.30	148.30	3.00	55.38	12.32	1.58	5.68	.31	2.44	7.61	.22	1.23			73	67			5	79	1.3	26	.20		1.65	88.72	77	8
26672	194.20	197.20	3.00	64.83	12.25	.01	2.35	.38	2.95	7.52	.47	.63			21	159			5	47	0.9	182	.03		1.47	92.98	56	6
26744	255.10	258.10	3.00	58.20	16.19	.01	3.75	.56	3.67	6.80	.27	.72			33	63			5	57	0.9	225	.01		1.62	91.89	99	7
26758	303.80	306.80	3.00	58.86	16.66	.01	1.80	.35	4.31	6.92	.33	.78			58	99			5	97	0.1	53	.01		2.79	93.02	96	6
26762	355.70	358.40	2.70	42.49	13.55	7.90	9.04	3.46	.07	9.93	.15	1.46			82	69			10	7	0.9	6	.19		1.04	89.28	28	1

MINNOVA INC.
DRILL HOLE RECORD

HOLE NUMBER: RG385 IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: Rea Horizon

PLOTTING COORDS GRID: Sam Survey
NORTH: 434.06N
EAST: 12490.80W
ELEV: 1052.80

ALTERNATE COORDS GRID: Estimated
NORTH: 4+40N
EAST: 124+90W
ELEV: 1047.00

COLLAR DIP: 70x 0' 0"
LENGTH OF THE HOLE: 157.50m
START DEPTH: 0.00m
FINAL DEPTH: 157.50m

COLLAR GRID AZIMUTH: 182x30' 0"
COLLAR ASTRONOMIC AZIMUTH: 227x 0' 0"

DATE STARTED: August 21, 1990
DATE COMPLETED: August 23, 1990
DATE LOGGED: August 22, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
ROD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: Frontier
CASING: Pulled
CORE STORAGE: Sawex

PURPOSE: Rea Horizon Stepout Drilling.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
50.30	-	-65x 0'	ACID	OK		-	-	-	-	-	
157.50	-	-65x 0'	ACID	OK		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 15.20	.CSG/					
15.20 TO 26.40	.Mflt	Green to greenish brown. Fine - med. Green fine to medium grained altered mafic lapilli tuff. Staining with potassium ferri cyanide picks out rounded to subrounded, fine - coarse calcite grains, possibly pseudomorphing after original feldspar. Occassional larger altered carbonate clasts also present. Matrix dominated by black - green chlorite. Minor transitional zones of light yellow brown green altered sericite tuff. Weak to moderate foliation developed within chlorite. Qtz dolomite veining occupies 2 - 3% of interval and exhibits folding stretching and boudinage.	74 85	Chloritic and carbonate alteration intense. Local silicification moderate to intense 15.2 - 16.2m.	Pyrite generally 2 - 3% within green chlorite tuff but where silicification and pyrite occurs up to 15 - 20% in 915.2 - 16.2% .15 - 20% Py/ fine disseminated grains, granular blebs and granular stringers.	
26.40 TO 28.20	.Ser Mflt/	Green, yellow, brown. Fine - coarse. Transitional zone of partly silicified, sericitized lapilli tuff showing locally intense deformation. Qtz dolomite veins occupy 8% of interval and show break up and folding.		Silicification moderate to intense associated with qtz dolomite veining. Sericitization moderate to intense producing yellow, yellow brown sericite.	Disseminated grains, granular blebs and stringers of pyrite averaging approximately 7% interval.	
28.20 TO 37.60	.Mflt/	Green - greenish brown. Fine coarse. Green to greenish brown fine to coarse grained altered mafic lapilli tuff. Rock appears fresher than similar unit at top of hole. Qtz-dolomite veining occupies 2 - 3% interval. Bleaching tends to occur either side of qtz carb veins. Core blocky with local fault gouge/bx. Zones at 30.1 - 30.4m. 36.6 - 36.7m.		Chloritic and carbonate alteration. Carbonitization less intense than unit 15.2 - 26.4m. Qtz dolomite veins locally silicifying volcanics. Weak to moderate development yellow brown sericite.	Fine disseminated pyrite and occassional blebs occupy 2 - 3% of interval.	
37.60 TO 42.70	.Ser Mflt/	Green, yellow, brown. Fine - coarse. Transitional zone chloritic sericitic tuff, deformed, almost tectonite in appearance with yellow brown sericite and fragments of qtz dolomite. Occasional clasts grey pyritic, fine grained tuff/sediment?		Intense sericitization, local moderate silicification associated qtz dol veining.	3 - 10% disseminate fine to blebby pyrite.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
42.70 TO 83.00	.Mflt/	Green, grey. Fine coarse. Sequence of carbonate rich altered mafic lapilli tuff which exhibits downhole fining of grain size. Core breaks along planes. Chlorite rich alteration at Qtz dolomite veins occupy 3% interval and show no preferred orientation. Folding and break up of some veins. Very minor zones (<1cm) fault gouge occur, no major zones faulting. 70.8 - 71.3: Partly healed fault bx in qtz vein and volcanic.	70	Intense carbonitization of original tuffaceous texture. Weak - moderate silicification associated with qtz dolomite veining 2 - 3% of interval. Some increase in brown - yellow sericite downhole. Good example carbonate sericite alteration of lapilli tuff at 77.1 - 77.2m. Lapilli preferentially ser/carb altered with matrix dominantly sericitized.	<1% fine disseminated pyrite.	Upper section of interval characterised by coarse crystalline tuff? porphyry? Metamorphism coarsening texture of mafic - intermediate(?) tuff.
83.00 TO 85.70	.Mflt Qtz V n Bx/	Green, grey. Fine coarse. Green to grey zone of faulted, altered lapilli tuff and qtz carbonate veins. Qtz-carb, sub angular to sub rounded fragments in fine sericitic matrix, locally healed.		Silicification moderate to intense. Moderate yellow brown sericitization.	3 - 7% Pyrite in stringers and blebs throughout interval. Locally 20% Py in fragments within and adjacent to broken qtz veins.	
85.70 TO 97.60	.Mflt/	Green - brownish green. Fine med. Altered green to greenish brown fine to medium grained lapilli tuff. Cross cutting qtz carbonate vein show minor deformation and occupy 3 - 4% of interval. Core breaks easily along planes sericite.	80 90 65 70	Intense chlorite carbonate alteration of volcanics. Subsequent silicification and sericitization. Moderate intensity sericite alteration.	3 - 5% Pyrite in blebs and stringers associated with qtz veining. Occasional fragments/clasts with very fine disseminated pyrite up to 20%.	
97.60 TO 121.70	.Mflt Arg/	Green, grey, black. Fine. Transitional zone of argillite dominated sediments and altered green tuffaceous volcanics. Interval shows tectonite character developed in fragmented silt/argillite and chert? Extensive faulting distrubuted through interval as follows: 9103.1 - 107.8L .Mflt arg flt bx/ Zone of fault bx/gouge locally healed. Minor faults 10 - 20 cm. through parts of interval 107.8 - 121.7.		Carbonate alteration moderately intense through remaining competent intervals. Sericite moderate to intense alteration. Locally intense silicification assoc. with qtz - carbonate veins. Veins generally grey, stretched, deformed with gradual alteration contacts with host rock. Later qtz dolomite veins with sharper contacts.	Interval contains approx. 10% Pyrite with local concentrations of very fine disseminated pyrite in clasts thin interbeds?	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
121.70 TO 123.70	.Arg Qtz Vn Flt Bx/	Black. Fine. Black graphitic fault gouge/bx zone in argillites and qtz vein. Qtz veins contorted broken within gouge and brecciated argillite.		Black argillites to graphite.	Pyrite not evident in gouge (destroyed) 1% is remnant argillite and qtz vein.	
123.70 TO 157.50	.Silt Arg/	Black, grey. Fine - v. fine. Black grey fine to very fine siltites and argillites interbedded and finely laminated. 123.7 - 129.7, numerous white qtz carbonate veins cross cutting, deformed or parallel with laminated argillite. Argillites in structurally upper 6m of interval show angle to C.A. "fresher" sediments downhole are at Blocky broken core 151 - 155.3 indicating minor fractures and faulting. END OF HOLE	40 80	Graphitic alteration argillites. Occassional silicification of silty interbeds.	1% Pyrite in very fine disseminated grains or occassional blebs.	

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
26602	26.50	28.00	1.50	.006	.01	.01	3.2	.01			60	37	142				20	81		21	3.2	4	
26603	83.00	84.50	1.50	.006	.01	.01	1.2	.01			60	57	14				6	95		5	1.2	1	
26604	108.10	111.10	3.00	.012	.01	.26	26.3	.01			121	84	2561				51	32		229	26.3	10	whole core litho'd
26605	114.30	115.80	1.50	.010	.01	.01	1.3	.02			95	52	58				50	36		12	1.3	18	
26606	118.70	120.20	1.50	.003	.04	.01	0.4	.01			26	363	65				25	48		1	0.4	2	
26607	120.20	121.70	1.50	.001	.01	.01	0.8	.01			14	132	32				23	41		5	0.8	2	
26608	121.70	122.70	1.00	.006	.02	.01	0.8	.02			59	179	25				194	79		5	0.8	24	
26609	122.70	123.70	1.00	.004	.02	.01	0.9	.01			39	217	52				47	51		7	0.9	1	
26610	124.70	126.40	1.70	.003	.01	.01	0.7	.01			26	91	24				84	403		1	0.7	2	

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
26601	45.90	48.90	3.00	37.94	12.33	9.14	8.03	2.81	1.68	10.12	.20	1.30			86	91			10	48	9.9	602	.16		.46	84.21	17.86	
26604	108.10	111.10	3.00	42.04	16.95	6.88	3.34	2.15	4.09	10.91	.29	1.29			121	84			10	32	26.3	2561	.06		7.60	95.67	51	229
26611	145.50	148.50	3.00	59.69	18.24	.84	2.81	1.42	3.75	6.89	.05	.91			41	124			5	46	1.2	94	.01		.63	95.30	66	15

HOLE NUMBER: RG386

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: SAM HORIZON

PLOTTING COORDS GRID: SAM SURVEY
NORTH: 802.49N
EAST: 12195.91W
ELEV: 1056.58

ALTERNATE COORDS GRID: ESTIMATED
NORTH: 8+ 0N
EAST: 122+ 0W
ELEV: 1055.00

COLLAR DIP: -55° 0' 0"
LENGTH OF THE HOLE: 185.00m
START DEPTH: 0.00m
FINAL DEPTH: 185.00m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: August 31, 1990
DATE COMPLETED: September 7, 1990
DATE LOGGED: September 6, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: FRONTIER
CASING: PULLED
CORE STORAGE: SAMEX

PURPOSE: STEPOUT DRILLING OF SAM HORIZON

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
50.20	-	-55° 0'	ACID	OK		-	-	-	-	-	
102.70	-	-56° 0'	ACID	OK		-	-	-	-	-	
184.40	-	-55° 0'	ACID	OK		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 46.90	«CSG»					
46.90 TO 60.70	«SIL CHT ARG»	Colour: brown grey black Grain Size: fine Mixed interval of deformed, grey black argillite and quartz veins (tectonite); cherty siliceous argillite and greyish brown, sericitic/pyritic altered sediments Zones of tectonite show fragmentation, stretching of grey silicfied "clasts" in a black, silicified very fine grained argillite matrix. Contorted folds occur, and at 59.9 m a bullseye structure is present Zones of sericite/pyritic alteration occupy 10% by volume, of the interval Core tends to break along phyllitic surfaces @ 65-70 deg	65	Intense silicification associated with quartz veining and quartz flooding Sericite occurs as grey brown, wispy laminae occasionally fragmented, within the more argillic sections, and as zones of moderate to intense alteration associated with pyrite graphitic alteration of argillite	The interval contain 7-10% py throughout, distributed in a variety of forms: -f.g. laminae parallel to foliation -fragmental clasts of py in tectonite -f. to c. blebs associated with qtz veins Locally over 1-2 cm intervals, 20% py is present	Core relatively competent owing to silicification
60.70 TO 62.00	«QTZ VN SIL CHT ARG»	Colour: brown grey black Grain Size: fine Interval is transitional with the above section and is distinguishable on its white quartz and sulphide content The interval appears chaotic with patchy grey white quartz due to fragmentation and folding; cherty zones possibly show faint ribbon texture		Intensely silicified primary chert and secondary quartz veining and flooding	7-10% pyrite in disseminated grains, blebs and bands {60.7-62.0} «7% Py, 5% Sp, <2% Tt?» The interval contains numerous rounded blebs of sphalerite, up to 5 mm in diameter. The sugary textured, brown to honey brown sphalerite occupies an est. 5% of interval, locally 15-20 over 15 cm, assoc. with intense zones qtz veining and silicification Blackish grey tetrahedrite? occurs in association with sp, est.: <2%	Tetrahedrite may be in part black sphalerite?

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
62.00 TO 73.60	«SER PY SED S»	Colour: grey brown black Grain Size: Interval is transitional with the overlying unit, and similarily shows mixed interbeds of sediments with various alteration types 80-90 deg Sericite/pyrite altered sediments dominate over silicified and cherty argillites in ratio 65:35 Deformed white quarz veins and patches, mainly within cherty argillite sections occupy 6% of the interval	80	Sericite alteration is mod. to intense occurring as fine grey disseminated flakes or wider yellow brown bands Intense silicification quartz veining and flooding throughout the argillic sections Moderate silicification of flakey grey sericite zones	15% pyrite occurs in blebby bands, stringers and fine "dusty" dissem-inations within the sericite/pyrite sediments 7% pyrite locally as high as 15% occurs in the cherty argillite sections <0.5% blebby, brown sugary sphalerite occurs in white quartz vein associated with cherty argillite	Flesh to mauve coloured fine grained minerals in association with sericite possibly leucoxene
73.60 TO 81.50	«QTZ CHT ARG»	Colour: white grey black Grain Size: Transitional to the overlying unit. Interval is dominated by grey black cherts and argillites which have been intruded by white qtz (minor dolomite) veins. The interval is generally chaotic with zones of chert argillite and qtz vein exhibiting folding and fragmentation (tectonite). Cherty zones show moderate development of ribbon bands. Phyllitic foliation is developed in sericite and graphitic argillite @ 70-80 deg	70	Localised qtz veining and flooding has bleached the chert argillite host rock, such that original texture is hard to distinguish. Quartz veining and flooding occupy 18% of the interval. Thin laminae of greyish brown sericite are moderately well developed in the less argillic zones and at 80.2-80.6 is well developed in association with py	5-10% pyrite with greater conc. associated with cherty argillites Pyrite banding (beds?) in places has been deformed within argillite and smeared around eyes of quartz vein {80.6-80.8} «2% Sp» -Quartz vein has blebby 2% Sp	
81.50 TO 85.30	«QTZ SER CH T ARG»	Colour: grey, black, yellow Grain Size: fine Transitional to the overlying unit. The chaotic texture persists but the interval is characterized by an increase in sericte and pervasive silicific-ation giving a lighter greyish yellow colour punctuated by black argillite. Some of the more siliceous zones may be chert but the original textures have been destroyed. Sericite occurs in laminae and bands which often show contorted folding and fragmentation		Moderate to intense yellow and brown sericite alteration. Silicification intense grey and greyish-white; minor white quartz	Pyrite unevenly distributed varying from 1 to 20% over small intervals (4-5 cm). Average approx. 7-10% py. Pyrite occurs as fine grained deformed bands, stringers and rounded blebs	Interval is not "classic yellow and black" qtz sericite and argillite banding owing to deformation

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
85.30 TO 86.30	«ARG QTZ VN »	Colour: grey white Grain Size: Grey, intensely silicified argillite (chert?) resulting from qtz veining and flooding. Original texture virtually destroyed. Qtz veins blend in with silicified host rock		Intense grey to greyish white silicification associated with qtz veining. Minor dolomite within qtz veins	1-2% py in small stringers often associated wth remnant styolite textured argillite	
86.30 TO 89.00	«SER PY SED S MAF?»	Colour: grey, brown Grain Size: fine Altered sericite, pyritic sediments and mafics?, have been faulted, in part to breccia and gouge. White to greyish white qtz dolomite veins invade the host rock. Dolomite shows a marked increase in % volume of veining (40%) compared to veins in structurally overlyng units. Quartz dolomite veining occupies up to 20% of the interval and is commonly folded and crosscuts foliation. The main interval of fault gouge and breccia occurs between 87.1-88.2		Moderate to locally intense, banded yellow brown sericite intimately associated with pyrite. Minor well developed grey soapy talc.	7-10% pyrite occurs as disseminated grains, blebs and thin (2-4 mm) bands. One subrounded, 4 mm bleb of sphalerite occurs within a patchy grey white qtz dolomite vein {86.8-87.01} « <0.5% Sp, 1% Py»	
89.00 TO 92.60	«CHT ARG HE T FRAG»	Colour: grey, black Transitional interval to the overlying unit, comprising two main lithologies: a greyish white silicified chert? argillite and a black het frag with fine argillite martrix supporting granule to pebble size silicified clasts 89.0-90.7 -silicified chert argillite 90.7-90.8 -green talc, sericite laminae and sub parallel patchy QDV. Possibly a small mafic volcaniclastic component 90.8-92.6 -Het frag with intervals of crosscutting QDV and altered sediments		Intense silicification of chert argillite or perhaps only bleaching of chert zones? Grey sericite locally intense as laminae in sections of altered sediments Minor yellow sericite occurs as a band in black argillite, and a similar quantity of grey talc laminae occurs with yellow brown sericite structurally above the het frag.	Approx. 7% pyrite unevenly distributed through interval. The silicified zone contains occasional patches of deformed, fine grained py up to 20% over 2 cm Het frag contains disseminated grains and small blebs of pyrite	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
92.60 TO 95.40	«QTZ SER»	Colour: grey, yellow Grain Size: fine Transitional contact with the overlying unit. Deformed greyish white qtz and creamy interstitial dolomite roughly banded with greenish yellow to pale brown sericite QDV and siliceous alteration clasts show fragmentation, stretching and flattening parallel to foliation. Cleavage moderately well developed at 95.3 m within sericite	70 24	Moderate to intense alteration laminae and patches of sericite	3-5% pyrite in disseminated grains small 1-2 mm blebs and occasional fine bands	
95.40 TO 101.20	«CHT ARG TECT»	Colour: Grain Size: Transitional contact with overlying unit. Interval comprises mixed "roughly" interbedded sections of qtz sericite and het frag but is dominantly a cherty arg breccia or tectonite QDV show extensive fragmentation and folding tight isoclines and hinge "bulls eye" zones. {98.3-98.9} «Het Frag» -zones of variable argillite matrix supported, to clast supported conglomerate/bx. Minor patchy QDV are also present Small intervals (1-2 cm) of graphitic gouge are present as are sections (to 10 cm) of blocky core	75	Intense zones qtz sericite alteration at: 93.7-93.9 99.5-98.0 Minor intervals of green talc associated with sericite	Pyrite varies from 1-15% with an average of 7% and a general increase in concentrations downhole. Pyrite form is generally as disseminated grains and blebs up to 5 mm, and occasional fine grained bands. Base metal sulphides are confined to the zone of het frag between {98.3-98.9} «7% Py, 7% Sp, <1% Cp Gn» Sphalerite occurs as brown sugary blebs and patches with some association to the QDV Small grains and traces of Cp and Gn occur in proximity fo the Sp.	
101.20 TO 105.40	«QTZ SER»	Colour: grey, yellow Grain Size: fine Altered, deformed interval of grey to greyish white qtz and brownish to greyish yellow sericite (altered sediments). Black argillite increases downhole. Deformation has resulted in a patchy appearance to parts of the interval, but where lamination/folitation is developed phyllitic		Intense sericite and silica alteration weak to moderate, local dolomitization associated with QDV	7% pyrite distributed as fine disseminations and blebs and granular stringers following qtz veins.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		surfaces have an angle to c.a. Two phases of qtz veining present, one parallel to foliation, the second, crosscutting sediments and earlier phase quartz	85			
105.40 TO 114.30	«CHT ARG»	Colour: grey, black Grain Size: Transitional contact with the overlying unit. Mixed, roughly interbedded interval dominated by grey black cherty, silty argillites but with an intermed. section of sericitic sediments or volcanics? The cherty silty argillite has been deformed and exhibits tectonite texture; isoclinal folding and cleavage developed sub parallel to bedding and phyllitic foliation Compositional layering Cleavage The lower downhole 1.5 metres is increasingly cherty and is transitional to the underlying chert fault breccia {110.8-112.1} «SER ARG VOLC» -including 20 cm of Het frag? -Het frag? is also present in the upper part of the interval from 105.4-	 85 70	Yellow brown, bands and laminae of sericite moderately well developed Silicification locally intense, possibly preferentially altering siltite bands in argillite	Pyrite concentration varies from 2-20% with an average of 10-12%. Pyrite concentration diminishes in the cherty zones to the base of the interval. Within the cherty argillite, pyrite occurs as disseminated grains and blebs Pyrite within the sericite argillite/ volcanic zone occurs as fine dusty disseminations and within deformed bed like bands. Base metal sulphides mainly chalco-pyrite are concentrated in a zone {110.1-111.1} «10% Py, 5% Cp,Sp,Tr Gn»	
114.30 TO 119.20	«CHT FLT BX »	Colour: grey, black Grain Size: Broken core fragments of grey black graphitic argillic cherts; broken quartz dolomite veins Interval includes 3 sections (20-30 cm) of whole core which show folded chert bullseye structure		Graphitic alteration of argillite	3-5% pyrite, locally 10-15% py in coarse blebs associated with qtz (minor dolomite) veins. <0.2% Sp in blebs associated with QDV	Notable that fault is concentrated in more competent chert Chert frags may also be due to fracturing in fold hinge zone? 114.6-119.2 -core loss, up to 50%

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
119.20 TO 121.70	«QTZ VN CHT ARG»	Colour: grey, black Grain Size: Dominantly white qtz (minor dolomite) vein with 10% chert argillite. Vein is blocky and very fragmented, between 119.4-119.9, indicating branch off main fault zone Vein system appears crudely parallel to foliation but true relationship difficult to assess.		Graphitic alteration of argillite	Zone is characterized by occasional large (1 cm) blebs of galena and sphalerite (Sp>Gn). Pyrite concentrations up to 20% over 1-2 cm in the argillite remnants Overall % sulphides is difficult to estimate [119.2-121.7] «3% Sp, 1% Gn, 6% Py»	
121.70 TO 128.50	«CHT FLT BX »	Colour: grey, black Grain Size: fine Continuation of fault zone, dominantly fragmented, broken chert, but with subordinate graphitic argillite and quartz vein. Approximately 60% of interval is faulted		Graphitic alteration argillite	7% pyrite in stringers, patches and disseminated grains and blebs Up to 30% coarse blebby pyrite over 3 cm at 124.0 associated with quartz flooding of argillite	Interval has up to 30% core loss
128.50 TO 137.60	«SER DOL MA F SE?»	Colour: grey, brown Grain Size: fine Structural upper contact faulted Grey dolomitized sediments? volcaniclastics? with interbedded/banded yellow brown sericite Dolomitzed and sericitized intervals vary from <1 cm to 4 cm and 2 mm to 4 cm, respectively Sericite banding near fault zone occurs at angle but outside of fault zone - gouge and breccia indicate the persistence of the major fault zone which has been present since a depth of 114 m. Approx. 25% of the interval is faulted Two small lithological subintervals occur: 132.6-133.1 -deformed grey black chert	60 85	Moderate to intense dolomitization. Moderate to intense yellow brown sericite alteration; occasional light green soapy talc	Pyrite varies from 5-30% with an average of 10%. The greater concentrations (to 30%) occur over 2-3 cm associated with qtz dolomite veins. Pyrite form is commonly fine grained to dusty disseminations within the sericite zones and coarse disseminated blebs (to 4 mm diameter) within the qtz dolomite veins.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		⊣134.1-134.5⊢ «Het frag» -deformed, stretched Qtz dolomite occurs as veins and grey white patches within the deformed host rock. Veining generally parallel to foliation				
137.60 TO 143.10	«CHT SILT ARG»	Colour: grey, black Grain Size: fine Transitional contact with the overlying unit. Interval is dominated by moderately deformed chert and interbedded siltite and argillite 70-75 deg Mafic compound is possibly present 142.3-143.1 where yellow brown sericite fuchsite? and green talc occur. White greyish white qtz (minor dolomite), occurs as deformed patches cross cutting and concordant veins Faulting is evident at: 141.0-141. 142.9-143.1	70	Argillite beds are graphitic Dolomitization is weak except where qtz dolomite veins invade the host rock. Silicification has destroyed much of the original rock texture between 139.4-140.7	Pyrite average 10% with concentrations up to 30% over 20 cm at 142.6-142.8. Zones of pyrite enrichment are associated with quartz dolomite veining and pervasive silicification. Pyrite is distributed in blebby patches, stringers and bands. <0.5% combined base metal sulphides grains and blebs of Sp and Cp occur over small intervals (1-2 cm) at 138.1 m and 140.6 m	
143.10 TO 146.00	«ARG CHT»	Colour: grey, black Grain Size: fine Contact with the overlying unit is faulted Interval is dominated by folded, faulted, grey black argillic chert. Folding shows bullseye structures and changing orientation of cherty banding from sub-parallel to nearly perpendicular to core axis. Approximately 35-40% of interval is broken, fragmental and gouge. Minor qtz dolomite veining		Graphitic alteration moderately intense within more argillic bands. Weak spotted dolomitization within cherts	2-3% pyrite in fine (1 mm) bands and stringers	
146.00 TO 168.90	«ALT SILT ARG»	Colour: grey, black Grain Size: fine Mixed, relatively thick sequence of altered sediments. Interval appears dominated by argillite and siltite but dolomitization has		Dolomitization is moderate to intense throughout the interval. Silicification is locally well developed in assoc.	Pyrite is distributed throughout the interval in a variety of forms	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		masked most of the original textures, particularly within the siltite lithologies In addition to the alteration the sequence is further complicated by folding and faulting Minor intervals have yellow brown sericite and green talc, possibly indicating a mafic component is locally present. There mafic sections occur as follows: 146.0-147.7 -patchy, laminated yellow brown sericite, deformed within dolomitization matrix 149.0-149.5 -deformed yellow brown wavy sericite with dolomitized interbeds The interbeds shows moderately well developed phyllitic foliation at 60-65 deg within the more argillic zones. Foliation of parallel to compositional layering. Folding has distorted the argillite siltite interbeds and intruding qtz dolomite veins often leaving a patchy mottled grey, black, white mixture of stretched flattened frags (tectonite) Faulting is abundant with minor intervals of gouge and breccia throughout. Notable fault zones occur as follows: 150.2-160.8 -intermittent gouge and breccia 167.6-168.5 -intermittent gouge and breccia	60	with qtz dolomite veins. Graphite is weakly to moderately developed in argillite and fault gouge and breccia	Sediments contains disseminated fine grained pyrite and occasional deformed patches and bands. Coarse blebby pyrite is generally confined to grey white QDV Overall 7-10% pyrite with local conc. to 30% at 152.8, 161.9 and 166.8 Base metal sulphides occur at: {166.4-167.0} «20% Py, 1% Cp» including possible Tr Tt?	
168.90 TO 180.30	«HET FRAG»	Colour: grey, white, black Grain Size: fine to coarse Transitional contact with overlying unit. Interval comprising clast supported, subrounded to subangular, often flattened, granule to pebble sized fragments of black cherty argillite, pale to darker brown sericite altered, grey white,		Moderate to intense dolomitization of minor intervals dominated by matrix supported Het frag. Intensely dolomitized clasts stands out from adjacent chert argillite and	Pyrite occurs mainly as secondary grains blebs and patches, ranging in concentration from 5-20% with overall distribution of 10%. Single bleb of sphalerite identified	Classic sections of Het Frag

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		sediments? and qtz dolomite. Light coloured, altered fragments and qtz dolomite clasts are greater in number than darker cherts and argillite. Approx. ratio 60:40 Grey white qtz dolomite veins rougly concordant with foliation occupy 4-5% of the interval. The veins are patchy grey white in texture with "hazy" alteration contacts with the host rock Interval appears chaotic due to faulting. Numerous faults, fractures are present. The zones of significance occur as follows: 175.4-175.8 -fractured Het Frag and gouge 178.9-179.2 -Het Frag, fault bx/gouge		sericite Sericite occurs as altered clasts within the Het Frag conglomerate breccia, but also as laminae within small zones intensely alterd to the extent that original texture are absent Sericite colour range from pale yellow to brown Black grey graphitic alteration of argillite and graphite in gouge	at 169.3 m {173.1-173.2} «2% Cp» -associated with patchy qtz dolomite alteration. Cp occurs as thin 1-2 mm blebby streaks	
180.30 TO 185.00	«HET FRAG ALT SEDS» E.O.H.	Colour: grey, black Grain Size: fine, coarse Contact with the overlying Het Frag is transitional. The interval is mixed with altered, dolomitized sediments, minor het frag, and argillite. The argillite content increases downhole 50% of the interval is faulted to breccia and graphitic gouge		Moderate to intense dolomitization of non-argillite intervals. Pale to yellow brown sericite wisps and laminae	Pyrite occurs as fine grains conc. in bands, grains and blebs. Overall 5-7% pyrite with minor concentrations to 15%	

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB		COMMENTS
26779	46.90	48.40	1.50	.002	.01	.01	0.9	.12			23	30	63				416	80		11	0.9	124		
26780	50.30	51.80	1.50	.013	.01	.01	4.0	.11			125	99	53				1068	60		93	4.0	110		
26782	59.20	60.70	1.50	.003	.01	.01	0.9	.08			28	101	67				1068	79		27	0.9	77		
26950	60.70	62.00	1.30	.642	1.94	.61	193.0	.77																
26784	62.00	63.70	1.70	.388	1.12	.46	144.6	.54			3882	11167	4577				1374	50		3884	144.6	538		
26785	66.70	68.20	1.50	.013	.02	.02	3.6	.05			126	234	223				448	56		125	3.6	51		
26786	68.20	69.70	1.50	.005	.01	.01	1.5	.20			47	113	69				1042	47		43	1.5	204		
26787	70.60	72.10	1.50	.009	.02	.01	2.2	.22			87	247	50				1597	61		59	2.2	217		
26788	72.10	73.60	1.50	.008	.03	.01	1.9	.18			81	335	65				1791	67		56	1.9	178		
26789	73.60	75.10	1.50	.003	.01	.01	1.3	.12			34	89	39				674	76		32	1.3	122		
26790	76.60	78.10	1.50	.004	.01	.01	1.8	.19			37	91	40				576	35		41	1.8	191		
26791	80.80	81.50	1.30	.004	.02	.01	0.8	.15			35	178	61				955	67		19	0.8	150		
26792	83.90	85.30	1.40	.004	.01	.01	0.4	.08			40	149	64				740	61		16	0.4	81		
26793	85.30	86.30	1.00	.001	.01	.01	0.1	.04			7	146	23				207	18		4	0.1	38		
26794	86.50	88.00	1.50	.005	.03	.01	1.2	.07			46	298	50				316	53		7	1.2	69		
26795	88.00	89.00	1.00	.065	.07	.02	9.9	.05			646	747	162				634	62		337	9.9	46		
26796	90.70	92.60	1.90	.002	.03	.01	1.2	.01			22	337	69				28	53		4	1.2	1		
26797	95.40	96.80	1.40	.001	.01	.01	0.5	.01			7	83	28				34	67		1	0.5	1		
26798	96.80	98.30	1.50	.007	.12	.05	2.2	.01			65	1224	523				1	136		22	2.2	2		
26799	98.30	98.90	0.60	.086	1.53	.62	18.6	.04			859	15299	6203				156	49		424	18.6	43		
26800	98.90	100.40	1.50	.003	.01	.01	0.6	.01			25	132	132				149	61		1	0.6	1		
26826	100.40	101.20	0.80	.004	.01	.01	1.5	.01			41	121	78				1	55		19	1.5	1		
26828	108.40	110.10	1.70	.004	.01	.01	0.4	.01			43	72	67				81	54		3	0.4	3		
26829	110.10	111.10	1.00	.106	.29	.25	22.5	.06			1060	2939	2451				234	50		151	22.5	57		
26830	111.10	112.60	1.50	.006	.03	.02	1.7	.04			58	271	172				509	63		13	1.7	44		
26831	114.60	116.70	2.10	.017	.07	.04	9.8	.12			171	706	390				88	46		49	9.8	116		
26832	119.20	120.70	1.50	.019	.49	.09	3.1	.02			188	4897	859				79	29		17	3.1	17		
26833	120.70	121.70	1.00	.013	.59	.04	2.4	.19			128	5886	407				270	63		15	2.4	186		
26834	121.70	124.00	2.30	.016	.05	.03	5.1	.15			156	472	292				299	67	47		5.1	146		
26835	127.00	128.50	1.50	.005	.03	.04	1.7	.03			52	313	364				194	60		11	1.7	34		
26836	128.50	130.00	1.50	.008	.04	.15	4.9	.04			76	484	1520				204	51		16	4.9	38		
26837	130.00	131.50	1.50	.025	.06	.06	3.8	.12			246	586	593				465	57		17	3.8	119		
26838	131.50	133.10	1.60	.022	.04	.05	3.9	.09			219	438	464				243	31		15	3.9	86		
26839	133.10	134.60	1.50	.007	.04	.02	1.6	.07			74	383	224				403	44		16	1.6	65		
26841	137.60	139.10	1.50	.012	.02	.01	3.1	.04			121	215	114				179	93		19	3.1	42		
26842	139.10	140.80	1.70	.013	.01	.01	1.0	.04			146	100	72				215	47		14	1.0	35		
26843	141.60	143.10	1.50	.010	.04	.02	2.0	.12			96	402	182				679	35		61	2.0	124		
26844	146.00	147.50	1.50	.006	.02	.01	0.9	.04			62	197	145				221	46		7	0.9	39		

Sample	From (m)	To (m)	Length (m)	CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB		
26845	152.40	153.90	1.50	.010	.02	.01	2.5	.08			96	150	119				328	22		22	2.5	77		
26846	155.80	157.50	1.70	.005	.02	.01	3.2	.04			48	157	104				309	33		25	3.2	42		
26847	158.50	160.00	1.50	.009	.02	.01	2.6	.05			91	150	54				330	28		37	2.6	47		
26848	161.40	162.90	1.50	.004	.03	.02	1.2	.01			42	268	156				84	37		14	1.2	10		
26849	164.90	166.40	1.50	.005	.21	.10	6.4	.04			50	2094	962				157	41		22	6.4	43		
26850	166.40	167.00	0.60	.196	1.07	.39	92.0	.14			1952	10703	3852				564	25		511	92.0	136		re-assayed for Au
26851	167.00	168.50	1.50	.006	.07	.06	4.0	.01			57	670	621				150	31		23	4.0	4		
26852	168.50	170.00	1.50	.015	.16	.10	10.5	.05			151	1592	1014				134	34		69	10.5	49		
26853	172.50	174.00	1.50	.016	.06	.05	3.1	.02			156	605	521				107	45		11	3.1	18		
26855	181.00	182.50	1.50	.014	.24	.13	2.4	.03			137	2378	1310				59	72		8	2.4	26		
26856	183.50	185.00	1.50	.004	.04	.03	1.4	.01			42	410	315				99	71		6	1.4	13		

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
26781	53.30	56.30	3.00	77.08	8.69	.08	.73	.05	2.10	4.98	.02	.89			25	46			175	44	1.8	66	.01		2.75	97.44	578	28
26827	105.40	108.40	3.00	64.96	12.18	1.79	2.05	.24	2.95	6.37	.22	.71			37	48			15	49	1.8	67	.12		2.94	94.63	128	14
26840	134.60	137.60	3.00	60.20	13.39	.01	1.98	1.17	1.40	9.89	.21	1.20			888	2072			100	33	10.6	936	.01		5.10	94.62	311	49
26854	175.90	178.90	3.00	63.74	7.95	6.09	3.75	.82	.74	6.94	.31	.71			219	985			20	34	4.5	505	.04		2.80	93.94	101	15

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: Sam Horizon

PLOTTING COORDS GRID:
NORTH:
EAST:
ELEV:

ALTERNATE COORDS GRID: Estimated
NORTH: 4+15N
EAST: 126+50W
ELEV: 1050.00

COLLAR DIP: -55° 0' 0"
LENGTH OF THE HOLE: 163.70m
START DEPTH: 0.00m
FINAL DEPTH: 163.70m

COLLAR GRID AZIMUTH: 180° 0' 0"

COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: August 24, 1990
DATE COMPLETED: August 25, 1990
DATE LOGGED: August 25, 1990

COLLAR SURVEY: NO
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: Frontier
CASING: Pulled
CORE STORAGE: Samex

PURPOSE: To test NW extension of Rea Horizon

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
44.80	-	-55° 0'	ACID		weak	-	-	-	-	-	
96.60	-	-55° 0'	ACID	OK		-	-	-	-	-	
163.70	-	-55° 0'	ACID		weak	-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 18.80	«CSG»					
18.80 TO 39.20	«ALT VOLC CHRT ARG»	Colour: black, grey, greenish brown yellow Grain Size: fine Altered, deformed interval of light coloured greenish brown mafic volcanics (tuffs); grey to black ribbon cherts and black argillites Interval is highly deformed, evidenced by tectonite development in cherty argillites folding stretching and brecciation of qtz veins. Cleavage developed @ Within wavy folds at 33 m. Altered volcanics occupy an estimated 20% of the interval {33.6-34.7} « ALT/VOL» -light greenish altered dolomitzed volcanic(Tuff?) or sediment? Qtz dolomite veins and fragments blebs appear abundant occupying 7-10% of the interval Fault gouge and breccia scattered through the interval with faults in range 10-45 cm at: 23.66-23.86 25.36-25.5 26.2-26.7 32.56-32.75 37.8-38.2	80	Moderate to intense silicification associated with QDV. Dolomitization concentrated within silty argillite and volcanic intervals; weak to moderate in intensity. Yellow brown sericite occurs mainly within the volcanic intervals	Approx. 10% pyrite occurring is disseminated fine grains, stringers and blebs. Occasional fine dissem. py in bed like form. Local concentrations of 15-20% py in granular blebs	
39.20 TO 59.40	«CHT ARG TE CT»	Colour: grey, black Grain Size: fine Interval of dominantly argillaceous sediments showing intense deformations folding stretching and brecciation (tectonite) Structural top of interval at 39.5 m, laminated argillites with quartz veins parallel to bedding have angle to c.a. 65-70 Quartz dolomite veining varies from 6-30% of core sections with an average throughout the interval of 8%	65	Argillites are moderately graphitic Silicification associated with QDV moderate; locally intense dolomitization Weak to moderate development of greenish sericite occurring as stretched deformed laminae/clasts? within argillite. Minor zone of qtz sericite dominated lithology at 56.3-57.0	Approximately 10% pyrite distributed through interval with local concen. up to 15%. Pyrite occurs as fine grains in blebs, granular blebs, stringer and deformed pyrite blebs as intervals within argillite	Generally ehaotic interval characterized by zones of intense tight folding

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		Cleavage developed in zones of tightly folded argillites with variable angles to c.a 55-79 Minor faults and fractures occur throughout the interval with gouge/bx zones of note at: 40.15-40.8 54.6-55.0				
59.40 TO 64.90	«SER DOL SE DS»	Colour: grey green Grain Size: fine Gradational upper contact from cherty argillite into sericite rich zone Interval still displays (minor) deformation but this has been masked by alteration. Sericite alteration generally has orientation to c.a. of but also occurs in irregular bleb form. White qtz dolomite veining occupies 2-3% of the interval Significant fault gouge/bx zone 62.0-63.1	70	Intense development yellowish green sericite Dolomitization is moderate to intense. Dolomite alteration accompanied by siticification. These zones are grey in colour. Minor green talc?, developed within sericite	10% pyrite distributed through interval generally in thin (1 mm) stringers parallel to sericite orientation. Local zone of pyrite rich qtz vein at ⟨61.5-62.0⟩ «25% Py»	
64.90 TO 70.30	«QTZ VN ARG FLT BX»	Colour: black, grey, white Grain Size: fine Fault brecciated interval of grey white qtz dolomite veins, silicified argillite and minor chert Intensely brecciated/gouge between: 65.4-65.5 66.6-67.5 67.5-69.2 White qtz dolomite stockwork between 67.5-67.6		Localised intense dolomitization and silicification. Minor remnant greenish sericite in fault zones Graphitic alteration for argillite	Occasional blebs and fine disseminated grains make up 3-5% of interval	
70.30 TO 76.00	«QTZ SER CH T ARG»	Colour: black, grey, green, white Grain Size: fine Similar interval to the above lithologically but less faulted. Zones of cherty black argillite grade into zones of qtz sericite. Argillites:qtz approx. 55:45 Core breaks along phyllite surfaces at 60-70 deg		Graphitic alteration argillites Sericite pale grey to green occuring as laminations and irregular blebs	5% pyrite distributed in fine dissem. grains and occasional blebs. Very local pyrite up to 7-10%	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
76.00 TO 80.60	«QTZ SER»	Colour: white, grey, green, black Grain Size: fine Dominantly qtz sericite with minor (5%) gradational interbed of black argillite. Sericite has laminar/foliated texture with angle to c.a. of 60-70	60	Intense pale grey green sericite alteration. Zones between sericite moderate to intensely dolomitized	5% disseminated pyrite	
80.60 TO 82.10	«DOL SILT ARG»	Colour: black, grey Grain Size: fine The above sericite alteration grades into black graphitic argillite	70	Moderate to intense dolomitization of "silty" argillite interbeds	3% disseminated and occasional blebs of pyrite	Probably represents last zone characteristic of the Sam stratigraphy
82.10 TO 86.60	«GREEN LITH IC WACKE»	Colour: grey, green Grain Size: fine, coarse Lithified grey green, granule to small pebble size subrounded to subangular clasts in fine (silty, clayey) sandy matrix. Clasts show orientation, flattening, stretching parallel to weak phyllitic foliation. Minor, weakly graphitic argillite at 85.6-85.9		Matrix moderately dolomitized with intense dolomite developed in coarse clasts	1% pyrite	Correlateable Unit
86.60 TO 91.20	«MAF VOLC»	Colour: greenish-grey Grain Size: fine, medium Interval of black, greenish, grey fine grained volcanic matrix with medium grain size, rounded dolomite as alteration product after feldspar in porphyritic volcanic? Weak phyllitic texture developed with an angle to c.a. 60-80	70	Moderate to intense dolomitization	2-3% pyrite occuring in granular oval shaped blebs and thin, stretched bed-like disseminations (1-3 mm width)	
91.20 TO 105.00	«ARG/MAF TUFF»	Colour: green, grey, black Grain Size: fine Interval dominated by volcaniclastics (70%) but		Moderate to intense dolomitization of	<1% pyrite	Unusual occurrence of altered volcanic

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		with argillite interbeds and argillite matrix (30%) between lapilli? Lapilli-like clasts vary in size 2 mm to over 10 cm. All have orientation in direction of foliation, indicating structural stretching. Core blocky-broken. Minor white qtz veining <1% of interval		volcaniclastics. Weak to moderate alteration argillite to graphitic		lapilli in argillite matrix possible due to sedimentary? (conglomerate/ breccia) or tectonic? (tectonite) mode of formation
105.00 TO 106.50	«QTZ VN ARG FLT BX»	Colour: white, black Grain Size: fine White quartz dolomite vein and argillite faulted to graphitic gouge and fault breccia		Intense alteration argillite to graphite	2% pyrite associated with broken qtz vein	Contact volcaniclastic and argillite lithologies. "REA HORIZON?"
106.50 TO 163.70	«SILT ARG WACKE»	Colour: black, grey Grain Size: fine Black argillite dominated interval. Fine grey laminations (1-5 mm) of silt interbedded with argillite. Thicker silt/wacke intervals downhole up to 45 cm. Possible minor intervals of tuff? White quartz carbonate veining is more abundant within the upper 12 m of the interval, occupying 2-3%. QDV decreases downhole. QDV show some deformation small monoclinal folds at 115.9 m QDV 2 mm-2 cm width but at {117.2-117.6} «Qtz Dol vein» Faulting occurs at intervals throughout argillite with notable zones as follows: 117.1-118.0 -qtz vein filled fault in argillite 118.4-119.5 -brecciated qtz vein, wacke and argillite 119.7-121.9-zone of intermittent fault gouge and breccia 147.1-148.3 -partly healed fault breccia zone	65	Weak to moderate dolomitization of coarser silt wacke units	Pyrite unevenly distributed, with disseminated grains, cubes occurring mainly in coarser silt/wacke intervals Overall, throughout interval 1% pyrite	Core splits very easily along laminations

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
	E.O.H.					

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB		COMMENTS
26612	18.80	20.30	1.50	.007	.01	.01	2.9	.04			69	65	45				115	56		12	2.9	42		
26613	22.00	23.40	1.40	.007	.01	.01	1.1	.02			68	48	27				26	64		5	1.1	19		
26614	23.40	24.80	1.40	.006	.02	.01	1.1	.02			60	194	50				80	74		5	1.1	23		
26616	29.00	30.50	1.50	.005	.01	.01	1.3	.03			46	69	24				60	35		4	1.3	29		
26617	32.00	33.50	1.50	.008	.01	.01	1.3	.02			78	63	25				66	43		6	1.3	16		
26619	40.30	41.80	1.50	.005	.01	.01	0.5	.02			51	62	37				4	90		6	0.5	21		
26620	41.80	42.30	0.50	.006	.01	.01	0.4	.02			64	62	33				33	94		4	0.4	15		
26621	47.50	49.20	1.70	.005	.01	.01	1.6	.01			47	55	31				30	88		5	1.6	2		
26622	55.00	56.50	1.50	.004	.01	.01	0.4	.01			36	49	43				42	63		1	0.4	2		
26623	60.50	62.00	1.50	.010	.01	.01	2.1	.05			95	91	30				70	64		5	2.1	46		
26624	67.50	69.00	1.50	.004	.01	.01	2.0	.01			43	32	19				36	68		3	2.0	6		
26625	71.40	73.10	1.70	.007	.01	.01	1.0	.01			68	56	25				74	71		1	1.0	1		
26676	77.40	78.90	1.50	.008	.01	.01	0.1	.01			82	68	51				30	47		1	0.1	2		
26678	101.90	103.40	1.50	.003	.01	.01	0.8	.01			30	98	26				30	78		1	0.8	3		
26679	103.40	104.90	1.50	.002	.01	.01	0.7	.01			18	105	34				28	90		1	0.7	1		
26680	104.90	106.50	1.60	.006	.03	.01	1.1	.01			57	267	57				53	81		5	1.1	2		
26681	106.50	108.20	1.70	.005	.03	.01	0.8	.01			51	277	24				60	67		2	0.8	2		
26682	116.90	117.90	1.00	.004	.01	.01	0.5	.01			38	92	31				75	51		1	0.5	1		

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
26615	24.80	27.80	3.00	47.14	8.88	13.69	5.40	.01	2.66	6.99	.32	.64			61	70			5	55	2.9	36	.25		3.10	89.14	68	14
26618	33.60	34.70	1.10	35.37	11.78	14.78	6.80	.01	2.61	9.69	.21	1.51			84	86			5	43	1.6	13	.11		1.68	84.59	65	4
26677	86.60	89.40	2.80	52.41	18.49	3.64	3.68	3.80	2.44	7.68	.05	.72			32	122			5	92	0.9	49	.01		2.95	95.96	55	7
26683	124.00	127.00	3.00	58.47	17.82	1.15	3.14	.85	3.74	7.47	.05	.88			43	130			5	55	0.7	40	.01		0.48	94.13	45	2

MINNOVA INC.

HOLE NUMBER: RG388 — DRILL HOLE RECORD — IMPERIAL UNITS: — METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER:
CLAIM NUMBER:
LOCATION: SOUTH OF PIT

PLOTTING COORDS GRID: FIELD
NORTH: 706.00N
EAST: 9300.00W
ELEV: 1473.52

ALTERNATE COORDS GRID: UTM
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -90x 0' 0"
LENGTH OF THE HOLE: 304.80m
START DEPTH: 0.00m
FINAL DEPTH: 304.80m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: September 16, 1990
DATE COMPLETED: September 18, 1990
DATE LOGGED: September 18, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
ROD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: FRONTIER
CASING: IN HOLE
CORE STORAGE: MINE SITE EXP CAMP

PURPOSE: DRILLED SINCE RG377 IMPASSABLE @ 161.2m. THE HOLEWAS RELOCATED AND DRILLED AS RG388

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
47.90	-	-88x 0'	ACID	OK		-	-	-	-	-	
145.40	-	0x 0'	ACID	--	BAD DOUBLE ETCH	-	-	-	-	-	
221.60	-	-79x 0'	ACID	OK		-	-	-	-	-	
278.30	-	-77x 0'	ACID	OK		-	-	-	-	-	
304.80	-	-75x 0'	ACID	OK		-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 7.50	.OB/					CASING TO 15.2 m
7.50 TO 254.50	.MYPRO/	Colour - green Grain size - fine Tuffaceous to coarsely fragmental major and minor flting with occ. qtz carb veins, + or - base metals throughout 7.5 - 12.3 m flted/rubbvle & gouge 913.5 - 15.2L .flt/ top contact dip = 10 deg.		Darker and more chloritic sections increase down the hole.	2 - 3% diss'd py throughout 19.6 - 19.8 qtz/carb vein 3% gal, 2% sph	
		20.0 - 20.6 rubble/gouge	55			
		20.6 - 20.9 barren qtz carb veins	60			
		24.3 - 24.5 flt. 25.0 - 25.2 flt. 28.8 - 29.3 flted. 929.5 - 30.3L .flt/ 30.6 - 30.9 flted 31.5 - 32.5 rubble/flted 35.6 - 36.6 rubble/flted 37.3 - 40.8 rubble/flted/qtz carb veining 3% py. 39.7 - 40.8 rubble/flted 941.5 - 42.4L .flt/ 43.0 - 43.6 rubble/flted 946.0 - 52.1L .flt with q.v./ Interval rubble & gouge occ very broken with barren qtz veins up to 40 cm 53.1 - 53.4 flt. 54.7 - 55.0 flt with weak sericitic alt within flt. 55.9 - 60.1 flt. 61.0 - 74.6 interval flted - rubble v. broken 975.2 - 75.3L .flt dip = 35 deg/			23.1 - 23.6 flted & 10% py in qtz.	
		80 m =	50			
		82.5 - 90.0 94.5 - 94.9 - flt 99.5 - 115.5 core intact slightly broken but no flting 104 m =	60			
		115.5 - 116.2 v. broken core 132.3 - 135.8 tectonic brecciation Top contact 50 deg X-cutting		116.5 - 130.4 lapilli weakly sericitic alteration from qtz/carb veining below	120.8 - 123.2 qtz/carb vein Tr - 1% gal & sph 3% py gouged TOI to 121.4 m and 123.1 to EOI	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		dip bottom contact broken				
		with folding				
		147.2 - 147.8 gouge and rubble				
		147.8 - 152.0 tectonic				
		150 m =	60			
		152.6 - 152.8 Flt dip = 60				
		parallel to foliation.				
		153.4 - 153.6 Flt.				
		156.3 - 156.6 flt.			158.0 - 158.6 qtz/carb vein	
					2% gal, 3% sph, 3% py, 1% cpy.	
		164.6 - 164.9 tectonic bx				
		166.8 - 166.9 flt.				
		169.0 - 169.2 tectonic bx				
		169.3 - 169.4 gouge			169.2 - 169.3 - qtz/carb vein	
					3% gal & cpy & py, tr. sph	
				169.7 - 179.4 m		
				spotted subrounded calcite blebs		
				distributed throughout core.		
				Locally can be interpreted as		
				stretched and strained veinlets.		
				However, overall randomly		
				distributed.		
		180 m =	80			
		190.1 - 190.5 flted sericitic mafics				
					190.5 - 191.5 qtz/carb vein with	
				191.5 - 192.4 flted qtz/carb veining	tr. gal, sph & py	
				and mafics		
				192.4 - 193.7 flted mafics		
				193.7 - 194.2 - rubble		
				194.2 - 197.4 as above		
				spotted calcite blebs		
				197.4 - EOI serecitic alt of		
		214.8 - 215.1 flt-rubble	80	lapilli		
		218.1 - 218.3 flted healed gouge tectonic				
		225.1 - 225.2 - flt.				
		225.7 - 226.1 flt.				
		227.8 - EOI gouge flted - rubble - very broken				
		core				248.5 - 249.2 & 250.3 - 250.7
						Barren bull qtz veining
						shattered by flting.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
254.50 TO 259.60	.SERT QTZ CARB VEINS/	Colour - olive Grain size - fine, v. fine				
		Heavily faulted, rubble to v. broken Occ. piece of mafic and arg in gouge. Whole interval faulted Basal contact flted		Sericite	9255.2 - 255.8L qtz carb veining .1% cp,py,ga 4%sp/	
259.60 TO 304.80	.MUT/	Colour - grey Grain size - v. fine to aph.				
		Typical highly fissile MUT Minor qtz carb veinlets prominent @ TOI Occ arg remnants & dolomitic towards EOH Gouged flted to v. broken to 263.9		Silver grey sericite	3% diss'd py throughout.	
		267.0 - 267.2 flted	55			
				267.2 becoming sil'd.		
		271.2 flt dip = 20 deg 2 cm gouge 279.8 - 280.3 flted		9279.6 - 282.1L .sil'd arg/ 282.1 - 282.5 tr. fuchsite 282.1 to EOH v. sil'd and moderate ferroan dolomite		
		299 =	80			
				9295.0 - 299.3L .SIL'D ARG/ with tr. gal & sph 299.3 - EOH strong ferroan dol.		
		303.0 - 303.7 minor flts.				
	EOH					

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
BCD28200	23.10	23.60	0.50	0.01	0.01	0.02	2	.17															
BCD28201	120.80	123.20	2.40	0.01	0.01	0.01	2	.10															
BCD28202	158.00	158.60	0.60	0.01	1.98	0.71	6	.03															
BCD28203	253.00	254.50	1.50	0.01	0.05	0.04	2	.03															
BCD28204	254.50	255.40	0.90	0.01	0.04	0.03	2	.03															
BCD28205	255.40	255.80	0.40	0.16	3.98	1.00	6	.03															
BCD28206	255.80	256.90	1.10	0.01	0.08	0.02	2	.03															
BCD28207	294.50	295.00	0.50	0.01	0.02	0.01	4	.03															
BCD28208	295.00	297.00	2.00	0.03	0.17	0.08	2	.03															
BCD28209	297.00	299.30	2.30	0.01	0.10	0.05	2	.07															
BCD28210	299.30	299.80	0.50	0.01	0.04	0.04	2	.03															

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MINNOVA INC.
DRILL HOLE RECORD

HOLE NUMBER: RG389 | IMPERIAL UNITS: | METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: Rea Horizon

PLOTTING COORDS GRID: Sam Survey
NORTH: 384.54N
EAST: 12794.84W
ELEV: 1086.20

ALTERNATE COORDS GRID: Estimated
NORTH: 4+15N
EAST: 128+ 0W
ELEV: 1070.00

COLLAR DIP: -65x 0' 0"
LENGTH OF THE HOLE: 236.80m
START DEPTH: 0.00m
FINAL DEPTH: 236.80m

COLLAR GRID AZIMUTH: 180x 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225x 0' 0"

DATE STARTED: August 26, 1990
DATE COMPLETED: August 31, 1990
DATE LOGGED: August 27, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: Frontier
CASING: Pulled
CORE STORAGE: Samex

PURPOSE: Test NW Extension Rea Horizon.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
72.20	-	-63x 0'	ACID	OK		-	-	-	-	-	
107.80	-	-63x 0'	ACID	OK		-	-	-	-	-	
135.30	-	-62x 0'	ACID	OK		-	-	-	-	-	
182.00	-	-58x 0'	ACID	OK		-	-	-	-	-	
236.80	-	-59x 0'	ACID		Weak	-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 39.00	.CSG/					
39.00 TO 73.60	.Till/	Grey, brown. Fine coarse. Grey brown sandy, clayey, pebble - boulder glacial till.				72.7 - 73.7: 80% core loss.
73.60 TO 76.50	.Qtz Arg Flt Bx/	Grey, black, brown. Fine. White grey qtz dolomite fragments and qtz vein brecciated, within graphitic argillite gouge. Minor intervals 10 - 20 cm. of more competent qtz vein and moderately silicified argillite.		Upper 1m. of interval intensely oxidized.	Faulting may have destroyed pyrite. Pyrite in more competent blocks 975.6 - 75.8L .20% py/ Overall 5% Py?	
76.50 TO 86.00	.Arg, Qtz Ser/	Yellow, black. Fine. Deformed interval of faulted, folded, silty argillite (minor arenite?). Grey qtz dolomite and abundant pale grey yellow sericite. Upper 2m. of interval dominantly argillite/ arenite, including 25cm. of yellow brown sericite. Highly deformed zone 81.3 to 82.1m. of argillite, qtz dol and sericite. Cleavage developed at angle to C.A. Sericite foliated at	85 70 80	Moderate dolomitization of upper 2m, decreasing in intensity downhole, within sericitized zone. Minor green talc.	Pyrite shows uneven distribution through interval, varying from 1 - 25% with an average of 5 - 7% Py occurs as bed like disseminations, granular blebs are isolated euhedral crystals. Trace galena was found at a depth of 79.4m. in qtz carbonate vein alteration.	
86.00 TO 90.00	.Arg Flt Bx /	Grey, black. Fine. Interval dominated by argillite fault breccia and gouge. 86.0 - 87.2m. silicified Fectonised argillite zone.		Moderate intensity silicification within tectonite.	Pyrite not visible in fault bx/gouge but occupies 3 - 5% of tectonite.	
90.00 TO 93.10	.Silt Arg/	Grey, black. Fine. Black very fine argillite laminated and interbedded with silt and fine sand (arenite). Argillite dominates approx. 65% of the interval. Light grey arenite interbeds vary from 1mm to 2cm.	70 88	Weak silicification and moderate graphitic alteration. Moderate dolomitization of arenite interbeds.	3 - 5% Pyrite concentrated in arenite laminae as fine bed like disseminations.	
93.10 TO 106.00	.Lithic Wacke/	Greyish, green. Fine coarse. Grayish green, granule to pebble size, subrounded to sub angular clasts of argillite, dolomite and grey qtz in fine grained dolomitic matrix. Weakly foliated at	75	Moderate to intense dolomitization, staining outlines both calcite and dolomite.	1% pyrite in rounded clast like blebs.	Possible volcaniclastic component?

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		Upper contact with argillite gradational, but argillic component rapidly diminishes. Interval displays a repetitive sequence of coarse to fine deposition, downhole. Fault breccia/gouge in argillite at 97.4 - 97.7m. Blocky broken core at 101.4 - 101.7m, possible fault/fracture.				
106.00 TO 106.80	.Arg Flt Bx /	Grey, black. Fine. Zone of black, broken graphitic argillite and graphitic gouge. Minor fragmented qtz vein.		Weak silicification.	2% pyrite in fine bed like disseminations within argillite.	
106.80 TO 114.50	.Maf Volc Arg Tuff/	Grey, green. Fine med. Greyish green fine grained chloritic matrix with 15% calcite as irregular phenocrysts. Lower 2m. of interval comprises tuff? and argillite with the latter in filling around sub rounded tuff clasts? Weak phyllitic foliation at	60 70	Moderate dolomitization.	1% Pyrite occurs as fine disseminated grains.	Possible intraformational breccia/ conglomerate.
114.50 / TO 115.40	.Arg Flt Bx /	Grey, black. Fine. Graphitic fault gouge and fractured argillite with minor broken qtz veining.			1% Pyrite.	
115.40 TO 116.70	.Arg Qtz Vn /	Black, white. Fine. Interval dominated by white qtz dolomite vein (80%). Vein appears to intrude parallel to lamination of the argillite.	65	Minor grey green sericite at 115.8m.	1% euhedral pyrite disseminated in qtz-dolomite vein.	Correlates with white qtz vein at similar depth in hole RG-387.
116.70 TO 201.20	.Arg Silt Wacke/	Grey, black. Fine. Grey, black, very fine, to fine grained laminations of siltite and argillite with angle Siltite and argillite show no regular fining or coarsening cydes. Occasional folds eg, bullseye structure at 137m. Between 116.7 - 159.0m. white qtz dolomite veins occupy 3 - 4% of the interval. Veins occur parallel to the bedding of the sediments, and range in width from 1 - 60cm. Notable faults occur at the following intervals: 117.9 - 118.6m. broken brecciated argillite. 133.1 - 134.2, blocky zone fragmented argillite	65 80	Minor weak dolomitization of siltite laminae. Weakly graphitic, with greater intensity of alteration within fault zones.	1% pyrite occurs throughout interval with very occasional, local concentrations up to 15% over 1 - 2cm intervals of siltite or associated with QDV. Isolated occurrences of sphalerite or chalcopyrite are hosted by QDV at the following depth: 9138.6 - 139.0mL .2 - 3% Sp/ 9157.7 - 158.2L .2% Py, <1% Cp/	Possible flame structures in siltite argillite bedding at 174.1m. indicating stratigraphic way up is downhole.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		and siltite. 137.2 - 142.2m. Intermittent fault zone of argillite gouge and fragments. Core very friable in the majority of this fault interval. 200.6 - 201.2, blocky core and minor gouge.				
201.20 TO 236.80	.Lithic Wacke/	Grey, fine to coarse. Contact with the above unit marked by a fault and qtz vein. Interval is dominantly lithic wacke varying from fine sand to conglomeratic in composition. Interval shows weak phyllitic foliation at Coarser units show strain, eg. conglomerate at 230.5 - 230.6m. has stretched argillite and qtz clasts at END OF HOLE 236.8M.	70 85 75	Very weak dolomitization.	1% Pyrite. Cross-cutting qtz vein in fault at 9201.2 - 201.3l .Tr, Sp 1% Py/	

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
26684	74.80	76.50	1.70	.007	.01	.01	1.3	.02			73	60	42				49	47		12	1.3	24	
26685	76.50	78.00	1.50	.006	.01	.01	1.7	.02			60	52	44				58	80		9	1.7	22	
26686	78.00	79.50	1.50	.005	.01	.01	0.9	.01			51	90	103				51	38		3	0.9	10	
26687	81.00	82.50	1.50	.007	.01	.01	0.7	.02			73	66	23				35	70		1	0.7	16	
26688	84.30	85.80	1.50	.009	.01	.01	0.5	.01			89	71	61				45	48		1	0.5	4	
26690	106.50	106.00	-0.50	.003	.01	.01	1.5	.01			30	110	39				60	84		1	1.5	2	
26691	113.00	114.50	1.50	.002	.01	.01	1.3	.01			16	148	33				45	80		2	1.3	6	
26692	114.50	115.40	0.90	.007	.02	.01	1.7	.02			65	222	62				68	78		7	1.7	21	
26693	115.40	116.70	1.30	.003	.01	.01	1.2	.02			28	120	65				47	46		3	1.2	16	
26694	116.70	117.90	1.20	.003	.01	.01	0.7	.01			33	114	27				67	52		1	0.7	12	
26695	127.70	129.20	1.50	.004	.01	.01	0.6	.02			36	98	33				64	46		1	0.6	20	
26696	138.50	139.10	0.60	.011	.56	.01	1.3	.01			109	5597	75				62	38		3	1.3	14	
26697	157.70	158.40	0.70	.004	.01	.01	0.7	.01			44	83	39				46	30		1	0.7	6	
26699	173.10	174.60	1.50	.005	.01	.01	1.0	.01			48	141	45				51	59		1	1.0	8	
26700	180.00	190.00	10.00	.005	.01	.01	0.7	.01			49	124	42				59	50		1	0.7	12	
26701	200.30	201.80	1.50	.003	.01	.01	0.9	.02			32	87	45				77	52		2	0.9	16	
26703	230.00	231.50	1.50	.001	.01	.01	0.8	.01			13	20	18				44	39		1	0.8	2	

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
26689	93.10	96.10	3.00	51.79	15.67	8.57	2.41	.83	3.25	5.70	.05	1.02			45	59			10	76	1.7	39	.21		.21	89.80	45	4
26698	161.00	163.00	2.00	55.56	17.37	.51	3.18	1.20	4.17	7.85	.08	.93			52	138			5	69	0.7	39	.02		.37	91.32	51.5	
26702	218.50	221.50	3.00	65.55	11.92	3.91	1.59	1.44	2.74	4.62	.07	.62			24	71			5	52	0.6	47	.01		.16	92.67	56	2

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: REA HORIZON

PLOTTING COORDS GRID: Sam Survey
NORTH: 419.42N
EAST: 12947.74W
ELEV: 1089.81

ALTERNATE COORDS GRID: Estimated
NORTH: 4+50
EAST: 129+50W
ELEV: 1065.00

COLLAR DIP: -65° 0' 0"
LENGTH OF THE HOLE: 157.60m
START DEPTH: 0.00m
FINAL DEPTH: 157.60m

COLLAR GRID AZIMUTH: 180° 0' 0"

COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: August 31, 1990
DATE COMPLETED: September 4, 1990
DATE LOGGED: September 4, 1990

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: Frontier
CASING: Pulled
CORE STORAGE: Samex

PURPOSE: Rea Horizon stepout drilling

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
157.60	-	-57° 0'	ACID	OK		-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 73.10	«CSG»					
73.10 TO 85.90	«SEL DOL MAF»	Colour: dark grey, yellow-brown Grain Size: fine Intensely altered mafic volcanic (tuff?) Original textures difficult to identify Moderate development of foliation within sericite core breaks easily at angle to c.a. 70-80 zones of sericite have spotted texture; comprising rounded bleb-like dolomite in a sericite matrix. Possible relict volcanic texture. Quartz dolomite flooding occurs in early and later phases, all exhibiting deformation: folding and fragmentation generally chaotic distribution of alteration lithologies	70	Intense grey white quartz dolomite veining and flooding throughout. Intense yellow-brown sericite alteration. Occasional light grey "soupy" talc alteration associated with sericite Quartz dolomite alteration 65-75% of interval with 25-35%	1% pyrite throughout but locally more abundant occurring in disseminated blebs and grains up to 3-4% in patches of quartz dolomite flooding	
85.90 TO 86.80	«QTZ ARG FL T BX»	Colour: black, white Grain Size: fine, coarse Black, highly graphitic, brecciated quartz vein and argillite. Upper and lower contacts appear conformable. Quartz dolomite fragments occupy 35-40% of interval		Intense graphitic alteration of argillite	No visible pyrite	
86.80 TO 103.80	«SER/PY/DOL VOLC»	Colour: grey, brown Grain Size: fine Intensely altered mafic volcanics with virtually complete destruction of original textures. Alteration zones of sericite show coarse banding with moderate development of phyllitic foliation at qtz-dol flooding has patchy mottled grey white texture. Stringers often cross cut zones of sericite. Very minor late stage, white quartz dolomite occurs concordant with foliation. Minor black graphitic argillite occurs at 95.6 m as partially altered and or fragmental relict of		Intense quartz dolomite flooding with local iron rich calcite. Pale yellow-brown sericite Ratio of qtz-dol:sericite approx. 65:35 with dolomite > quartz	Pyrite content increases downhole with overall variation from 1-25% averaging 10%. Trace sphalerite. Pyrite is distributed so fine grains in stringers and fine to coarse blebby dissemminations associated with zones of quartz dolomite alteration {100.5-100.7} «25% Py, <1% Sp»	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		argillite interbed? Faulting is evident, with breccia/gouge intervals concentrated near the structural upper contact with the argillite flt. bx.				
103.80 TO 128.60	«DOL VOLC»	Colour: grey, brown Grain Size: fine Transitional contact with the above unit Grey brown, fine grained, moderate to intensely altered, mafic (possibly minor intermediate?) volcaniclastics The interval is lithologically similar to the structurally overlying "unit" but there is a textural difference: Quartz dolomite alteration appears more pervasive, with fewer patches of mottled grey, black, white quartz dolomite Sericite ocurs in finer bands and wisps parallel to foliation at angle to c.a. Minor black graphitic argillite occurs at the following intervals {104.3-105.0} «VOLC ARG» 106.7-107.0 -intermixed with fragments/patches of quartz dolomite alteration	70	Quartz dolomite alteration decreases in intensity downhole from a high to moderate degree of alteration Moderate to intense pale yellow-brown sericite	Approx. 10% pyrite throughout interval distributed in fine bands parallel to foliation discordant stringers and disseminated grains and blebs. Locally pyrite concentration to 25% over 1-2 cm	Possible intermediate volcanic at structural top of interval?
128.60 TO 131.70	«VOLC ARG»	Colour: grey, black Grain Size: fine The overlying volcaniclastics have a conformable contact with grey black tectonised silty argillite possibly retaining some volcanic component Interval shows local tight "S" folds with slip along cleavage at angle to c.a. 60-66 Cleavage is parallel/subparallel to bedding and graphitic foliation surfaces		Dolomitization is weak and confined to minor quartz dolomite veins. Veins/ patches vary in width from 1 mm to 4 cm and show folding and fragmentation Weak to moderate greenish grey sericite alteration Sericite increases in % volume down-hole. Graphitic alteration of argillite	5% blebby pyrite Trace Cp associated with fragment of QDV at 130.8	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
131.70 TO 142.70	«ARG QTZ SER»	Colour: black, greyish yellow Grain Size: fine Transitional contact with the overlying interval, the distinction being due to an increase in greyish yellow sericite downhole Sericite % by volume = 55-65% with combined argillite and quartz dolomite making up the remainder Graphitic or sericitic phyllitic foliation parallel to layering/laminations at 72-78 deg QDV generally occur parallel to lamination but are locally cross-cutting. Minor late stage, white QDV clearly cross-cut foliation/lamination Minor widths of the interval also display tectonite characteristics 134.5-134.6 135.0-135.5 Core breaks easily along planes of foliation. Minor faulting present at: 134.6-134.8: bx/gouge 137.3-137.4: bx/gouge 142.4-142.5: bx/gouge	72	Intense grey to greenish yellow sericite alteration. Local silicification associated with QDV	1-5% pyrite occurs as disseminated grains, blebs and fine laminations	Characteristic yellow and black texture
142.70 TO 146.40	«VOLC ARG»	Colour: grey, black Grain Size: fine Conformable to the structurally overlying interval Grey, black, dominantly argillic interval but may also comprise volcanic and wacke lithologies 142.7-144.3 -partly silicified siltite and argillite 144.3-145.4 -chaotic zone tectonite? broken stretched frags qtz dol and sericite in argillite matrix 145.4-146.4 -mainly volcaniclastic, weakly chloritic		Weak dolomitization of coarse grained interval and spotted dolomite pseudomorphs? in volcanics Locally weak to moderate greenish yellow sericite	<1% disseminated pyrite	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		core broken, blocky indicating faulting, fracturing throughout interval				
146.40 TO 157.60	«SILT ARG»	Colour: Grain Size: Faulted contact with the structurally overlying unit {146.4-146.7} «Qtz vn arg flt bx» -highly graphitic Black graphitic argillite with siltite laminae varying from 1 mm to 8 cm. Siltite tends to increase by % volume downhole. Interval is characterized by numerous thin QDV varying in width from <1 mm to 15 mm. The veins tend to run subparallel to the argillite lamination but are often folded with a wavy pattern. Laminations have an angle to c.a. of 70-85 deg. Weak cleavage is shown in the argillite through the displacement of QDV, and occurs at	70 24	Minor silicification associated with qtz-dolomite veins and stringers	<1% pyrite in thin wispy laminae and pyritic concretions. Locally 5% in siltite laminae	
	E.O.H.					

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB		COMMENTS
26704	77.00	78.50	1.50	.009	.01	.01	1.3	.01			91	80	15				1	19		1	1.3	1		
26705	82.60	84.10	1.50	.008	.01	.01	1.6	.01			81	38	8				1	19		1	1.6	1		
26706	84.40	85.90	1.50	.007	.01	.01	1.6	.01			65	40	8				1	23		1	1.6	3		
26707	85.90	86.80	0.90	.003	.01	.01	1.5	.01			27	47	23				8	33		1	1.5	2		
26708	86.80	88.30	1.50	.010	.01	.01	1.4	.01			97	52	15				1	27		1	1.4	2		
26710	96.60	98.10	1.50	.010	.01	.01	1.0	.05			98	53	23				21	18		1	1.0	46		
26711	99.50	101.00	1.50	.010	.05	.01	1.0	.05			104	479	27				1	20		1	1.0	54		
26712	101.00	102.50	1.50	.010	.01	.01	1.3	.04			94	47	25				1	21		1	1.3	40		
26713	103.80	105.30	1.50	.006	.01	.01	1.3	.02			56	68	9				1	17		1	1.3	21		
26715	106.50	108.00	1.50	.012	.01	.01	0.9	.07			115	65	28				9	19		4	0.9	72		
26716	119.20	120.70	1.50	.008	.01	.01	0.9	.01			84	64	13				1	15		1	0.9	1		
26717	127.10	128.60	1.50	.014	.01	.01	0.5	.07			137	78	29				5	36		7	0.5	70		
26718	128.80	130.10	1.50	.005	.01	.01	0.5	.01			54	52	37				17	62		2	0.5	2		
26719	130.10	131.60	1.50	.006	.01	.01	0.4	.01			56	56	27				1	87		1	0.4	2		
26720	133.20	134.70	1.50	.007	.01	.01	0.3	.01			70	69	47				14	32		3	0.3	14		
26721	138.80	140.30	1.50	.004	.01	.01	0.1	.01			43	60	39				12	33		1	0.1	2		
26722	141.20	142.70	1.50	.013	.01	.01	0.1	.01			131	66	43				1	38		1	0.1	3		
26723	142.70	144.30	1.60	.005	.01	.01	1.6	.01			46	41	22				41	50		1	1.6	6		
26724	144.30	145.40	1.10	.006	.01	.01	1.2	.01			59	76	26				38	43		1	1.2	2		
26725	145.40	146.40	1.00	.003	.01	.01	1.1	.01			229	78	27				16	47		1	1.1	1		
26776	146.40	146.90	0.50	.003	.01	.01	1.5	.01			34	103	62				45	68		5	1.5	7		
26777	146.90	148.40	1.50	.011	.01	.01	1.2	.01			106	97	55				14	73		1	1.2	3		

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
26709	90.50	93.50	3.00	39.89	14.21	13.05	4.20	3.23	1.21	8.92	.24	1.16			101	109			20	23	0.9	23	.07		2.18	88.39	1	1
26714	111.90	114.90	3.00	47.38	15.45	5.29	2.10	3.10	2.11	12.23	.18	1.40			110	71			5	28	0.4	24	.01		9.18	98.46	29	4
26778	151.10	154.10	3.00	60.84	15.77	2.35	2.96	0.83	3.00	7.90	.08	0.88			48	129			5	84	0.7	30	.05		0.47	95.22	1	1

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: Beneath Rea Conc.

PLOTTING COORDS GRID: est
NORTH: 299.00N
EAST: 9650.00W
ELEV: 1360.00

ALTERNATE COORDS GRID: est.
NORTH: 2+99N
EAST: 96+50W
ELEV: 1360.00

COLLAR DIP: -70°30' 0"
LENGTH OF THE HOLE: 488.90m
START DEPTH: 0.00m
FINAL DEPTH: 488.90m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: September 17, 1990
DATE COMPLETED: September 24, 1990
DATE LOGGED: September 24, 1990

COLLAR SURVEY: NO
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: Frontier Drilling
CASING: pulled
CORE STORAGE: Samex Camp

PURPOSE: To test the Rea horizon in vicinity of RG-43,whichwas abandoned short of target. Laid out by survey

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
20.70	-	-72° 0'	ACID	OK		-	-	-	-	-	
71.90	-	-71° 0'	ACID	OK		-	-	-	-	-	
129.20	-	-71° 0'	ACID	OK		-	-	-	-	-	
188.70	-	-70° 0'	ACID	OK		-	-	-	-	-	
236.80	-	0° 0'	ACID		BAD ETCH	-	-	-	-	-	
310.00	-	-67° 0'	ACID	OK		-	-	-	-	-	
364.20	-	-65° 0'	ACID	OK		-	-	-	-	-	
426.70	-	-63° 0'	ACID		WEAK ETCH	-	-	-	-	-	
462.40	-	-62° 0'	ACID	OK		-	-	-	-	-	
458.40	209° 0'	-62° 0'	TRO-PARI	OK	TROPARI	-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 19.50	«CSG/WSTE DUMP»	Triconed through the waste dump. No return to sample and no recovery				
19.50 TO 21.80	«CHERT»	Colour: pale grey Grain Size: aphanitic Stylolitic argillaceous partings, in dense white to pale grey chert Core is broken, about 80% recovery Weak foliation/parting @	60	Hazy bordered qtz veinlets throughout, probably just sweats. Unit is a cherty argillite over last 15 cm and ends in a gouge	1% py as fracture fillings	Also traces of silver sericite on some fractures
21.80 TO 30.10	«SER/ARG FL T BX»	Colour: yellow, black Grain Size: fine Interval contains numerous fault gouges, and consists of yellow sericite and black argillite contorted bands cut by qtz veinlets and banding foliation	65	Yellow sericitic alteration of argillite and silt? assoc. with qtz veinlets and pre-faulting	3% wispy py	
30.10 TO 30.60	«QTZ/DOL VE IN»	Colour: white Grain Size: coarse Bully white vein with broken contacts, containing carbonaceous stylolites		Minor sil. of wallrock	Mostly barren except for 1% coarse brown sphalerite near upper contact	
30.60 TO 51.60	«ARG/CHT TE CT» "Tectonite»	Colour: white, grey, black Grain Size: fine Strongly flattened, boudined and brecciated black arg and grey chert in thin contorted beds or fragments. Flattening foliation becomes a spaced cleavage locally in "hinge zones" of cherty material	65	Minor silicification assoc. with widely spaced qtz veins {425-48.0} «str. flt. gouge»	2% diss. py.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
51.60 TO 75.50	«YELLOW SER /ARG»	Colour: yellow, black, pale grey Grain Size: fine Compositionally banded yellow sericitic rocks, with a strong schistose fabric, locally displaying kink folding, boudin, and tectonic brecciation. Intensity increases downhole, along with friable {65.8-75.5} «fault breccia» Shearing/foliation	75	Selective alteration to yellow sericite schist of probable tuffaceous /volcaniclastic? interbeds. Patchy dolomitization also restricted to these beds. Widely space qtz-dol veins up to 20 cm also present	2-3% py mostly dissem. in sericitic portions but also along margins of qtz veins. Exception is: {74.0-74.6} «7% py» -in strong schist	
75.50 TO 77.80	«GR. ARG FL T BX»	Colour: black and grey Grain Size: fine Friable, graphitic fault breccia, containing abundant broken qtz-dol veinlets				?middle fault?
77.80 TO 104.90	«DOL MAFICS »	Colour: green, brown, black Grain Size: fine Although faulted, the upper contact contains thinly interbedded black argillite. Unit comprised of brown sericitic Fe-dol altered mafic pyroclastics? and flows. Intensity of fabric decreases downhole, where relict porphyritic (feldspar?) textures are visible, now replaced by carbonate {85.8-86.3} «arg» Interbed of argillite. A few ghosted lapilli visible downhole. Foliation	60	Intense Fe-dol with brown sericite after chlorite; Dol veinlets and segregations common	2% dissem. py	Rea mafics?
104.90 TO 144.20	«ARG/SILT TECT»	Colour: black and grey Grain Size: aphanitic to fine Conformable contact at thinly bedded argillite and siltstone, highly contorted and intraformally	65	Fe-dol alteration of more porous beds is moderate to intense. Dol-qtz	1% fracture filling pyrite	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		brecciated. Numerous hinge areas present where the foliation becomes a spaced cleavage almost perpendicular to bedding		veinlets from 1 cm to 10 cm are common and also deformed 130.9-144.2 -a coarse qtz-dol vein snakes in and out of the hole at low angles to c.a.		
144.20 TO 147.90	«DOL/MAF V-CLASTICS» "volcani-clastics"	Colour: brown and grey Grain Size: Conformable knife sharp contacts expressed by change in alteration mineralogy. Faint banding possibly relict bedding?	60	Intense Fe-dol in patches surrounded by wispy brown sericite. Traces of talc.	3% dissem. py as alteration assemblage	
147.90 TO 151.00	«ARG/SILT TECT»	Colour: black and grey Grain Size: Interbed of similar material to 104.9-144.2 Sharp contacts marked by veinlets Cleavage	65	Dol veining flooding, hydro-breccia common	2% dissem. py	
151.00 TO 265.70	«DOL MAF FLOWS»	Colour: green, grey, brown Grain Size: Monotonous pile of mafic volcanics with faint ghosted lapilli textures rare but pseudomorphed porphyry common. Probably blocky porphyritic flows. Mostly chloritic but intensely carbonatized. Sericite is pale green to brown in patches		Brown sericite development is only patchy, except for first 5 m which are moderately brown sericitic throughout Pervasive Fe-dol alteration through-out interval with numerous deformed veinlets	1-2% dissem. pyrite	See the series of lithogeochem samples
265.70 TO 267.90	«SIL/PY MAFICS»	Colour: olive green to brown Grain Size: Distinctive coloured, pyritic, silicified interval of mafics. Appears to be silicification over-printing typical brown sericitic to olive green dol mafics. Quartz occurs in a few bully boudins but is mostly pervasive or in patches with coarse cataclastic hydrobrecciated pyrite		Brown to olive sericite overprinted by qtz flooding and pyrite. Qtz pyrite stringers, patches and boudins now semi-conformable to foliation. A few relict lapillis visible	15% coarse broken pyrite euhedra asso. with qtz flooding and veinlets. Also a small proportion of dense fine grained py assoc. with brown sericitic patches	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		Lower contact is marked by 1 cm of fault gouge Wavy foliation	70			
267.90 TO 273.30	«ARG/SER TUFF?»	Colour: black, brown, green, yellow Grain Size: fine Interbanded interval of black cherty argillite tectonite and mafic tuff? altered to sericite schist. Banding is on a 0.5-1.0 m scale Cleavage Lower contact marked by 2 cm fault gouge	75	Entire interval is silicified and cut by deformed thin qtz veinlets. The mafic tuff bands are variously brown, pale green or yellow sericitic Proportions are 30% arg and 70% schist	2-3% py occuring as fine dissem. in the argillite and in kink-banded wisps within the sericite schist	
273.30 TO 289.80	«CHERT/CHTY ARG»	Colour: black and grey Grain Size: aphanitic Contorted and tectonically brecciated ribbon chert and lesser cherty argillite. Breccias are well-healed by silica. Local spaced cleavage From about 281 m to end of interval, a qtz stock-work is present that is well mineralized 280.6-281.4 -qtz stockwork with hazy borders has 3% aspy and 2% py 282.4-288.1 -a dense black cherty argillite hosts clearly crosscutting qtz veinlets at low angeles to c.a. (10-30 deg) which are rich (10%) in py-sp-cp-aspy and gn in decreasing order of abundance. Veinlets are 1 to 10 cm wide irregular and deformed	70	Silicification assoc. with stockwork veinlets and flooding	5% medium to coarse grained py fracture fillings with notable exceptions of mineralized qtz stockwork {280.6-288.1} «qtz stwk, 3% bm, tr. as» Best sample is from 286.9-288.1 where a rich veinlet snakes along the core axis with 5% sp, 5% py, 2% cp and tr. gn and aspy as coarse clotty sulphides	
289.80 TO 305.60	«SER/PY SILT?& ARG»	Colour: yellow and black Grain Size: Conformable contact with yellow sericite, pyrite, argillite schist. Strong fabric best expressed by wispy, stylolitic to kinked pyrite bands only a few mm wide. Argillite occurs as common bands and as a few angular clasts within sericite matrix.		Silicification assoc. within boudined qtz veinlets is patchy. Sericite is pervasive through all but the black argillaceous portions of the core. Qtz veins with trace aspy dominate the	7% py overall as wispy bands {294.5-295.4} «10% py, 2% sp, 1% asp» -assoc. within qtz veining and flooding	Quite possibly the yellow sericitic alteration could be silty sediments

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		Relict fragmental texture visible but only locally		interval 300.0-300.8 {298.0-298.5} «flt. gou.+bx»		
305.60 TO 336.70	«ARG/LITHIC WACKE»	Colour: black and grey Grain Size: Dense, black, argillite, medium bedded with alternating sandy to conglomeratic lithic wacke Clast types include argillite, silt, wacke, chert, mafics, and py in decreasing order. Very conformable upper contact Bedding Top direction indeterminant 330.7-331.7 -contains minor yellow sericitic bands {331.5-336.7} «flt. gou.+bx» Grading and inverse grading present in wacke beds	60	Fresh to begin with, becomes weakly phyllitic at 316.0 m, in an envelope about a thick silicified wacke bed at 323.0-324.6. This envelope also contains elevated, finely disseminated pyrite	3% dissem. pyrite, except from 316-332 contains 5% py	Compare unaltered bimodal seds. to weakly "mutized" seds in two litho samples, respectively
336.70 TO 352.00	«DOL MAFICS »	Colour: brown and grey Grain Size: Strongly faulted upper contact with typical strongly dol mafics, probably pyroclastic flows Foliation is all over, but mostly at Conformable lower contact	60	Wispy brown sericite bent around grey dolomite patches	3% dissem. py except 350.8-352 which has 10% diss. py	
352.00 TO 356.20	«SIL ARG/ CHT BX»	Colour: black and grey Grain Size: Very chaotic, intensely silicified interval of tectonic breccia, well healed except for: {354.8-356.2} «flt. gou+bx» Probably some primary ribbon chert component, but alteration too intense to be sure		Intense silicification, with qtz veins from 354.3-354.8 and fragments in the flt gouge	10% fracture filling py with a couple of 1 cm "seams" possibly primary Tr. sphalerite	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
356.20 TO 382.20	«INTERMED. TUFF?»	Colour: green grey Grain Size: Correlative lithology to that intersected in deep hole RG256. Clearly a pyroclastic interval with internal fragmental texture, but gradationally becomes a finely bedded ash and crystal tuff by 367 m. Bedding Foliation is parallel to bedding, warped and poorly developed. Feldspar (?) crystals are now replaced by carbonate. Quartz eyes are rare	70	Intense pervasive ferrodolomitization but brown sericite is notably absent. Pervasive sericite is pale green to grey and yellow	3% pyrite overall, occuring as disseminations and along thinly spaced bedding planes in the ash tuff	
382.20 TO 388.30	«QTZ DOL VE IN»	Colour: white Grain Size: coarse Milky white and completely barren of sulphides. Contacts are sharp, irregular, but roughly parallel to foliation		A few wallrock inclusions are strongly sericitic {388.0-388.3} «FLT BX»		
388.30 TO 391.30	«SIL CHTY ARG»	Colour: grey and black Grain Size: fine Strongly silicified grey cherty rock with black argillaceous material and pyrite along connected fracture system. Gradational lower contact		Hazy bordered qtz veinlets and silica flooded patches, pervasive silicification	3% fracture filling pyrite	
391.30 TO 441.90	«INTERMED TUFF»	Colour: pale green Grain Size: Interval begins with qtz-dol veined, yellow to brown sericitic volcanics, but by 400.7 has gradationally become a monotonous pile of pale green "greenstone". Fine grained to aphanitic. No bedding or internal structures apparent. When stained a granular texture with Fe-calcareous grains in dol. matrix is visible.		Pervasive ferrodolomitization and minor bleaching along fractures. Internal textures largely "washed out" by alteration	tr. diss. py	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
441.90 TO 453.70	«ARG»	Colour: black and green Grain Size: aphanitic Gradational interbedded contact with thinly bedded black argillite. Thin beds of above lithology occur throughout, but most commonly near upper and lower contacts. Bedding is warped and locally contorted but averages	60	Fe-dolomitic tuff interbeds	Disseminated pyrite euhedra up to 1 cm comprise 2% of interval	
453.70 TO 488.70	«INTERMED. TUFF/PYRO»	Colour: pale green to grey Grain Size: fine to med. Similar to 356.2-382.2, pyroclastic interval with wispy pyrite, pseudomorphed grains, etc. Foliation	60	Strong pervasive carbonitization pale green sericitization	Wispy fracture fillings and along bedding planes which parallel foliation 3% pyrite	{484.0-484.6} «arg. flt. bx»
488.70 TO 488.90	«ARG» E.O.H.	Colour: black and grey Grain Size: Interbedded, gradational contact, as above				

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB		COMMENTS
27076	30.10	30.60	0.50	.020	.07	.02	1.8	.14			200	663	239				976	41		5	1.8	140		
27079	74.00	74.60	0.60								109	116	49				100	113		6	1.8	40		
27080	74.60	76.10	1.50								73	119	62				21	88		1	1.1	6		
27081	76.10	77.80	1.70								69	73	52				74	140		3	1.8	1		
27082	77.80	79.30	1.50								104	113	41				171	55		2	2.6	1		
27089	264.20	265.70	1.50								122	165	93				106	78		5	2.8	1		
27090	265.70	266.80	1.10								89	110	39				76	101		2	0.6	1		
27091	266.80	267.90	1.10								88	131	44				83	135		1	0.5	3		
27092	267.90	269.40	1.50								53	68	48				58	87		1	0.6	18		
27034	273.30	274.50	1.20	.004	.01	.02	0.6	.03			43	123	173				125	129		3	0.6	30		
27093	274.50	275.50	1.00								87	540	210				332	95		5	0.8	56		
27094	275.50	276.60	1.10								36	526	232				81	98		2	0.5	15		
27095	276.60	278.10	1.50	.010	.08	.04	1.0	.14			98	798	432				2502	93		15	1.0	138		
27096	278.10	279.60	1.50								51	101	165				257	79		7	0.7	23		
27097	279.60	280.60	1.00								87	398	279				581	153		6	0.9	66		
27098	280.60	281.40	0.80	0.8	.031	.33	.24	3.8	.56															
27099	281.40	282.40	1.00	1.0	.029	.21	.13	2.0	.08															
27100	282.40	283.20	0.80	0.8	.192	.59	.41	4.3	.03															
27026	283.20	284.00	0.80	0.8	.023	.20	.08	1.9	.23															
27027	284.00	285.00	1.00	1.0	.021	.08	.04	2.2	.07															
27028	285.00	285.40	0.40	0.4	.040	.15	.25	2.6	.02															
27029	285.40	286.90	1.50	.064	.29	.07	2.0	.09																
27030	286.90	288.10	1.20	.147	1.54	.58	9.7	.40																
27031	288.10	289.40	1.30	.158	.70	1.73	15.9	.48																
27032	289.40	289.80	0.40	.027	.41	.18	2.1	.20																
27033	289.80	290.80	1.00	.006	.04	.01	0.3	.04			60	412	122				113	129		3	0.3	40		
27035	294.50	295.40	0.90	.009	.56	.12	2.1	.06			88	5625	1218				2177	31		1	2.1	61		
27037	296.90	298.00	1.10	.018	.01	.02	0.7	.06			176	96	160				1509	78		8	0.7	62		
27038	300.00	300.80	0.80	.014	.05	.03	0.9	.12			144	523	293				4934	100		12	0.9	126		
27042	350.80	352.00	1.20	.014	.01	.01	1.7	.02			141	146	36				139	100		3	1.7	21		
27043	352.00	353.50	1.50								26	28	40				123	54		5	0.7	10		
27044	353.50	354.80	1.30								45	79	106				105	49		5	1.3	27		
27045	354.80	356.20	1.40								59	121	132				210	83		8	1.1	20		
27046	356.20	357.20	1.00								21	145	43				92	62		1	1.6	20		

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
27077	31.00	34.00	3.00	81.76	5.79	1.65	1.57	.01	0.01	3.97	.01	.32			49	63			10	111	0.7	43	.01		1.7	97.01	67	4
27078	55.00	58.00	3.00	60.54	17.36	.50	2.04	.25	3.40	6.66	.25	.80			47	60			5	52	0.1	54	.27		0.79	93.14	31	1
27083	90.50	93.50	3.00	35.92	11.95	14.18	7.04	1.65	0.55	10.43	1.65	1.22			88	64			5	16	2.5	39	.72		0.21	84.05	168	1
27084	108.00	111.00	3.00	64.35	12.75	2.05	5.14	.25	2.37	5.91	.25	0.56			49	83			10	74	1.2	30	.65		0.17	94.37	74	1
27086	114.00	117.00	3.00																									
27087	117.00	120.00	3.00																									
27085	151.00	154.00	3.00	37.17	11.79	10.50	8.23	.25	3.15	7.58	.25	1.53			63	70			5	58	2.4	18	.99		0.45	81.90	147	1
27086	163.00	166.00	3.00	47.10	12.25	7.22	14.75	.85	0.64	9.84	.85	1.66			64	59			10	40	2.1	14	1.04		0.21	95.77	29	1
27087	218.50	221.50	3.00	46.04	15.10	6.69	4.56	1.05	3.41	8.67	1.05	1.41			80	47			5	40	1.7	35	.57		4.73	92.47	41	5
27088	261.00	264.00	3.00	37.08	12.70	10.87	8.60	1.26	2.34	9.92	1.26	1.20			104	73			10	31	2.1	40	.84		2.73	88.00	136	7
27039	307.00	310.00	3.00	47.40	14.53	1.66	12.74	.11	1.58	8.71	.11	1.20			48	188			20	19	2.2	136	.79		4.08	92.94	39	1
27040	316.00	319.00	3.00	52.58	15.02	1.01	7.62	.29	1.81	10	.29	1.03			33	69			25	47	0.9	94	.56		6.31	96.35	101	1
27041	339.00	342.00	3.00	40.84	10.82	11.32	8.26	.11	2.42	9.10	.11	1.19			67	57			5	31	2.1	21	.70		2.61	87.69	127	4
27047	371.00	374.00	3.00	57.27	17	4.30	2.31	2.54	2.59	6.49	2.54	.63			21	49			5	120	1.3	43	.20		2.68	96.24	52	2
27048	388.30	391.30	3.00	80.15	8.72	0.51	0.96	.01	.01	4.69	.01	.51			29	17			10	70	0.6	31	.01		2.44	98.08	72	3
27049	410.00	413.00	3.00	60.07	19	1.93	2.01	6.80	.01	5.02	6.80	.70			13	74			5	113	0.7	29	.01		0.20	95.95	42	1
27050	469.00	472.00	3.00	61.38	17.59	2.32	2.12	.45	2.78	5.30	.45	.64			26	55			10	161	1.1	67	.01		3.19	96.13	97	3

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: Beneath Rea Conc.

PLOTTING COORDS GRID: est.
NORTH: 288.00N
EAST: 10050.00W
ELEV: 1308.00

ALTERNATE COORDS GRID: est.
NORTH: 2+88N
EAST: 100+50W
ELEV: 1308.00

COLLAR DIP: -80° 0' 0"
LENGTH OF THE HOLE: 371.20m
START DEPTH: 0.00m
FINAL DEPTH: 371.20m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: September 19, 1990
DATE COMPLETED: September 24, 1990
DATE LOGGED: September 24, 1990

COLLAR SURVEY: NO
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: Frontier
CASING: pulled
CORE STORAGE: Samex Camp

PURPOSE: Laid out by survey

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
83.20	-	-79° 0'	ACID	OK		-	-	-	-	-	
150.20	-	-75° 0'	ACID	OK		-	-	-	-	-	
192.90	-	-68° 0'	ACID	OK	weak etch	-	-	-	-	-	
237.70	-	-66° 0'	ACID	OK	v. bad etch, est. result	-	-	-	-	-	
294.70	-	-63° 0'	ACID		v. bad etch, est. result	-	-	-	-	-	
365.80	-	-63° 0'	ACID	OK		-	-	-	-	-	
304.20	227°50'	-63° 0'	TRO-PARI	OK	Tropari	-	-	-	-	-	
365.20	227°50'	-63° 0'	TRO-PARI	OK	Tropari	-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 64.00	«CSG/WASTE»					
64.00 TO 80.50	«CHT ARG TE CT»	Colour: grey, black Grain Size: fine Folded; stretched boudined interval of graphitic argillites and chert which have been intensely broken and brecciated by later faulting. Approx. 55% of core is brecciated. Grey white quartz dolomite veining and flooding occupies 5% by volume. Phyllitic foliation well developed in blocks of cht/arg parallel to compositional layering. Folded pyrite, argillite and chert from bullseye structure at 70.2		Cherts (and siltites) show moderate dolomitization due to QDV and flooding Intense graphitic alteration of argillite	5-10% of pyrite visible in remnant chert argillite blocks as 1-5 mm fine grained bands, disseminated grains and blebs	Friable core
80.50 TO 221.80	«DOL MAF VO LCS»	Colour: greyish, white-light green & browny-yellow Grain Size: The contact with the structurally overlying unit is faulted. The interval comprises a thick pile of altered mafic flows and volcaniclastics. Original textures are generally destroyed, with the exception of ghost lapilli are visible (eg at 93.0 m) and relict porphyritic flows can be interpreted eg dolomite pseudomorphs 119.7-121.5 Phyllitic foliation is consistent around angle {203.5-204.3} «QDV Maf Flt-Bx»	70	Intense ferro-dolomitization throughout the interval. Intense development of yellow brown sericite in laminae and bands parallel to foliation. Brown sericite and quartz dolomite show well developed compositional layering between 141.0-145.0. Quartz dolomite veining has lead to the local bleaching and silicification of the host rock eg. 99.7-101.6	Pyrite appears throughout the interval, distributed as bands and lamine parallel to foliation; disseminated grains and blebs and blebby aggregations. The latter is often associated with QDV, the range in pyrite concentration is approx. 1-20% Base metals occur in the bleached zone {99.7-101.61} «<0.5% Gn, 7% Py»	
221.80 TO 234.50	«SER CHT AR G»	Colour: yellow grey and black Grain Size: fine The interval is mainly sedimentary in conformable contact with the structurally overlying mafic volcanics. Black graphitic argillites, light and dark grey cherts, pale yellow sericite and patchy QDV are mixed, folded and foliated at angle to c.a. 40-80 deg. A minor interval of dol. mafic volcanics (tuff)		Pale yellow sericite is intermittently well developed as compositionally layers within the chert argillite mixed sediments	2-5% pyrite, locally 20% over 2-3 cm is distributed as diss. grains and blebs, and occasional bands and laminae	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		is mixed with argillite between: 229.6-230.8 «Dol Maf Arg» The interval is intermittently faulted, with blocky broken core and 5-15 cm sections of breccia and gouge				
234.50 TO 244.50	«ARG CHT»	Colour: dark grey, black Grain Size: fine Laminated to deformed and faulted dark grey cherts and black graphitic argillites. The contact with the overlying sericitic unit is marked by a minor fault. The chert varies from a massive ribboned texture with thin (<1 mm) graphitic argillite partings, to a comparatively finely laminated chert (1-3 mm) with similar width graphitic argillite laminae. The latter breaks easily along bedding at angle to c.a. Locally chert laminae have been stretched and boudined		Quartz dolomite veining parallel to and crosscutting the compositional layering has locally bleached the cherts. QDV occupy 1-3% of the interval	1-3% pyrite is distributed in thin bands (<1mm) parallel to argillite laminae; as dusty bands following folds in black silicified cherty argillite and as occasional blebs associated with QDV	Laminated argillite and chert breaks easily into discs.
244.50 TO 268.90	«ARG QTZ SE R»	Colour: grey, black, greenish yellow Grain Size: fine Minor faulted contact with the above unit. However argillite and minor chert do persist into the interval. Grey white patchy quartz and dolomite have rough compositional layering with pale greenish yellow sericite wisps and laminae 60-70 deg. The concentration of quartz dolomite flooding has locally formed patchy QDV up to 70 cm e.g. 266.5-267.2. Creamy white dolomite lathes crystals well developed. Cherty argillite (unaltered remnants) occupy approx. 5% of the interval		Intense development of pale greenish yellow sericite. Patchy spotted dolomitization and thin wispy flakes of brown sericite suggest a mafic component 252.5-254.6 «DOL MAF VOLC?»	2-7% pyrite with up to 15% locally developed over 2-3 cm. Pyrite is distributed as laminae and bands (<1 mm - 4 mm) disseminated grains and blebs. The greater % pyrite occurs as blebby concentrations associated with patchy QDV	
268.90 TO 294.70	«ARG LITHIC WACKE»	Colour: greenish grey Grain Size: fine to coarse The contact with the overlying unit is conformable		Staining outlines locally well	Pyrite is very variable to its dis-	The lithology is similar to the

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		The interval is dominated by greenish grey, angular to subrounded, sand to pebble size (debris flow), conglomerate/breccia. Black argillite (and minor siltite) are occasionally lithic wacke (conglomerate) is also transitional to a cherty/arg het. frag?/tectonite? interval with pyritic argillite matrix between 283.9-291.0 The section from 268.9-273.8 shows downhole coarsening of the wacke from fine matrix and granule size clasts to fine matrix supported granule to pebble size clasts. The latter comprise flattened, elongate black argillite, subrounded, pale grey yellow siltstone, greyish chert and occasional rip-up clasts of fine pyrite		developed dolomite nodules within the wacke ranging from coarse sand to granule size. The sub-interval from 283.0-294.7 appears to silicified to a greater extent than the overlying wacke. This may be due to a greater primary chert component in the rock rather than secondary silicification	tribution throughout the interval. The green lithic wacke tends to be pyrite poor, with occasional patches of fine disseminated pyrite up to 7% over 2-10 cm. There is some increase in pyrite to the bottom of the interval particularly within the cherty/arg het frag/tect between {288.3-288.8} «10-15% Py» where it is concentrated in blebs	"JOHNSON PYROCLASTICS"
294.70 TO 297.50	«WACKE PY A RG»	Colour: dark brown, black grey Grain Size: fine The contact with the above is not clear however if there is discontinuity, it is minor. The interval comprises argillite, wacke? and pyritic argillite, with the latter dominating between 295.9-297.5 (57% of the interval). The pyritic argillite has been partly faulted and therefore is very friable. Quartz dolomite has invaded part of the fault and a drusy cavity is encrusted with euhedral pyrite. Clasts within the wacke have been flattened and stretched parallel to foliation		The wacke has been very weakly dolomitized. Graphitic alteration of argillite	The 50 cm section of wacke contains <1% pyrite in local, patchy fine disseminations & blebs. The pyritic argillite contain 20% pyrite as very fine "dusty" grains disseminated throughout the subinterval	
297.50 TO 303.90	«SIL WACKE»	Colour: greenish grey to grey Grain Size: fine, coarse Minor faulted contact represented by overlying broken graphitic argillite. The interval comprises whitish grey silicified wacke, (silicified after dolomitization) with flakey grey sericite laminae. Foliation is well developed at angle to c.a. Sericite encloses or wraps around the silicified fragments which have been stretched and boudined parallel to foliation The bottom 2-3 m from 301.6-303.9 is invaded by	70	Weak spotted to tecally well developed dolomitization within the wacke sed. Silicification is moderate to intense but there is doubt as to whether all of the silicification is secondary alteration. Protolith may be cherty in part, cherty fragments? The bottom 2.3 m is intensely silicified owing to the quartz dolomite veining and flooding	2-3% pyrite is distributed throughout as patchy disseminations, bands (2-3 mm) and occasional blebs. Local concentration 7-10% occurs at 299.6 m Trace galena occurs in association with the QDV at {301.6-302.6} «Tr. Gn, 1% Py»	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		cross-cutting quartz dolomite veins The 20 cm section 303.7-303.9 comprises pyritic argillite		Intense sericitic alteration		
303.90 TO 305.40	«PY ARG WAC KE»	Colour: greyish brown Grain Size: fine to medium The upper and lower contacts of the interval are conformable, with the exception of 10 cm of graphitic argillite from 303.9-304.0 m the interval comprises a homogeneous pyritic greyish brown fine to medium grained, argillic sandy wacke. Minor coarse grains are also visible. Weak foliation is developed and grains tend to show flattening parallel to foliation at angle to c.a. 80-90 deg.			The pyrite content is difficult to extimate, but could be in range 15-20%. The density of the rock feels too low for the pyrite content to be greater. The pyrite is evenly distributed as very fine "dusty grains	
305.40 TO 315.20	«DOL SEDS P Y ARG»	Colour: brown grey, black Grain Size: fine to medium A mixed interval of black to brown pyritic arg to black "shiney" graphitic argillite, dark greyish brown pyritic wacke (arentie?) and lighter greyish dolomitic sediments (siltites and wackes) The litholgies are modertely faulted and some-what tectonised. Folding, stretching and boudinage are exhibited. Commpositional layering and foliation 70-80 deg. Quartz dolomite veining occurs parallel to and cross cutting commpositonal layering but only occupies 1-2% of the interval		Dolomitization has preferentially altered non argillite lithologies with the exception of sericite. Staining outlines spotted dolomite alteration texture. Grey sericite is well developed	7-12% pyrite is mainly concentrated as zones, bands laminae and wisps of fine "dusty grains". Coarser grained pyrite in blebs is associated with QDV and sections showing greater strain.	
315.20 TO 331.30	«DOL SEDS»	Colour: grey Grain Size: fine to medium A minor (1 cm) zone of fault gouge marks the contact with the overlying unit. The interval is dominated by grey spotted, nodular, dolomitized sediments, probably of wacke origin 60-70 deg. Original textures are virtually destroyed in the zones of intense		Grey sericite is well developed forming the planes of foliation. Overall, intense dolomitization	Pyrite content has decreased in relation to the above unit. The dolomitization zones have less than 1% Py, whereas the argillite has bands (1-4 mm) contain up to 15% Py over 10 cm e.g. 325.0 m.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		dolomitization The dolomitized intervals are occasionally transitional and interbedded with black argillites. The latter sections combined occupy approx. 10% of the interval. A minor mafic volcaniclastic sub-interval occurs [328.0-328.3] «MAF VOLC» evidenced by the characteristic dark yellow brown sericite. White QDV cross-cut foliation and occupy 2-3% of the interval			Occasional blebs pyrite are associated with QDV. Similarly one 2 mm bleb of chalcopyrite at 324.7 m	Argillite intervals are quite friable due to faulting
331.30 TO 339.10	«SEDS QTZ V N FLT BX»	Colour: white grey Grain Size: fine to coarse Interval comprises white quartz dolomite veins, dolomitized sediments and graphitic argillite in ratio 55:20:25, which have been faulted to breccia and graphitic gouge.		Intense graphitic alteration of arg. Non argillite sediments intensely dolomitized. Quartz breccia locally healed with quartz dolomite matrix	<1% pyrite occurs, unevenly distributed as coarse blebs associated with QDV fragments. Trace chalcopyrite in two blebs at 334.2 (blebs, 1-2 mm diameter)	The fault appears to have moved parallel to the foliation as evidenced by contact of gouge and foliated dolomitic sediments. (60 deg to c.a.)
339.10 TO 342.30	«ARG SILT W ACKE»	Colour: black, grey Grain Size: fine, medium Black fine grained argillite and minor grey siltite wacke interbeds are fractured and broken due to their proximity to the above major fault Minor QDV <1%		Porous, siltite and wacke preferentially dolomitized.	1% pyrite distributed as fine grained blebs in silicified and dolomitized siltite and wacke and bordering QDV contact with argillite	
342.30 TO 361.80	«ARG SILT W AKE QTZ VN»	Colour: grey, black, white Grain Size: Intensely quartz dolomite veined argillite siltite and wacke. The veining has locally altered the host rock to a green sericite and talc. The alteration is probably confined to the more porous siltite and wacke. QDV occur parallel to and crosscutting compositional layering, occasionally trending parallel to core axis		Siltite and wacke interbeds dolomitized In addition to the sericte/talc contact alteration zones patchy dark green talc up to 30-40%, over 10 cm occurs in mixed argillite and quartz vein, giving a mixed black green and white coloured texture	1-2% pyrite occurs as coarse grained blebs and occasional euhedral crystals. Minor sections (2-3 cm) have 7-10% pyrite as fine to blebby patches and aggregations. A single chalcopyrite bleb (3 mm diameter) occurs on the edge of an argillite clast in QDV at 351.1 m.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		From 342.5-343.4 the core is broken and blocky indicating fracturing and faulting From {345.5-349.0} «Qtz-dol vn» the sub-interval is entirely QDV (Qtz>dol in ratio 65:35). The orientation is difficult to determine as the upper and lower contacts are hazy. It appears parallel to foliation 40-50 deg.			3 blebs of galena occur in quartz vein stylolites {361.7-361.8} «0.5% Gn»	
361.80 TO 367.10	«ARG SILT W ACKE»	Colour: grey, black Grain Size: fine to coarse Bedded sequence of black argillites, grey fine grained siltites and dark grey black fine to coarse, sand and pebbly wacke. Granules and pebbles are oriented parallel to foliation. Two intervals of granule/pebble wacke, 23 cm and 80 cm width, occur at the following intervals 364.27-364.50 366.3-367.1 Crosscutting QDV occpy 1% of the interval		Grsater porosity, siltite and sandy wacke beds are moderately to intensely dolomitized and partly silicified	<1% pyrite as dispersed grains, blebs and patches. Blebby aggregations and fine grained patches occur close to QDV	Rip-up clast of argillite in pebbly wacke at 364.3 suggests tops downhole
367.10 TO 371.20	«ARG SILT» E.O.H.	Colour: grey, black Grain Size: fine, medium Conformable interval to the overlying generally coarser grained unit. Banded to laminated black argillite and grey siltite to arenite. Siltite/arenite > argillite in ration 55:45. Laminae and bands show same deformation (stretching) parallel to compositional layering. Occasional crosscutting QDV are folded.	80	Coarser grained lithologies dolomitized	<1% pyrite in patchy bands, blebs and occasional euhedral crystals	

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB		COMMENTS
27119	99.70	101.60	1.90	.012	.10	.11	4.6	.05			123	1020	1121				3	33		34	4.6	53		
27122	220.30	221.80	1.50	.009	.01	.02	2.0	.16			86	95	151				179	23		12	2.0	161		
27123	221.80	223.30	1.50								63	96	64				55	60		4	1.1	30		
27124	225.80	227.30	1.50								48	174	58				71	54		3	0.9	1		
27125	229.60	230.80	1.20								91	106	61				195	67		8	1.7	23		
27126	230.80	232.30	1.50								24	105	58				85	79		4	0.7	1		
27127	234.50	236.00	1.50								21	23	39				61	89		4	0.6	62		
27128	243.00	244.50	1.50								23	28	46				62	84		4	0.5	50		
27129	244.50	246.00	1.50								30	84	34				97	119		2	0.7	1		
27130	249.00	250.50	1.50								31	54	41				58	129		3	1.2	100		
27131	251.60	252.50	0.90								42	201	51				49	104		6	2.5	53		
27133	261.80	263.40	1.60								39	152	116				23	117		3	2.1	2		
27134	266.50	267.30	0.80								46	94	47				8	148		1	1.4	18		
27136	278.50	280.00	1.50								11	14	97				27	102		1	0.6	21		
27137	286.50	288.00	1.50	.004	.64	.16	2.0	.03			36	6395	1622				117	99		6	2.0	30		
27138	288.00	289.50	1.50	.003	.03	.02	0.9	.06			30	255	216				41	139		3	0.9	57		
27139	293.20	294.70	1.50	.003	.02	.01	1.3	.08			30	169	67				51	156		3	1.3	79		
27140	294.70	295.90	1.20	.005	.02	.01	1.6	.24			49	164	64				72	63		3	1.6	240		
27141	295.90	297.50	1.60	.005	.01	.01	1.3	.26			48	147	72				60	56		4	1.3	259		
27142	301.60	302.60	1.00	.003	.01	.01	3.2	.22			30	27	140				31	243		8	3.2	220		
27143	302.60	303.90	1.30	.002	.01	.01	2.5	.93			21	69	63				86	118		5	2.5	930		
27144	304.00	305.40	1.40	.067	.11	.08	9.6	.24			665	1101	782				325	56		109	9.6	241		
27145	305.40	306.90	1.50	.009	.03	.02	3.4	.49			89	308	162				259	125		19	3.4	486		
27146	306.90	308.40	1.50	.022	.07	.02	12.6	.11			220	726	223				194	54		55	12.6	107		
27148	311.40	313.00	1.60	.009	.02	.01	2.7	.12			85	203	136				139	123		9	2.7	123		
27149	313.08	315.20	2.12	.009	.03	.01	3.2	.02			85	312	135				148	140		12	3.2	21		
27150	326.70	325.60	-1.10	.007	.01	.01	0.9	.01			65	94	57				27	69		3	0.9	1		
27151	332.80	334.30	1.50								75	98	508				86	107		3	1.8	1		
27152	334.30	335.80	1.50								61	575	114				54	108		3	1.2	1		
27153	335.80	337.00	1.20								42	18	32				69	211		1	0.7	1		
27154	342.30	343.80	1.50								22	26	19				95	172		1	1.1	6		
27155	345.50	347.00	1.50								13	22	237				86	61		1	2.1	1		
27156	348.60	350.20	1.60								66	56	50				92	81		1	1.1	1		
27157	350.20	351.70	1.50								55	89	312				82	89		1	2.7	7		
27158	351.70	353.20	1.50								40	126	43				83	97		1	1.1	3		
27159	355.20	356.30	1.10								44	160	52				89	128		1	0.7	1		
27160	358.30	359.80	1.50								58	111	45				33	79		1	1.1	1		
27161	359.80	361.30	1.50								24	53	34				72	58		1	1.2	1		

Sample	From (m)	To (m)	Length (m)	CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB		
27163	361.80	363.40	1.60								22	66	24				59	108		1	1.1	1		

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
27118	80.50	83.50	3.00	42.48	12.44	6.54	11.81	.01	.98	10.02	.20	1.46			128	157			10	37	2.3	163					54	2
27120	141.10	144.10	3.00	42.37	16.74	5.89	3.84	3.19	2.05	9.27	.24	1.50			79	50			5	22	1.8	43					53	6
27121	207.60	210.60	3.00	42.23	13.57	7.93	7.04	1.38	1.80	9.05	.38	1.54			92	60			5	23	1.9	25					43	5
27132	258.20	261.20	3.00	52.39	17.47	1.66	6.14	.50	2.98	7.98	.13	.79			77	92			5	157	1.0	21					61	1
27135	270.40	273.40	3.00	48.71	17.66	3.64	7.19	.51	1.98	9.85	.03	1.25			62	64			5	170	1.7	40					1	1
27147	308.40	311.40	3.00	51.08	18.05	2.27	1.87	1.06	3.85	9.34	.06	1.11			122	376			330	66	7.2	218					189	26
27162	361.30	361.80	0.50	78.22	3.13	4.44	1.80	.35	1.13	3.70	.12	0.16			34	85			5	67	2.0	494					82	2
27164	364.00	367.10	3.10	71.00	9.54	3.18	2.11	.37	2.77	3.92	.05	0.46			19	51			5	76	1.0	31					70	2

HOLE NUMBER: RG393

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: Sam Horizon

PLOTTING COORDS GRID: est.
NORTH: 885.00N
EAST: 12100.00W
ELEV: 1063.00

COLLAR GRID AZIMUTH: 180° 0' 0"

ALTERNATE COORDS GRID: est.
NORTH: 8+85N
EAST: 121+ 0W
ELEV: 1063.00

COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

COLLAR DIP: -55° 0' 0"
LENGTH OF THE HOLE: 261.20m
START DEPTH: 0.00m
FINAL DEPTH: 261.20m

DATE STARTED: September 22, 1990
DATE COMPLETED: September 26, 1990
DATE LOGGED: September 26, 1990

COLLAR SURVEY: NO
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: Frontier Drilling
CASING: pulled
CORE STORAGE: Samex

PURPOSE: Last hole in 1990 program!(RG308-RG393)

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
35.70	-	-57° 0'	ACID	OK		-	-	-	-	-	
69.20	-	-56° 0'	ACID	OK		-	-	-	-	-	
133.20	-	-56° 0'	ACID	OK		-	-	-	-	-	
157.60	-	-55° 0'	ACID	OK		-	-	-	-	-	
197.20	-	-55° 0'	ACID	OK		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 33.50	«CSG»					
33.50 TO 45.40	«SILT ARG W ACKE»	Colour: grey, black Grain Size: fine to medium Grey and black laminated argillite, siltite and fine to medium grained sandy wacke. Laminae and bands are variable in width: argillite 1 mm - 8 cm and siltite/wacke 1 mm - 20 cm. 75-80 deg Cleavage weakly developed at 20-25 deg The upper 3-4 m of the interval, 33.5-37.5 show minor deformation, stretching of siltite and distortion of bedding. The section 33.7-33.9 is very deformed and partly silicified, probably due to quartz vein injection. Intermittent sections of broken core and fault gouge. A minor fault marks the contact with the underlying interval but overall the lithology is gradational		Siltite and wacke interbeds are preferentially dolomitized owing to their greater porosity	Trace pyrite, except for deformed section 33.7-33.9 where large blebs (5x7 mm) developed in QDV	Core breaks easily along foliated/ bedding surfaces
45.40 TO 50.20	«LITHIC WAC KE»	Colour: grey, black Grain Size: fine to coarse Repetative sequence of lithic wacke (conglomerate/ breccia) and fine to coarse sandy wacke. Sections are akin to a heterolithic fragmental. Clasts tend to be flattened and oriented parallel to bedding and weak phyllitic foliation. Clastic fragments comprise quartz, dolomite argillite and yellow sericitized siltites?	80	Light coloured silty and sandy grains and clasts show weak to moderate dolomitization	3-10% pyrite is disseminated through-out as fine cubic grains. The greater abundance occurs in the sandy sub-intervals eg. 46.9-47.2; 48.5-48.9	
50.20 TO 58.90	«AREN ARG»	Colour: black Grain Size: fine The contact with the overlying unit is faulted parallel to foliation 80-90 deg. Black, graphitic silty argilite and black graphitic fine grained, well sorted arenite. The sandy beds are a fine mixture of white dolomitic grains in a black graphitic argillite matrix.		The sand intervals have been preferentially dolomitized with alteration of non argillite lithologies Dolomitization weak to moderate, suggesting grains are partly siliceous.	3-5% pyrite overall with argillite hosting the greater %. Pyrite is distributed mainly as bands (1-10 mm) within the argillite. Fine disseminated pyrite occurs in some sandy beds	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		Black, dolomitic arenite occupies approx. 35% of the interval with the principle sub-interval 52.0-54.9. Intermittent faulting represented by broken core and graphitic gouge		Dolomite also occurs as concentric nodular growths (1-2 mm)		
58.90 TO TO 69.20	«ARG DOL AR ENTITE»	Colour: grey, black Grain Size: fine, medium Lithologically similar to the overlying unit but the interval is characterized by a greater % of dolomitized grey arenite. (to 50%). Intermittent fault gouge and breccia, with main zones as follows: {63.4-64.2} «Flt Gou/Bx» {66.8-67.3} «Flt Gou»	70	Nodular dolomitic growths are abundant in the sub interval 58.9-61.9, av. 40% by volume. The conc. may be related to a vein-like structure at 60.8-60.9	Pyrite occurs as folded bands in argillite (1-4 mm) occasional blebs associated with dolomite (qtz) patches, and fine grained disseminations. Overall 3-5% pyrite	
69.20 TO 80.00	«SIL SEDS C HT»	Colour: grey, black Grain Size: fine The contact with the overlying sediments is faulted but there is no immediate variation in lithology. The change appears gradational. The interval comprises silicified grey, fine grained arenite/siltite; black, pyritic argillite and grey chert with fine black argillite partings (<1 mm) The lithologies tend to be gradational with the exception of the pyritic argillite between 70.9-72.1 m. The cherts (+ silicified siltite?) dominate the lower part of the interval from 76.2-80.0 and are gradational with the underlying het frag. Bedding is poorly defined but weak phyllitic foliation is developed at 70-80 deg. Faulting is confined to the upper 0.8 m of the interval 69.2-70.0 (strained sediments and graphitic gouge)		Silicification increases downhole, due to primary chert rather than secondary silicification	Pyrite generally occurs as fine grained bands and patches with occasional coarse grained blebs. Overall 2-7% pyrite with concentration within black argillite {70.9-72.1} «7-10% Py» Several blebs (1-2 mm) of sphalerite occur over 10 cm at {75.6-75.7} «1% Sp» associated with minor patchy quartz dolomite	
80.00 TO 82.50	«HET FRAG»	Colour: grey, white, black Grain Size: fine to coarse Grey, black, chert, quartz dolomite, granules to		Locally silicified	7-10% pyrite occurs as fine "dusty"	

153

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		pebble size, subrounded to subangular clasts form a heterolithic fragmental. The Het frag varies from clast, to argillite matrix supported			disseminations in irregular patches, coarser grains in blebs and occasional cubic crystals	
82.50 TO 124.60	«DOL MAF»	Colour: grey to greenish yellow and brown Grain Size: Although a 2-3 cm interval of fault gouge marks the contact with the Het frag. The lithologies appear gradational. The mafic interval has been intensely altered, such that no relict textures are visible. Greyish white quartz and dolomite with yellow brown sericite and green talc form a generally chaotic mixture of lithologies Folded, mottled grey white QDV crosscut foliation. Faulting is concentrated towards the lower contact as follows: 108.0-108.2 116.0-117.9 blocky, broken core and gouge The lower sub interval from approx. 119.0-124.6 appears strained with generally friable core. The contact with the underlying interval appears lithologically gradational		Yellow brown sericite alteration forms patches and lammellae with foliation developed at 70-80 deg to c.a. Green talc and fuchsite are often associated with the zones of sericite alteration Intense dolomitization	Pyrite content decreases downhole from 7-10% near the Het frag. contact to 1-2% at the lower contact. Pyrite occurs as fine disseminations in patches, fine grains parallel to sericite laminae and disseminated fine grains and occasional blebs	
124.60 TO 130.00	«MAF VOLC A RG»	Colour: light to dark grey and black Grain Size: fine Transitional interval comprising dolomitized mafic volcanics and black argillite Interval shows deformation with stretching parallel to foliation and folding of cross-cutting QDV. Faulted contact with underlying argillites and cherts		Weak to moderate development of yellow brown sericite as fine laminae (< 1mm) Green talc and fuchsite well developed adjacent ot fault at 130.0 m. Mod. to intense dolomitization of volcanic component	<1% disseminated pyrite	
130.00 TO 172.40 139.8	«ARG CHT»	Colour: light to dark grey, and black Grain Size: fine Interval dominated by light to dark grey cherts with graphitic argilite partings (<1 mm) and argillite interbeds (1-10 cm).		A minor interval of quartz and pale yellow sericite occurs between 138.1-138.6	Overall the interval is relatively pyrite poor with est. 1-4% py. However locally pyrite and base metal sulphides	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		The lithologies are generally deformed and faulted. The upper sub-interval 130.0-142.5 exhibits tectonised texture and structure with folded stretched and boudined argillite and chert Ribbon cherts are well developed from 142.5-148.0 152.6-158.6 and 168.0-171.6 Quartz dolomite veining and flooding appears as more than one phase of intrusion but overall is estimated at 10% of the interval Faulting has resulted in up to 25% of the interval being broken and brecciated. The more significant zones are as follows: 140.6-142.3: 148.2-150.7: blocky 162.0-163.4: blocky 166.4-168.0: gouge+blocks The lower contact with dolomitized mafics is faulted, with 30 cm of gouge and infilling QDV		Chert appears to have been locally bleached by QDV at 145.0 m and 159.0. Quartz dolomite veining and flooding has also caused local silicification of argillite interbeds	of greater conc. do occur. {139.8-140.6} «5% Sp,<1% Gn Cp, Tr Tt» and 8% pyrite. Sugary brown irregular blebs of sphalerite have intimately associated grains and small blebs (1-2 mm) galena and tetrahedrite. Chalcopyrite is associated with blebby aggregations of pyrite. All occur within an irregular folded patchy grey white QDV which crosscuts foliation and essentially floods the host arg and chert 3% combined Sp,Gn,Cp (tr. Tt?) occur in a white QDV between 141.1-141.2, yellow-green arsenic? staining occurs in faulted, broken QDV + Arg/Cht at 162.5 Pyrite is locally concentrated in patchy QDV + Arg/Cht at {166.4-167.4} «20-30% Py» as fine grained semi-massive bands and coarse cubic aggregations	Graphitic argillite and chert provides the right host rock chemistry for the precipitation of BMS brown silica rich fluids
172.40 TO 198.20	«DOL MAF VO LC»	Colour: brown to grey Grain Size: Intensely altered mafic volcanics. No remnant textures visible. Texture is characteristically called a whitish grey to grey and yellow brown patchy mixture with locally well developed mottled grey and white dolomite zones		Intense dolomitization throughout and locally well developed yellow brown sericite alteration Fuchsite and green talc occur in close association with sericite particularly in zones of faulting	Trace to 4% pyrite	
198.20 TO 209.40	«MAF ARG CHT FLT BX»	Colour: grey, white and black Grain Size: fine Mainly a faulted interval of mixed, altered mafic volcanics, grey cherts and black graphitic argillite. Approximately 25% of the interval is not brecciated with the lower 1.1 m to 209.4 m		Intense dolomitization of mafic sub-intervals and intense local development of yellow brown sericite. Gouge is highly graphitic	3-5% pyrite occurs as disseminations or blebby aggregations associated with quartz dolomite veins and fragments	203.3-205.4 -20% core loss

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		relatively competent Quartz dolomite veining and flooding occupy 10% of the interval either as competent blocks or broken fragments				
209.40 TO 212.70	«LITHIC WACKE»	Colour: grey, brown, black Grain Size: fine to coarse Gradational contact with the overlying unit. Greyish, fine to coarse grained, pyritic (arenite) wacke grades into coarser granule to pebble, clast supported (conglomerate/bx) wacke. Grains and clasts tend to be flattened parallel to foliation at	80	Light coloured grains and clasts have been dolomitized	7-10% pyrite is disseminated throughout as fine grains and cubic grains with occasional coarse blebs to 3-4 mm diameter. Fine dusty pyrite in bands (3-4 mm), parallel to foliation also occurs locally	
212.70 TO 221.40	«MAF ARG CHT»	Colour: grey, greenish-brown and black Grain Size: fine to coarse Conformable contact with overlying wacke. The interval comprises deformed, folded mixed argillite, chert and dolomitized mafic. A minor sub-interval of (conglomerate/bx) wacke occurs between {218.2-218.6} «WACKE» Cherty zones display bullseye folds e.g. at 213.3 and 214.0. Foliation developed at Patchy QDV and zones of flooding occupy 10-12% of the interval	65	Intensely dolomitized and sericitized mafic sub-intervals. Green talc and fuchsite locally developed along foliation parallel to sericite	5% pyrite occurs in a variety of forms -disseminated grains and blebs assoc. with QDV and argillite interbeds -fine disseminated grains in bands or patches	
221.40 TO 231.90 22714	«LITHIC WACKE»	Colour: grey, brown and black Grain Size: fine to coarse Contact relationship uncertain as quartz dolomite floods the zone where the lithologies merge. The interval is dominated by a variably coloured pebble to cobble (conglomerate/breccia) wacke Clast sizes range up to 6 cm in diameter and vary in composition from mafic to sedimentary. Zones have been flooded with quartz dolomite creating		Mafic clasts are intensely dolomitized and sericitized. Lighter coloured clasts of sedimentary origin show weak patchy to overall intense dolomitization	5-10% pyrite is distributed as fine disseminated grains and coarser blebs patches and bands. Concentrated zones of pyrite and base metals occur as follows: {227.4-227.9} «3%Cp, 3%SpGn,<0.1%Tt» Within a zone of quartz dolomite	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		a patchy grey white matrix to argillite, chert and mafic clasts. A 30 cm zone from 225.2-225.5 m is distinctly Het frag in nature comprising clasts supported in a black argillite matrix. The contact with the underlying mafics is marked by a minor zone of fault gouge, however the lithological change appears gradational. QDV and pyrite complicate the location of the contact point			flooding, Cp intimately associated with blebby aggregations of pyrite. Galena similarly related Sp. A single irregular blebby aggregation of tetrahedrite (3x6 mm) occurs with py and galena. From 227.9-228.4 in the zone of QDV persists but BMS diminish with <1% Sp observed. Pyrite increases overall to the contact overall to the contact with the underlying mafics, with the underlying mafics, with the minor subinterval 231.7-231.9 having 15% pyrite by volume	
231.90 TO 247.10	«DOL MAF VO LCS»	Colour: grey and brown Grain Size: fine Intensely altered interval of mafic volcanics. No relict textures are visible. Foliation well developed with sericite at:	70	Intense grey dolomitization and yellow brown sericitization. Talc and fuchsite developed in faulted zones at 246.0	Overall 2-3% pyrite occuring as fine disseminations and occasional blebs. The upper 1.0 m is more concentrated in pyrite and contains a 2cm wide zone of disseminated to blebby Sp and Gn [231.9-232.9] «<1% Sp+Gn, 10% Py» within qtz-dol flooding	
247.10 TO 261.20	«ARG CHT WA CKE»	Colour: grey, black, brown, white, green Grain Size: fine to coarse Contact with the above mafics appears gradational. the interval comprises a complex mixture of argillite, chert and well developed (conglomerate/ breccia) wacke. QDV and flooding complicate the overall lithological picture, and similary faulting and stretching distort any bedding structures. Altered mafic (dolomite+sericite), argillite, chert (and siltite), clasts, brown granule to pebble size from the wacke. Intermittent faulting occurs with a principal zone between 258.2-259.2		Dolomitizationn is evident throughout all light coloured clasts. Yellow brown sericite is well developed with mafic fragments/clasts. Green talc and fuchsite occur with sericite	7-10% pyrite distributed in grains, blebs, patches and bands. A concentrated zone of pyrite with BMS occurs as follows: [258.1-258.2] «20% Py, <1% SpGn» associated with a cross-cutting vein of white quartz dolomite	
	E.O.H.					

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB		COMMENTS
27165	45.40	46.90	1.50	.015	.05	.04	3.0	.02			154	532	355				107	152		4	3.0	22		
27166	46.90	48.50	1.60	.038	.11	.06	3.8	.03			379	1069	574				137	120		2	3.8	30		
27167	48.50	50.20	1.70	.018	.05	.02	3.1	.04			183	492	208				87	109		27	3.1	39		
27168	55.50	57.00	1.50	.007	.02	.01	1.9	.01			70	198	58				39	147		7	1.9	9		
27169	58.90	60.50	1.60	.006	.01	.01	2.8	.01			56	140	42				1	123		10	2.8	4		
27170	67.30	68.80	1.50	.003	.01	.01	2.7	.01			29	54	20				1	87		1	2.7	5		
27171	70.90	72.50	1.60	.004	.01	.01	1.6	.37			37	26	58				425	134		13	1.6	371		
27172	75.30	75.90	0.60	.009	.14	.02	16.0	.34			93	1392	153				649	71		86	16.0	336		
27173	78.30	80.10	1.80	.003	.09	.02	5.4	.61			34	854	203				1581	77		26	5.4	608		
27174	80.10	81.10	1.00	.004	.04	.02	2.9	.57			38	428	168				1921	68		20	2.9	570		
27175	81.10	82.50	1.40	.010	.05	.02	2.9	.36			102	536	175				2541	73		31	2.9	363		
27176	82.50	84.00	1.50	.010	.01	.01	1.8	.16			97	104	78				2006	89		21	1.8	162		
27177	84.00	85.50	1.50	.058	.06	.02	9.9	.12			583	579	237				519	84		191	9.9	118		
27178	123.30	124.60	1.50	.010	.01	.01	1.6	.01			103	120	31				1	78		1	1.6	2		
27179	124.60	126.10	1.50	.011	.01	.01	1.8	.01			122	147	30				10	66		17	1.8	3		
27181	130.00	131.60	1.60	.037	.01	.01	2.8	.01			169	49	47				144	155		39	2.8	10		
27182	138.60	139.80	1.20	.004	.01	.02	2.1	.01			39	144	230				127	73		7	2.1	5		
27183	139.80	140.60	0.80	.191	1.61	.65	55.7	1.39			1906	16065	6471				587	42		682	55.7	1320		
27184	140.60	141.30	0.70	.076	.16	.14	21.4	.17			758	1563	1365				189	49		205	21.4	170		
27185	141.30	142.70	1.40	.005	.04	.02	1.4	.03			54	434	184				113	75		10	1.4	28		
27186	144.80	146.30	1.50	.005	.01	.01	1.3	.01			46	130	80				72	83		8	1.3	2		
27187	151.20	152.60	1.40	.007	.03	.01	1.8	.06			72	315	95				126	191		8	1.8	57		
27188	155.30	155.80	0.50	.018	.12	.02	7.5	.14			182	1171	220				208	166		40	7.2	140		
27189	158.60	160.10	1.50	.005	.01	.01	0.9	.01			45	90	45				79	69		14	0.9	2		
27190	161.80	163.40	1.60	.003	.03	.01	0.8	.01			28	284	75				106	114		10	0.8	1		
27192	166.40	167.40	1.00	.013	.06	.04	2.2	.12			113	630	432				170	47		15	2.2	122		
27193	167.40	168.90	1.50	.027	.02	.05	2.3	.03			267	221	548				129	74		86	2.3	27		
27194	170.90	172.40	1.50	.007	.02	.01	2.3	.01			68	227	122				145	146		18	2.3	8		
27195	172.40	173.90	1.50	.010	.02	.02	1.1	.01			98	230	183				151	41		1	1.1	2		
27196	196.70	198.20	1.50	.006	.01	.01	1.6	.01			62	136	93				39	76		1	1.6	1		
27197	198.20	199.70	1.50	.002	.01	.01	0.6	.02			18	99	87				94	76		2	0.6	21		
27198	203.30	205.40	2.10	.006	.01	.02	1.1	.01			61	147	168				194	109		2	1.1	5		
27199	207.90	209.40	1.50	.006	.02	.01	0.9	.03			59	238	122				46	51		1	0.9	25		
27201	217.80	219.40	1.60	.009	.13	.07	2.7	.02			91	1267	694				188	95		3	2.7	24		
27202	219.90	221.40	1.50	.002	.01	.01	0.3	.01			24	107	59				99	116		1	0.3	2		
27203	221.40	222.90	1.50	.003	.01	.01	0.8	.02			27	56	85				85	155		1	0.8	16		
27204	225.90	227.40	1.50	.010	.08	.04	2.2	.02			100	811	362				123	143		1	2.2	24		
27205	227.40	227.90	0.50	.83	1.14	.24	69.7	1.64			8326	11399	2373				808	88		310	69.7	1600		

Sample	From (m)	To (m)	Length (m)	CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB		
27206	227.90	228.40	0.50	.047	.29	.09	10.0	.31			471	2917	872				302	112		83	10.0	310		
27208	231.40	231.90	0.50	.008	.03	.05	2.5	.09			79	258	462				266	119		2	2.5	90		
27209	231.90	232.90	1.00	.007	.08	.06	2.3	.11			67	821	614				348	110		3	2.3	110		
27210	232.90	234.40	1.50	.003	.02	.01	1.5	.03			34	191	115				243	147		1	1.5	25		
27212	247.10	248.60	1.50	.002	.01	.01	1.3	.02			24	82	138				198	188		1	1.3	20		
27214	252.20	253.70	1.50	.003	.02	.01	0.7	.03			32	213	103				170	260		1	0.7	29		
27215	255.10	256.60	1.50	.007	.06	.04	2.4	.06			70	627	408				138	164		1	2.4	57		
27216	256.60	258.20	1.60	.007	.01	.01	1.0	.25			73	102	114				263	186		1	1.0	245		
27217	258.20	259.70	1.50	.010	.10	.05	1.9	.76			95	1030	453				365	23		6	1.9	761		
27218	259.70	261.20	1.50	.006	.02	.01	1.3	.06			64	159	90				177	236		1	1.3	60		

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
27180	102.70	105.70	3.00	39.56	15.10	3.81	12.68	.24	1.85	11.30	.28	.86			135	162			60	80	2.5	33	.01		2.40	86.34	84	6
27191	163.40	166.40	3.00	81.47	5.47	0.70	0.27	.03	1.45	5.38	.01	.38			123	468			200	152	3.5	275	.05		4.55	98.40	344	39
27200	209.40	212.40	3.00	54.10	9.10	2.97	5.78	.25	0.87	14.45	.25	.79			88	138			10	68	1.6	197	.09		8.78	96.60	115	1
27207	228.40	231.40	3.00	57.27	10.57	6.83	4.72	.56	1.10	8.54	.25	1.14			85	865			25	152	2.7	667	.08		4.62	94.83	157	1
27211	239.90	242.90	3.00	45.14	12.43	9.06	7.70	.56	0.84	8.45	.34	1.65			29	78			5	94	1.7	79	.01		2.21	87.70	148	1
27213	249.20	252.20	3.00	67.42	10.25	3.77	3.53	.14	1.69	5.76	.22	.59			31	99			35	261	1.0	77	.01		2.91	94.85	130	1

HOLE NUMBER: RG394

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: SE of pit

PLOTTING COORDS GRID: Sam est.
NORTH: 600.00N
EAST: 9300.00W
ELEV: 1475.00

ALTERNATE COORDS GRID: Est.
NORTH: 6+ 0N
EAST: 93+ 0W
ELEV: 1475.00

COLLAR DIP: -75° 0' 0"
LENGTH OF THE HOLE: 387.40m
START DEPTH: 0.00m
FINAL DEPTH: 387.40m

COLLAR GRID AZIMUTH: 180° 0' 0"

COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: May 21, 1991
DATE COMPLETED: May 28, 1991
DATE LOGGED: May 22, 1991

COLLAR SURVEY: NO
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: Frontier
CASING: Left in hole.
CORE STORAGE: Samex camp.

PURPOSE: 9300w section, hole p-15. (as laid out with topofil, AH91)

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
90.50	-	-75° 0'	ACID	OK		-	-	-	-	-	
104.80	-	-74° 0'	ACID	OK		-	-	-	-	-	
187.70	-	0° 0'	ACID	NO	POOR ETCH	-	-	-	-	-	
230.40	-	0° 0'	ACID	NO	POOR ETCH	-	-	-	-	-	
271.20	-	-71° 0'	ACID	OK		-	-	-	-	-	
321.50	-	-69° 0'	ACID	OK		-	-	-	-	-	
355.50	-	-68° 0'	ACID	OK		-	-	-	-	-	
386.20	-	-66° 0'	ACID	OK		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 9.70	«CSG»	Overburden/casing, left in hole.				
9.70 TO 167.50	«MAF VOLC»	Green and white. Fine to medium grained. Typical chloritic and calcareous Sam mafics. Moderately broken core down to 35.0m, with 10% white carb/qtz veining. 9.7-24.0m: lapilli tuff. 24.0-53.0m: fine to med. grained lows. 53.0-125.5: mafic lapilli tuff. A few crosscutting dol-qtz veins begin at 59.5m Major brittle fault from 67.0-101.2m. During the faulted interval core ranges from gauge to moderately broken, but only weakly carb'd. FOLIATION at 107.0m: 118.0-120.3m: frioble fault breccia, very green. Below this the degree of Fe-dol alternation increases 'til mafic rock type is indistinguishable. Continues increasing to contact, with strong streching fabric at....	40 80 75	‡24.0-32.0‡ «Brittle flt.» with vuggy carb veins. ‡67.0-101.2‡ «Major br. flt.» Minor bright green talc and moderate carb'n, assoc. with faulting. ‡125.0-167.5‡ «Strong dol. altn» with assoc. py and talc, and brown sericite.	No visible sx. except: ‡59.5-59.9‡ «qdv, 3% cpy, 3% gn» and ‡67.1-69.3‡ «qdv, flt, 1% gn, tr cpy» ‡81.4-82.4‡ «qdv, tr gn» 105.3-105.4m: thin dol vein with 5% py and trace gn, sp. 125.0-167.5m: 2-5% as dissem and f.f. assoc. with carb flooding.	
167.50 TO 168.80	«QTZ SER/ ARG»	Yellow and black. Contact is knife sharp and marked by a 5cm broken qtz-ser veinlet. Interval is strongly fragmented but well healed, faint contorted relict bedding between argillaceous and yellow sericitic portions (1:5). Probably correlative with "serts" and "trans frags" of previous loggers. Strong stretching fabric at.... White crystalline qtz now in "balls" and lenses.	75	Intense yellow to pale green sericite, with white qtz fragments and segregations. Silicified and not carb'd.	Wispy fracture filling pyrite (2-3%).	
168.80 TO 181.00	«GREY SER/ PY/ARG»	Grey and black. Very fine grained. Conformable, knife sharp contact with "snowy mut" (grey sericite schist) with a nodular carbonate overprint. A few slivers of argillite present, ranging from a few mm to a few cm. At 170.6m argillite is finely laminated with syngenetic(?) looking pyrite, although highly contorted and cut by hazy qtz-carb veinlets. Schistosity @ 171.5m A 30cm slug of white qtz-carb vein, barren, within	70	Strong grey "muddy" sericite, pyrite, carbonate alteration. ‡173.1-178.0‡ «Flt @ 40degs.» with gouge, breccia, and a swing in fabric to 40degs. at 177.0m. Probably all variable flt. breccia to lower contact.	15-25% very fine grained py disseminated throughout. Minor coarser pyrite and trace sphalerite assoc. with veinlets of carb-qtz. ‡168.8-181.0‡ «15% py»	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		gouge @ 173.5m. Good debris flow(?) textures @ 177.5m.				
181.00 TO 182.20	«MASSIVE PY»	Sharp contact with massive, milled-up pyrite in a siliceous matrix. Texture is cataclastic, with a few cm scale qtz patches rimmed by gn, sp, cp and a few grains of tet(?).		Possible silicification which seems to add base metal sulphides to an older pyrite body.	‡181.0-182.2‡ «60% py, 3% sp, tr gn, cp, tt»	Resembles core from recent u/g drilling of gold zone.
182.20 TO 192.00	«FLT/PY/ QTZ/SER/ ARG»	Grey. Mostly friable interval of grey sericitic, siliceous, pyritic schist. Short 5-10cm seams of massive pyrite may be fault blocks of above interval. Relict fragmental textures present. (ie: brecciated breccia).		Quartz injection pre and possibly synfaulting. Minor arg survives, intense grey sericitization, mostly as clasts.	‡182.0-192.0‡ «20% py, 3% sp, tr tt?» Coarser pyrite assoc. with qtz veinlets and minor base metals. A few suspected grains of tetrahedrite.	
192.00 TO 194.00	«SIL ZONE»	White and grey. Very hard, intensely silicified zone. White stockwork cuts grey siliceous material, with argillaceous & pyritic stylolites. Probably a silicified argillite.		Intense sil.	Pyrite (5%) in stylolites. A few coarse grains of brown sphalerite and galena assoc. with qtz veinlets.	
194.00 TO 206.80	«SER/DOL/ PY/MAFICS?»	Brown, grey and green. Upper contact marked by change from sil. to carb. alteration, appearance of brown sericite, and traces of fuchsite. Faulting continues, but mostly parallel to foliation... Strong fabric, locally friable. Minor argillaceous component present.	65	Intense ferrodol'n, with brown sericite (after chlorite?), and minor weak fuchsite development. Pyrite also an alteration product.	‡194.0-206.8‡ «15% py, tr sp» disseminated throughout.	Is this a "mutized" mafic volcaniclastic? Resembles "mut" above in this hole, but is browner.
206.80 TO 208.40	«SIL/PY ZONE»	Another intensely silicified zone, but this time with considerably more sulphides. Quartz is pervasive, light to dark grey, & finely crystalline.		Intense sil of probable argilliceous sediments.	‡206.8-208.4‡ «10% py, 2% sp, tr cp, tt?» Pyrite is medium to coarse grained and concentrated in bands, roughly parallel to foliation. Sphalerite concentrated along veinlet margins.	
208.40 TO 220.20	«GREY SER SCHIST»	Grey. Rather monotonous interval of dense grey ser., with 15% white qtz wisps along foliation at Competant with very little broken core. Relict coarse wacke texture visible in places. Lower contact a fault.	60	Intense grey sericite, moderate silicification. ‡220.1-220.2‡ «Gouge»	Very fine grained pyrite dissem. throughout. ‡208.4-220.2‡ «15% py» Also ‡213.8-214.3‡ «QDV, tr sp, gn,tt» as coarse grains in milky vein.	
220.20 TO 224.50	«RIBBON CHERT»	Grey. Aphanitic grained. Very finely laminated light grey chert, highly contorted, with disharmonic, chaotic folding throughout. Layers are separated by all or one of black argillite, pyrite, or grey sericite.		Minor grey sericite septae. Virtually no evidence of qtz veining.	5% pyrite as septae between chert layers.	Corrugated look, with rough core surface.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
224.50 TO 235.70	«SIL ARG/ CHT»	Black and white. Very black argillite with grey ribbon chert, laminations contorted. Qtz. veining is white and barren with black stylolites. Ratios arg: cht: qv are 2:5:1. Strong fabric avg.	65	Silicification is moderate in arg. Minor dol also in veins.	2% py as thin bands and fracture fillings.	
235.70 TO 241.80	«DOL MAF VCLASTICS?»	"Dolomitized Mafic Volconiclastics?" Buff and grey. Upper contact broken, into interval of buff sericitic rock with grey dolomitic lenses. Rock has banded appearance, with no relict textures. Lower contact is conformable and sharp.	70	Strong carbonatization, brown ser, grey Fe-dol, trace fuchsite.	2% dissem py.	
241.80 TO 362.90	«ARG/CHT/ TUFF BX»	Black, grey, and pale green respectively. Long sequence of laminated to thinly bedded argillite, with lesser chert, and thin beds of pale green tuff(?). Fabric is strong & varies from foliation to spaced cleavage +\- 10degs. Proportion of dol. mafics increases from 10% to 40% at 325.5m, and looks like a volcaniclastic wacke. Gradational lower contact.	65	Silicification is moderate in arg, dol is pervasive in tuff. White qdv's common and mostly deformed, and barren, both crosscutting and conformable. ‖268.7-269.3‖ «Flt. gouge»	Only trace to 1% pyrite as dissem. assoc. with veining.	Highly contorted, tectonically brecciated, and strained. Fault intensity is centered around ‖239.4-261.3‖ «Ductile thrust?» and weakens downhole.
362.90 TO 387.40	«ALT MAFICS»	Green, white and grey. Consistantley textured green mafics with pervasive carbonate. However, no brown sericte is developed. Widely spaced qtz-carb veining is typical of unaltered Sam mafics. Internal volcanic textures destroyed. Weak foliation..... END OF HOLE.	60	Evenly spotted texture with porphyroblastic carbonate (Fe-dol) giving rock a "pseudogabbroic" appearance. Chlorite is abundant also.	Trace diss. py only.	"Middle Mafics" At 386.9 the lithology changes to lapilli tuff from a probable massive flow.

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB		COMMENTS
BCD45226	59.50	59.90	0.40	.213	.80	.15	4.2	.03			2129	8024	1542				1			1	4.2	26		
BCD45230	60.80	61.90	1.10								1145	563	250				1			1	2.3	18		
BCD45227	67.10	68.70	1.60								1517	1696	1143				1			3	3.9	34		
BCD45228	68.70	69.30	0.60								45	114	145				34			1	1.6	19		
BCD45229	81.40	82.40	1.00								34	129	373				1			1	2.7	20		
BCD45231	166.00	167.50	1.50								63	106	9				206			1	1.7	10		
BCD45232	167.50	168.80	1.30								21	65	18				62			1	0.6	2		
BCD45233	168.80	170.60	1.80								84	93	68				47			1	2.1	22		
BCD45234	170.60	172.10	1.50								86	157	95				10			1	2.7	16		
BCD45235	172.10	173.10	1.00								93	218	81				45			5	2.4	25		
BCD45236	173.10	174.00	0.90								53	236	360				57			2	2.1	87		
BCD45237	174.00	175.50	1.50								39	60	166				59			1	1.7	75		
BCD45238	175.50	177.00	1.50								65	238	335				131			3	3.2	142		
BCD45239	177.00	178.50	1.50	.015	.47	.39	11.8	.13			147	4721	3966				278			29	11.8	132		
BCD45240	178.50	180.00	1.50	.007	.16	.18	4.7	.10			73	1596	1822				282			8	4.7	100		
BCD45241	180.00	181.00	1.00	.011	.05	.07	2.5	.10			107	488	652				236			13	2.5	103		
BCD45242	181.00	182.20	1.20	1.163	2.37	3.99	58.9	.56									3140			2820				
BCD45243	182.20	183.20	1.00	.178	.38	.82	16.6	.27			1776	3803	8245				920			365	16.6	270		
BCD45244	183.20	184.70	1.50	.089	1.39	.64	10.2	.21			894	13889	6438				700			124	10.2	212		
BCD45245	184.70	186.20	1.50	.040	1.41	.33	6.5	.31			404	14105	3362				728			50	6.5	309		
BCD45246	186.20	187.70	1.50	.173	2.43	1.52	21.7	.26			1731	24298	15237				742			92	21.7	264		
BCD45247	187.70	189.20	1.50	.058	.82	.78	14.1	.06			580	8205	7879				509			65	14.1	61		
BCD45248	189.20	190.70	1.50								227	410	224				228			33	3.8	78		
BCD45249	190.70	192.00	1.30								83	220	242				246			7	2.5	76		
BCD45250	192.00	193.00	1.00								61	735	403				127			6	1.9	29		
BCD45251	193.00	194.00	1.00								24	67	82				238			3	1.6	38		
BCD45252	194.00	195.50	1.50								44	136	63				326			1	2.4	37		
BCD45253	195.50	197.00	1.50								83	294	456				865			5	3.7	292		
BCD45254	197.00	198.50	1.50								137	484	468				549			1	2.9	108		
BCD45255	198.50	200.00	1.50								60	209	318				420			1	2.1	29		
BCD45256	200.00	201.50	1.50								77	1507	438				426			1	2.3	68		
BCD45257	201.50	203.00	1.50								95	94	198				408			6	2.0	19		
BCD45258	203.00	204.40	1.40								96	207	316				659			1	1.7	92		
BCD45259	204.40	205.50	1.10								499	1765	1636				411			6	4.4	90		
BCD45261	205.50	206.80	1.30								102	1476	1805				1300			4	6.1	119		
BCD45262	206.80	208.40	1.60	.257	2.18	1.09	15.3	.38			2573	21889	10989				1068			270	15.3	382		
BCD45263	208.40	209.40	1.00								49	123	178				140			5	6.1	130		
BCD45264	209.40	210.90	1.50								39	121	132				104			4	2.9	84		

HOLE NUMBER: RG394

ASSAY SHEET

DATE: 16-October-1991

Sample	From (m)	To (m)	Length (m)	CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB		
BCD45265	210.90	212.40	1.50								30	27	66				83			2	2.6	72		
BCD45266	212.40	213.80	1.40								184	722	582				110			5	4.7	55		
BCD45267	213.80	214.30	0.50								65	172	3171				18			16	8.0	18		
BCD45268	214.30	215.80	1.50								25	35	175				29			3	8.8	37		
BCD45269	215.80	217.30	1.50								26	1775	2592				23			6	11.4	69		
BCD45270	217.30																							

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: SE OF PIT

PLOTTING COORDS GRID: SAM GEOL.
NORTH: 954.30N
EAST: 9552.30W
ELEV: 1452.88

ALTERNATE COORDS GRID: SAM EST.
NORTH: 9+50N
EAST: 95+55W
ELEV: 1452.00

COLLAR DIP: -89° 0' 0"
LENGTH OF THE HOLE: 614.70m
START DEPTH: 0.00m
FINAL DEPTH: 614.70m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: May 28, 1991
DATE COMPLETED: June 8, 1991
DATE LOGGED: June 8, 1991

COLLAR SURVEY: NO
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: FRONTIER DRILLING
CASING: LEFT IN HOLE
CORE STORAGE: SAMEX CAMP

PURPOSE: PROPOSED HOLE P-18, TEST SAM HORIZON 150M UPSTRIKERG 376.

DIRECTIONAL DATA: (cd's as laid out by survey)

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
75.20	-	-87° 0'	ACID	OK		-	-	-	-	-	
124.00	-	-86° 0'	ACID	OK		-	-	-	-	-	
178.90	-	-83° 0'	ACID	OK		-	-	-	-	-	
228.60	-	-80° 0'	ACID	OK		-	-	-	-	-	
270.40	-	-76° 0'	ACID	OK		-	-	-	-	-	
316.10	-	-89° 0'	ACID		STUMPER?	-	-	-	-	-	
346.60	-	-74° 0'	ACID	OK		-	-	-	-	-	
386.20	-	-72° 0'	ACID	OK		-	-	-	-	-	
465.40	-	-70° 0'	ACID	OK		-	-	-	-	-	
495.90	-	-70° 0'	ACID	OK		-	-	-	-	-	
533.70	-	-70° 0'	ACID	OK		-	-	-	-	-	
556.90	-	-69° 0'	ACID	OK		-	-	-	-	-	
303.90	211° 0'	-75° 0'	MULTISHOT	OK	SPERRY-SUN	-	-	-	-	-	
553.80	209° 0'	-70° 0'	MULTISHOT	OK	SPERRY-SUN	-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 15.80	«CASING»	Casing through overburden.				
15.80 TO 327.90	«MAF VOLC»	Dark to light green. Core is badly broken from ‡15.8-24.6‡ «Flt Bx» and bleached out from ‡26.7-32.0‡ «Carb Flt.» Otherwise a dark green chloritic greenstone, cut by 10-15% irregular qtz-calcite veinlets. Moderate FOLIATION @ 50 First lapilli seen at 122m, but still mostly massive volcanics. Relatively fresh and green, with dark spots, and white veinlets and segregations through to 307.5m. From ‡237.6-240.0‡ «Qdv, Flt Bx» & ‡262.4-264.2‡ «Qdv, Flt Bx» break the monotony. Lower contact is sharp and conformable at angle of ..... 65 Competant core.		Pervasive calcareous and chloritic except around faults as noted, where ferrodolomitization and minor diss. pyrite present, along with trace fuchsite and talc. Patchy weak fe-dol. locally throughout 65.0-90.0m. Carbonatization, centered around lapilli, starts gradationally at 319.0m and increases intensity along with fabric until contact. ‡319.0-327.9‡ «Dol Alt»	2-3% disseminated pyrite except for a fairly rich dol (+/- qtz.) vein. ‡54.5-54.7‡ «3% gn, 2% sp, py, cp» with spectacular pegmatitic "spider web" textures. Minor disseminated pyrite only except for a mineralized dol vein from ‡322.8-323.1‡ «2% sp, gn; qdv»	
327.90 TO 361.40 329.1	«SIL ARG/ TUFF TECT»	Black and pale green. Apparently a part of the mafic pile (or very well annealed) is a competant, black argillaceous unit, with grey silty & cherty clasts and deformed laminations. Very strong FOLIATION @ 55 Parallel qtz veinlets (10%) and axial cleavage to small scale folds. Clast are angular or boudin shaped. Lower contact is interbanded (bedded?) & marks last argillite seen.		Silicification related to veinlets, with minor pale green to yellow sericite development in tuff layers which comprise 10-30% of unit increasing down hole.	Trace disseminated pyrite only except ofr mineralized qtz-dol veinlets: ‡329.1-329.3‡ «qdv» with 10% sp in a medium grained pyritic mass, 3% gn, tr cp. Also at 344.6-344.8m & 347.1-347.7m and 353.1-354.1m. These veinlets are 1-10cm thick & although often parallel, are deformed. Most were sampled.	
361.40 TO 395.30	«DOL MAF»	Grey and mustard yellow. Grey dolomite in medium to coarse grained patches separated by sericite (15%) and lesser talc or fuchsite. Irregular fabric swings from 30-70 degs. (Does this mean that alt. is post penetrative deformation?). Lower contact is also interbanded and gradational and marks reappearance of blk argillaceous component.		Very intense ferrodolomitization and mustard yellow to buff sericitization. Becomes darker buff and dark grey downhole.	3-4% disseminated pyrite only until 390m when sulphide rich qtz-carb veins become common. ‡390.7-395.3‡ «7% py, 2% sp, tr gn,cp»	
395.30 TO 411.30	«ARG/SILT TUFF TECT»	Black, yellow grey, green. Mixed lithology tectonic breccia, with a strong stretching fabric at 55 Possible "heterolithic fragmental" from ‡395.3-397.0‡ «het frag?» Mainly an argillaceous matrix, with siliceous clasts, although there are short intervals of yellow sericite or fuchsite. Overall a very "ratty" irregular texture, very disturbed. Minor gouge & friable breccia throughout but most intense at		Patchy silicification associated with 1-10cm qtz veinlets and also patchy yellow or green sericte apparently host rock dependant. ‡410.6-411.3‡ «fuch. fault gouge»	3% py as wispy disseminations and in cataclysed siliceous patches & veinlets Trace sphalerite associated with py. Very rare cp at 397.4m.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		bottom contact.				
411.30 TO 445.60	«SIL ARG/ CHT?	Black, white, and grey. Very hard and silicified interval, cut by white milky quartz veins up to 10cm, and by grey quartz stockwork, crosscutting & deformed. Clotty fine to coarse grained pyrite & sphalerite are disseminated and fracture filling, as well as in veins. Interval textures destroyed, with only minor contorted laminations remaining. Fabric ranges from 40-90 degs. to core axis.		Pervasive, vein controlled silicification. Some siltstone now is cherty, perhaps some primary chert. Black, graphitic "stylolites" common throughout. {416.2-416.5} «fuch.» {434.8-436.8} «cht?» {443.4-444.6} «15%py,5%sp,2%gn in qvs» Minor fault breccia over last 5m.	Patchy veinlet related sulphides. {411.3-445.6} «7% py, 2% sp, tr g & c» Sphalerite is generally brown, medium to coarse grained and within veins with trace galena. Pyirte is more widespread in veins and in wallrock dissem and patches.	Continuously sampled for ICP/Geochem analysis.
445.60 TO 501.00	«MIXED SEDS TUFF/ TECT»	Black, grey, and green. Top contact friable fault breccia for 60cm with silicified and dolomitized fragments containing disseminated pyrite (10%). Lithologically mixed and altered, apparently laminated argillite/siltstone (+/- cht?) with thicker 0.1-1.0m scal interbeds of heavily carbonatized & fuchsitic tuff? or volcaniclastic wacke. The laminated portions are contorted, disrupted, and silified. Spaced cleavage at 456m Fragmental, tectonic bx locally. Unit becomes thickly bedded coarse wacke(?) downhole, with only patchy argillaceous material. At 490m the black argillite is cut by fractures, now deformed and filled in with qtz-carb, which display strongly pyritized/wallrock alteration envelopes. (see specimen). Gradational lower contact.	60	Silicification predominates, with dol'n host rock dependant eg: {451.0-451.9} «fuch.» Sericite (yellow and brown) in patches appears around 454m within mafics, and minor grey sericite around 458m in argillaceous portions. Gradationally (ca 477m) downhole the rock becomes more even textured & dark grey; probably a coarse wacke with minor argillaceous component, now pervasively ferrodolomitized. Very little grey sericite developed, just enough to give broken surfaces a sheen.	Coarse, caraclysed, pyrite grains in siliceous seams and veins, with minor sphalerite and traces of galena. {445.6-501.0} «6% py, 1% sp, tr gn,cp» Particular samples of interest include: 446.2-446.7m: 3% cpy. 463.3-369.4m: 10% py, 3% sp. From 477m down the richer basemetal bearing deformed veinlets are less common and wider spaced (2-3m apart) and only 1-2cm thick. Very fine grained py disseminations increase inversely 499-501m: 15% very fine grained pyrite.	Very reactive unit, possible due to porosity, and primary carbonate component(?) The alteration `corona' looks like "Mut". This specimen given to J. Clarke for petrography.
501.00 TO 516.00	«DOL MAF?»	Brown to grey. Gradational contact expressed mainly by the increase in buff to brown sericite present. Still a highly altered, dense dolomitic rock with irregular fabric. Possible fold nose at 503m, broad and open.		Pervasive, strong ferrodolomitization with accompanying brown sericite and pyrite. Also cut by uncommon, irregular white qtz-dol units.	5-10% disseminated pyrite throughout.	
516.00 TO 519.00	«FAULT»	Brown and white. Hosted by a strong talc-sericite schist which way to fault gouge and breccia from 516.5-517.4m. Milky silicification from 517.4 to 519m. Angles varied, but much subparallel to core axis.		Strong dolomitization cut by milky white quartz veining (20%). Associated sericite and talc common.	Only 5% pyrite as very fine grained disseminations in wallrock.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
519.00 TO 563.40	«MAF LAP TUFF»	Pale green to buff and olive. Easily recognizable lapilli textures, although rock quite bleached. Rock has no foliation, & lapilli are not flattened but are lighter colour than matrix. Chlorite common in matrix. Deformed 1cm qtz-carb veinlets comprise about 10% of interval. Lower contact sharp with fault gouge.		Weak fe-dol, centered about lapilli. From ‡521.0-521.8‡ «qdv» which is white and barren.	2-3% disseminated pyrite only. One speck of galena at 520m in siliceous patch.	Typical "Sam Mafics" occuring where 'Middle Mafics" usually appear.
563.40 TO 614.70	«SIL ARG/ TUFF?»	Black and white. Friable fault gouge and breccia at top of interval, with black argillite and qtz vein fragments. ‡563.4-565.2‡ «Flt.» Unit is comprised of about 20% white xaline quartz veins, highly deformed along with finely laminated argillite/siltstone. Most common cleavage direction: with bedding at all orientations. From ‡586-602.5‡ «fold nose?» where bread open folds with bedding along axis and common q.v.'s. END OF HOLE	55	Intense vein related silicification becomes pervasive in places. The rock has a pale greenish tinge in siltier portions & around veining esp. at 593-598m and from 608.2-612m perhapse due to minor tuffaceous component. Very minor buff sericite also in the green portions.	Only a few coarse euhedra of pyrite in quartz-dol veining around 594-595m.	In places resembles HW seds, but more likely correlatable with the "SIL ARG/ TUFF TECTONITE" near the top of the hole.

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
BCD45260	54.50	54.70	0.20	.113	1.34	.65	9.7	.07			1131	13397	6453				67	22		20	9.7	65	
BCD45273	322.80	323.10	0.30	.059	.91	.35	4.0	.02			591	9131	3457				1	63		11	4.0	16	
BCD45274	329.10	329.30	0.20	.079	11.45	2.10	12.9	.10			785	114544	20958				485	33		54	12.9	97	
BCD45275	344.60	344.80	0.20	.029	.74	.14	2.0	.01			293	7425	1425				177	77		4	2.0	2	
BCD45276	344.80	345.80	1.00								31	448	228				30	86		1	0.9	1	
BCD45277	345.80	347.10	1.30								51	206	110				18	81		1	0.8	3	
BCD45278	347.10	347.70	0.60	.052	1.64	.29	3.6	.04			515	16380	2915				136	55		10	3.6	40	
BCD45279	353.10	354.10	1.00	.068	1.96	.87	13.7	.06			680	19578	8738				345	38		222	13.7	57	
BCD45280	357.50	358.70	1.20	.029	.61	.44	6.4	.06			287	6118	4439				229	54		105	6.4	56	
BCD45281	360.90	361.40	0.50	.035	.66	.57	4.5	.05			346	6649	5674				221	70		23	4.5	53	
BCD45282	361.40	369.90	8.50								33	255	200				132	287		1	0.9	8	
BCD45283	390.70	392.30	1.60								270	2076	690				621	169		20	2.4	42	
BCD45284	392.30	393.80	1.50								261	900	851				377	146		10	2.1	37	
BCD45285	393.80	395.30	1.50	.044	.38	.18	4.5	.06			439	3840	1831				795	140		31	4.5	55	
BCD45286	395.30	396.80	1.50	.039	.27	.15	3.6	.05			392	2669	1512				278	147		39	3.6	54	
BCD45287	396.80	397.60	0.80	.11	.87	.16	4.7	.04			1105	8737	1647				274	167		28	4.7	39	
BCD45288	411.30	412.80	1.50								43	423	305				226	283		8	0.9	27	
BCD45289	412.80	414.30	1.50								61	995	875				351	122		28	2.9	43	
BCD45290	415.70	417.30	1.60								49	2293	1017				145	165		13	2.4	31	
BCD45291	417.30	418.80	1.50								131	107	129				196	151		11	0.5	26	
BCD45292	417.30	418.80	1.50								29	81	139				205	163		10	0.9	25	
BCD45293	418.80	420.30	1.50								30	79	164				303	92		12	0.9	37	
BCD45294	420.30	421.80	1.50								44	207	276				315	59		14	1.1	46	
BCD45295	421.80	423.30	1.50								50	671	435				401	91		28	1.7	72	
BCD45296	423.30	424.80	1.50								138	1433	612				632	116		25	2.1	89	
BCD45297	424.80	426.30	1.50								27	57	111				177	134		10	0.8	38	
BCD45298	426.30	427.80	1.50	.006	.08	.21	3.9	.06			58	810	2093				365	134		44	3.9	57	
BCD45299	427.80	429.30	1.50	.034	.10	.22	4.4	.08			337	1047	2214				594	113		41	4.4	78	
BCD45300	429.30	430.80	1.50	.128	1.03	.50	9.6	.14			1275	10321	5016				759	70		45	9.6	138	
BCD45301	430.80	432.30	1.50								18	55	83				120	111		1	0.1	59	
BCD45302	432.30	433.80	1.50								18	137	76				154	107		1	0.1	74	
BCD45303	433.80	435.30	1.50								16	37	86				222	73		2	0.3	63	
BCD45304	435.30	436.80	1.50								70	1184	136				360	76		5	0.5	80	
BCD45305	436.80	438.30	1.50								47	211	116				346	62		43	0.9	102	
BCD45306	438.30	439.80	1.50								15	138	74				152	62		2	0.1	103	
BCD45307	439.80	441.30	1.50								20	64	101				331	93		2	0.1	76	
BCD45308	441.30	442.40	1.10	.004	.10	.01	0.4	.14			37	97	140				436	55		13	0.4	140	
BCD45309	442.40	443.40	1.00	.004	.28	.02	1.1	.12			44	2799	185				290	89		10	1.1	122	

Sample	From (m)	To (m)	Length (m)	CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB
BCD45310	443.40	444.60	1.20	.157	2.16	.40	31.5	.34			1565	21580	4035				1862	26		150	31.5	337
BCD45311	444.60	445.60	1.00								56	1537	215				354	83		5	0.3	19
BCD45334	445.60	446.20	0.60								55	732	1141				788	58		6	0.5	86
BCD45312	446.20	446.70	0.50	.083	.66	.48	7.8	.10			833	6632	4793				643	27		23	7.8	96
BCD45313	446.70	448.00	1.30								35	176	214				359	67		1	0.1	44
BCD45314	448.00	449.50	1.50								31	117	330				1579	46		1	1.1	26
BCD45315	449.50	451.00	1.50								31	126	94				391	29		1	0.1	37
BCD45316	451.00	451.90	0.90								40	70	105				948	38		1	1.1	28
BCD45317	451.90	453.40	1.50								62	102	190				793	63		1	0.8	82
BCD45318	453.40	454.30	0.90	.069	.79	.71	8.1	.09			693	7858	7089				664	63		26	8.1	85
BCD45319	454.30	455.80	1.50								43	165	282				288	89		4	0.1	46
BCD45320	455.80	457.30	1.50								28	113	112				143	121		1	0.2	31
BCD45321	457.30	458.80	1.50								10	80	74				103	113		1	0.2	29
BCD45322	458.80	460.30	1.50								19	165	141				233	112		1	0.3	42
BCD45323	460.30	461.80	1.50	.016	.13	.16	2.7				164	1308	1571				263	89		5	2.7	27
BCD45324	461.80	463.30	1.50	.015	.20	.30	3.6				148	1967	3059				376	37		12	3.6	60
BCD45325	463.30	464.80	1.50	.061	.38	.50	9.7				614	3787	4968				340	73		39	9.7	68
BCD45326	464.80	466.30	1.50	.009	.09	.17	2.9				86	871	1706				313	66		5	2.9	80
BCD45327	466.30	467.80	1.50	.017	.04	.12	2.7				167	402	1234				383	68		10	2.7	121
BCD45328	467.80	469.40	1.60	.056	.92	.37	9.3				555	9240	3727				505	53		41	9.3	184
BCD45329	478.30	479.30	1.00	.067	1.41	1.4	19.5				667	14183	14006				877	29		104	19.5	163
BCD45330	479.30	480.00	0.70	.067	.27	.41	7.1				678	2748	4097				2984	88		75	7.1	141
BCD45331	480.00	481.50	1.50	.126	.90	1.57	16.3				1260	9025	15728				1441	65		206	16.3	192
BCD45332	481.50	483.00	1.50	.023	.72	.16	1.5	.12			227	7210	1624				623	45		26	1.5	115
BCD45333	483.00	484.50	1.50								61	529	459				462	67		7	0.2	68
BCD45335	491.70	493.20	1.50	.077	.33	.19	4.1	.07			768	3289	1909				510	56		28	4.1	65
BCD45336	493.20	494.70	1.50	.234	.40	.43	10.6	.07			2343	4043	4290				543	92		31	10.6	69
BCD45337	494.70	496.20	1.50	.077	.31	.30	11.1	.04			765	3127	2957				344	110		24	11.1	38
BCD45338	496.20	496.90	0.70								38	98	214				232	97		3	1.6	27
BCD45339	496.90	497.80	0.90	.114	.57	.38	9.1	.07			1138	5749	3824				637	43		54	9.1	71
BCD45340	497.80	499.30	1.50	.027	.11	.05	1.5	.05			267	1075	530				526	87		25	1.5	48
BCD45341	499.30	501.00	1.70	.046	.66	.15	3.0	.07			461	6576	1465				507	51		43	3.0	72
BCD45342	509.60	511.10	1.50								48	376	231				401	71		7	0.1	64
BCD45343	511.10	512.60	1.50								67	87	226				390	40		10	0.8	79
BCD45344	512.60	514.10	1.50	.012	.28	.19	3.1	.31			118	2780	1862				594	29		26	3.1	310
BCD45345	514.10	515.50	1.40								101	1018	823				407	63		11	1.4	143
BCD45346	515.50	516.50	1.00								119	930	1386				153	57		7	1.5	75
BCD45347	593.00	595.30	2.30								32	221	100				38	80		1	0.9	2

Sample	From (m)	To (m)	Length (m)	CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB		

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: SE PIT

PLOTTING COORDS GRID: estimated
NORTH: 925.00N
EAST: 9400.00W
ELEV: 1490.00

ALTERNATE COORDS GRID: SAM EST.
NORTH: 9+25N
EAST: 94+ 0W
ELEV: 0.00

COLLAR DIP: -88° 0' 0"
LENGTH OF THE HOLE: 647.70m
START DEPTH: 0.00m
FINAL DEPTH: 647.70m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: June 8, 1991
DATE COMPLETED: June 22, 1991
DATE LOGGED: June 22, 1991

COLLAR SURVEY: NO
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: FRONTIER DRILLING
CASING: LEFT IN HOLE
CORE STORAGE: SAMEX CAMP

PURPOSE: (P-16) TO FOLLOW-UP 150m DOWNDIP OF RG 376. (not surveyed, laid out by Topofil, AH91)

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
60.00	-	-89° 0'	ACID	OK		-	-	-	-	-	
117.50	-	0° 0'	ACID		LOST TUBE	-	-	-	-	-	
159.40	-	-89° 0'	ACID		BAD ETCH	-	-	-	-	-	
171.50	-	-86° 0'	ACID		BAD ETCH	-	-	-	-	-	
204.50	-	-82° 0'	ACID		BAD ETCH	-	-	-	-	-	
281.90	-	-84°30'	ACID		BAD ETCH	-	-	-	-	-	
332.80	-	-76° 0'	ACID	OK		-	-	-	-	-	
360.50	-	-74° 0'	ACID		REDUNDANT	-	-	-	-	-	
385.00	-	-72° 0'	ACID	OK		-	-	-	-	-	
434.90	-	-70°30'	ACID	OK		-	-	-	-	-	
477.60	-	-70° 0'	ACID	OK		-	-	-	-	-	
506.40	-	-70° 0'	ACID	OK		-	-	-	-	-	
578.20	-	-68°30'	ACID	OK		-	-	-	-	-	
633.00	-	-66°30'	ACID	OK		-	-	-	-	-	
334.40	218° 0'	-73°30'	MULTISHOT	OK	SPERRY SUN	-	-	-	-	-	
473.70	215° 0'	-70° 0'	MULTISHOT	OK	SPERRY SUN	-	-	-	-	-	
611.70	218° 0'	-66°30'	MULTISHOT	OK	SPERRY SUN	-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 12.20	«CSG»					
12.20 TO 73.00	«MAF/FLT ZONE»	Green, pale green and white. Hole collared in an intense fault zone with brittle breccia, friable clay rich gouge and lesser chlorite schist at.... A notably long pale green clay zone was cored nicely from 32.6-38.8m. Stains blue. Core becomes more competant but still broken from 49.5-73.0m.	40	Dark green chlorite has survived for the most part except for 38.8-43.0m where yellow, brown and green sericite is developed in fault breccia.	Trace disseminated pyrite only. Around 73.5m there is minor maroon hemotite staining of the mafics with associated fault bx and silicification.	The casing will be pushed forward to prevent the hole whipping out. Also, this fault forms a prominent topographic low, and may be part of the TWIN MTN. Shear?
73.00 TO 357.90	«MAF VOLC»	Green and white. Chloritic, calcareous mafic volcanics, with only a few relict lapillis, and common quartz-calcite segregations and deformed veinlets. Moderate foliation at..... Minor short stretches of fault breccia throughout up to 270m. From 270-330.3m the mafics are fresh, chloritic, with a few ghosted lapilli and 15% quartz-calcite veinlets. From ╫330.3-334.0╟ «Flt Bx» that is friable, clay healed, but cores well.	50	Weak to moderate fe-dol around faulted areas. ╫81.4-89.0╟ «Flt» ╫95.1-101.8╟ «Flt» which display friable breccia. ╫169.5-172.2╟ «Flt Bx & Clay» Below 334m the mafics become progressively more bleached. Brown sericite appears at 353.4m and appears centered around ╫335.8-356.2╟ «Intense Br Flt».	Trace disseminated pyrite only except for a couple of dolomite veins at: ╫99.1-102.7╟ «5% py, 2% sp, gn, qdv's» ╫105.6-106.8╟ «qdv» Typical mafic hosted "Scarlet" veins. Also, 2cm galena rich veinlets at 118.2m and 212.7m. ╫137.5-140.0╟ «qdv» with only minor py. Disseminated & wispy pyrite associated with yellow-brown sericite ranges from 2-5% from 334-357.9m.	Casing pushed ahead to 57.9m because of hole whipping out in bad ground.
357.90 TO 379.00	«DOL/SIL MAFICS»	Brown, green, grey. Gradational contact with harder, almost glassy core, and intensely altered mafics. Brown sericitic and chloritic patches remain, but most of unit is comprised of grey fe-dol cut by hazy bordered white quartz veinlets. The interval textures are all but destroyed by "nodular" and lense-like patches of silica and carbonate.		Very intense, pervasive fe-dol, with lesser vein controlled silicification. Brown sericite and lesser chlorite is subordinate.	7-15% disseminated pyrite except for quartz veins and flooded areas which contain coarse pyrite and trace sp, gn, cp, and possibly a few grains of tetrahedrite. ╫357.9-379.0╟ «7-15% py assoc. w/sil»	Ghosted lapilli visible at 362.5m.
379.00 TO 383.30	«SIL ARG +/- TUFF?»	Black, grey and brown. Fairly sharp and conformable looking contact, although well silicified. Unit begins with 10cm of cherty fragmental in a black matrix (tectonic?) which grades into a highly disturbed and silicified "mixed bag" of brecciated argillite, brown sericitic tuff?, and grey sericite.		Patchy silicification with lesser brown and grey sericite developed locally. White quartz stringers common, deformed and brecciated. ╫380.6-383.3╟ «Shear Zone at 67 deg.» has gouge and grey sericite schist.	Thin seams and veinlets of pyrite, cataclysed, and fracture filling. Average about 5%.	
383.30 TO 410.10	«SIL ZONE/+/- ARG»	Light grey to black. Aphanitic. Faulted upper contact with glassy, silicified "pseudochert". Faint relict laminated texture is present in broad open folds at low angle to core axis. Possibly some primary ribbon chert, but methinks its a silicified argillite. Black argillite appears at		Intense pervasive silicification with hazy white quartz stockwork stringers, crosscutting laminations at all angles. Minor carbonate visible in veins also, but very subordinate. From 396.3 to end of unit white, vuggy,	3% pyrite and trace sp associated with veinlets only up to 388m. From there the sulphides increase in veins and veinlets. ╫388.2-409.4╟ «5% py, 2% sp, tr gn, cp» Mineralization is scattered widely	Possibly a oomponent of primary ribbon chert, or at least cherty argillite. A few grains of material in the quartz veinlets may be tetrahedrite. Check the assays.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
572.00 TO 586.80	«CHT/CHTY ARG»	Black and grey. Gradational sedimentary contact with laminated chert and cherty argillite. Best ribbon chert is from 579.6-581.7m. Entire interval is highly contorted. Veining is stylolitic, white quartz from ╢577.1-578.7╟ «qv, 5% py, tr. gn, cp»		Minor silicification only.	Seamy pyrite associated with quartz veinlets is overall minor. Trace gn at 577.2m in margin of vein, along with a couple of cpy flecks.	
586.80 TO 591.40	«SER SILT/ARG»	Yellow and black. Conformable interval of pale yellow-green siltstone(?) and thinly interbedded black argiltite.		Selective sericitization of non-argillaceous beds.	Wispy pyrite 3%.	
591.40 TO 614.90	«SIL ARG +/- TUFF»	Black, white, and green. Conformable contact with pale grey to black argillite cut by common quartz-dolomite veinlets, at all orientations & deformed. Also, a subordinate pale green tuff? forms some laminations (about 5%).		Silicification and dolomitization, veinlet controlled. Approx. 25% of interval is veinlets. Quartz-carbonate ratio is about 7:3.	Trace disseminated pyrite only.	
614.90 TO 647.70	«ALT MAFICS»	Gradational contact with pale greenish grey tuffs (?) increasing proportionately relative to argillaceous component. From 624.2-626.0m a dark green chlorite is developed, almost. From 639.8-647.7m ghosted lapilli are present, along with spotty porphyroblastic overgrowths of carbonate. ╢639.8-647.7╟ «Lap Tuff» END OF HOLE.		Pervasive ferro-dolomitization but notably with only minor brown sericite development.Possible primary carbonate.	Trace pyrite only.	Apparently these mafics are getting less altered downhole.

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
BCD45348	100.10	101.10	1.00	.073	2.39	1.24	10.2	.01			729	23920	12393				34	20		24	10.2	12	
BCD45349	101.10	102.00	0.90								58	454	127				54	32		1	0.8	1	
BCD45350	102.00	102.70	0.70	.048	.72	.54	5.0	.04			477	7238	5440				94	36		11	5.0	38	
BCD45351	105.60	106.80	1.20	.007	.14	.10	2.0	.01			68	1389	1016				43	30		5	2.0	3	
BCD45352	357.90	359.10	1.20								40	216	297				714	138		25	1.0	42	
BCD45353	359.10	360.30	1.20								47	220	422				188	65		4	1.5	6	
BCD45354	360.30	361.80	1.50	.086	.19	.07	3.2	.01			860	1909	657				228	70		22	3.2	2	
BCD45355	361.80	363.30	1.50	.091	.15	.14	15.2	.02			905	1561	1406				186	63		100	15.2	18	
BCD45356	363.30	364.40	1.10	.018	.06	.10	2.0	.06			178	630	1008				515	135		17	2.0	57	
BCD45357	364.40	365.50	1.10	.272	.67	.64	54.4	.30			2722	6694	6438				1545	48		1086	54.4	304	
BCD45358	365.50	366.40	0.90	.019	.07	.07	3.7	.13			185	682	748				2323	138		92	3.7	130	
BCD45359	366.40	367.90	1.50	.016	.23	.11	2.9	.06			160	2273	1097				926	118		65	2.9	56	
BCD45360	367.90	369.40	1.50								175	444	687				654	143		67	2.4	15	
BCD45361	369.40	370.90	1.50	.031	.27	.17	3.4	.04			306	2690	1708				537	107		117	3.4	36	
BCD45362	370.90	372.30	1.40	.010	.10	.03	1.2	.04			99	1021	333				743	131		36	1.2	37	
BCD45363	372.30	373.80	1.50								119	261	165				722	122		46	2.2	2	
BCD45364	373.80	375.30	1.50	.019	.01	.02	5.1	.06			191	146	182				1463	93		105	5.1	61	
BCD45365	375.30	376.50	1.20	.025	.07	.07	2.2	.02			246	730	680				710	173		31	2.2	21	
BCD45366	376.50	376.70	0.20	.131	.24	.16	23.9	.07			1311	2379	1614				1066	84		525	23.9	72	
BCD45367	376.70	377.50	0.80								143	290	213				329	92		11	1.3	2	
BCD45368	377.50	378.10	0.60	.127	.20	.26	7.0	.01			1267	2013	2590				491	78		32	7.0	8	
BCD45369	378.10	379.00	0.90								59	131	142				402	262		4	0.9	2	
BCD45370	379.00	380.50	1.50								33	87	298				235	251		8	1.3	1	
BCD45371	380.50	382.00	1.50								36	473	548				214	124		9	0.9	4	
BCD45372	382.00	383.30	1.30	.042	.67	.38	4.7	.04			419	6723	3807				362	244		152	4.7	37	
BCD45373	383.30	384.80	1.50	.002	.07	.05	1.0	.01			20	651	527				126	98		11	1.0	3	
BCD45374	388.00	389.50	1.50	.008	.38	.20	4.4	.05			78	3824	1951				705	98		38	4.4	45	
BCD45375	389.50	391.00	1.50	.014	.32	.17	2.8	.14			142	3242	1706				433	104		33	2.8	140	
BCD45376	391.00	392.50	1.50	.037	.10	.15	5.3	.01			367	1033	1451				156	49		111	5.3	1	
BCD45377	392.50	394.00	1.50	.042	.64	.21	4.3	.04			421	6374	2065				177	83		48	4.3	42	
BCD45378	394.00	395.50	1.50	.039	.05	.09	4.9	.06			389	512	892				377	114		102	4.9	63	
BCD45379	395.50	396.60	1.10	.019	.16	.18	5.4	.08			190	1550	1763				438	97		73	5.4	81	
BCD45380	396.60	398.10	1.50	.003	.23	.04	0.5	.01			25	2251	411				90	208		8	0.5	3	
BCD45381	398.10	399.60	1.50								47	113	611				124	158		14	1.1	8	
BCD45382	399.60	401.10	1.50								40	249	376				73	149		10	0.7	3	
BCD45383	401.10	402.60	1.50	.006	.15	.01	0.6	.01			59	1513	82				129	137		10	0.6	2	
BCD45384	402.60	404.10	1.50	.039	.22	.09	3.6	.05			385	2158	940				423	60		27	3.6	52	
BCD45385	404.10	405.60	1.50								40	140	83				89	89		8	0.2	12	

Sample	From (m)	To (m)	Length (m)	CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB
BCD45386	405.60	406.40	0.80								47	106	159				158	95		10	0.4	26
BCD45387	406.40	406.80	0.40	.050	1.38	.91	14.6	.10			498	13836	9130				3165	59		176	14.6	100
BCD45388	406.80	408.30	1.50								39	279	191				89	166		9	0.5	3
BCD45389	408.30	409.60	1.30								61	643	321				143	160		8	0.9	4
BCD45390	409.60	410.10	0.50								159	483	455				199	196		15	1.8	32
BCD45391	413.60	415.20	1.60								51	128	48				44	134		5	0.5	16
BCD45392	416.40	417.00	0.60								50	71	33				30	186		6	0.6	1
BCD45393	419.00	420.00	1.00								65	56	36				33	154		5	0.8	2
BCD45396	428.90	429.90	1.00								43	28	36				65	141		2	0.6	2
BCD45397	429.90	431.10	1.20	.116	.13	.26	19.4	.04			1157	1294	2562				296	131		201	19.4	40
BCD45398	431.10	432.60	1.50	.213	.23	.12	4.6	.03			2128	2292	1183				191	125		13	4.6	34
BCD45399	432.60	434.10	1.50								106	510	619				75	47		9	1.4	2
BCD45400	434.10	435.60	1.50	.004	.15	.05	0.5	.01			42	1487	457				82	80		5	0.5	2
BCD45401	435.60	436.60	1.00	.004	.13	.04	0.7	.01			38	1311	387				82	40		6	0.7	3
BCD45402	436.60	437.60	1.00								45	180	87				49	50		11	0.4	2
BCD45403	437.60	439.10	1.50	.019	.88	.30	2.7	.03			185	8819	2978				275	54		16	2.7	28
BCD45404	439.10	439.90	0.80								51	91	58				86	93		5	0.1	8
BCD45405	439.90	441.60	1.70								103	48	39				82	113		7	0.2	17
BCD45406	441.60	444.00	2.40								57	66	77				90	255		6	0.3	20
BCD45407	444.00	445.00	1.00	.023	.41	.10	2.5	.01			234	4071	1036				113	83		24	2.5	5
BCD45408	445.00	446.50	1.50								23	34	271				92	94		4	0.4	6
BCD45409	451.00	451.60	0.60								32	94	109				414	118		11	0.1	57
BCD45410	451.60	453.00	1.40								15	29	74				279	86		7	0.4	22
BCD45411	453.00	454.00	1.00	.004	.08	.13	3.0	.02			35	829	1280				333	98		5	3.0	15
BCD45412	462.70	464.20	1.50								54	176	281				148	158		6	1.3	2
BCD45413	464.20	465.70	1.50								42	225	357				186	82		7	1.1	7
BCD45414	465.70	467.20	1.50								88	347	868				168	74		11	2.2	6
BCD45415	467.20	468.70	1.50								138	598	831				244	78		8	1.7	21
BCD45416	468.70	470.00	1.30	.031	.15	.14	2.3	.01			310	1515	1358				248	67		14	2.3	8
BCD45417	470.00	470.50	0.50	.080	1.04	.81	10.4	.01			798	10442	8080				441	53		107	10.4	4
BCD45418	470.50	471.50	1.00	.012	.16	.17	2.0	.04			118	1646	1701				223	44		15	2.0	42
BCD45419	471.50	473.00	1.50								47	610	591				67	47		13	1.6	2
BCD45420	473.00	474.50	1.50								61	640	718				82	29		7	1.1	1
BCD45421	474.50	476.40	1.90	.045	.20	.10	6.7	.04			448	1954	952				261	76		74	6.7	3.5
BCD45422	476.40	477.50	1.10	.073	.27	.13	6.1	.40			734	2724	1344				1495	107		58	6.1	400
BCD45423	482.70	484.30	1.60	.009	.06	.03	2.4	.46			91	595	280				646	28		33	2.4	460
BCD45424	484.30	485.30	1.00	.009	.10	.17	2.6	.28			94	1001	1669				1280	74		22	2.6	275
BCD45425	485.30	486.80	1.50	.029	.16	.08	6.9	.10			285	1624	800				451	176		125	6.9	100

Sample	From (m)	To (m)	Length (m)	CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB
BCD45426	486.80	488.00	1.20	.065	.04	.06	6.7	.10			649	354	564				610	26		124	6.7	97
BCD45427	488.00	489.50	1.50	.027	.02	.16	5.8	.14			266	235	1632				879	40		105	5.8	140
BCD45428	489.50	490.80	1.30	.011	.04	.02	2.9	.17			113	382	236				698	35		92	2.9	172
BCD45429	495.90	496.80	0.90	.020	.06	.04	6.8	.25			195	576	421				407	21		117	6.8	250
BCD45430	527.40	528.90	1.50								47	374	754				120	93		7	1.9	775
BCD45431	528.90	530.50	1.60								24	206	235				123	120		5	1.5	160
BCD45432	572.00	573.50	1.50	.13	.10	.18	4.0	.03			1316	953	1754				497	68		8	4.0	25
BCD45433	573.50	575.00	1.50								57	66	56				103	99		2	0.4	2
BCD45434	575.00	577.10	2.10								246	308	71				152	148		4	1.1	8
BCD45435	577.10	577.30	0.20	.063	.31	.81	11.4	.06	20cm		631	3054	8147				964	57		27	11.4	529
BCD45436	577.30	578.70	1.40								205	77	94				82	77		3	1.1	3
BCD45437	578.70	579.60	0.90	.067	.17	.01	2.3	.01			672	1722	70				237	291		6	2.3	4
BCD45438	579.60	581.10	1.50								31	45	29				62	190		2	0.4	2

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
BCD45394	425.00	426.50	1.50	38.90	19.76	7.64	6.30	.40	4.09	8.97	.14	1.33			36	47			5	294	1.3	27	.32		5.32	93.39	22	1
BCD45395	428.00	428.90	0.90	60.87	15.18	1.52	2.00	.01	3.27	7.02	.03	1.65			37	30			5	254	0.7	39	.16		4.81	96.70	108	3

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 247
CLAIM NUMBER:
LOCATION: NEAR CANA LINE

PLOTTING COORDS GRID:
NORTH: 760.00N
EAST: 12600.00W
ELEV: 1060.00

ALTERNATE COORDS GRID: ESTIMATED
NORTH: 7+60N
EAST: 126+ 0W
ELEV: 1060.00

COLLAR DIP: -55° 0' 0"
LENGTH OF THE HOLE: 325.20m
START DEPTH: 0.00m
FINAL DEPTH: 325.20m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: June 7, 1991
DATE COMPLETED: June 11, 1991
DATE LOGGED: June 11, 1991

COLLAR SURVEY: NO
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: FRONTIER DRILLING
CASING: PULLED
CORE STORAGE: SAMEX CAMP

PURPOSE: FILL IN UPDIP OF C91-10 AND "266-STYLE" SEDIMENTS.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
86.60	-	-57° 0'	ACID	OK		-	-	-	-	-	
125.60	-	-57° 0'	ACID	OK		-	-	-	-	-	
181.70	-	-57° 0'	ACID	OK		-	-	-	-	-	
233.50	-	-57° 0'	ACID	OK		-	-	-	-	-	
297.80	-	-57° 0'	ACID	OK		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 48.80	«CASING»					
48.80 TO 52.00	«SIL SEDS/QTZ VN»	Grey, white. Fine grained. Intense silicification of sediments washes out original textures. 1/3 of interval is massive white bull qtz. Principal qtz vein is located between 51-51.9m. Vein orientation and prominent fracture in the vein is at .... Fracture surfaces in qtz vein are coated with limonite.	25	Very intense silicification.	Trace pyrite.	
52.00 TO 53.50	«QTZ/SER/PYALT SEDS»	Grey. Fine grained sediments have been strongly and variably altered. FOLIATION at	50	52.0-52.9m: pervasive weak to moderate grey sericite and pyrite alteration. Some limonite on fracture surfaces. 52.6-52.9m: gradational change in alt'n 52.9-53.5m: weak to moderate pale yellow grey to greyish sericite and silica flooding give core banded appearance.	52.0-52.6m: 15% fine to medium grained disseminated pyrite. 52.6-52.9m: 10% pyrite in dissemination and stringers. 52.9-53.5m: <5% disseminated pyrite except the final 45mm which contain 40% pyrite.	
53.50 TO 68.30	«TECT BX ARG»	Black, grey. Fine to 4cm. Strongly tectonized argillite interval which contains up to 50% subangular to subrounded and elongated clasts of quartz cherty seds, and sericitic seds. In some location tectonism has not moved fragments large distances or has only contorted the seds;sense of cleavage @ Minor late stage quartz veining or flooding except 53.5-55.5m where the arg is unbrecciated (outside of some crackle breccia) and silicified. ‡68.1-68.3‡ «Flt Gouge»	70	Alteration throughout hole is generally weak grey sericitization which gives core phyllitic surfaces. Minor intervals to 20cm of more intense yellowish sericite alt'n. 53.5-55.5m: moderate to intense silicification as in the overlying interval at 48.8-52m. Between 56.0-56.5m, 57.15-57.3m, and 57.7-57.9m there is pervasive strong modular porphyroblastic dolomite growths. Sericite alt'n increases downhole.	2-5% fine grained disseminated pyrite.	
68.30 TO 75.20	«QTZ/SER/PYSED»	Yellow. Fine grained. Intense alteration destroys original textures; 10% white quartz veinlets/veins Some of the veins are contorted. Numerous small fault gouge zones comprise 20% of interval, faulting decreases with depth. ‡68.3-68.7‡ «Flt Gouge»		Intense yellow sericite alt'n. Alt'n becomes patchy at base of interval as unit grades into the underlying unit.	10% disseminated pyrite.	
75.20 TO 78.80	«ALT SEDS FLT BX»	Black, grey. Fine grained. Black argillite is the principal rock type. Argillite is laminated by silty and cherty bands. Bedding is strongly deformed. 5% white qtz veining-fractured. Interval is very blocky and is commonly weak to moder-		Minor, graphitic agillite of moderate intensity. Weak grey sericite alteration. Gradation into patchy yellow sericite at base of interval as alteration grades into that of underlying	3% pyrite which generally occurs as fine grained seams and some disseminations.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		ately fault bx.		unit. Patchy zones of nodular porphroblastic dol growth.		
78.80 TO 105.90	«ARG/CHT FL T BX/GOU»	Black. Fine grained. Interval is strongly fault brecciated with zones of well developed fault gouge. 75% of interval consists of argillite, 25% argilliceous chert. Cherts are generally finely laminated; 5% white quartz veining. 84.9-93.0m: principally argilliceous chert.		Minor graphite. Argillite has weakly phyllitic surfaces. Minor talc. Some intervals are a paler grey due to more intense sericitic alteration & bleaching.	Pyrite content varies between 1-15%; Pyrite is fine grained and occurs as dissem to patches and seams. 89.8-90.0m: quartz vein contains 1% med grained coarsely disseminated galena; 10% pyrite.	96.6-98.1m: 60% core recovery.
105.90 TO 108.90	«HET FRAG»	Grey, black. Fine to 3cm. Argilliceous to silty matrix supports up to 50% clasts. Clast composition includes, quartz argillite & sericitic seds? Much of the clastic textures appear to be caused by tectonism rather than a primary texture. Clasts are subrounded somewhat elongate - well milled. 5% interbeds of argillite, 5% quartz veining and flooding.		Interval is weakly sericitice (grey) altered which gives core phyllitic surfaces. Minor silicification associated with quartz veins.	3% disseminated pyrite. 105.9-106.5m: 10% disseminated & patchy pyrite. 107.1-107.2m: 2% disseminated sphalerite in silicified interval; associated with brilliant green talc.	
108.90 TO 116.50	«ALT MIXED SEDS»	Black, grey, white. Fine grained. Interval consists primarily of variably altered argillite. Local alteration obscures protolithic textures. Numerous small (generally <10cm wide) Het Frag intervals (as above) make up 15% of volume. Principal interval ‡113.9-114.7‡ «Het Frag» Some quartz stringer in filling of fractures. Bedding contorted, FOLIATION at 60-90 degs.	75	15% patchy intense to moderate silic. and quartz veining. Max vein width 20cm. Rock is phyllitic due to weak to moderate grey sericite development. Local patchy greenish sericite alteration. ‡114.1-114.3‡ pyritiferous, sericitic alteration zone in a Het Frag interval. «py,ser»	3% disseminated fine to medium grained pyrite. 114.1-114.3m: 30% very fine grained pyrite.	
116.50 TO 125.80	«HET FRAG»	Shades of grey, black. Fine to 6cm. Angular to subrounded clasts. Elongate clasts common. Clasts are unsorted. Large and small clasts commonly intermixed.Matrix is argilliceous to silty, but is a relatively minor component of unit. Framework supported locally clasts. Clast composition includes argillite, quartz, and grey, beige, brown altered (ser, dol) altered seds? ‡120.3-122.9‡ fairly pervasive mod. «Flt Bx,Gou» 123.4-124.0m: cherty arg; FOLIATION at	45	Weak but pervasive grey sericite alt'n. Local zones of moderate grey to brownish sericite alt'n. Trace Mut. 121.9-122.3m: intense yellow-green sericite alt'n.	2% fine to coarser grained pyrite dissem and blebs.	Clastic texture may be a combination of tectonism and conglomerate.
125.80 TO 128.10	«ARG TECT B X»	Black. Fine grained. Black argillite which contains 20% quartz/chert? in disrupted laminae? and cataclastic fragments. The silica is pale grey in colour. Interval contains 2% late stage white quartz veining. FOLIATION at	60	Weakly developed sericite gives phyllitic sheen.	5% fine grained pyrite in fine - coarse dissem.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		{127.3-127.6} «Het Frag» interval similar to overlying unit.				
128.10 TO 129.40	«QTZ/SER AL T SED»	Grey, green. Fine grained. Intense alteration destroys original textures. FOLIATION GRADATIONAL CONTACTS	65	Pervasive grey to green sericite alt'n which contains abundant (20%) discontinuous and boudined quartz veinlets & lenses.	7% disseminated pyrite.	Early stages of a yellow sericite and quartz alteration?
129.40 TO 141.10	«HET FRAG»	Shades of grey/black. Fine to 4cm. Similar to the Het Frag between 116.5-125.8m. Textures between 129.4-136.3m are obscured by structures and alteration. From 136.3-141.1m clastic texture is well defined. {132.0-134.7} «Flt Bx, Gouge» Intermittant, narrow gouge zones 134.7-136.3m.		Weak sericite alt'n throughout. 132.0-133.2m: moderate grey/green sericite in faulted interval. 133.5-133.9m, 134.15-134.3m, 135.3-136.3m intense yellow sericite altered intervals.	5% fine to coarse grained pyrite in fine to coarse dissem. 129.5-129.56m: 5% combined gn, cp, sp. BM are very fine grained. Occur in Het Frag matrix. Some silicification of nearby core. 132.2-132.8m: 15% fine grained pyrite.	Base Metals likely to have been introduced by siliceous fluids although, silicified core is unmineralized except by pyrite.
141.10 TO 177.40	«QTZ/SER AL T SED»	Yellow, grey, black. Fine grained. Intensely altered seds in which original textures destroyed. Patchy intervals in which alteration is not complete consist of laminated sericite and argillite. Bedding is contorted in these intervals; bullseye structures and bedding that is subparallel to the core axis is common. Bedding offset by cleavage 75-90 degs. Argillite most common in the following intervals: 141.1-144.5m, 150.3-153.3m, where argillite and sericite is cut by 40% white to grey fractured qtz veining, and 167.4-173m. Overall the interval contains 15% argillite. Some folded structures seen in the intensely altered seds as well 3% late stage quartz veining. {157.6-159.1} weak to moderate «Flt Bx» with clay gouge. 172.9-174.5m: fracture oriented parallel to core axis with gouge developed along it, ending in fault bx.		Intense yellow sericite alt'n which locally grades into a grey/green sericite. <30% white to grey quartz veinlets & patches found throughout interval veining is generally parallel to foliation. Foliation varies widely in orientation.	1-2% fine to medium grained dissem pyrite; local concentrations to 5%.	Hinge Zone Area?
177.40 TO 181.60	«QTZ VEIN»	White, grey. Veining is grey and white. Some of the white quartz may be a later stage of veining. White quartz veining contains <20% pink, medium grained dolomite vein, 3% grey altered argillite inclusions; between 180.2-181.3m 50% green/brown sericitic altered seds.			3% coarsely disseminated pyrite and minor arsenopyrite.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
181.60 TO 203.10	«QTZ/SER AL T SEDS»	Yellow, grey, black. Fine grained. Similar to the interval 141.1-177.4, except that bullseye structures are not common and argilliceous zones are less intermixed with sericite. ‡188.3-188.6‡ «Het Frag» ‡188.8-189.3‡ «Het Frag» Het frag intervals have sericite/pyrite to silty matrix. Clasts reach a max size of 3cm but are generally <1cm. Between 188.3-188.45m clasts are rounded quartz grains-possibly well milled tectonite. Clasts are heterolithic and coarser downhole. Clast comp'n quartz, argillite and sericite alt. seds.		Alt'n similar to that of141.1-177.4m. Sericite alteration is variably yellow to mustard with minor grey and brown ser. patches. Alteration somewhat more mottled that in overlying interval. Quartz content <35%.	5% pyrite. 188.3-188.45m: 10-20% fine grained pyrite in matrix.	
203.10 TO 206.50	«HET FRAG»	Grey. Fine to 4cm. Silty sericitic and pyritiferous matrix supports 50% clasts. Clasts are subrounded to subangular; rounded to elongate in shape; clasts are predominantly cherty or quartz with subordinant amounts of intensely silicitized clasts and argillite.		Matrix is sericitically altered - grey sericite.	10% disseminated pyrite.	
206.50 TO 219.90	«QTZ/SER AL T SED»	Yellow, grey, black. Fine grained. Similar to similarly titled intervals above; 141.1-177.4m and 181.6-203.1m. ‡213.2-214.7‡ «Flt Bx» weakly developed, clay gouge is also present.		Alteration is similar to that of overlying intervals. Sericite is tending more of greenish grey rather that yellow between 208.9-213.0m. 30% quartz veining.	2-3% disseminated pyrite.	
219.90 TO 225.80	«CHERTY ARG »	Black, grey. Fine grained. Black argillites are laminated by grey siliceous and silty bands. Bedding is contorted and disrupted. CLEAVAGE at Minor quartz/dol stringers. Some small scale folding present. 221.7-222.5m: quartz vein with minor graphite and dolomite.	75	Patchy weak dol of argillite/silt? bands and within some quartz veinlets. Argillite in the H/W of quartz vein is graphitic. Minor sericitized zones.	1% coarsely disseminated py. patches.	Interval appears to be subjected to broad folding.
225.80 TO 232.90	«SIL ARG/SE R SED?»	Grey, black. Fine grained. 65% black cherty to silty laminated argillite, 35% intensely altered sed? BEDDING at 227.4m CLEAVAGE at 227.4m Overall sense of FOLIATION at	40 75 65	There is an abundant silica throughout interval as patchy banding in argillite and local intense silicification in argillite and as the typical quartz banding with intense yellow to brownish ser + chl? which destoys original textures. Argillite is generally not silicified but is veined + banded.	<15% very fine grained disseminated pyrite in quartz/ser alt. seds? 3% pyrite in argillite. ‡232.65-232.8‡ «10%sp 5%cp 1%gn» occurs in sil. sed. between and quartz veins. BM are fine to medium grained, coarsely disseminated. 1% medium grained arsenopyrite, 10% pyrite.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
232.90 TO 260.60	«QTZ/SER AL T SED?»	Grey, greenish. Fine grained. Intense alteration destroys original textures. Minor remnant bedding? is contorted. Weak CLEAVAGE at 70-80 degs.	75	Intense yellow to greenish-brown sericite alteration. Pervasive moderate patchy silicification.	5% disseminated pyrite.	
260.60 TO 262.10	«QTZ VEIN»	White, grey. Quartz vein is weakly fractured, 5% sericitized argillite clasts and satures. 10% grey cherty material with argillite banding.			‡260.7-261.2‡ «20%py» very fine to fine grained. Very coarsely disseminated and patches to semi-massive. 261.2-262.1m: 1% pyrite.	
262.10 TO 267.30	«CHERT/ARG»	Grey, black. Fine grained. 262.1-263.35m: grey chert has 5% 1mm wide argillite partings - remnant bedding. 263.35-267.3m: 60% of interval is relatively massive to finely laminated cherts with argillite partings, 40% argillite, sil arg, cherty arg?. The sil/cherty arg contains grey patchy silica which is locally pyritiferous. 10% white, late stage quartz veining. Veins have diffuse boundaries within the chert.		262.1-263.35m: chert has been silicified by white quartz which washes out some argillite partings. 263.35-267.3m: patchy moderate grey sericitization. Patchy silic. Minor yellow sericite att'n.	262.1-263.35m: 1-2% pyrite which occurs in argillite and seams in chert. 263.35-267.3m: 15% fine grained pyrite in the argillite.	
267.30 TO 279.60	«QTZ/SER AL T SED/ARG»	Yellow, grey, black. Fine grained. Black argillites alternate with intensely altered sediments (SERT). 75% of the interval is altered. Locally cleavage offsets sericitic bands. CLEAVAGE FOLIATION is also at (in general) 5% white late stage quartz veining and patches. Abundant grey quartz veinlets and lenses which have been stretched & truncated by cleavage (30%).	75 75	Intense yellow sericite alteration and quartz. Minor silicification of argillite.	10% dark brassy coarsely disseminated pyrite in the altered seds. Up to 15% very coarsely disseminated and patchy pyrite in the argillites - primarily associated with quartz.	
279.60 TO 282.40	«QTZ/ARG FL T BX»	Black. Fine grained black argillite is out by 20% white quartz veining & patches. Interval is fault brecciated with clay gouge developed locally.		Argillite is strongly graphitic. Minor moderate silicification when quartz veiningis present. Trace talc.	3% coarsely disseminated pyrite. 279.7-279.85m: 5% cp, 2% gn, 35% py. 280.25m: 3cm wide 15% cp, 5% gn, 3% py in a veinlet. 280.7m: 2% galena in a 2cm veinlet.	Middle thrust fault?
282.40 TO 298.50	«QTZ/SER/DO L SEDS»	Black, grey. Fine grained. Core consists of argillite which is laminated by silty beds. Bedding is weakly contracted. 15% white to grey quartz veins to 20cm, 70% qtz/30% dol.		Weak to moderate grey sericite throughout; locally sericite is buff colored. Core has been weak to moderate dol alt locally. Dol occurs as modular porphyroblastic growths. As well, some dolomite is found in the quartz veins. Minor, moderate grey silicification of argillite caused by silica flooding/ uplacement.	Pyrite occurence is irregular throughout interval. 282.4-294.7m: 3-15% pyrite patches and disseminations. 294.7-298.5m: 2% pyrite.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
298.50 TO 325.20	«SER SEDS»	Grey, black. Fine grained. Interbedded argillite & siltstone with minor chert bed at 316.6-316.8m. Bedding is frequently clastic, locally boudined. Weak cleavage at ..... General sericitic banding/foliation at 60-80 degs. At 302.5m seds exhibit small scale disharmonic folding. Axial plane at..... 5% white to grey qtz veining. 301.15-301.5m: fault bx and gouge. {322.2-325.2} intermittant «Flt Gouge» END OF HOLE.	10 70 55	Spotty moderate grey to yellow/grey sericite alt'n increases downhole. Minor talc at end of hole.	1% disseminated pyrite, upto 5% coarsely disseminated pyrite and pyrite patches in quartz veins.	

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB		COMMENTS
BCD31403	52.00	53.50	1.50								148	77	73				32	199		1	0.1	15		
BCD31404	88.40	90.20	1.80								42	139	237				494	57		19	0.8	87		
BCD31405	94.80	96.30	1.50								131	613	114				241	137		11	1.2	172		
BCD31406	105.90	107.30	1.40								134	269	206				57	98		50	2.7	25		
BCD31407	113.40	114.50	1.10								27	77	90				89	102		1	0.5	10		
BCD31408	122.80	124.30	1.50								34	93	92				26	99		1	0.1	8		
BCD31409	124.30	125.80	1.50								36	147	84				1	74		1	0.2	2		
BCD31410	129.40	130.10	0.70	.072	.56	.27	4.4	.01			722	5610	2711				81	245		268	4.4	12		
BCD31411	130.10	131.70	1.60								149	1306	621				36	121		7	0.8	14		
BCD31412	131.70	133.20	1.50								67	131	226				50	133		1	0.1	3		
BCD31413	137.80	139.32	1.52								69	278	233				125	67		18	0.7	5		
BCD31414	177.40	178.90	1.50	.004	.01	.01	0.3	.15			44	81	142				4472	31		33	0.3	145		
BCD31415	178.90	180.40	1.50								28	40	89				275	54		5	0.1	4		
BCD31416	188.30	189.30	1.00								221	186	102				173	79		1	0.1	2		
BCD31417	203.10	204.20	1.10								48	146	124				1	78		1	0.3	2		
BCD31418	204.20	205.30	1.10								142	410	353				39	91		28	1.7	3		
BCD31419	205.30	206.40	1.10								202	897	576				1	100		9	2.7	4		
BCD31420	231.50	232.65	1.15								78	365	374				577	71		1	0.9	40		
BCD31421	232.65	232.80	0.15	0.619	3.07	1.71	41.5	0.55	15cm		5923	26247	13847				3968	26		95	42.4	413		
BCD31422	232.80	234.30	1.50	.027	.04	.03	1.3	.14			274	418	307				1442	77		7	1.3	144		
BCD31423	260.70	261.20	0.50	.015	.02	.03	0.8	.23			150	208	310				1008	47		58	0.8	229		
BCD31424	261.20	262.10	0.90								22	61	60				91	23		5	0.2	6		
BCD31425	263.10	264.60	1.50								15	14	59				86	48		3	0.1	2		
BCD31426	264.60	266.10	1.50								30	31	51				79	39		3	0.1	1		
BCD31427	266.10	267.30	1.20	.008	.01	.01	0.6	.14			76	54	97				1554	65		18	0.6	141		
BCD31428	267.30	268.80	1.50								46	79	86				679	87		6	0.2	35		
BCD31429	274.20	275.70	1.50	.006	.01	.01	0.4	.04			60	31	50				1414	111		28	0.4	40		
BCD31430	278.10	279.60	1.50								66	30	54				314	98		6	0.1	14		
BCD31431	279.60	280.70	1.10	.166	.26	.32	7.4	.06			1664	2586	3249				519	171		29	7.4	58		
BCD31432	280.70	282.40	1.70								91	817	501				114	226		7	0.9	2		
BCD31433	282.40	283.90	1.50								80	128	102				199	93		4	0.2	6		
BCD31434	283.90	285.40	1.50	.008	.03	.02	0.1	.21			80	262	165				2617	85		26	0.1	212		
BCD31435	285.40	286.90	1.50								38	25	71				1576	98		12	0.1	109		
BCD31436	286.90	288.40	1.50								51	49	72				439	122		2	0.1	4		

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: MBA GOLD ZONE

PLOTTING COORDS GRID: SAM GEOL
NORTH: 791.55N
EAST: 11999.85W
ELEV: 1046.64

ALTERNATE COORDS GRID: ESTIMATED
NORTH: 8+ 0N
EAST: 120+ 0W
ELEV: 1050.00

COLLAR DIP: -55° 0' 0"
LENGTH OF THE HOLE: 374.80m
START DEPTH: 0.00m
FINAL DEPTH: 374.80m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: June 11, 1991
DATE COMPLETED: June 17, 1991
DATE LOGGED: June 16, 1991

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: FRONTIER DRILLING
CASING: LEFT IN HOLE
CORE STORAGE: SAMEX CAMP

PURPOSE: FILL-IN GAP ON SAM HORIZON REPETITIONS NEAR MIDDLEFAULT ON SECTION 1200W. NEW "MBA GOLD ZONE" DIS-

DIRECTIONAL DATA: COVERY HOLE.

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
46.60	-	-56° 0'	ACID	OK		-	-	-	-	-	
114.60	-	-56° 0'	ACID	OK		-	-	-	-	-	
163.70	-	-55° 0'	ACID	OK		-	-	-	-	-	
221.60	-	-52° 0'	ACID	OK		-	-	-	-	-	
267.30	-	-52° 0'	ACID	OK		-	-	-	-	-	
303.90	-	-52° 0'	ACID	OK		-	-	-	-	-	
338.90	-	-53° 0'	ACID	OK		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 33.50	«CASING»	No core - overburden.				
33.50 TO 51.40	«QTZ-SER AL T SEDS»	Yellow, white, black, grey. Strongly sericitized, thinly bedded, contorted mixed sediments cut by 10% white quartz veinlets that are boudined and deformed. Short black argillaceous intervals (up to 10cm) are tectonic breccias. Possibly minor tuff as portions (<10%) are brown sericitic and carbonatized. Relict bedding at all orientations. Strong FOLIATION at	65	Intense yellow sericite after ?siltstone, silicification related to veinlets, and minor ferrodolomitization are patchy and controlled by permeability of host rock.	Wispy pyrite (5%) along bedding planes and in fractures.	Typical "Sert".
51.40 TO 55.20	«SIL ARG + CHT»	Black, white grey. Very sharp conformable upper contact. Laminated argillite and cherty argillite cut by 20% deformed white quartz veinlets. Bedding is tectonically disturbed but commonly parallels fabric at.....	70	Very hard and "glassy" core due to pervasive silicification. Carbon "stylolites" are common.	2-3% pyrite in fractures.	
55.20 TO 60.80	«RIBBON CHT + ARG»	Grey and black. Gradational contact with light grey, very finely laminated ribbon cherts, cherty argillite and argillite. Bedding is buckled and chaotic with numerous bull's eyes. Local spaced CLEAVAGE	50	Minor silicification is possible, as hazy quartz stringers are throughout.	Minor pyrite only except for: ⌊55.2-56.1⌋ «12% py, 2% sp, qv» in highly deformed quartz veinlets 1-10cm thick.	
60.80 TO 61.10	«MASS PY»	Fine grained. Massive, cataclysed pyrite seam, probably a vein as it resembles the smaller vein at 55.2m. Matrix is white and clear interstitial quartz. Sharp upper and lower contact at....	60		«75% py, 1% sp in qv»	
61.10 TO 64.00	«ARG BX»	Back into contorted black cherty argillite as on other side of the vein. Less siliceous, with a higher proportion of argillite (80:20) to siltstone or chert.		Minor silicification of silty beds. ⌊62.0-64.0⌋ «Flt Bx»	Trace pyrite.	
64.00 TO 82.70	«DOL/SER AL T SED/VOL?»	Grey and black. Upper contact faulted, schistose, gougey, and interbanded. ⌊64.0-64.5⌋ «Flt Gou» intense alteration destroys most original textures - interval contains some altered argillite but other rock types indeterminant. Local granular textures may have been due to remnant wackes. 10% grey quartz/dolomite vein-		Patchy bands of intensely dolomitized and bleached rock is interbanded with grey to brown sericitized core. Minor silicification associated with veining. At 82.4-82.5m 10% talc.	Generally fine grained disseminated pyrite. 3% pyrite. ⌊73-74.2⌋ «10% py, minor cp» Pyrite occurs in patches and coarse disseminated primarily in contorted quartz veinlets. Chalcopyrite occurs between ⌊73.5-73.61⌋«8% cp» coarsely, dissem.	In places the core looks to be a precursor to Mut.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		lets and patches to 3cm. 81.4-82.7m: 20% quartz veining in weakly altered black argillite.			cp in quartz with associated pyrite.	
82.70 TO 106.10	«FLT'D ALT SEDS»	Black, grey. Fine grained. 60% of interval is black argillite which interbedded with an intensely altered grey granular? sediment? Granular texture may be secondary, due to alteration - possibly a silt/wacke. Argillites are intensely fault brecciated and altered to clay gouge, except between 102.1-102.85m where the argillite is silicified. The grey altered seds are generally more competent. Bedding parallels foliation..... Some low angle foliation present. 10% quartz veining to 25cm. Much of the veining is fault brecciated or fractured. 102.8-106.1m: 25% white to grey quartz veining. {105.1-105.65} «Qtz Vn» 15% pink dolomite.	70	Grey seds? are strongly dolomitized and phyllitic where not clay altered. Where argillite is not altered to swollen clays it is phyllitic except at 102.1-102.85m. where there is moderate silicification. Minor talc. Minor intense graphite.	2-3% pyrite. Local concentrations.	
106.10 TO 108.20	«MIXED SEDS VOLC/H.F.»	Grey, buff, black. Fine to 3cm. Contacts are gradational. Much of the interval is strongly altered but has local clastic textures: quartz, sericite, argillite in a grey sericite matrix. Local interbeds of argillite and volcanics. 5% argillite, 20% volcanics?, 75% het frag (?).		Locallized nodular dolomite growths. Dolomite intense in grey alt volc? Dolomite also occurs in veinlets. Moderate grey sericite alteration. Brownish sericite in volc? clast/bed.	3% very fine grained disseminated and stringer pyrite. Pyrite concentrations up to 10% in narrow zones which approach `Mut' in texture and style of mineralization.	
108.20 TO 111.30	«GR SER/PY ALT SEDS»	Brownish grey. Fine grained. Original rock type completely altered. FOLIATION at 15% white quartz stringers and veins. Veinlets locally exhibit small scale folding.	75	Rock is pervasively altered te grey sericite, fine grained quartz and <25% fine grained pyrite.	25% pyrite. Minor amounts of coarsely disseminated sp and gn are associated with quartz veins and coarser grained pyrite. Overall <1% b.m. in unit. Trace tetrahedrite at 109.3m.	Typical `Mut'.
111.30 TO 138.45	«MIXED ALT SED/VOL»	Grey, green, black, white. Fine to 8cm. Beds of het frag which range in thickness from 10cm to over 2m. 30% het frag is interbedded with 40% black argillite, 30% volc? + wacke?. Clast composition again consists of quartz, argillite, sericitic/dolomitic clasts in a silty matrix. 10% white quartz veining to 9cm. Some veins contain up to 40% dol/feldspar, but the majority of veins are primarily quartz. Some small scale folding of veinlets. Bedding in argillite is chaotic where visible. General FOLIATION at 128.1-129.7m: Pyritiferous (10%) and 8% quartz veined argillite.	85	Alteration is dependent on protolith. Volc? are calcareous, dol alt, various shades and grades of sericite present throughout ranging froma weak phyllite to an intense yellow sericite & quartz alteration between 113.9-115.2m. 115.2-116m: moderate silicification and brecciated quartz in argillite. 122.9-123.6m: patchy quartz veining and moderate silicification.	Pyrite content is variable with rock type volc, wacke contain <3% in general Argillites can contain 2-12% fine to coarse disseminated & stringer pyrite. {115.75-115.79} silicified zone contains «5%cp, 3%tt, 1%gn» {118.6-118.7} «20%py, <1%sp» 20% coarse clots of pyrite with <1% pale coarsely disseminated sp in a silicified het frag. {122.9-123.6} «15%py, min gn+cp+tt?»	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
138.45 TO 140.80	«CHERTY ARG »	Black, grey. Fine grained. Argillite is laminated by chert bands. Bedding is chaotic. Some bulls-e textures. Upper contact is sharp - bedding truncated - cleavage offsets bedding 3% white quartz veining.	90	Minor moderate silicification.	Up to 5% fine grained pyrite coarsely disseminated in the argillite.	Soft sediment slump contact.
140.80 TO 149.20	«CHERT?»	Grey, white. Fine grained. Chert? locally has some remnant bedding and partings which have been sericitized. Bedding is chaotic. Contacts are gradational. Cherts are cut by 1% greyish white dolomite stringers. Minor clay fault gouge. 40% of the interval consists of massive to weakly fractured white bull quartz. Veins contain local fragments of pyritiferous, altered country rock. Veins range from stringers to veins in excess of 1m. Vein orientation is irregular and at low angles to core axis. It is quite likely that there is a vein which is deformed and cuts back & forth through the rock. ⌊142.7-145.8⌋ is the principal interval that is «Qtz Vn» with 85% veining.		Local zones of moderate silicification. Wall rock clasts are sericitized. Patchy, minor dolomite. 148.9-149.05m: 10% fuchsite/talc?	Pyrite content varies between 2-5% in chert and altered partings (arg?). Trace to minor pyrite in the quartz veins. ⌊141.5-141.8⌋ «20% py» Fine grained, coarsely disseminated to semi-massive. ⌊142.3-142.5⌋ «20% py»	Quartz veins similar to that which is auriferous below.
149.20 TO 156.30	«CHERT/ARG»	Grey, black. Fine grained. Top of interval consists of chert laminated by argillite. Chert content decreases with depth to laminations within argillite. Bedding is contorted, local tectonite. Contacts are gradational. 5% white to grey irregular quartz veining with minor dolomite - some small scale foling.		Argillite is weakly phyllitic.	3-5% patchy disseminated pyrite in argillite.	
156.30 TO 160.75	«QTZ/SER AL T SED?»	Grey, buff. Fine grained. Intensely altered sediments? Alteration destroys original textures. Some cataclastic textures - clasts of quartz/sericite. Minor fault gouge in narrow zones. ⌊156.9-157.3⌋ «Qtz Vn» Vn has irregular contacts @ Vein is generally massive white bull quartz with 10% wall rock inclusions which have been altered to a dark grey color - mineralogy uncertain - include py, sericite. Pyrite also forms medium grained crystal clots on margins of clasts.	30	Interval is strongly silica flooded and sericitized - grey, buff, minor yellow sericite. Alteration is mottled. 156.3-156.6m: Patchy weak dolomitization, minor talc. ⌊157.3-157.6⌋ «Int Ser» Greyish sericite on footwall of quartz vein.	<5% disseminated pyrite; local concentrations in bands. ⌊156.9-157.3⌋ «1%py, min. Au». Gold occurs as three coarsely disseminated clots at 157.2m. Gold occurs at or near margins of altered wallrock clasts. Approximately 26 grains of gold seen which range from 1.5mm to very fine grained. Gold is smeared from coring. Each auriferous zone is <2cm in diameter. 157.3-157.6m: 15% pyrite, fine grained.	157.3-157.6m: Similar to Mut.

Au Zone.
Key

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
160.75 TO 163.70	«QTZ VN & F LOOD»	White. Fine to coarse grained. 20% of the interval is white bull quartz/dolomite (95/5%) veining. Dolomite is coarse grained, coarsely disseminated within veins, preferentially along margins of vein. Where vein margins are identifiable they are irregular with no identifiable preferential orientation, but there is a weak consistent fracture plane at..... In general veins grade into a white & grey quartz flooded zone with clasts of wallrock. These `messy' veins are locally mineralized. Wallrock comprises 10% of interval. Wallrock is altered.	30	Wallrock is altered to a grey to brown sericite.	Minor fine grained disseminated sphalerite in quartz vein. 3% fine grained, coarsely disseminated pyrite in altered wallrock. ‖160.75-161.55‖ «Min. gn+cp, 2%cp» B.M. are fine to medium grained, in fine to coarse disseminations. Sphalerite occurrence is primarily between 161-161.1m where there is 5% sp. 162.6m: A 3cm zone containing 8% sp, <1% gn. BM are in coarsely disseminated band. The following 10cm contains 15% fine grained semi-massive pyrite patches.	
163.70 TO 165.00	«QTZ/SER AL T SED?»	Grey, buff. Fine grained. Similar to interval 156.3-160.75m. Lower contact is gradational as core becomes increasingly siliceous.		Similar to interval 156.3-160.75m.	2% disseminated pyrite.	
165.00 TO 172.40	«QTZ VN/ALT SED»	White, grey, buff. Fine grained. Interval contains 30% grey to green/buff altered sediments which are locally silicified and flooded as in the interval 160.75-163.7m. The remainder of the interval consists of bull white quartz veining, with up to 10% grey to pink coarse grained dolomite and veining with altered wallrock clasts. Increasing country rock with depth; veins have irregular contacts and orientation. Bull quartz vein sections are up to 50cm. wide. Some buckle folds.		Intense sericitic (grey to brown) alteration of clasts/country rock.	2% pyrite disseminated in altered country rock. 165.2-165.5m: 10% dark, coarsely disseminated pyrite.	Veins are locally deformed & move into and out of the core.
172.40 TO 232.50	«QTZ/SER AL T SED?»	Yellow, grey, white. Fine grained. Intense alteration destroys original textures. Minor black argillite present. Locally core exhibits a good cleavage at..... Foliation varies between 60-80 degrees. Banding in the core (remnant bedding?) is locally strongly contorted locally parallel to core axis. 10% of the interval is patchy, irregular white quartz veins. Veins contain altered clasts of wallrock & minor, coarsely disseminated pyrite patches. Some veins are fractured by en echelon jointing which is oriented between 25-50 degrees. Local vugs. Largest (intermittant) vein zone 80mm wide. Narrow zones of fault bx and gouge. 183.7-183.8m: Fault gouge. ‖190.2-190.5‖ «Flt Bx/Gou»	75	Intense pervasive sericite alteration. Sericite alt'n varies in color from pale yellow to a pale grey-green. Silica is also pervasive throughout interval although more patchy than the sericite. Silica is greyish to white. Quartz/sericite bands the core. Dolomite veinlets are also present. Grey in color, fine grained. Locally dol. makes up 10% of vein material.	5% fine grained, coarsely disseminated pyrite. Pyrite occurs as discontinuous patches and stringers in quartz, which are locally contorted/folded. Trace sphalerite in quartz veins.	The most heavily veined rections of core have been sampled. Typical `Sert'. Hinge zones.

162.5

232.9

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		‡197.9-198.4‡ «Flt Bx» ‡211.4-215.9‡ intermittant «Flt Bx»				
232.50 TO 316.00 232.9 -235.7 Au	«ALT SEDS/ARG»	Yellow, grey black, buff. Fine grained. 60% of the interval is quartz/sericite altered seds as in the overlying unit. This rock typed grades into and out of 40% black argillite with silty laminae. Some of the silt is altered. Discernable bedding is frequently chaotic. The banding within the altered seds parallels bedding? - relict bedding. Black argillaceous sediments are most prevalent in the intervals: 232.5-236.7m, 242.2-244.4m, 249-258.7m and 280.8-295.1m. Lower contact is gradational. Core contains 5% white, largely bull, quartz veins to 70cm. Some veins contain intensely altered wall-rock clasts. ‡232.5-239.9‡ «50% QV» Intermittant veining with <10% pink, coarse grained dolomite. ‡249.9-254.4‡ «45% QV» Narrow fault bx and gouge zones common. Major fault intervals occur at: 237.9-238.15m: Fault bx. 238.45-238.6m: Fault gouge. ‡253.7-259.4‡ intermittant «Flt Bx» of 70% of interval. ‡263.8-267‡ «Flt Bx/Gou» ‡307.1-307.9‡ «Flt Bx/Gou»		The quartz/sericite alteration is similar to that of the overlying interval except that locally the sericite can be a darker green/brown color-chloritic? - possible mafic vol component. Argillites are locally phyllitic with minor moderate grey sericite alteration bleaching core. In fault zones some argillite is moderately graphitic. Silty beds are locally weakly dolomitically altered or silicified.	5% coarsely disseminated and patchy pyrite in the quartz/sericite alt seds? as in the overlying unit. Argillites similarly contain up to 5% pyrite. Pyrite concentrations can reach 10% locally. ‡232.9-233.4‡ «Min. V.G.» one patch o smeared gold grain(s) occurs over area 2x3mm at 233.35m where vein is in contact with argillite. A second .5mmx1mm grain occurring in the same quartz vein is 0situated near coarse white to grey dolomite crystals. Two final grains of VG occur at 233.07m. These grains are very fine- up to .5mm in length. ‡238.15-238.16‡ «Tr V.G.» Four grains of gold in a 1cm diameter. The largest grain measures 1mm. Au occurs in quartz on broken rather than cut surface.	237.9-238.6m: These faulted intervals affect the auriferous quartz vein.
316.00 TO 326.60	«ARG»	Black, grey. Fine grained. Argillite contains bleached zones, possibly after silty intervals. Minor small zones of tectonite. 8% white quartz veinlets and veins. Veins show some preference for orientations parallel to foliation. Quartz also occurs as patches and warped veins. FOLIATION at 55-85 degrees to core axis. Some offsetting by cleavage plane at..... ‡321.8-323‡ intermittant «Flt Bx»	75	Argillite is phyllitic due to development (weak) of grey sericite. Minor dolomite.	3% fine grained coarsely disseminated pyrite and stringers of pyrite.	
326.60 TO 351.30	«ALT SED/ARG»	Yellow, black, grey, buff. Fine grained. Very similar to the interval 232.5-316m. Bedding in argillite is chaotic and locally tectonized. Intermittant narrow fault gouge zones to 10cm. ‡335.2-336.3‡ intermittant «Flt Bx/Gou»		Alteration as in 232.5-316m. The amount of alteration increases downhole. Yellow to grey-green sericite (chl??) in banded by grey quartz/dolomite veinlets and patches.	2-5% fine grained, coarsely disseminated and patchy pyrite. 348.25-348.9m: 8% pyrite in grey sericitized argillite.	342m: Change to BQ core.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
351.30 TO 358.20	«QTZ/SIL/SER/PY ARG»	Black, yellow, white, grey, buff. Fine grained. Interval of variably altered argillaceous seds. Lower contact is faulted.		351.3-352.7m: Sediments are primarily altered to yellow sericite with irregular quartz/dolomite banding and zones of blacker, pyritiferous, less altered argillite which is locally graphitic. 352.7-355.5m: Interval is primarily quartz veined and silicified argillite, which ends in a 6cm qv with 60% pyrite. 355.5-357.7m: Another quartz/sericite altered interval with irregular quartz/veining. 357.7-358.2m: Tectonized & silicified/veined argillite.	Pyrite is common throughout interval. Very fine to fine grained. In quartz and argillite pyrite occurs as disseminated to semi-massive patches. At 335.5m there is a 6cm vein which contains 60% pyrite. In quartz sericite altered core pyrite occurs in irregular patches-primarily in deformed ? quartz stringers and veinlets. Minor arsenopyrite was seen in a diffuse disseminated 2cm band at 353.7m. Aspy is fine grained. Minor sp, cp is disseminated in some quartz veins. BM are fine grained, fine to coarse dissemination.	
358.20 TO 360.10	«SER ALT MAF/SED?»	Green. Fine grained. Margins of interval are altered mafic volcanic. From 358.5-359.7m is an altered sediment? Shear FOLIATION at The altered sed contains a white veinlet which is locally buckled and offset and which trends down the core axis.	60	The alteration of the mafics is a moderate chloritic to mustard yellow sericite. Core is locally bleached to a grey color where core is strongly dolomitic. 358.5-359.7m: Intense yellow to mustard sericite alt'n, no chloritic coloration. Patchy moderate to intense dolomite.	Minor pyrite in the mafics. 5-15% dark, very fine grained pyrite patches and bands in the seds?. Trace cp in quartz veins.	With the amount of fe-carbonate (dol) in the altered seds? they may be volcanics which are just more intensely altered.
360.10 TO 374.80	«CARB MAFICS»	Green. Fine grained. Speckled to massive mafic volcanics. Volcs are weak to moderately carbonatized. White spotting comes from an fe-calcite (stains red) porphyroblasts?- rounded to cyclindical in shape. Up to 10% white quartz/fe-calcite, (70/30%) veining and stringers. Some veins exhibit small scale folds. END OF HOLE.		Mafics are at least locally chloritic. Green matrix stains blue-so it may be dolomitized; primary carbonate?.	No visible sulphides.	Rea Mafics.

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
BCD31437	54.20	55.20	1.00					.01			148	250	143				90	85		70	2.8	10	
BCD31438	55.20	56.10	0.90	.039	.22	.12	15.8	1.8			386	2242	1243				475	60		234	15.8	180	
BCD31439	56.10	57.00	0.90					.02			113	822	281				56	121		55	3.1	15	
BCD31440	57.00	58.50	1.50					.01			18	119	87				37	128		8	0.5	5	
BCD31441	58.50	59.80	1.30					.01			45	138	73				50	170		22	0.8	10	
BCD31442	59.80	60.80	1.00					.02			31	161	69				61	151		18	0.5	20	
BCD31443	60.80	61.10	0.30	.318	.10	.18	68.8	3.35			3180	1043	1820				1696	14		1481	68.8	3350	
BCD31444	61.10	61.80	0.70					.05			92	234	80				76	144		50	1.6	45	
BCD31445	73.00	74.20	1.20	.147	.13	.03	2.5	.62			1468	1282	264				498	61		29	2.5	620	
BCD31446	81.20	82.70	1.50					.04			138	415	238				102	200		15	3.4	35	
BCD31447	98.60	100.10	1.50					.01			222	386	236				331	327		64	5.0	10	
BCD31448	101.60	103.10	1.50					.01			39	88	81				51	196		6	1.2	5	
BCD31449	103.10	104.60	1.50					.02			59	390	188				59	324		11	1.5	15	
BCD31450	104.60	106.10	1.50					.01			39	448	236				70	196		1	1.0	5	
BCD31451	106.10	107.10	1.00					.01			123	1199	445				127	147		19	1.8	5	
BCD31452	107.10	108.20	1.10					.01			40	188	193				107	151		3	0.6	5	
BCD31453	108.20	109.70	1.50	.024	.09	.09	6.8	.04			244	989	864				89	144		116	6.8	40	
BCD31454	109.70	111.30	1.60					.01			33	773	493				88	117		9	1.6	10	
BCD31455	111.30	112.80	1.50					.01			35	29	76				72	168		1	0.5	5	
BCD31456	115.20	116.00	0.80	.066	.14	.13	32.9	.08			662	1387	1256				82	91		140	32.9		
BCD31457	116.00	117.70	1.70					.01			29	254	253				110	118		1	1.0	5	
BCD31458	117.90	119.10	1.20					.02			55	429	191				182	93		13	1.2	15	
BCD31459	122.90	123.60	0.70	.083	.42	.13	4.9	.03			827	4165	1286				251	97		16	4.9	30	
BCD31460	123.60	125.10	1.50					.01			49	173	125				128	198		1	0.5	5	
BCD31461	128.20	129.70	1.50					.01			51	78	84				72	240		1	0.4	5	
BCD31462	129.20	131.20	1.50					.01			42	144	96				104	282		1	3.8	5	
BCD31463	139.80	141.30	1.50					.10			23	47	44				78	209		1	0.2		
BCD31464	141.80	142.80	1.00					.09			16	1	65				134	221		8	0.4	90	
BCD31465	142.80	143.30	0.50					.29			14	12	55				65	111		1	0.4		
BCD31466	143.30	145.70	2.40					.01			6	2	40				25	79		1	0.7	5	
BCD31467	145.70	147.20	1.50					.09			14	1	41				74	186		1	0.6	90	
BCD31468	147.20	148.20	1.00					.05			15	1	39				70	309		1	0.1	50	
BCD31469	148.20	149.00	0.80					.22			13	60	71				49	125		1	0.9		
BCD31470	154.80	156.30	1.50					.23			19	1	40				95	145		1	0.3	225	
BCD31471	156.30	156.90	0.60	.005	.01	.02	0.4	.66			48	37	166				157	324		1	0.4		
BCD31472	156.90	157.30	0.40	.001	.01	.01	6.8	208.31			5	13	32				23	56		1	6.8		
BCD31473	157.30	158.40	1.10	.001	.01	.01	0.2	.32			20	15	61				124	166		1	0.2	320	
BCD31474	158.40	159.50	1.10					.06			11	32	41				99	143		1	0.1	60	

Sample	From (m)	To (m)	Length (m)	CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB
BCD31475	159.50	160.75	1.25					.10			21	502	59				205	170		4	0.4	100
BCD31476	160.75	161.55	0.80					.13			91	863	98				183	187		6	0.8	125
BCD31477	161.55	162.45	0.90					.58			23	238	85				122	86		3	0.7	
BCD31478	162.45	162.80	0.35					1.79			75	1762	433				322	142		37	1.7	
BCD31479	162.80	163.70	0.90					.12			13	40	54				75	100		1	0.7	
BCD31480	163.70	165.00	1.30					.19			14	28	61				107	157		1	0.1	195
BCD31481	165.00	166.70	1.70					.35			145	185	150				142	120		16	1.2	
BCD31482	166.70	167.60	0.90					.02			35	43	36				46	61		1	0.1	
BCD31483	167.60	168.60	1.00					.02			6	24	42				26	137		1	0.5	
BCD31484	168.60	169.50	0.90					.01			17	18	58				176	124		1	0.3	10
BCD31485	169.50	170.60	1.10					.01			6	25	40				47	94		1	0.4	
BCD31486	170.60	171.80	1.20					.02			11	21	60				129	298		1	0.3	
BCD31487	171.80	172.40	0.60					.01			6	68	93				66	176		1	0.5	
BCD34106	173.20	173.80	0.60																			
BCD34107	173.80	175.30	1.50																			
BCD34108	199.10	200.60	1.50																			
BCD31488	200.60	201.90	1.30					.08			17	84	41				1001	84		12	0.1	
BCD31489	203.60	205.10	1.50					.09			21	61	73				1113	66		14	0.1	95
BCD31490	207.00	208.50	1.50					.21			52	67	74				2663	51		44	0.9	215
BCD31491	215.30	216.80	1.50					.08			11	95	69				2275	131		27	0.1	80
BCD31492	227.90	229.50	1.60					.18			18	19	42				171	132		4	0.1	
BCD31493	229.50	231.00	1.50					.01			10	15	32				103	114		2	0.1	10
BCD31494	231.00	232.50	1.50					.24			12	40	43				104	165		1	0.1	
BCD31495	232.50	232.90	0.40					.20			6	16	28				81	117		1	0.3	
BCD31496	232.90	235.40	0.50	.801	.01	.01	0.5	5.90			6	14	27				46	101		1	0.5	
BCD31497	233.40	235.95	0.55					.18			9	18	35				117	161		1	0.1	
BCD31498	233.95	234.60	0.65					.16			9	18	37				91	122		1	0.5	
BCD31499	234.60	235.30	0.70					.07			5	20	29				95	137		1	0.2	
BCD31500	235.30	236.60	1.30	.002	.01	.01	0.2	10.39			9	20	36				82	151		1	0.2	
BCD31501	236.60	238.00	1.40	.002	.01	.01	0.5	.87			16	37	55				79	165		1	0.5	
BCD31502	238.00	238.70	0.70	.001	.01	.01	0.4	15.4			5	21	35				12	74		1	0.4	
BCD31503	238.70	240.20	1.50	.002	.01	.01	0.2	.51			20	22	43				101	171		2	0.2	
BCD31504	249.90	251.10	1.20					.21			8	33	44				56	190		1	0.4	
BCD31505	251.10	252.60	1.50					.08			25	223	77				101	176		1	0.1	
BCD31506	252.60	254.10	1.50					.08			20	42	67				93	173		1	0.2	
BCD31507	254.10	255.60	1.50					.25			46	68	88				93	180		1	0.1	
BCD31518	262.20	263.80	1.60					.02			22	27	46				29	120		1	0.1	
BCD31508	267.00	268.50	1.50					.09			21	17	46				71	103		1	0.1	

ASSAY SHEET

DATE: 21-August-1991

Sample	From (m)	To (m)	Length (m)	CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB
BCD31509	268.50	270.00	1.50					.02			17	28	47				48	107		1	0.1	
BCD31510	270.00	270.90	0.90					.02			14	36	51				91	143		1	0.1	
BCD31409	304.00	305.60	1.60																			
BCD31410	307.70	308.70	1.00																			
BCD31411	308.70	309.50	0.80																			
BCD31412	311.10	312.40	1.30																			
BCD31413	316.20	317.80	1.60																			
BCD31414	320.00	320.20	0.20																			
BCD31415	325.70	327.20	1.50																			
BCD31416	327.20	328.70	1.50																			
BCD31417	328.70	330.20	1.50																			
BCD31418	330.20	330.70	0.50																			
BCD31419	330.70	331.60	0.90																			
BCD31420	334.20	335.30	1.10																			
BCD31421	335.30	337.20	1.90																			
BCD31511	348.00	348.90	0.90					.01			73	196	310				295	88		5	1.0	5
BCD31512	351.30	352.70	1.40					.01			71	66	105				203	79		3	0.5	5
BCD31513	352.70	355.50	2.80	.026	.15	.07	3.0	.10			259	1543	716				4589	79		40	3.0	105
BCD31514	355.50	356.60	1.10					.01			92	83	237				481	84		5	0.9	5
BCD31515	356.60	357.80	1.20					.01			60	79	106				128	54		1	0.6	5
BCD31516	357.70	358.20	0.50					.01			77	111	77				204	44		5	0.9	5
BCD31517	358.20	359.70	1.50					.01			161	378	161				141	96		3	1.6	5

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: REA HORIZON

PLOTTING COORDS GRID: SAM GEOL GRID
NORTH: 269.21N
EAST: 11580.70W
ELEV: 1014.81

ALTERNATE COORDS GRID: ESTIMATED
NORTH: 2+70N
EAST: 115+90W
ELEV: 1026.00

COLLAR DIP: -55° 0' 0"
LENGTH OF THE HOLE: 102.70m
START DEPTH: 0.00m
FINAL DEPTH: 102.70m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: June 17, 1991
DATE COMPLETED: June 18, 1991
DATE LOGGED: June 20, 1991

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: FRONTIER DRILLING
CASING: PULLED
CORE STORAGE: SAMEX CAMP

PURPOSE: TO TEST A PREVIOUSLY UNTESTED PORTION OF THE REA HORIZON. (P-8).

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
0.00	-	0° 0'	ACID			-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 61.10	«CASING»					
61.10 TO 76.30	«CHERT»	Grey, white, black. Fine grained. 61.1-72.2m: Grey cherts contains contorted black argillite partings. Locally partings are weakly styolitic. Density of partings tends to increase downhole. The subinterval contains 15-20% white quartz veining, which primarily concentrated between 67-70m. Quartz veins are generally massive, bull quartz with 3% white coarse grained dolomite. Veins contain styolitic argillite. Veins oriented at all angles to core axis. Some veins are vuggy. ‡72.2-73.0‡ Chert and quartz as above has been «Flt Bx» and rehealed. 73.0-75.1m: Argillaceous chert to cherty argillite, 7% white quartz veining. 75.1-76.7m: Silicified cherts and/or argillites. Remnant bedding and cleavage in quartz is at low angles.		There is strong limonitic minor hemcotitic, staining along fractures and vuggy margins of veins to a depth of 64.2m. The limonite in the veins is derived from the oxidation of fe-carbonates. Limonite decreases downhole. Patchy silicification along margins of some veins gives those veins diffuse rather than sharp margins. 73.0-75.1m: Argillite is graphitic. 75.7-76.3m: Patchy moderate greenish-yellow sericite and moderate to intense silicification.	2% very fine grained pyrite occurs in irregular bands within argillites.	
76.30 TO 77.70	«YELLOW/GREY SER SEDS»	Greenish-yellow, grey. Fine grained. Intensely altered sediments.		76.3-76.55m: Intense greenish yellow sericite alt'n. No carbonate present. Minor patchy quartz vein and numerous tiny deformed, discontinuous pyritiferous quartz stringers. 76.55-77.7m: Intensely grey sericite altered matrix is weakly fe-dolomitized Locally bleached with dolomite nodules. Minor quartz/dol stringers.	76.3-76.55m: 15% very fine grained, coarsely disseminated pyrite and blebs. 76.55-77.7m: 10-15% very fine grained pyrite in faint bands.	Sediments are most likely to have been argillites with interbedded silt. 76.55-77.7m: Approaches what is called `MUT' in the vine.
77.70 TO 102.70	«ARG/SILT WACKE»	Black, grey. Fine grained. Clean turbidites. Bedding is generally at..... but locally is deformed. Core exhibits a wavy crosscutting micaceous cleavage at the base of the hole oriented at..... There is some poor evidence that structural tops are downhole. The interval between 78.5-87.5 is weakly to strongly blocky. ‡79.8-80.0‡ «Flt Bx» <5% massive white quartz/dol veins (90/10%) and veinlets. Veining is generally oriented at steep angles to core axis. ‡88.2-90.1‡ «90% Qtz/Dol Vn» Dolomite is white to pink in colour, coarse grained veins contain in-	75 45	Very little alteration outside of sericitization of wall rock fragments in quartz veins. Argillites are weakly graphitic locally and are phyllitic.	Minor disseminated pyrite. ‡88.2-89.0‡ «5% py, 5% b.m.» Veins contains 5% medium grained	Coarse seds are strongly dolomitic, but this appears to be primary rather than alteration.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		tensely altered (green sericite) wall rock fragments. 85% quartz, 15% dolomite. END OF HOLE.			coarsely disseminated patchy pyrite. 4% `clotty' chalcopyrite occurs by itself and intermixed with the pyrite. Trace galena 1% extremely fine grained grey metallic intimately associated with the cp; mineral is soft and has a silvery grey streak-galena? copper mineral? Other veins in vicinity are apparently barren except for pyrite.	

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB		COMMENTS
BCD31519	61.10	62.60	1.50								42	57	17				47	68		3	0.5	5		
BCD31520	62.60	64.10	1.50								32	50	13				37	50		2	0.5	5		
BCD31521	64.10	65.60	1.50								24	11	12				19	79		1	0.3	15		
BCD31522	65.60	67.10	1.50								75	35	40				63	124		3	0.9	55		
BCD31523	67.10	68.60	1.50								28	11	32				30	68		2	0.5	30		
BCD31524	68.60	70.10	1.50								15	20	12				24	59		2	0.3	10		
BCD31525	70.10	71.60	1.50								20	19	144				34	97		4	1.2	45		
BCD31526	71.60	73.10	1.50								174	97	103				76	121		5	1.4	35		
BCD31527	73.10	74.70	1.60								72	48	257				48	108		4	1.6	40		
BCD31528	74.70	76.30	1.60	.009	.01	.01	2.1	.09			93	126	144				81	172		7	2.1	85		
BCD31529	76.30	77.70	1.40								91	65	51				49	147		6	1.5	35		
BCD31530	88.20	89.00	0.80	.549	.32	.01	14.4	.01			5490	3151	56				115	38		8	14.4	5		
BCD31531	89.00	90.30	1.30								80	48	15				87	38		1	1.0	5		

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: `MBA' ZONE

PLOTTING COORDS GRID: SAM GEOL
NORTH: 674.03N
EAST: 11998.90W
ELEV: 1034.92

ALTERNATE COORDS GRID: ESTIMATED
NORTH: 6+85N
EAST: 120+ 0W
ELEV: 1045.00

COLLAR DIP: -55° 0' 0"
LENGTH OF THE HOLE: 242.90m
START DEPTH: 0.00m
FINAL DEPTH: 242.90m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: June 18, 1991
DATE COMPLETED: June 21, 1991
DATE LOGGED: June 22, 1991

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: FRONTIER DRILLING
CASING: PULLED
CORE STORAGE: SAMEX CAMP

PURPOSE: TO TEST THE UPDIP EXTENSION OF THE NEW GOLD ZONE.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
101.20	-	-56° 0'	ACID	OK		-	-	-	-	-	
154.50	-	-56° 0'	ACID	OK		-	-	-	-	-	
218.50	-	-55° 0'	ACIO	OK		-	-	-	-	-	
104.20	234° 0'	-56° 0'	SING.SHOT	OK	SINGLE SHOT	-	-	-	-	-	
236.80	230° 0'	-55° 0'	SING.SHOT	OK	SINGLE SHOT	-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 92.65	«CASING»					Starting with this hole an attempt will be made to seperate yellow sericite (& quartz) alt'n. from greenish-yellow sericite alt'n. Abbreviated as Gn-Yel Ser.
92.65 TO 97.50	«GN-YEL/SER QTZ SEDS?»	Grey, greenish brown, yellow, white. Fine grained. Intense alteration of country rock. Resultant core is banded grey (quartz/dolomite) and yellow, brown, and greenish from shades of sericite. Banding may mimic bedding. General banding orientation is at 60-70 degrees. 3% white, coarse quartz veins (late stage?) except between 96.3-97.5m, where there is 15% white veining. Some quartz veinlets are extremely buckled.	65	Alteration consists of a greenish to brownish yellow sericite which is banded by quartz/dolomite (70/30%), fine grained veinlets. Limonite on fracture surfaces to 93.4m. Between 96.3-97.3m the sericite is a much purer yellow.	Overall pyrite content is 5-7% with local concentrations to 15%. Pyrite is generally very fine grained and occurs as blebs to bands in quartz and locally as coarse to fine disseminated in sericite. At ⌊93.4-93.48⌋ there is 1% very fine grained matted to accicular arsenopyrite coarsely disseminated in quartz. «1%Aspy».	
97.50 TO 106.60	«QDV & ALT SED?»	White. Interval consists of 15% intensely altered sediments? as above. 85% of interval consists of coarse grained white quartz/carb veining. Veins are 95% quartz 5% white, grey, pink bladed iron carbonates, except for veins between 103.0-104.0m where the ratio is 65/35%. Veins contains 10% altered wallrock fragments. Veins contain minor vugs and in general appears to be quite barren. Veins are locally irregular. Contact orientations vary from 20-90 degrees to core axis. Some low angle fracturing of quartz veins. ⌊98.15-98.25⌋ «Flt Gouge».		The host rock and wall rock inclusions in the interval are in general intensely altered to a grey/brown sericite. Larger host rock intervals contain some greenish & yellowish sericite as well. Sericite alt'n (+/- chl.) is intense & still contains early grey quartz veinlets.	Altered seds? contain 5-10% pyrite which occurs as in the overlying interval. Quartz/carbonate veins contain <1% medium grained disseminated pyrite. ⌊99.45-99.5⌋ «2%py, tr Au» medium to coarse pyrite forms selvage to a quartz veinlet. One grain of gold, irregular in shape, measuring .75x2mm is present in the selvage. ⌊106.35-106.6⌋ «2% Aspy» Aspy occurs as very fine grained coarse disseminations in quartz. Crystal habit is a felted mass of cubes and accicular needles.	Grey/brown sericite is most intense adjacent to veins - replacing yellow sericite?.
106.60 TO 112.10	«GN-YEL SER ALT SED»	Yellow, grey, white. Fine grained. Interval consists of pervasively and intensely altered sediments which contain 1% late, white bull quartz veins. Interval is competent.		Intense pervasive yellow sericite alt'n with greenish tint. 15% grey, irregular quartz veinlets with vague contacts.	7% fine to medium grained pyrite. Pyrite is coarsely disseminated in contorted stringers of grey quartz. ⌊107.37-107.65⌋ «10% aspy+py, 8%BM» Sulphides occur in quartz flooded/siliceous interval. Sulphide breakdown is 5% aspy, 5% py, 3% galena, 4% sphalerite, 1% chalcopyrite. BM are fine grained, coarsely disseminated. Arsenopyrite occurs as very fine grained masses to coarse diamonds. Py and aspy are also coarsely disseminated and are locally intimately associated.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
112.10 TO 115.05	«QTZ VN/ALT SED?»	White, yellow, grey, green. 80% of interval consists of irregular white quartz veining containing and surrounding 2% intensely altered wallrock. Veins contain minor iron carbonates. Vein orientations are highly variable.		Wallrock material is intensely altered to yellow sericite with a greenish tint. Wallrock is the same as in the overlying unit.	5% fine grained pyrite in coarse disseminations in the altered seds as above. Quartz veins contain 3% medium to coarse grained patches of pyrite. There is also 2% very fine grained felted masses of accicular arsenopyrite coarsely disseminated throughout the veins.	Accicular aspy may be auriferous. Assay for metallics and fire assay.
115.05 TO 124.40	«GN-YEL SER ALT SED»	Yellow, grey. Fine grained. Rock is the same as that in 106.6-112.1m. Between 123-123.7m there is 70%, late white, coarse grained quartz vein.		As in 106.6-112.1m. 123-123.3m: Sericite is cleaner, yellower in colour.	As in 106.6-112.1m. Minor aspy associated with quartz veins.	
124.40 TO 204.70	«ARG/YEL/SER SED»	Black, yellow, grey, white. Fine grained. 50% of interval is black argillite, 50% variably altered seds. Argillites contain variable amounts of quartz stringer and veins, ranging from 5-60% and average 20%. Veining is irregular, frequently contorted, & locally offset with minor locallized tectonic bx. Quartz veining is similar within the altered seds although the smaller veins do not stand out against the yellow/grey groundmass. Bedding is frequently contorted. Where bedding/foliation is consistent their orientation varies between 60-80 degrees to core axis. Intense zones of quartz veining occur as follows: {127.4-133.1} «40% Qtz Vn» {134.1-135.4} «95% Qtz/Carb Vn» Vein is comprised of 65% quartz, 35% white to pink coarse grained iron carb. {188.9-193.5} «30% Qtz Vn» veining occurs in both altered and unaltered rock. Narrow fault bx and gouge zones comprise 2% of the core. Larger fault intervals occur as follows: 128.8-129.0m: Fault gouge. {129.6-130.25} «Flt Bx/Gou» 135.2-135.6m: intermittant fault bx. {200.9-202.1} «Flt Bx» The interval {171.9-174.9} is a fine grained argillite debris flow. «Het Frag» Quartz veinlets have been bx. CLEAVAGE at	75	Altered seds are intensely sericitized. Sericite coloration ranges from yellow to greenish yellow to brownish green and grey. Some sericitic alteration is banded by grey quartz veinlets. Intense alteration locally grades in and out of black argillite via a grey sericite. Grey sericite alt'n of argillite is commonly seen in envelopes surronding some quartz veins.	1% fine grained coarsely disseminated pyrite in quartz. Trace sphalerite and galena in quartz veins.	J.C. calls it a debris flow/soft sed slumping. Similar to much of what has been called tectonite.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
204.70 TO 242.90	«ARG/ALT SE D»	Black, grey, green. Fine grained. This interval is a continuation of the overlying unit with weaker alteration. 65% of the interval is black to greyish argillite/silt and 35% greyish to green sericitically altered sediments. Minor chert present. Interval contains 15% quartz in veins, stringers, patches, clasts and minor stockwork in chert laminated argillite. Bedding and veining is frequently chaotic due to soft sed slumping? and tectonism. There is a moderate fe-carbonate component which occurs intermixed with quartz veining and cherty laminae and local spotty growths. 204.7-206.3 «Flt Bx/Gou» 215.8-216.2 «Flt Gou» in cherty interval. At 238.6m, CLEAVAGE at..... Bedding is parallel to core axis. END OF HOLE.	65	Most argillite is phyllitic due to development of weak grey sericite. Locally grey sericite alt'n increases to moderate intensity. In general moderate to intense sericite alteration is greenish to brown in colour. Patchy weak to moderate silicification. No yellow sericite.	Trace coarsely disseminated galena, chalcopyrite in quartz veins at 240.75m 3-5% fine grained pyrite occurs as disseminations, patches, stringers in argillite and quartz. 242.1-242.9m: 10% pyrite.	238.6m: Possible, small, hinge zone.

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
BCD31532	94.80	96.30	1.50					0.10			21	62	20				330	107		4	0.4	100	
BCD31533	96.30	97.50	1.20					0.20			35	65	30				441	98		5	0.3		
BCD31534	97.50	98.15	0.65					0.10			10	49	54				86	52		2	0.5		
BCD31535	98.15	99.20	1.05					0.80			48	19	102				657	115		10	1.4		
BCD31536	99.20	99.60	0.40					1.69			30	6	45				932	74		9	0.8		
BCD31537	99.60	101.10	1.50					0.12			16	51	43				188	49		2	0.4		
BCD31538	101.10	102.60	1.50					0.81			37	13	47				245	47		8	1.2		
BCD31539	102.60	104.10	1.50					0.24			8	30	37				49	16		1	0.4		
BCD31540	104.10	105.50	1.40					0.50			37	13	31				827	47		6	0.6		
BCD31541	105.50	106.60	1.10					0.36			28	23	29				2384	57		15	0.4		
BCD31542	106.60	107.37	0.77					0.10			33	7	31				478	112		3	0.6	95	
BCD31543	107.37	107.65	0.28	.190	2.48	2.59	81.3	5.26			1903	24787	25894				23676	45		394	81.3		
BCD31544	107.65	109.20	1.55					0.07			24	23	37				688	110		4	0.4	65	
BCD31545	109.20	110.70	1.50					0.11			21	54	18				737	133		7	0.4	105	
BCD31546	110.70	112.10	1.40					0.17			17	60	14				1293	86		10	0.4	165	
BCD31547	112.10	113.00	0.90					0.36			40	235	240				2219	51		32	0.8		
BCD31548	113.00	114.00	1.00					0.46			28	173	187				3734	50		47	0.7		
BCD31549	114.00	115.05	1.05					0.70			35	112	70				3017	58		28	0.8		
BCD31550	115.05	116.00	0.95					0.30			13	46	20				2063	73		19	0.5	300	
BCD31551	116.50	118.00	1.50					0.20			8	36	10				1196	102		8	0.3	200	
BCD31552	122.80	124.40	1.60					0.11			11	68	34				281	55		2	0.1		
BCD31553	127.40	128.80	1.40					0.06			7	50	30				330	68		3	0.1		
BCD31554	128.80	130.30	1.50								11	22	17				240	177		6	0.2	10	
BCD31555	130.30	131.80	1.50					0.01			13	54	31				331	76		5	0.1		
BCD31556	131.80	133.30	1.50					0.02			23	36	19				336	68		5	0.1		
BCD31557	133.30	134.10	0.80					0.02			23	31	17				214	82		2	0.1		
BCD31558	134.10	135.70	1.60								13	200	20				115	52		2	0.2	20	
BCD31568	135.70	137.20	1.50								10	58	14				140	112		1	0.1	5	
BCD31559	137.20	138.70	1.50								13	59	16				262	91		2	0.1	5	
BCD31560	138.70	140.20	1.50					0.01			30	49	31				284	115		3	0.1		
BCD31561	185.00	186.50	1.50								37	72	78				48	56		2	0.6	10	
BCD31562	186.50	188.00	1.50								22	42	23				36	63		1	0.3	10	
BCD31563	188.00	189.50	1.50								35	58	42				47	57		1	0.2	5	
BCD31564	189.50	191.10	1.60								25	59	34				54	85		1	0.2	5	
BCD31565	191.10	192.50	1.40								33	103	41				46	74		1	0.1	5	
BCD31566	192.50	194.00	1.50								21	54	32				37	36		1	0.2	5	
BCD31567	194.00	195.50	1.50								25	44	36				36	63		1	0.4	10	
BCD31574	205.80	207.30	1.50								30	81	142				30	63		1	0.6	5	

Sample	From (m)	To (m)	Length (m)	CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB		
BCD31569	212.50	214.00	1.50								52	208	129				56	55		1	0.5	5		
BCD31570	214.00	215.50	1.50								49	193	125				54	53		1	0.5	10		
BCD31571	219.70	221.20	1.50								53	33	33				51	49		1	0.3	5		
BCD31572	240.30	241.70	1.40								103	193	223				84	142		5	0.9	5		
BCD31573	241.70	242.90	1.20								45	114	175				30	63		1	0.9	10		

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: MBA GOLD ZONE

PLOTTING COORDS GRID: SAM GEOL
NORTH: 721.97N
EAST: 12100.46W
ELEV: 1046.27

ALTERNATE COORDS GRID: ESTIMATED
NORTH: 7+35N
EAST: 121+ 0W
ELEV: 1074.00

COLLAR DIP: -55° 0' 0"
LENGTH OF THE HOLE: 310.30m
START DEPTH: 0.00m
FINAL DEPTH: 310.30m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: June 21, 1991
DATE COMPLETED: June 26, 1991
DATE LOGGED: June 23, 1991

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: FRONTIER DRILLING
CASING: PULLED
CORE STORAGE: SAMEX CAMP

PURPOSE: TO TEST THE STRIKE EXTENSION OF THE NEW GOLD 100m GRID-WEST AND 65m GRID-SOUTH OF THE ORIGINAL

DIRECTIONAL DATA: INTERSECTION IN RG 398.

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
86.00	-	-55° 0'	ACID	OK	POOR ETCH.	-	-	-	-	-	
215.50	-	-55° 0'	ACID	OK		-	-	-	-	-	
270.40	-	-55° 0'	ACID	OK		-	-	-	-	-	
151.80	226° 0'	-55° 0'	~~MULTISHOT~~	OK	SINGLE SHOT.	-	-	-	-	-	
304.20	228° 0'	-54° 0'	~~MULTISHOT~~	OK	SINGLE SHOT.	-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 27.70	«CASING»					
27.70 TO 39.30	«CHERT/CHTY ARG»	Grey, black. Fine grained. Interval consists primarily (75%) of argillaceous chert, remainder of interval consists of interbedded cherty argillite. The principal argillite intervals occur between 27.7-29.5m and 32.8-34m, and 38.4-39.3m. The argillites contain 10% white quartz veining whereas the cherts have <5% veining. Veins and stringers are locally vuggy. Bedding is locally contorted, general sense of BEDDING at	75	Argillites are locally weakly silicified in vicinity of veins. Minor sericite. Limonite on fracture surfaces to 32.6m. Argillites are weakly graphitic except between 38.4-39.3m where there is strong graphite.	Minor pyrite in cherts. 2-10% fine grained pyrite as dissem. and bands in argillite. The final 4cm of the interval contains 30% fine to coarse pyrite. Quartz veins within the cherts locally contain minor amounts of sp, cp, gn, tt. |29.45-29.65| «10% py, 7% bm, 2% tt» Mineralization occurs in silicified argillite; SX occur as coarse dissem.-fine to very fine grained. BM are 1% sp 3% gn, 3% cp.	
39.30 TO 54.80	«SER/QTZ/PY ALT SED»	Grey, white, brown, black. Fine grained. Sediments are strongly altered, where alt'n is weaker the sediments are argillite. |39.3-40.8| «Flt Bx/Gou» Faulting is most intense at top of the interval. 40.2-40.4m: Competent quartz/dolomite (85/15%) vein. Quartz/dolomite (65/35%) veining and flooding throughout unit. Veins are buckled locally.		Core is altered to weak grey sericite with 25% white to grey quartz/dolomite veining, flooding. 52.9-54.8m: Core is weakly to moderately dolomitized. Trace fuchsite associated with quartz.	39.3-49.2m: 20-50% pyrite. Pyrite is fine to medium grained. Pyrite occurs as disseminations to semi-massive patches. Locally brassy pyrite rims darker pyritic masses. Between 49.2-54.8m pyrite content is <15% with overall content decreasing downhole. Between 44.2-49.3m there is 1% base metals disseminated in quartz veins. Sp>cp>gn. The principal intervals mineralized by base metals are: 44.2-44.6m with 2% cp, 1% sp, minor very fine grey metallic mineral - galena?, tet??, 46.2-46.35m with 4% sp, and 48.8-49.1m with 2% sp.	There may be a mafic component to the seds.
54.80 TO 69.70	«ALT VOL?/HET FRAG»	Grey. Fine to 1cm. The principal rock type is a grey strongly altered volcanic?. Original textures are indistinct but there appears to be minor argillite interbeds. There is 5% quartz/carbonate (80/20%) veining and patches which in the final 7m of the interval. There are narrow interbeds of het. frag which are located as follows: 54.8-56.6m: 50% het frag interbeds; and 69-69.15m. Het frag has an argillite/silt matrix which supports quartz/argillite/sericite clasts in ratio, 60/35/5%. Clasts comprise 30-50% of intervals.		Volc? are moderately Fe-dolomitized; moderate patchy grey to brown sericite alt'n with minor fuchsite.	3% fine to medium grained disseminated pyrite; <5% in the het frag.	The volc? may be a siltstone/wacke with a strong mafic component. This interval correlates fairly well with a Dol Maf Vol unit in RG 393.

29.5
15cm

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
69.70 TO 73.10	«HET FRAG»	Black, grey. Fine to 2cm. Argillite to silty argillite matrix supports up to 70% clasts. Locally clasts are framework supported. Clast composition is 20% quartz, 20% argillite, 60% variably altered (ser, carb) clasts. Interval contains thin argillite/wacke interbeds. 2% quartz/carbonate stringers which are strongly deformed.		Weak silvery to grey sericite development give core phyllitic sheen. Minor patchy brown sericite.	Fine to medium grained pyrite content varies between 3-12%. Pyrite occurs as dissemination & blebs in the matrix and in quartz. Minor sphalerite occurs as dissem in quartz/ carbonate veining at 71.8-73.1m.	
73.10 TO 94.60	«ALT ARG»	Black, grey, white. Fine grained. Rock is primarily argillite with local silty intervals that has been weakly to moderately altered. Style of alteration varies. Rock is locally intensely deformed. Bullseye textures and tight folds are present at 77m. Bedding is locally oriented subparallel to the core axis. CLEAVAGE at Interval contains 5% white quartz/carbonate (90/ 10%) veining. The carbonate is coarse grained, pale orange in colour. Veins are oriented at all angles to core axis. Some veinlets are buckled. Veining is most predominant between 75.4-76.8m and 79.7-81.3 «35% Qtz/Carb Vn» 73.7-74.4 «Flt Bx» 85.9-86.5 «Flt Gou» 92.2-92.35m: Fault breccia.	80	Argillites are locally graphitic. Patchy intense grey sericite gives an intense phyllite sheen. Sericite locally grades into a greenish tinted variety. 86-92.2m: Core is moderately silicified Subinterval contain numerous cross-cutting quartz stringers and veins.	3-5% coarsely disseminated pyrite with minor concentrations in quartz. 86.5-86.6m: Minor galena in quartz/ carbonate vein.	
94.60 TO 100.00	«MIXED SEDS »	Grey, black, white. Fine to 5cm. Het frag is the principal (60%) rock type which is interbedded with argillite, cherty argillite and siltstone. Matrix is difficult to determine, appears to be silty. Clasts are frequently framework supported; clastic texture is relatively poorly developed - may be partially tectonite in origin. CLEAVAGE plane at	60	Argillite is weak to moderately silicified except 98.5-98.9m, which is intensely silicified. Minor talc and fuchsite? Patchy streaks of green to brown sericite alt'n.	5% coarsely disseminated pyrite.	
100.00 TO 110.40	«SIL ARG/VO L?»	Grey, black, white. Fine grained. 75% of interval is greenish grey volcanics? (possibly a coarser altered sediment). Generally massive in appearance. 3% white to grey quartz veining and crosscutting stringers. Minor white quartz/carbonate veining. 21% argillite with minor silt. 1% chert? occurs between 109.45-110.2m. Where bedding is discernable it is weakly contorted.		Volcanics are moderately fe-dolomitized with patchy green to brown sericite alt'n. Argillite is weak to moderately silicified and glassy in appearance due to quartz flooding.	Trace sphalerite & galena are coarsely disseminated in silicified argillite. Minor galena occurs in a white quartz/ carbonate vein between 103.1-103.22m. 1-5% coarsely disseminated pyrite.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
110.40 TO 112.65	«HET FRAG»	Green-grey. Fine to 3cm. Silty to sandy matrix supports <30% clasts. Clast composition is qtz, sericite altered rock, argillite in decreasing order of abundance. Clasts are angular to sub-rounded. 10% white quartz/dolomite (90/10%) veining. The principal vein intersection occurs at 110.95-111.15m.		Patchy brown sericite alt'n. Matrix is weakly ferro-dolomitized.	5% disseminations and blebs of pyrite.	
112.65 TO 123.80	«ARG/SILT»	Grey, black. Fine grained. 50% of interval is greenish grey siltstone which is interbedded with argillite and minor tectonically? bx argillite. 5% quartz/carbonate veining. Carbonate is iron rich and comprises 20-70% of the veins. In general quartz is the predominant mineral but 123.1-123.3m is an example of a fine grained carbonate vein with 30% quartz. Interval contains broad fault bx zones: ┤114.4-115.4├ «Flt Bx» ┤118.0-118.6├ «Flt Bx» ┤119.6-123.8├ intermittant «Flt Bx», 90% of interval is brecciated.		Argillite is generally weakly silicified with patchy minor brown sericite alt'n. Coarse sediments are fe-dolomitic, moderate to intense.	Trace galena + sphalerite associated with qdv. Up to 4% fine to medium grained pyrite dissem and blebs. Pyrite content is generally higher in the argillites.	
123.80 TO 161.90 149-158c	«SER ALT SED»	Yellow, grey, white. Fine grained. Intensely altered sediments. Original textures have been largely destroyed. FOLIATION at Locally foliation may be an expression of bedding, elsewhere it expresses cleavage where bedding? appears to be subparallel to core axis. Fault intervals occur as follows: 138.2-138.3m: Fault bx. 141.4-141.6m: Fault bx. ┤141.9-142.4├ «Flt Bx. Irregular white quartz veins present, which are variably mineralized. Some stringers/veinlets are buckled. The interval ┤133.4-134.1├ appears to be a silicified «Het Frag?» Similarily ┤136.05-136.2├ «Het Frag» Het frag intervals contain clasts of argillite and sericitically altered rock. 157.4-161.9m: Predominant alteration weakens, core becomes locally banded with argillite; minor Het frag between 158.5-158.65m. Minor narrow zones of fault bx and gouge.	60	Pervasive moderate to intense pale yellow sericite alt'n. No carbonate present. Approximately 25% quartz in matrix as grey stringers, veinlets and groundmass.	10% fine to medium grained coarsely disseminated pyrite in quartz stringers Locally some of the white quartz veins are mineralized with sp, gn, cp, tt, aspy. Mineralization occurs as follows: ┤125.1-125.15├ 30% py, 5% gn, 1% tt, 10% sp in quartz «30% py, 15% bm, 1% tt » ┤128.6-128.7├ «10% py, 1% tt, 6% bm» Base metals are 5.5% sp, .5% galena. ┤133.3-134.5├ «8% py, 3% sp, 1% gn» 150m: 2cm wide veinlet contains 45% py 1% cp, 10% tt, 10% gn. ┤152.8-154.4├ Interval contains four 10-15cm quartz veined zones with sulphides. Sulphides make up 15% of the interval. Sulphide composition is approximately 43% py, 1% arsenopyrite, 23% sphalerite, 10% tt, 15% galena, 8% chalcopyrite.	Sericite alt'n of the type which has been proposed to be caused by diagenesis.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
161.90 TO 213.40	«HET FRAG» CONGL.	Shades of grey, white, black. Fine to 7cm. Interval consists of 95% clastic material, which is angular to subrounded. Clasts are framework supported. Clasts composition is 50% variably sericitically altered clasts, 30% quartz and siliceous clasts, 2% argillite and sil argillite. Minor pyrite clasts. 2% white quartz/carbonate veining (80/20%). 171m: Narrow fault gouge. 185.2-185.8m: Quartz vein. ‡209.1-209.7‡ «Qtz/Carb Vn» (60/40%)		Interval is weakly dolomitized by nodular porphyroblastic growths. 171-175.8m: Intense carbonate growths and flooding. Interstitial to carbonate growths the core is altered to dark grey to brown sericite. 185.5-187.1m: Moderate grey sericite, pyrite alteration.	There is 5% fine to medium grained disseminated pyrite. Trace galena in quartz veins at 203.7-204m. ‡172.5-173.3‡ «2% sp» disseminated in the carbonate altered het frag.	A distinctive appearance to unit. 185.8-187.1m: Similar to Mut, but lacks the overwhelming foliation.
213.40 TO 243.10	«ARG/ALT SED»	Black, brownish green. Fine grained. 70% of interval consists of black argillite. Argillite commonly contains siliceous laminae which are discontinuous, locally contorted or stretched in plane of foliation at..... 1% of quartz +/- carbonate stringers are cross-cutting, local buckling. 20% moderate to intensely green to grey, altered sediments. 10% white quartz veining and flooding. Minor Het frag. ‡221.7-225.2‡ intermittant intense «Flt Bx/Gou» ‡230.9-231.05‡ «Flt Gou» ‡236.9-243.1‡ intermittant «Flt Bx/Gou»	65	20% of interval has been quartz veined and altered to a green/brown sericite. Sericite is a pale green color locally. Sericitic alteration is patchy. Between 227.8-230.8m there is patchy weak to moderate silicification associated with quartz veining.	3% fine grained, coarsely disseminated pyrite.	
243.10 TO 256.20	«HET FRAG»	Shades of grey, green, white, brown. Fine to 5cm. Unit is very similar to the Het Frag between 161.9-213.4m in clast composition, and alteration (ser, fe-dol), but clasts are matrix supported in general, 40-80% clasts. Matrix is intensely altered. Minor quartz veinlet ‡245.3-245.7‡ «Flt Gou»		Porphyroblastic carbonate growths and greenish sericite as in 161.9-213.4m.	1% disseminated pyrite.	Unit does not have the distinctive appearance of the het frag at 161.9-213.4m.
256.20 TO 310.30	«ARG/ALT SED»	Black, green, grey, yellow, white. Fine grained. Very similar to unit between 213.4-243.1m, but much more of the rock has been altered - 35% of interval is black argillite with silty, grey interbeds. There is 5% white quartz/carbonate (90/10%) veining within the argillites. Some veinlets are buckled. There is 20% quartz veining within the sericitically altered core. ‡260.8-261.9‡ intermittant «Flt Gou» ‡278.9-279.0‡ «Flt Gou» ‡286.4-292.6‡ intermittant brittle «Flt Bx» and gouge. ‡300.1-310.3‡ intermittant «Flt Bx/Gou» Faulting		Argillites grade into and out of greenish to brownish sericite alteration. Minor patchy dolomite alt'n. 306.6-309.4m: Sericite is an intense yellow color.	1-2% coarsely disseminated pyrite with local concentrations to 5%.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		increases in intensity and pervasiveness with depth. Where bedding is identifiable it is commonly contorted. {279.1-279.55} «Qtz/Carb Vn» Carbonate is pink, coarse grained in white quartz which also contains chloritized wall rock fragments. Hanging wall seds are silicified for 4cm. END OF HOLE.				

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
BCD31575	27.70	29.50	1.80								75	294	91				77	212		19	2.0	14	
BCD31576	29.50	29.65	0.15	.368	.92	.97	123.9	.28			3680	9172	9687				436	38		1667	123.9	275	
BCD31577	35.70	37.20	1.50								81	389	107				54	86		16	1.1	6	
BCD31578	37.20	38.70	1.50								146	157	91				103	95		24	1.6	21	
BCD31579	38.70	39.30	0.60	.090	.05	.03	15.2	.08			902	529	314				263	105		250	15.2	75	
BCD31580	39.30	40.40	1.10								161	1043	297				144	119		26	2.0	4	
BCD31581	40.40	41.90	1.50	.018	.25	.08	3.3	.04			181	2539	790				303	58		28	3.3	42	
BCD31582	41.90	43.40	1.50								60	951	564				266	37		14	1.5	68	
BCD31583	43.40	44.90	1.50	.042	.06	.01	4.3	.08			422	556	129				498	28		40	4.3	82	
BCD31584	44.90	46.40	1.50								58	436	109				369	29		15	1.2	128	
BCD31585	46.40	47.90	1.50								107	118	79				305	28		20	1.9	69	
BCD31586	47.90	49.40	1.50	.038	.09	.01	11.0	.29			380	850	144				525	37		119	11.0	286	
BCD31587	49.40	50.90	1.50								29	196	56				354	32		6	1.1	95	
BCD31588	70.10	71.60	1.50	.055	.13	.08	2.2	.01			48	1250	841				117	49		5	2.2	8	
BCD31589	71.60	73.10	1.50	.005	.10	.09	2.5	.01			45	1046	898				111	37		6	2.5	3	
BCD31590	75.20	76.70	1.50	.006	.02	.03	1.9	.04			61	212	294				154	130		12	1.9		
BCD31591	76.70	78.20	1.50								63	169	61				144	109		9	1.1	12	
BCD31592	78.20	79.70	1.50								41	116	49				104	132		5	0.6	4	
BCD31593	79.70	81.30	1.60	.004	.08	.01	1.0	.01			39	828	128				86	279		6	1.0		
BCD31594	89.90	91.50	1.60	.003	.04	.03	1.8	.01			34	440	320				66	85		9	1.8		
BCD31595	98.40	100.00	1.60								30	243	157				80	80		4	0.8	22	
BCD31596	100.00	101.50	1.50	.007	.11	.07	1.8	.01			69	1085	723				119	38		3	1.8	7	
BCD31597	101.50	103.00	1.50	.008	.13	.07	1.9	.02			84	1258	656				128	34		1	1.9	18	
BCD31598	103.00	104.50	1.50	.013	.18	.06	1.9	.01			129	1762	592				84	62		3	1.9	6	
BCD31599	107.40	108.90	1.50								48	511	389				101	80		3	1.5	5	
BCD31600	108.90	110.40	1.50								39	190	239				84	56		3	1.3	10	
BCD31601	115.90	117.40	1.50								53	957	276				251	449		13	2.5	40	
BCD31602	117.40	118.90	1.50								50	720	497				131	114		5	1.7	4	
BCD31603	122.30	123.80	1.50								27	922	272				134	311		9	2.0	38	
BCD31604	123.80	125.30	1.50								34	579	902				239	85		10	2.1	47	
BCD31605	127.60	129.10	1.50								43	317	234				411	72		14	1.9	42	
BCD31606	131.80	133.30	1.50								14	46	39				402	54		8	0.6	56	
BCD31607	133.30	134.50	1.20	.025	.49	.11	12.2	.37			252	4954	1099				539	40		94	12.2	368	
BCD31608	134.50	136.00	1.50								43	193	189				410	56		21	1.9	49	
BCD31609	143.90	145.40	1.50								42	63	94				692	127		13	1.1	63	
BCD31610	149.80	150.00	0.20	.311	.07	.23	131.8	.16			3113	658	2277				1224	65		1280	131.8	158	
BCD31611	151.50	152.80	1.30	.004	.01	.01	1.2	.03			41	60	121				488	63		16	1.2	32	
BCD31612	152.80	153.60	0.80	.414	.12	.22	189.3	.16			4143	1191	2180				1437	152		2018	189.3		

Sample	From (m)	To (m)	Length (m)	CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB
BCD31613	153.60	154.40	0.80	.220	.60	.12	49.1	.08			2199	5966	11593				1248	73		706	49.1	
BCD31614	154.40	156.00	1.60	.028	.03	.02	6.4	.09			278	312	223				789	110		121	6.4	86
BCD31615	157.40	158.90	1.50	.004	.01	.01	3.0	1.22			36	116	112				8275	115		129	3.0	1230
BCD31616	158.90	160.40	1.50	.003	.03	.02	1.4	.16			28	283	205				1857	121		27	1.4	157
BCD31617	160.40	161.90	1.50								22	86	40				1020	88		12	0.2	28
BCD31618	170.90	172.40	1.50								73	293	153				49	81		32	2.3	5
BCD31619	172.40	174.10	1.70	.037	.56	.32	5.7	.01			371	5580	3193				40	55		183	5.7	2
BCD31620	174.10	175.60	1.50	.022	.11	.03	4.7	.03			223	1129	323				51	95		99	4.7	32
BCD31621	185.30	185.80	0.50	.003	.01	.01	1.3	.01			30	92	44				8	633		9	1.3	
BCD31622	185.80	187.10	1.30	.004	.01	.01	0.6	.01			36	49	43				77	141		8	0.6	5
BCD31623	209.10	209.80	0.70	.002	.01	.01	1.5	.04			23	70	38				146	92		6	1.5	
BCD31624	227.80	229.30	1.50					.02			31	88	33				42	68		6	1.8	
BCD31625	229.30	230.80	1.50					.02			62	513	42				64	84		6	0.6	
BCD32276	230.80	232.40	1.60								53	173	93				54	108		8	0.9	24
BCD32277	277.60	279.10	1.50								15	79	29				30	80		2	0.2	1
BCD32278	279.10	279.55	0.45					.01			6	37	27				22	57		4	0.2	
BCD32279	281.00	282.50	1.50								25	35	14				44	62		2	0.1	2
BCD32280	307.30	308.80	1.50								112	56	51				89	127		2	0.3	4
BCD32281	308.80	310.30	1.50								58	64	63				143	68		6	0.5	14

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: SE PIT

PLOTTING COORDS GRID: Sam est.
NORTH: 825.00N
EAST: 9300.00W
ELEV: 1495.00

ALTERNATE COORDS GRID: ESTIMATED
NORTH: 8+25N
EAST: 93+ 0W
ELEV: 1500.00

COLLAR DIP: -88° 0' 0"
LENGTH OF THE HOLE: 504.40m
START DEPTH: 0.00m
FINAL DEPTH: 504.40m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: June 23, 1991
DATE COMPLETED: 0, 0
DATE LOGGED: 0, 0

COLLAR SURVEY: NO
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: FRONTIER DRILLING
CASING: LEFT IN HOLE
CORE STORAGE: SAMEX CAMP

PURPOSE: P-17 HAD TO REDUCE TO BQ AT 1227' DUE TO FAULTING.

DIRECTIONAL DATA: (as laid out by topofil,AH91)

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
85.60	-	-87° 0'	ACID	OK		-	-	-	-	-	
145.30	-	-85°30'	ACID	OK		-	-	-	-	-	
197.20	-	-77° 0'	ACID	OK		-	-	-	-	-	
288.50	-	0° 0'	ACID		NO ETCH	-	-	-	-	-	
346.60	-	-72° 0'	ACID	OK		-	-	-	-	-	
260.50	197° 0'	-76° 0'	MULTISHOT	OK	SPERRY SUN	-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 3.00	«CSG»	No recovery.				
3.00 TO 322.10	«MAF VOLC/F LT BX»	Dark green. Typical green chloritic Sam mafics, but with only minor quartz-calcite veinlets. Core is very broken but a strong foliation exists at: Ghosted pale green lapillis become common at 73m, and this rock type continues through 208m with minor broken core and fault breccia throughout. From 208-?(320m) the core is shattered and badly broken. Bleaching is patchy over 0.5-1.0m runs. Dolomite-quartz veining, much of low angles to core axis, comprises 25% of the core. {218.8-221.5} «Flt at 30 deg» {300.8-303.5} «Clay Flt Gou»	30	Chlorite and very minor dolomite locally. {23-25.4} «Flt Bx» {32.2-57} «Flt Bx» Fault breccia is friable throughout. Notably low in quartz-carbonate veining {146.5-175.0} «Flt Bx» {314.5-320.3} «Flt Bx» Patchy dol'n associated with veining from 208m. Minor yellow-brown sericite after chlorite.	Trace disseminated pyrite only. Trace to minor disseminated pyrite associated with dolomite (<2%). At 206.5-206.8m a dolomite vein contains 3% gn and sp.	
322.10 TO 365.00	«DOL MAF VO LC»	Brown and grey. Fairly sudden change to brown sericitic, strongly carbonatized mafics. Fault brecciation also stops. Ghosted lapilli still visible to end of interval, marked by fault breccia and qdv over 20cm. FOLIATION avg.	55	Pervasive brown sericite after chlorite with minor chlorite surviving. Also patchy grey fe-dol flooding.	2-3% disseminated pyrite.	Very competant core.
365.00 TO 373.30	«GRY SER/SE D FLT BX»	Variably broken, gougey, and schistose mixed sediments. Unit starts below a 10cm clean qdv and from {365.1-365.9} «Het Frag» with yellow sericitic, argillite, and cherty clasts up to 4cm stretched out 7:1. Below this is a fault brecciated, disrupted, silicified argillite/siltstone/wacke pile. Argillite laminae have survived, while coarsely beds are strongly grey sericitic, and pyritic. Faulted schistosity 90-40 degrees.	55	Patchy, white, broken veins (<10%) and silica flooding. Grey sericite/pyrite alteration also patchy, moderate to intense.	Overall 7% disseminated pyrite. Best sample is:{368.6-369.3} «15% py, tr sp»	
373.30 TO 437.60	«GREY SER/P Y DF SEDS»	Rather monotonous pile of "washed out" grey sericite/pyrite schist that cores well and strongly over prints primary sed textures. Most of pile displays relict coarse lithic wacke to he frag textrures typical of debris flows. From {409.2-410.0} «Arg» finely laminated, and contorted with pyrite laminae; has escaped sericitization. Fairly even textured with strong foliation at..... From {406.2-406.8} «Fold Hinge» broad and open.	70	Strong, near complete grey sericitization with accompanying finely disseminated pyritization. An excellant argument for diagenetic development as no veining is present at all, except: {398.9-399.2} «Barren Qdv 25 deg» and «10% from 379-390». Spotted dol overgrowths common throughout, especially from 410.5-end of hole. Probably indicating primary carbonate component.	Finely disseminated pyrite throughout. Selectively alters coarser beds in argillaceous portions. {373.3-437.6} «10% Pyrite» {427.9-437.6} «Het Frag» with recognizable clasts up to 4cm stretched out to 4:1 at 60 degrees.	Natural wedging after reduction to BQ size core 370.9-end of hole. Redundant core from 370.9-373.9m.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
437.60 TO 438.50	«QV ZONE»	Gradational, silicified contacts with quartz veined zone. Interval begins with semi-massive pyrite for 20cm and followed by relatively barren smokey grey quartz and sil wall rock.		Intensely sil. wallrock slivers contained within interval of white and smokey grey vein quartz.	‖437.6-438‖ «25% py, 10% sp, tr gn, sp» in massive seam along vein margin. Remainder of veined zone has spotty pyrite and trace sp.	
438.50 TO 444.30	«SIL ARG + CHT?»	Gradational upper contact, faulted lower contact. Interval is highly contorted light grey "cherty" silicified argillite and short 10-20cm runs of black argillite. Possibly a primary chert? component. FOLIATION at.....	50	Intense patchy-pervasive sil associated with 15% white stockwork quartz veinlets.	3-4% and trace sp only, disseminated and in veins. Trace gn in veinlet at 442.8m also.	
444.30 TO 455.30	«ALT'D MAF»	Brittle fault breccia at ‖443.3-443.6‖ «Flt Bx». The interval begins with brilliant green fuchsitic rock, pervasively silicified, with coarse pyrite grains in thin seams and disseminated throughout. From 445.8m down the interval is less siliceous, carbonatized mafic tuff(?), with only minor fuchsite, and a minor argillaceous component.		‖443.3-445.8‖ «Sil/Fuchsite/Py» ‖445.8-450.5‖ «Dol/Py» Also quartz-carbonate vein from 451.5-451.9m with trace cpy, and "mutlike" alt. on HW side for 1.0m.	5% pyrite over first half of interval, with euhedral aspy grains (2-3mm) at 445m and 445.7m (trace). Dol portions 2-3% pyrite disseminated only.	
455.30 TO 463.80	«SIL ARG +/ - TUFF»	Conformable contact at angle of: Interval of black argillite, highly contorted and silicified, internally brecciated, with subordinate pale green to brown tuff interbeds (15%). Conformable lower contact.	80	Stockwork quartz veinlets (20%) and pervasive silicification of argillaceous breccia. Minor dolomite of tuffaceous component with brown sericite and at 460.4-460.6m yellow sericite.	Only 2-3% fracture filling pyrite. Minor graphite at 463m.	
463.80 TO 486.50	«DOL MAF +/ - ARG»	Typical dolomitized mafic volcanics, with brown sericite and grey dol patches. Foliaiton strong at 465.5m..... Silicified argillite as above from ‖472.3-474.5‖ «Sil Arg» and ‖486.2-486.5‖ «Sil Arg»	55	Carbonatized mafics predominate. ‖473.2-473.4‖ «Flt Bx»	2-3% disseminated pyrite except ‖469.8-472.3‖ «5% py, tr cp» associated with qdv's.	
486.50 TO 504.40	«SER/QTZ SC HIST»	Faulted contact with pale yellow sericite schist with 20% quartz "segregations" forming bands across core roughly parallel to foliation at..... Minor black argillite component from 492.3-494.2m. Pale green chloritic wisps become a minor component increasing downhole. ‖486.5-487.2‖ «Flt» Fabric is weakening downhole. END OF HOLE.	55	Strong yellow sericite and silicification.		Very finely laminated relict tuffaceous textures, highly contorted.

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB		COMMENTS
BCD45456	362.50	364.00	1.50								79	901	960				78	40		10	2.1	10		
BCD45457	364.00	365.10	1.10								45	397	617				220	112		1	1.2	11		
BCD45458	365.10	365.90	0.80								36	51	95				133	123		1	0.8	20		
BCD45459	365.90	367.40	1.50								8	86	41				66	84		1	0.4	1		
BCD45460	367.40	368.60	1.20								14	110	77				97	232		1	0.4	2		
BCD45461	368.60	369.30	0.70	.097	.31	.46	7.1	.02			968	3067	4592				540	169		178	7.1	18		
BCD45462	369.30	371.00	1.70								34	74	151				50	150		3	0.8	5		
BCD45463	371.00	371.80	0.80								39	202	60				40	246		2	0.8	2		
BCD45464	371.80	373.30	1.50								85	129	99				48	132		6	0.6	4		
BCD45465	373.30	373.90	0.60								46	24	47				63	94		2	1.1	2		
BCD45466	373.90	375.40	1.50								18	30	59				51	169		1	0.6	12		
BCD45467	375.40	376.90	1.50								41	57	74				53	134		1	0.5	2		
BCD45468	376.90	378.40	1.50								63	27	56				45	159		1	0.3	3		
BCD45469	378.40	379.90	1.50								94	33	85				83	162		1	0.5	2		
BCD45470	379.90	381.40	1.50								58	166	36				69	154		1	0.5	10		
BCD45471	381.40	382.90	1.50								65	17	69				56	135		1	0.5	21		
BCD45472	382.90	384.40	1.50								42	69	114				53	144		1	0.6	2		
BCD45473	384.40	385.90	1.50								37	66	106				101	120		1	0.7	1		
BCD45474	385.90	387.40	1.50								39	250	585				91	156		1	0.9	2		
BCD45475	387.40	388.90	1.50								39	22	29				100	138		1	0.2	24		
BCD45476	388.90	390.40	1.50								44	45	51				96	131		1	0.3	1		
BCD45477	390.40	391.90	1.50								55	57	136				60	108		1	0.3	1		
BCD45478	391.90	392.90	1.60								114	819	656				61	109		2	0.7	15		
BCD45479	392.90	394.40	1.50								80	47	60				44	142		1	0.1	18		
BCD45480	394.40	396.90	2.50								83	58	145				21	146		1	0.2	4		
BCD45481	396.90	397.40	0.50								86	76	53				34	176		2	0.3	12		
BCD45482	397.40	398.90	1.50								126	75	76				31	157		1	0.2	14		
BCD45483	398.90	399.20	0.30								31	52	538				1	39		6	1.2	1		
BCD45484	399.20	400.20	1.00								77	151	79				37	160		1	0.1	16		
BCD45485	408.00	409.20	1.20								83	140	36				1	127		1	0.1	20		
BCD45486	409.20	410.40	1.30								76	66	33				36	126		1	0.1	26		
BCD45487	428.50	431.00	2.50								42	106	36				44	175		3	0.1	7		
BCD45488	431.00	432.50	1.50								37	111	23				29	185		1	0.1	2		
BCD45489	432.50	434.00	1.50								43	120	31				42	162		3	0.1	11		
BCD45490	434.00	435.50	1.50								40	92	28				36	184		3	0.4	8		
BCD45491	435.50	437.00	1.50								26	71	54				44	104		3	0.3	21		
BCD45492	437.00	437.60	0.60								25	19	66				111	88		4	0.3	75		
BCD45493	437.60	438.00	0.40	.040	2.15	1.29	23.6	.39			364	18106	9752				3480	14		101	18.3			

Sample	From (m)	To (m)	Length (m)	CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB
BCD45494	438.00	438.50	0.50								21	24	80				78	169		3	0.4	32
BCD45495	438.50	439.40	0.90								29	138	163				241	89		10	0.7	89
BCD45496	439.40	440.80	1.40								21	165	461				120	127		5	1.0	63
BCD45497	440.80	442.30	1.50								26	25	56				78	62		6	1.0	118
BCD45498	442.30	443.30	1.00	.011	.20	.27	5.9	.06			111	2016	2717				105	78		18	5.9	61
BCD45499	443.30	444.30	1.00	.045	.08	.03	0.5	.19			451	766	279				3506	51		26	0.5	186
BCD45500	444.30	445.80	1.50	.025	.14	.03	0.2	.21			245	1391	313				7105	116		48	0.2	214
BCD45501	445.80	447.20	1.40								41	135	173				446	101		1	0.5	27
BCD45502	450.50	451.50	1.00								79	54	234				148	140		1	0.2	82
BCD45503	451.50	451.90	0.40								125	37	81				49	63		1	0.9	9
BCD45504	451.90	452.90	1.00								228	146	64				493	36		1	0.7	19
BCD45505	469.80	470.40	0.60	.224	.40	1.52	15.6	.07			2243	3953	15246				334	107		31	15.6	68
BCD45506	470.40	471.50	1.10	.010	.02	.10	0.7	.03			97	182	988				272	66		1	0.7	27
BCD45507	471.50	472.30	0.80	.252	.73	.49	9.2	.04			2521	7338	4927				197	75		16	9.2	44
BCD45508	472.30	473.40	1.10	.015	.35	45	4.1	.02			147	3528	4460				98	222		10	4.1	23
BCD45509	473.40	474.50	1.10								26	58	75				84	65		2	0.5	3

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: MBA GOLD ZONE

PLOTTING COORDS GRID: SAM GEOL
NORTH: 740.10N
EAST: 11899.00W
ELEV: 1031.35

ALTERNATE COORDS GRID: ESTIMATE
NORTH: 7+45N
EAST: 119+ 0W
ELEV: 1037.00

COLLAR DIP: -55° 0' 0"
LENGTH OF THE HOLE: 264.30m
START DEPTH: 0.00m
FINAL DEPTH: 264.30m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: June 24, 1991
DATE COMPLETED: June 26, 1991
DATE LOGGED: June 27, 1991

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: FRONTIER DRILLING
CASING: PULLED
CORE STORAGE: SAMEX CAMP

PURPOSE: FOLLOW-UP GOLD VEINS IN RG398, 100M UPSTRIKE TO THE SE.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
122.00	-	0° 0'	ACID		POOR ETCH	-	-	-	-	-	
188.00	-	-53° 0'	ACID	OK		-	-	-	-	-	
244.40	-	-51° 0'	ACID	OK		-	-	-	-	-	
121.00	228° 0'	-54°30'	SING.SHOT	OK	SPERRY SUN	-	-	-	-	-	
255.10	222° 0'	-50° 0'	SING.SHOT	OK	SPERRY SUN	-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 40.80	«CSG»	No recovery.				
40.80 TO 55.60	«SIL/SER MI XED SEDS»	Black, grey, yellow, and brown. Mixed altered sediments displaying local soft sediment deformation and "het frat" debris flow textures over short 20-30cm intervals. Laminated, black and white silicified argillite, and pale yellow-green to brown sericitic intervals separate the fragmentals. Warped foliation average orientation at..... Fragmental's clasts are not stretched	70	Silicification is weak to moderate and deformed veinlet (5%) controlled. Patchy yellow-green and brown sericite appears protolith dependant. Black argillite comprises 30% of interval in bands. Patchy dol with assoc. brown sericite is minor until 51.4m, then is main alt. to end of interval.	Disseminated fine to medium grained pyrite comprises 2-3%. ‡40.8-55.6‡ «25% het frag» ‡51.4-55.6‡ «mafics?»	
55.60 TO 67.50	«QTZ-DOL VE IN»	Upper contact is 10cm gouge. Unit is comprised of a coarse grained, milky white, quartz +/- carbonate vein (80:20). Very broken and limonite stained on fractures that are open. A large sliver of highly altered ?mafic wallrock from 57.1-58.3m. From ‡66.1-67.5‡ «Flt Gou+Bx» is broken qv in grey pyritic gouge. Broken contact and fractures at angle of.....	30	Wallrock slivers(15%) and fragments are wholly altered to brown sericite, pyrite, dolomite + talc.	5% pyrite, only associated with altered wallrock inclusions.	Metallic assays throughout. No visible gold observed but core is rusty and fairly broken.
67.50 TO 91.10	«SIL/SER TU FF»	Silicification is pervasive and weakens downhole. Interval is fairly monotonous pale yellow green sericitic. Almost cherty from 67.5-75.3m due to pervasive sil. Strong spaced cleavage, now infilled with fine wispy pyrite, cuts kinked and contorted sericite rock. Cleavage ranges from 30-90 degrees but most commonly at..... Brittle flt breccia from ‡77.6-84.0‡ «Flt Bx, 20% qdv» is possible fold nose.	60	Intense pervasive yellow-green sericite overprinted by very intense sil which weakens downhole.	Wispy fracture filling pyrite 5-10% throughout. Most intense from 67.5-71.3 where up to 20% pyrite in 5cm seams associate with sil. Veined interval from 78.7-84.0m has 5% pyrite and traces of sp and cp only.	
91.10 TO 140.60	«SER SCH/TU FF?»	Pale yellow green, monotonous pile of very fine grained, dense sericite. Faint laminations are highly contorted and marked by wispy disseminated pyrite, and minor quartz-dolomite stringers. Overall 95%+ sericite! Moderate to strong cleavage FOLIATION at Faulting: ‡96.4-96.8‡ «Brittle Flt» ‡124.1-125.7‡ «Brittle Flt», both cored well but are friable, with qv. frags (<10%).	50	Intense, pervasive, complete pale yellow-green sericitization. Possibly diagnetic sericite formed in limy siltstone? Lighter colored laminations stain pale blue. ‡133.3-133.7‡ «Qdv».	3% disseminated and wispy fracture filling fine pyrite.	Complete lack of argillite is certainly notable.

124

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
140.60 TO 198.70	«QTZ/SER SI LT ARG»	Yellow and black. Marks the beginning of brecciation, increase in quartz-dolomite veining (15%), and appearance of dark green to black chloritic and argillaceous band from 10-50cm thick. From ⫞162.9-163.7⫟ «Felsic Dyke?» which is light grey, aphanitic, and very hard and siliceous. Only trace pyrite on fractures. Contacts sharp and parallel to foliation..... Compare lithochem to ⫞181.9-182.9⫟ «Ribbon Cht» which is light/dark grey and barren with interval hydrobreccia texture.	60	Strong pale yellow-green sericitization is dominant (70%) but is separated by dark bands of argillite-chlorite-dolomite overgrowths. Probable an argillite siltstone-mudstone package now variably altered.	Veining is mostly barren except for 2% pyrite. Margins of some veins show chlorite after sericite. Also..... ⫞168.5-169.9⫟ «Qv In Flt Bx» resembling the gold veins in RG398. ⫞174.0-175.8⫟ «Qv's In Flt Bx» resembling the gold veins in RG398.	Short veined intervals throughout are sampled for Au.
198.70 TO 215.50	«SIL ARG +/ - SER»	Beginning of interval marked by sudden appearance of disseminated pyrite (7%) throughout in grey to black contorted siltstone and argillite. Short intervals of yellow sericite still present but in minor amounts. From ⫞211.9-215.5⫟ «Qdv's All Angles» resemble gold veins.		Silicification pervasive to fracture controlled from highly deformed white veins (20%). Patchy sericite is subordinate, & from 207.5m to end of interval it has undergone 50% destructive alteration to green-brown chlorite.	5-7% fine to coarse disseminated and fracture filling pyrite.	
215.50 TO 252.00	«SER SILT S EDS»	Return gradationally to monotonous pale yellow-green sericite rock after siltstone(?). Typical wispy pyrite along contorted laminae. From ⫞225.5-226.5⫟ «Flt Bx» is very brittle.		Pervasive, complete sericitization. Minor thin contorted quartz stringers. Trace chlorite marginal to quartz stringers.	3% wispy pyrite.	
252.00 TO 264.20	«SER SILT A RG SEDS»	Return of black and green laminated interbands. Highly contorted with strong cleavage at..... Fault breccia from 259.0-261.0m. Typical "yellow and black" lithology. END OF HOLE.	70	Minor olive green sericite(?) after patchy yellow sericite (90%). Minor chlorite associated with quartz veinlets. Real "grab-bag" of alteration types probably reflecting primary rock types.	3% wispy pyrite.	

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
BCD32282	49.90	51.40	1.50								81	51	50				115	141		5	1.2	68	
BCD32283	51.40	52.90	1.50								85	118	108				218	165		4	1.1	156	
BCD32284	52.90	54.40	1.50								57	276	132				241	185		2	0.9	54	
BCD32285	54.40	55.60	1.20								47	178	128				170	411		4	0.7		
BCD32286	55.60	56.60	1.00								15	184	96				47	40		2	1.0		
BCD32287	56.60	57.50	0.90								6	9	6				20	17		1	0.4		
BCD32288	57.50	58.30	0.80								74	172	57				249	301		1	0.1		
BCD32289	58.30	59.70	1.40								23	35	28				76	149		1	0.5		
BCD32290	59.70	61.20	1.50								22	30	46				77	79		1	0.4		
BCD32291	61.20	62.90	1.70								12	13	19				25	13		1	0.6		
BCD32292	62.90	64.30	1.40								9	6	15				19	8		1	0.4		
BCD32293	64.30	68.10	1.80								41	29	106				29	36		2	3.2		
BCD32294	66.10	67.50	1.40								27	122	73				94	414		6	0.7		
BCD32295	67.50	68.50	1.00								17	49	24				208	194		4	0.5		
BCD32296	68.50	69.80	1.30	0.01	0.036	0.008	4.3	0.10			102	360	75				626	99		33	4.3	104	
BCD32297	69.80	71.30	1.50								29	76	56				365	94		6	0.9	89	
BCD32298	78.70	80.20	1.50	.004	.01	.01	1.6	.01															
BCD32299	80.20	81.70	1.50	.005	.04	.01	1.9	.02															
BCD32300	81.70	83.30	1.60	.040	.04	.05	4.7	.03															
BCD32301	83.30	84.00	0.70	.016	.01	.01	1.9	.02															
BCD32305	124.10	126.10	2.00	.003	.01	.01	0.1	.49			27	33	20				142	51		2	0.1	494	
BCD32306	126.10	127.10	1.00								35	36	18				132	64		3	0.1	13	
BCD32302	140.60	142.50	1.90								9	57	22				70	78		2	0.1	3	
BCD32303	142.50	143.60	1.10								11	38	18				57	45		3	0.1	2	
BCD32304	143.60	144.90	1.30								33	49	14				72	55		2	0.1	2	
BCD32307	153.30	153.70	0.40								8	72	15				41	56		1	0.1		
BCD32309	167.80	168.50	0.70								28	93	81				271	112		5	0.1		
BCD32310	168.50	169.90	1.40								32	426	142				86	300		3	0.4		
BCD32311	169.90	170.90	1.00								45	67	43				111	94		4	0.1		
BCD32312	174.00	175.40	1.40								36	62	37				49	76		2	0.1		
BCD32313	175.40	175.80	0.40								7	79	29				1	14		1	0.1		
BCD32315	182.90	184.00	1.10								49	51	26				62	55		3	0.1	1	
BCD32316	184.00	185.20	1.20								40	40	17				79	91		3	0.1	2	
BCD32317	185.20	186.20	1.00								32	42	28				146	88		4	0.1	16	
BCD32318	197.80	198.30	0.50								19	196	16				57	63		1	0.1		
BCD32319	211.90	213.10	1.20								50	33	22				97	85		2	0.1		
BCD32320	213.10	214.00	0.90								35	32	21				55	173		3	0.1		
BCD32321	214.00	215.30	1.30								219	44	16				62	103		3	0.1		

Sample	From (m)	To (m)	Length (m)	CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB		
BCD32322	215.30	215.50	0.20								18	27	28				62	25		1	0.1			
BCD32323	260.90	264.00	3.10								16	39	10				50	79		1	0.1	2		

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
BCD32308	162.90	163.70	0.80	91.89	1.77	.33	.54	.03	.40	1.84	.10	.07			12	34			5	27	0.4	21	.01		.06	97.03	46	3
BCD32314	181.90	182.90	1.00	93.47	1.71	.07	.37	.06	.35	1.35	.06	.06			31	18			5	24	0.1	12	.01		.12	97.63	25	3

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: `MBA' GOLD ZONE

PLOTTING COORDS GRID: SAM GEOL
NORTH: 878.71N
EAST: 12000.20W
ELEV: 1040.12

ALTERNATE COORDS GRID: ESTIMATED
NORTH: 8+89N
EAST: 120+ 0W
ELEV: 1048.00

COLLAR DIP: -55° 0' 0"
LENGTH OF THE HOLE: 358.70m
START DEPTH: 0.00m
FINAL DEPTH: 358.70m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: June 26, 1991
DATE COMPLETED: June 30, 1991
DATE LOGGED: June 30, 1991

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: FRONTIER DRILLING
CASING: PULLED
CORE STORAGE: SAMEX CAMP

PURPOSE: TO TEST THE DOWN DIP EXTENSION OF THE `MBA' GOLD ZONE.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
50.90	-	-55° 0'	ACID	OK		-	-	-	-	-	
121.00	-	-55° 0'	ACID	OK		-	-	-	-	-	
157.60	-	0° 0'	ACID	NO	BAD ETCH	-	-	-	-	-	
197.20	-	-55° 0'	ACID	OK		-	-	-	-	-	
279.50	-	-55° 0'	ACID	OK		-	-	-	-	-	
317.60	-	-54° 0'	ACID	OK		-	-	-	-	-	
151.50	219° 0'	-55°30'	SING.SHOT	OK		-	-	-	-	-	
352.70	238°30'	-51°30'	SING.SHOT	OK		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 29.90	«CSG»					
29.90 TO 46.10	«BL ARG/CAR B/SIL ALT»	Black, grey. Fine to 5mm. The protolith is a black argillite with silty laminae. Bedding is locally contorted. Alt'n locally bleaches core to a very pale grey. General sense of bedding... 2% white quartz/carbonate veining crosscuts bedding. Core relatively blocky, locallized shear and gouge zones. ‖36.9-38.1‖ intermittant «Flt Bx». Contact with underlying mafics is faulted.	55	299-36.1m: Interval is intensely carbonate altered - coarse porphyroblasts of fe-poor calcite grow in an ankerite matrix at top of interval. By 30.4m original protolith is completely altered. Carbonate is nearly massive in appearance locally, but in general coarse blades/porph can still be seen. Alteration starts weakening at 33.2m. 38.5-46.1m: Patchy weak to moderate silicification. Possibly cherty locally.	Carbonte altered rock is sulphide poor. Black argillites contain 5% fine grained stringers, patches, seams of pyrite. ‖45.0-46.1‖ «20% Pyrite»	
46.10 TO 76.70	«DOL MAF VO L»	Grey. Fine grained. Interval consists of an intensely dolomitized mafic volc. Alteration destroys original textures. Core is grey in colour with a green tint. 3% quartz/carbonate (80/20%) veining veins are generally oriented at low angles to core axis. ‖46.1-46.7‖ «Flt Bx» ‖66.3-67.5‖ «Qtz/Carb Vn».		Intense dolomite/ankerite alteration bleaches core. Spotted texture caused by alteration/overprinting. Fuchsite occurs on margins of some veins; minor talc in sheared zones.	<1% fine grained disseminated pyrite.	
76.70 TO 85.90	«BL ARG/CAR B-SIL ALT»	Black, grey, white. Fine to 7mm. Protolith is an argillite which may have been somewhat cherty locally; minor altered volcanics? Core is very blocky. ‖84.2-84.4‖ «Flt Bx»		30% of interval is weak to moderately silicified caused by quartz veining and flooding. Argillite is weakly graphitic in these zones. Where the core is not silicified it is commonly carbonatized. Zones of argillite contain coarse crystals locally euhedral, of white, dolomite in an ankerite altered groundmass. In some instances dolomite/ankerite occur with quartz. Intense carb alt'n occurs between 78.8-79.5m and 85.2-85.9m.	1% fine grained, fine to coarsely disseminated pyrite.	
85.90 TO 86.60	«DOL MAF VO L?»	Grey. Fine grained. Interval is the same as that between 46.1-76.7m except there is 10% patchy quartz veining.		Intense carbonate alt'n with greenish sericite as in 46.1-76.7m.	5% pyrite.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
86.60 TO 88.45	«QTZ VN»	White. Core is very blocky. Massive white quartz contains 5% white to grey carbonate (+/- feldspar ?) and 10% altered wallrock inclusions. Contacts at.....	75	Carbonate, sericite alt'n of wallrock fragments.	1% fine to medium grained pyrite in wallrock, and coarsely disseminated in the vein.	
88.45 TO 93.90	«SER SEDS»	Grey, black, brown, white. Fine grained. Black argilliceous sediments are banded by grey, brown, yellow sericitically altered sediments. 90% of the interval is altered. Locally core has cataclastic textures and minor isoclinal folds. Axial plane..... ‡88.95-90.15‡ «Flt Bx» 91.2-91.4m: White quartz/carbonate vein (85/15%) with contacts oriented at..... General sense of foliation.....	45 25 60	Patchy weak to intense sericite alteration. Minor silicification.	2-3% coarsely disseminated pyrite.	
93.90 TO 113.80	«CHERT/ARG/ TUFF?»	Grey, black. Rock types varies between a coarsely laminated to cherty argillite. Locallized contortions of bedding are common. The cherty end of the spectrum is prevalent. Core is very blocky, intermittant fault bx throughout. ‡95.8-99.3‡ «Brittle Flt Bx». 5% white quartz veining/patches. 103.4-103.75m: Quartz vein. ‡106.7-109.1‡ intermittant «Flt Bx».		Minor graphite in argillite. 93.9-96m: Cherts have been moderately sericite altered. Sericite is grey to pale brown in colour.	2% fine grained coarsely disseminated pyrite. ‡93.9-96.5‡ «4%Py, 2%BM» Sulphides are fine grained and very coarsely disseminated in silicified zones. BM concentration sp>gn=cp. 100.1m: An irregular 6cm wide, patch of quartz veining contains 12% sp, 2% tt, 10% cp, 7% gn, 10% py. Sulphides are coarsely disseminated. 110.5-110.7m: 20% fine grianed pyrite bands/disseminated associated with quartz veining.	
113.80 TO 117.30	«SER/PY ALT VOL?»	Green, grey. Fine grained. Intense alteration destroys original textures. Contacts are sheared/ fault gouge. 35% white quartz veining which occurs in the interval 114.8-116.3m. The vein is patchy + contains some black argillite fragments. Weak, intermittant fault breccia occurs between 113.8-115.9m. Some low angle warped foliation.		Matrix is weakly Fe-dol altered. Pervasive moderate to intense green to brown sericite alt'n, small amounts of fuchsite present.	113.8-115.9m: 15% fine to medium grained pyrite disseminated, bands and patches. Minor narrow semi-massive zones. 115.9-117.3m: 5% pyrite.	There is a good possibility that the interval is an altered sediment.
117.30 TO 120.00	«SIL/CHERTY ARG»	Black, whtie. Fine grained. Bedding in argillite/ cherty argillite is weakly contorted. Argillite locally is finely laminated by cherts. 10% of interval is patchy white quartz veining. Locally the veins have been brecciated.		Argillite is weakly silicified in vicinity of quartz veining.	Minor to 1% fine grained, pale brown sphalerite is disseminated in quartz. 2% coarsely disseminated pyrite.	

93.9-
190.3

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
120.00 TO 143.10	«ALT VOL?/SED TR ZN»	Grey, black, brown. Interval consists of 60% intensely altered mafic volcanics which are interbedded with argillites. Argillites are thenselves frequently intensely altered - presumably some silty sediments were present & have been altered. 5% fault brecciation within the interval. Individual zones are <20cm wide. 15% grey quartz/carbonate veins/ veinlets. There has been some minor folding of the veinlets. Some veins can contain 60% coarse grained Fe-dolomite. Upper and lower contacts are faulted.		Volc? are very Fe-carbonate rich. This alt'n bleaches the core. Brownish sericite bands are weakly developed. Minor talc. Argillites have a preponderance for altering to grey sericite.	1-3% disseminated pyrite. Trace sphalerite in quartz/carbonate veins. Between 132.6-133.8m and 135.4-136.7m. There is 7% pyrite.	"Dol Seds"
143.10 TO 156.30	«ARG FLT BX»	Black, White. Fine grained. Argillite has been intermittantly fault bx throughout the interval; faulting decreases downhole. Interval contains 20% white quartz veining which has also been bx by faulting. Quartz veins can contain up to 40% pale grey coarse grained fe-dol.		Argillite is weakly graphitic. Argillite has been weakly silicified by and in the vicinity of veins.	Pyirte content varies between 1-5%. Pyrite is generally fine grained, coarsely disseminated. Minor sphalerite is disseminated in quartz/carbonate veins. [152.2-152.4] «1%gn 3%cp 10%py» sx are fine grained, coarsely disseminated in quartz.	
156.30 TO 191.40 176.4-177.6	«ALT MIXED SED/VOL»	Grey, black, white. Interval consists of 10% black argillite, 15% het frag, 10% quartz/carbonate veining and 65% grey altered volcanics?. Volcanics are strongly altered, alteration tends to wash out original textures. Argillite is patchy interbedded with the het frag & volcanics; bedding is indeterminant. Argillite also locally occurs as wispy `beds' with the volc (possibly altered silt/sandstone). [167.6-169.1] «Het Frag» [171.3-173.6] «Het Frag» [174.6-175.2] «Het Frag» Clasts are sericitized volc/seds, argillite, quartz in a silty matrix. Clasts comprise up to 60% of the fragmental intervals. Some highly altered core appears to have originally been clastic but alt'n washes out most textures. Quartz/dolomite (80/20) veins are white to grey in color. Veins are irregular-occur as stringers to veins, patches. Vein orientation is highly variable particularly within argillite. [162.35-163.6] irregular «Qtz/Carb Vn» oriented subparallel to core axis. [169.4-170.6] patchy «Qtz Vein»ing and silicification.		Volcanics? are intensely Fe-dol altered and banded by <20% brown sericite. Argillite is locally moderately silicified. Silicification is related to the abundant white/grey quartz veins, stringers, and patches that occur within the argillite. Matrix of het frag interval is sericitized grey to brown in color. 174.6-177.5m: Patchy intensely green fuchsite and talc alt'n closely associated with quartz veining.	Het frag and argillite contains 5-7% fine to medium grained, coarsely disseminated and patchy pyrite. Minor disseminated sphalerite in the quartz veins. [161.4-161.6] «20%py 12%sp 2%gn» in a quartz vein oriented at 45 degrees to core axis.	Sample between 176.1-177.6m returned decent values but the only distinguishing characteristic is minor narrow white quartz veinlets and a small fault gouge zone. Footwall sample taken.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		‖183.7-184.05‖ «Qtz/Carb Vn» ‖177.2-177.5‖ «Flt Bx»				
191.40 TO 192.80	«QTZ/DOL VN »	White. Coarse grained. Bull white quartz vein containing 25% grey to pink coarse banded Fe-dol (ankerite). Upper contact is fault brecciated. Lower contact at.....	60			
192.80 TO 208.85	«HET FRAG/S EDS»	Grey, black, white. Fine to 4cm. Het frag comprises 70% of interval. HF is interbedded with argillite and siltstone. In the HF <60% subangular to subrounded clasts are supported by a silty matrix. Bedding is indeterminant. Foliation at Interval is cut by 15% white, irregular and locally deformed/cleaved quartz veining. Quartz veining is preferentially concentrated within argillite/silt. 205.7-206.0m: 50% patchy quartz veining becomes a well developed quartz vein breccia between 206.0-206.3m and again tetween 206.63-206.7m, on margin of a quartz pyrite vein zone. Clasts are angular and are comprised of argillite. ‖208.15-208.45‖ «Flt Bx»	85	Weak but pervasive grey to yellowish sericite alt'n gives core phyllitic sheen. Minor moderate yellow-green sericite alt'n. 192.8-193.1m: Intense dolomite alteration bleaches core. Patchy brown sericite banding and 4% green talc/fuchsite spottying (interval may be volc). 193.1-193.8m: Weakening dol alt'n in fine silt?	There is 5-10% fine to medium grained pyrite disseminated throughout interval local concentrations of 20-75% over narrow widths. ‖201.7-202.45‖ «60% py» semi-massive to massive pyrite in quartz, including a sulphide poor central, 10cm wide, section. Some pyrite may be cataclastic. ‖206.3-206.63‖ «75%py min cp+gn+sp+as» bull quartz. Quartz is transluscent grey to white in color. ‖207.85-207.92‖ quartz vein with coarsely disseminated sulphides «40%py 3%cp+sp tr gn» Trace galena seen in quartz clasts.	206-206.7m: MBA zone?
208.85 TO 210.00	«QTZ/CARB V N»	White. Coarse grained. Massive white, fractured vein contains 20% altered wallrock fragments and 15% coarse white to grey ankerite. Upper contact is gradational. Lower contacts in fault gouge.			1-2% fine grained pyrite is concentrated in the wallrock frags.	
210.00 TO 223.10 210-211.5	«DOL MAF VO L?»	Grey, green, white. Fine grained. Intense alteration destroys original textures 3% white to grey quartz veins and patches. ‖222.5-223.1‖ «Flt Gou».		Intense pervasive Fe-dol alt'n which is banded by green to brown sericite. Minor talc.	3-10% disseminated pyrite, local concentrations to 30% over 10cm widths. ‖201.3-210.45‖ «2%gn 1%sp 15%py» in quartz vein as fine to coarse disseminated and blebs. 216.2-217.8m: 1% sp, gn, 2% cp, disseminated in patchy quartz veining.	
223.10 TO 229.40	«HET FRAG»	Grey, black, white, buff. Fine to 5cm. Silty to argillaceous matrix supports up to 80% subangular to rounded clasts. Clast composition includes argillite, quartz and sericitized volc/seds. Mean clast size varies throughout interval. Interval contains numerous narrow fault gouge and shear zones. Intensity and frequency increases		Weak grey sericite alt'n give core some phyllitic sheen.	2% coarsely disseminated pyrite.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		with depth.				
229.40 TO 248.90	«DOL MAF VO L»	Grey, green. Fine grained. Identical to the unit between 210-223.1m. Intermittant fault bx zones between 229.4-234.7m. ‖237.2-237.6‖ «Flt Bx»		As in 210-223.1m. Minor fuchsite.	3-5% disseminated pyrite. 234.7-234.79m: 2% sphalerite, 8% py in silicified interval.	
248.90 TO 252.90	«MIXED SEDS »	Black, grey, white. Fine grained. Argillite is the principal rock type. Local interbeds of siltstone, het frag and tectonite or silt sed slump - contains quartz clasts. Het frag is poorly developed 20% altered volcanic clasts and argillite in a silt to sandy matrix. 15% white, crosscutting quartz/carb (90/10%) stringer, fracture filling veins and patches. Lower contact is faulted.		Patchy weak silicification of argillite.	3% fine grained, coarsely disseminated pyrite except between 251.3-252.9m, where there is 12% pyrite. Trace cp in quartz vein.	
252.90 TO 281.60 252.9-254.05 2	«QTZ-SER AL T SEDS»	Grey, yellow, white, black. Core has largely been intensely altered. Minor black argillite remnants present, small het frag intervals are locally only weakly altered, or are recognizable from clastic textures. Het frag intervals between 257.2-257.9m, 259.2-259.35m, 276.7-277.1m and 278.5-278.8m. Core has a banded appearance due to sericite and quartz-after bedding? Locally this bedding? is contorted. At 275.7m a strong, widely spaced cleavage is oriented at..... Intermittant narrow zones of fault bx over 10% of the interval. 10% white quartz/carbonate veins/veinlets and patches. Locally veinlets are strongly buckled. ‖252.9-255.25‖ patchy sulphide rich, «Qtz Vn». Quartz veining comprises 30% of interval Coarse quartz-Fe carbonate veins similar to those hosting visible gold mineralization occur at: ‖273.7-275‖ «Qtz/Carb Vn». The bulk of the vein occurs between 274.6-275m. Between 273.7-274.6m the vein is narrow (<2cm) and oriented subparallel to the core axis. Minor sp and gn. ‖278.85-279.75‖ «Qtz/Carb Vn». The carbonate in the veins is ankerite, pink in colour, coarse bladed.	70	Moderate pervasive sericite alt'n which ranges from grey through pale yellow to green/brown in color.	5% fine grained pyrite. Pyrite occurs as disseminations and as dark patches/ stringers associated with quartz. Minor sphalerite and galena - fine grained, fine to coarsely dissemination occur in the quartz veins. ‖252.9-255.25‖ «7%py 1.5%sp .5%gn» coarsely disseminated in the quartz. ‖280.85-281.6‖ «10% py» occurs as massive bands. <1cm	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
281.60 TO 291.50	«HET FRAG»	Grey, black, buff. Fine to 5cm. Sericitized and dolomitized volcanics, argillite & quartz (50/40/10%) clasts are supported by a silty matrix. Clasts comprise 40-80% of interval. Minor pyrite clasts present. 1% white quartz veining. Intermittant narrow fault bx zones.		Patchy weak, grey to yellow sericite alt'n, silicification and nodular dol alt'n. Minor talc.	3% fine grained pyrite which occurs in bands. 291.35m: 5cm wide quartz vein & silicified zone which contains 15% pyrite, 3% tt, 1% sphalerite, 1% cp, 5% galena. Sx are fine grained, coarsely disseminated. ╢291.2-291.5╟ 8cm wide quartz vein oriented at 40 degrees to core axis. Minor aspy, 1% tt, .5% cp, 5% sp, 2% gn, 20% py. «1%tt 8%BM»	
291.50 TO 385.70 291.2-296.1	«ARG & QTZ/ SER SED?»	Yellow, grey, black, white. Fine grained. Intensely altered seds comprise 55% of the unit; 15% of the unit is black argillite with silt (weakly altered). Weakly altered seds are most prevalent between 294-295.7m, 307.3-308.6m and 317.6-330.8m. General sense of bedding..... Locally bedding is contorted but in these areas there is a cleavage at..... ╢291.7-292.1╟ «Flt Bx» ╢300.95-301.3╟ «Flt Gou» ╢329.9-330.8╟ intermittant «Flt Bx» ╢340.4-341.3╟ «Flt Bx» Quartz veining comprises approximately 15% of the interval. Veins are generally massive, barren, white, quartz +/- carbonate. The interval 348-358.1m contains 20% quartz veining with associated chlorite. Quartz-carbonate veins similar to those that host visible gold in RG 398 occur as follows: ╢300.7-300.85╟ «Qtz/Carb Vn» ╢301.9-302.7╟ «Qtz/Carb Vn» ╢313.3-313.65╟ «Qtz/Carb Vn» trace sp. ╢315.5-316.25╟ «Qtz/Carb Vn» ╢325.55-325.95╟ «Qtz/Carb Vn». END OF HOLE.	70 70	Intense, patchy yellow green sericite alt'n.	Intensely altered core contains 2-5% fine grained disseminated pyrite 2% pyrite in argillite. ╢295.7-296.1╟ «1%aspy 12%BM» BM are roughly equal amounts of coarsely disseminated sp, gn, cp in siliceous quartz veined sed/argillite. Seds are altered to brownish green sericite. 10% pyrite. Fine to medium grained.	Sx are similar to those which occur between 291.2-291.5m.

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
BCD32324	38.40	40.00	1.60								53	74	73				494	97		21	0.8	164	
BCD32325	43.50	45.00	1.50								21	33	31				1245	93		15	0.8	228	
BCD32326	45.00	46.10	1.10								123	123	96				1430	86		28	20.6	257	
BCD32327	46.10	47.60	1.50								114	74	31				501	137		42	21.5	181	
BCD32328	66.30	67.60	1.30								55	115	1				74	25		7	1.5	28	
BCD32329	85.10	86.60	1.50								18	46	1				34	57		2	1.1	6	
BCD32330	86.60	88.45	1.85					0.02			6	42	3				9	523		1	0.2		
BCD32331	93.90	95.40	1.50								3100	12344	6338				237	53		770	99.8	84	
BCD32332	95.40	96.50	1.10					0.21			2019	6271	7968				265	54		258	48.4	208	
BCD32333	99.20	100.30	1.10								954	1591	1055				98	108		236	27.3	21	
BCD32334	110.50	112.20	1.70								87	259	267				357	74		56	2.6	76	
BCD32335	113.80	114.80	1.00								165	230	121				307	95		15	0.2	40	
BCD32336	114.80	116.30	1.50					0.09			69	302	250				233	106		12	0.2		
BCD32337	117.85	119.50	1.65								129	382	101				151	103		20	1.3	38	
BCD32338	132.60	133.80	1.20								310	1137	471				462	71		59	4.5	69	
BCD32339	135.40	136.70	1.30								194	428	243				405	59		28	2.7	37	
BCD32340	145.10	146.50	1.40								56	66	112				76	221		6	0.9	23	
BCD32341	151.50	153.00	1.50								779	406	383				165	158		107	34.5	46	
BCD32342	153.00	154.50	1.50								76	221	236				121	100		16	2.2	39	
BCD32343	154.50	156.10	1.60								80	711	340				154	158		19	1.9	38	
BCD32344	159.90	161.40	1.50								59	233	385				186	112		3	0.5	24	
BCD32345	161.40	161.60	0.20								328	43181	13628				418	78		42	17.8	363	
BCD32346	161.60	162.35	0.75								66	1878	547				198	153		5	0.7	19	
BCD32347	162.35	163.60	1.25					0.02			51	108	217				66	87		1	0.2		
BCD32348	163.60	164.10	0.50								31	216	143				124	173		3	0.3	23	
BCD32349	169.40	170.60	1.20								42	229	159				103	119		4	0.9	30	
BCD32350	174.60	176.10	1.50								39	179	124				354	273		5	0.8	146	
BCD32456	176.10	177.60	1.50	.004	.017	.007	0.1	0.92			42	173	72				196	109		1	0.1		
BCD32458	177.60	178.90	1.30								74	2802	1086				323	194		6	2.7	62	
BCD32352	178.90	180.40	1.50								99	1886	571				321	210		11	2.1	99	
BCD32353	182.20	183.70	1.50								103	1428	583				348	233		4	1.2	280	
BCD32354	183.70	184.05	0.35					0.02			15	120	148				92	103		2	0.5		
BCD32355	190.00	191.40	1.40								53	116	157				212	229		3	0.9	316	
BCD32356	191.40	192.80	1.40								6	68	25				39	76		1	0.4		
BCD32357	192.80	194.30	1.50								40	114	78				224	180		4	0.8	102	
BCD32358	194.30	195.40	1.10								50	313	207				160	148		7	1.2	67	
BCD32359	195.40	197.40	2.00								42	428	88				81	147		3	1.2	36	
BCD32360	197.40	198.90	1.50								28	93	73				66	113		2	0.9	42	

Sample	From (m)	To (m)	Length (m)	CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB
BCD32361	201.70	202.45	0.75								29	114	284				178	68		1	0.1	67
BCD32362	202.45	204.20	1.75								25	79	85				91	134		1	0.7	26
BCD32363	204.20	205.70	1.50								39	245	67				94	159		2	1.0	22
BCD32364	205.70	206.30	0.60								141	1084	388				178	122		19	5.8	2
BCD32457	206.30	206.70	0.40	.113	.387	.226	81.8	2.9			1134	3873	2260				1481	33		423	81.8	
BCD32366	206.70	207.85	1.15								79	179	338				142	122		10	3.5	64
BCD32367	207.85	208.85	1.00								124	1056	380				217	165		16	3.7	174
BCD32368	208.85	210.00	1.15	0.005	.02	.03	1.0	0.19			52	241	278				111	199		3	1.0	
BCD32369	210.00	211.50	1.50								720	4330	1701				450	43		14	5.6	880
BCD32370	211.50	212.40	0.90								162	2316	540				200	107		4	1.8	146
BCD32371	213.70	214.90	1.20								176	1343	635				167	159		2	2.1	142
BCD32372	216.20	217.80	1.60								443	7689	2017				271	165		12	5.6	64
BCD32373	224.60	226.10	1.50								139	306	262				114	90		63	6.0	37
BCD32374	251.30	252.90	1.60								51	253	610				357	107	1	12	2.4	69
BCD32375	252.90	254.05	1.15	0.74	.89	.39	25.8	0.63			737	8851	3948				551	15		164	25.8	
BCD32376	254.05	255.25	1.20	0.009	.17	.04	1.4	0.10			89	1713	416				427	103		17	1.4	
BCD32377	264.20	265.60	1.40								124	191	64				163	73		9	1.8	20
BCD32378	273.65	275.00	1.35								19	814	136				241	65		6	0.1	
BCD32379	278.85	279.75	0.90								10	136	68				120	39		5	0.6	
BCD32380	280.85	281.60	0.75				277				106	206	125				1247	81		52	3.3	58
BCD32459	291.20	291.50	0.30	.604	1.11	.670	27.70	0.68			6035	11108	6704				2298	56		2893	277	
BCD32460	295.70	296.10	0.40	.372	.569	1.681	47.6	0.63			3719	5694	16814				4894	52		186	47.6	
BCD32395	296.10	297.60	1.50								27	67	180				177	131		5	1.0	25
BCD32383	300.70	300.95	0.25	0.001	.03	.84	6.1	0.01			4	253	8387				43	25		15	6.1	
BCD32384	300.95	301.90	0.95								17	31	29				104	82		3	0.5	16
BCD32385	301.90	302.70	0.80					0.02			18	44	163				37	281		4	0.1	
BCD32386	307.80	309.00	1.20					0.02			8	55	50				57	65		2	0.1	
BCD32387	313.30	313.60	0.30					0.01			10	43	33				42	52		1	0.1	
BCD32388	315.50	316.25	0.75					0.02			5	145	119				20	594		2	0.7	
BCD32389	319.20	320.00	0.80					0.02			10	49	37				62	108		2	0.3	
BCD32390	320.00	321.50	1.50								10	119	13				51	93		1	1.0	21
BCD32391	325.55	325.95	0.40					0.08			13	39	24				52	576		1	0.1	
BCD32392	347.40	348.90	1.50								22	58	24				55	113		6	0.9	5
BCD32393	354.20	355.70	1.50								25	46	12				47	93		2	0.5	12
BCD32394	355.70	357.20	1.50								15	42	13				47	82		2	0.5	9

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: REA HORIZON

PLOTTING COORDS GRID: SAM GEOL
NORTH: 377.08N
EAST: 11643.26W
ELEV: 1013.55

ALTERNATE COORDS GRID: ESTIMATED
NORTH: 3+80N
EAST: 116+50W
ELEV: 0.00

COLLAR DIP: -60° 0' 0"
LENGTH OF THE HOLE: 249.00m
START DEPTH: 0.00m
FINAL DEPTH: 249.00m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: July 1, 1991
DATE COMPLETED: July 3, 1991
DATE LOGGED: July 2, 1991

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: FRONTIER DRILLING
CASING: PULLED
CORE STORAGE: SAMEX CAMP

PURPOSE: TO TEST A PREVIOUSLY UNTESTED SECTION OF THE REA HORIZON IN THE VICINITY OF JOHNSON CREEK.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
60.00	-	-61° 0'	ACID	OK		-	-	-	-	-	
105.50	-	-57° 0'	ACID	OK		-	-	-	-	-	
169.80	-	-57° 0'	ACID	OK		-	-	-	-	-	
249.00	-	-54° 0'	ACID	OK		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 37.80	«CSG»					
37.80 TO 58.90	«MAF TUFF»	Green, grey. Fine grained. 37.8-45.6m: Aphanitic green matrix with paler yellow, green spotty. FOLIATION at Matrix is calcareous 2% fe-calcite stringers and veinlets with a weak preference for the plane of foliation. 45.6-58.9m: Textures weaken downhole, core becomes bleached, more massive in appearance. Change is due to alteration. Between, 45.0-54.0m, core is very blocky, minor narrow zones of clay fault gouge.	70	Limonite stain occurs on fractures through to 57m. 37.8-45.6m: Core is chloritic and weakly calcareous. 45.6-58.9m: Core is increasingly calcareous (ankerite). Chlorite content decreases. Carbonate flooded patches.	37.8-45.6m: <1% disseminated pyrite. 45.6-58.9m: <2% disseminated pyrite.	
58.90 TO 64.10	«ARG/SILT»	Black, grey. Fine grained. Argillite is finely laminated by silt. Bedding is locally weakly warped. BEDDING at Upper contact is quartz veined. 5% white quartz/carbonate (90/10%) veining. Foliaiton appears to be oriented parallel to bedding.	60	Seds are weakly phyllitic.	<.5% disseminated pyrite in fine to coarse grained.	
64.10 TO 115.10	«TUFF/SED TRAN ZONE»	Green, black, grey, white. Fine grained. Altered tuffs which range in colour from a pale yellow-green (after epidote/zoisite?) to medium green is finely to coarsely interbedded with argillite and siltstone. 60% volc, 40% seds. Locally alteration destroys original volcanic textures - increasingly so with depth to the point where protilith is uncertain except that there are some argillite laminae remain. Core is generally blocky with most competant intervals comprised of volc and alt volc. Argillite are extremely blocky and intermittantly fault breccia. Brittle fault bx zones occur as follows:╫75.2-79.5╫ «Flt Bx», ╫85.4-92.7╫ «Flt Bx», ╫101.1-105.9╫ «Flt Bx» 10% massive white quartz/carbonate (90/10%), veins to 35cm. FOLIATION at 95m	50	There is minor weak silicification of argillites. With depth the tuffs(?) are increasingly altered to green and yellow sericite. This style of alteration is the most pervasive between 92-100.7m. Below 100.7m there is only green sericitic alteration which is finely laminated with argillite. Volcanics are strongly fe-carbonatized (ankerite).	Overall pyrite content 3% local concentrations to 5%. Trace cp on vein margins.	Locally there is some minor intense yellow sericite quartz alt'n of what looks like was tuff - precursor to Quartz/Sericite altered sediments? Rock type-maybe a tuff not a sediment! Becoming "Yellow and Black" unit. Core recovery: 75.2-76.7m: 55% 76.7-78.0m: 70% 78.0-79.5m: 53% 79.5-81.3m: 69% 85.9-87.4m: 60% 90.5-91.4m: 75% 91.4-92.0m: 65%
115.10 TO 163.60	«ALT TUFF?»	Green, greyish tint. Fine grained. At top of interval the tuff? is aphanitic, massive, medium green colour with minor quartz/carbonate stringers At 124.4m rock grades into a mottled volc. due to differential alteration?. Localized zones of		Volcanics are strongly calcareous - ankerite - throughout interval. Weak green sericite. Patchy, very weak silic associated with quartz/carbonate flooding. The green calcareous - silic	115.1-140.2m: <1% disseminated pyrite. 140.2-163.3m: Pyrite content varies between 1-10%. High concentrations of pyrite are coarsely disseminated in siliceous alt. vol. tuff.	The mottled interval of volc. between 124.4-140.2m may be a seperate tuff bed of slightly different composition than that surrounding it. Samples taken for J.Clarke to analyze.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		bleaching. Spotty patches of a pale apple green calc-silicate mineral; altering epidote/clinozoisite? Pale brown, spotty mineral may be leucoxene (1-3%). Between 140.2-163.6m the mottled textures caused by the green calc-silicate is no longer present. Leucoxene? is still present. Quartz/carbonate patches are more prevalent than at the top of the interval. Lower contact is sharp at..... and is conformable with the underlying sediments.	70	mineral maybe an alteration mineral.		
163.60 TO 249.00	«ARG/SILT/WACKE»	Grey, black. Fine grained. Typical turbidite sequence of finely interbedded argillite and silt and coarse wacke beds to 6m. Bedding is consistent at..... Minor quartz/carbonate veins except between 193.5-201.8m where there is 10% veining. Veins are largely barren except for minor pyrite. Veins are 65% quartz, and 35% carbonate. {165.4-166.1} «Flt Bx» END OF HOLE.	65	Core is relatively unaltered.	Minor pyrite.	

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB		COMMENTS
BCD32396	72.20	72.70	0.50								38	102	9				20	42		2	0.7	4		
BCD32397	75.20	78.00	2.80								39	37	15				29	68		3	0.4	1		
BCD32398	78.00	80.10	2.10								61	56	55				28	138		4	0.7	2		
BCD32399	85.95	88.10	2.15								68	56	20				37	32		3	0.3	1		
BCD32401	126.60	128.10	1.50								82	47	14				20	19		3	0.1	19		
BCD32403	140.20	141.70	1.50								125	39	14				10	19		3	0.1	78		
BCD32404	143.80	145.30	1.50								153	79	2				10	14		3	0.1	46		
BCD32405	145.30	146.80	1.50								152	69	6				8	20		3	0.1	30		
BCD32406	146.80	148.30	1.50								162	63	7				14	21		2	0.1	40		
BCD32407	148.30	149.80	1.50								153	86	11				5	23		2	0.1	40		
BCD32408	149.80	151.30	1.50								251	100	6				12	16		2	0.1	36		
BCD32409	151.30	152.80	1.50								107	80	2				8	20		2	0.1	17		
BCD32410	152.80	154.30	1.50								111	59	9				15	22		3	0.1	29		
BCD32411	159.10	160.70	1.60								140	65	19				21	38		3	0.1	41		
BCD32412	162.10	163.60	1.50								128	75	19				46	64		6	0.1	21		
BCD32413	199.50	200.80	1.30								44	54	25				85	51		2	0.2	1		
BCD32414	200.80	201.80	1.00								47	53	20				97	50		2	0.2	1		

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
BCD32400	115.80	118.80	3.00	42.13	15.06	6.71	7.68	3.22	.99	10.14	.19	1.13			103	71			5	18	.6	1	.02		.28	87.56	1	1
BCD32402	131.70	134.20	2.50	41.93	15.86	7.48	6.37	4.19	1.08	8.73	.20	1.15			89	61			5	18	.6	1	.03		.65	87.71	2	1

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: SE OF PIT

PLOTTING COORDS GRID: Sam estimated
NORTH: 650.00N
EAST: 9225.00W
ELEV: 1470.00

ALTERNATE COORDS GRID: ESTIMATED
NORTH: 6+50N
EAST: 92+25W
ELEV: 1470.00

COLLAR DIP: -78° 0' 0"
LENGTH OF THE HOLE: 386.10m
START DEPTH: 0.00m
FINAL DEPTH: 386.10m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: July 1, 1991
DATE COMPLETED: July 6, 1991
DATE LOGGED: July 6, 1991

COLLAR SURVEY: NO
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: FRONTIER DRILLING
CASING: PULLED
CORE STORAGE: SAMEX CAMP

PURPOSE: P-15A (as laid out by topofil,AH91)

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
90.50	-	-75° 0'	ACID	OK		-	-	-	-	-	
197.20	-	-70° 0'	ACID	OK		-	-	-	-	-	
367.90	-	-67° 0'	ACID	OK		-	-	-	-	-	
294.70	221° 0'	-69° 0'	MULTISHOT	OK	SINGLE SHOT	-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 12.10	«CSG»					
12.10 TO 245.60	«MAFIC VOLC»	Green. Typical mafic "lapilli tuff" and blocky flows; weakly broken core. Overall still green and chloritic except for bleached envelope around qdv from ‡25.4-34.7‡ «Dol Mafics» From ‡109.5-112.1‡ «Flt Bx» with yellow lapillis in green matrix in envelope for several meters on either side. Again from 155.5 to 187.6 the lapilli are yellow surrounding faulting and quartz-dolomite veining from 175.0-179.3m. From ‡215.0-245.6‡ «Brittle/Clay Flt Bx» FOLIATION at 150.0m FOLIATION at 175.7m FOLIATION at 199.0m Bottom contact follow long faulted interval, where mafics are still chloritic with yellow lapillis. Only weak to moderate patchy carb.	 70 35 55	Patchy fe-dol locally associated with quartz-dolomite veining. Mostly calcareous chloritic Sam mafics. A couple of specks of galena in thin broken qdv's near the contact.	Only trace pyrite except for galena and sphalerite in quartz-dolomite veins: 12.1-12.3m: 3% galena, 1% sphalerite. 23.8-24.0m: 2% galena. ‡28.7-29.5‡ «9% sp, 5% gn, tr. cp, qdv» 69.95-71.1m: 5% sphalerite, 1% galena. 135.5-136.4m: qdv., 3% galena, sphalerite. 139.0-140.6m: qdv., tr. cp, gn, sp.	
245.60 TO 250.50	«GREY SER/PY FLT BX»	Friable, fault brecciated core up to 249.5, consists of siliceous, grey sericite-pyrite schist. Faint cleavage in faulted mat'l at..... From 249.4-249.8m the unit is intact and consists of faintly laminated grey sericite +/- pyrite schist. Possibly a very stretched out fragmental. FOLIATION at Bottom contact sharp, but marked by quartz veinlet.	 30 50	Grey "cherty" siliceous patches in broken interval. Intense pervasive grey sericite and fine pyrite alteration.	‡245.6-250.5‡ «15% py» finely disseminated throughout. From ‡249.8-250.0‡ «qdv, tr. gn, cp» cuts core at 40 degrees.	
250.50 TO 252.00	«SER/SIL MAFICS»	Interval comprised of 25% brown sericite, 50% qtz, 25% fe-dol in typical patchy "dol mafics" texture. Possibly overprinted by silica. Warped FOLIATION	 60	Brown sericite, sil and carb alteration fiarly complete and destructive.	Disseminated pyrite, in boudin(?) and lense shaped quartz +/- dolomite patches, up to 10%. Average 5%.	
252.00 TO 253.30	«SIL ARG BX»	Black and grey. Well healed, cherty argillite breccia. Laminations contorted and intraformationally brecciated. Lower contact is 20cm black gouge. Non-graphitic.		Weak to moderate silicification, fracture controlled.	1% disseminated pyrite only.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
253.30 TO 254.40	«GREY SER D EB FLOW»	Strong grey sericite/pyrite schist but displays good relict fragmental textures, with clasts now paper thin and stretched out 10:1 at an angle of: Heterolithic clasts of argillite, chert, brown sericite, pyrite and yellow sericite. Last 30cm friable and faulted.	60	Strong, complete grey sericite/pyrite alteration.	10-15% finely disseminated pyrite mostly in matrix, but also selectively replacing clasts.	
254.40 TO 254.70	«FLT BX»	First 10cm is fuchsitic schist, followed by argillaceous schist.			5% disseminated pyrite in first 10cm only.	
254.70 TO 265.90	«DOL MAFICS »	Typical, strongly carbonatized mafic lapilli tuff and pyroclastics. Fault brecciation up to 258.5m.		Brown sericite after chlorite, intense pervasive dark grey dolomite. Also minor sil patches and traces of talc on fractures.	3-4% disseminated pyrite.	
265.90 TO 339.80	«LIMY ARG + /- TUFF?»	Black and green. Conformable contact with laminated to thinly interbedded black argillite and pale green silty tuff? beds. Laminations contorted but common bedding at..... which parallels foliation. Overall 80/20 argillite to tuff.	75	More argillaceous portions tend to be silicified, playing host to stockwork quartz veinlets. Tuffaceous portions are carbonatized without the creation of brown sericite.	1-2% disseminated and vein controlled pyrite.	Resembles "Victory Volcaniclastics".
339.80 TO 386.10	«DOL MAF V' CLSTCS»	Spotted, pale, bleached, washed-out appearance to massive green chloritic volcaniclastics(?). Rock now has a "pseudo-intrusive" look, but is clearly conformable with argillites showing interbedded contacts. From [349.3-356.9] «Arg» argillite (as above) forms conformable interbed with pale green siltstone. It is contorted, but foliation and contacts at..... From 356.9 to end of hole, typical strong dolomite mafics, with ghosted lapilli from 382m to end. END OF HOLE.	50	Patchy carbonatization with modular fe-dolomite overgrowths. There is no brown sericite development, and alteration is warning with depth.	Trace pyrite only in uncommon qd veinlets.	

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
BCD45439	28.70	29.50	0.80	.055	7.63	6.18	35.2	0.17			546	76300	61770				64	46		87	35.2	172	
BCD45440	69.95	71.10	1.15	.022	1.63	.262	3.4	0.03			216	16253	2618				1	34		8	3.4	34	
BCD45441	135.50	136.40	0.90								17	499	307				1	38		3	1.4	23	
BCD45442	139.00	140.60	1.60	.017	.148	.075	1.8	0.04			165	1477	746				48	73		5	1.8	38	
BCD45443	157.90	158.10	0.20	.015	.642	1.03	5.8	0.07			152	6417	10285				175	102		20	5.8	74	
BCD45444	177.90	179.30	1.40								50	425	361				105	106		1	0.6	39	
BCD45445	241.40	242.90	1.50								64	399	378				48	274		1	0.5	22	
BCD45446	242.90	244.40	1.50								102	350	202				34	317		1	0.8	6	
BCD45447	244.40	245.60	1.20								115	332	92				25	286		1	0.5	4	
BCD45448	245.60	248.00	2.40								62	112	105				331	44		4	0.1	80	
BCD45449	248.00	249.00	1.00								30	60	74				205	97		1	0.1	104	
BCD45450	249.00	249.80	0.80								44	142	102				169	153		1	0.1	208	
BCD45451	249.80	250.50	0.70								81	189	365				74	93		2	0.4	230	
BCD45452	250.50	252.00	1.50								113	160	20				232	64		1	0.2	61	
BCD45453	252.00	253.30	1.30								49	55	41				761	73		6	0.5	64	
BCD45454	253.30	254.40	1.10								93	108	18				234	98		3	0.8	5	
BCD45455	254.40	256.90	2.50								68	26	39				95	67		4	0.1	84	

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: REA HORIZON

PLOTTING COORDS GRID: SAM GEOL
NORTH: 343.92N
EAST: 11416.74W
ELEV: 1003.67

ALTERNATE COORDS GRID: ESTIMATED
NORTH: 3+65N
EAST: 114+20W
ELEV: 1025.00

COLLAR DIP: -70° 0' 0"
LENGTH OF THE HOLE: 199.00m
START DEPTH: 0.00m
FINAL DEPTH: 199.00m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: July 3, 1991
DATE COMPLETED: July 5, 1991
DATE LOGGED: July 5, 1991

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: FRONTIER DRILLING
CASING: PULLED
CORE STORAGE: SAMEX CAMP

PURPOSE: FILLIN DRILLING ON THE REA HORIZON IN THE VICINITYOF JOHNSON CREEK.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
113.40	-	-66° 0'	ACID	OK	DOUBLE ETCH	-	-	-	-	-	
194.10	-	-64° 0'	ACID	OK		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 52.60	«CSG»					
52.60 TO 95.50	«ALT MAF TU FF»	Green, grey, buff, yellow. Fine grained. Tuffs are variably altered throughout interval. The interval 71-87.5m is relatively unaltered and is comprised of a dark green chloritic tuff which is spotted by white fe-foor calcite nodules/patches and minor stringers. Carbonate content is 15-20%. A weak foliation at..... which may be representative of a bedding plane. ‡63.35-63.45‡ «Flt Bx»	70	52.6-71m: Alteration is highly variable Core varies between a green chloritic tuff with pale sericite patches which are paler than the matrix. Core in these zones are moderately fe-calcareous. These weakly altered tuffs grade into/out of a pale, buff, siliceous, bleached tuff. These zones are only weakly calcareous and are highly pyritiferous. A brilliant green to yellow alt'n mineral sericite? - also occurs within this alt'n type. Between 61.5-63.25m the core has patchy moderate silicification associated with patchy white quartz. Quartz has fe-calcite along fractures. 71.0-87.5m: Relatively unaltered tuff. Strongly calcareous, chloritic. 87.5-95.5m: Core becomes bleached. Some chlorite destroyed, development of a yellowish sericite (weak) calcite stringers most prevalent within this subinterval.	52.6-71m: 10% medium to very fine grained pyrite. Patches coarsely disseminated within the bleached core. Local concentrations to 20%. ‡62.7-63.1‡ Interval is primarily patchy quartz veining. A 5cm wide selvage on the upper contact of one vein contains 5% cp, .5% gn, 3% sp. Overall the interval contains «1% bm, 4% py» 71.0-87.5m: Minor pyrite. 87.5-95.5m: 1% pyrite.	
95.50 TO 102.80	«INTERB TUF F/SED»	Black, yellow-green, white. Fine grained. 40% of the unit consists of black argillite, which contains 20% massive white to grey quartz veining (fe-dolomite in fractures). The remainder of the interval is finely laminated argillite and sericitized tuff. Tuff laminae are similar to overlying altered tuffs. BEDDING at... Core is very blocky throughout. Locallized fault brecciation. ‡95.6-97.5‡ «Flt Bx» and gouge. Minor fault gouge at 98.5-98.7m.	70	Tuff are altered to green to yellow sericite. Tuffs are calcareous. Between 95.7-96m the argillites are moderately graphitic.	Minor pyrite is disseminated in disseminated in the laminated core. The black argillite contains 1% disseminated and stringers of pyrite.	
102.80 TO 127.90	«GN/GY SER/ DOL TUFF?»	Green, grey, yellow. Fine grained. Interval consists of strongly altered mafic tuffs(?). Most marked textural change is the very gradational change from green-yellow to grey. ‡121.85-122.5‡ «Wk Flt Bx» Lower `contact' is very gradational. Minor zones of core are very similar to the green tuffs seen		Tuffs are initially very calcareous are pervasively, moderately altered to green to yellow sericite. The green/ yellow sericite alt'n very gradually weakens, leaving the core grey in color with increasing depth the amount of carbonate also starts decreasing, weak-	102.8-108.3m: 5% pyrite; very fine grained patches, coarse dissemination. 108.3-127.9m: <1% pyrite.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		at the top of the hole.		ening of carbonate starts later than that of the yellow/green sericite, and does not completely disappear. The green/yellow sericite colour effective disappears by 115m.		
127.90 TO 155.10	«PY/QTZ ALT TUFF?»	Grey. Fine grained. Tuffs? are the same as those immediately above, except that they are pyritiferous and siliceous. Some pale brown patchy mineral - leucoxene? Between 138.7-141m there is a minor amount of recognizable wispy argillite remnants. 152.7-154.2m: intermittant weak fault bx. Lower contact is sharp but is faulted. Contact is apparently at.....	90	Core is weakly calcareous & siliceous. Silica is markedly higher than in the rock above and below. Minor grey sericite and brown sericite. 153.4-155.1m: Alteration grades into banded yellow sericite + quartz + pyrite.	Pyrite content varies between 8-25%. Pyrite is generally very fine grained but locally becomes coarse. Pyrite occurs as coarse disseminated and patches. 148-155.1m: Pyrite is less patchy, more finely disseminated.	Possibly a defined stringer zone. Protolith maybe sedimentary or mixed volc + seds, but no clear contacts - very gradational changes.
155.10 TO 199.00	«ARG/SILT»	Black, grey. Fine grained. A finely interbedded sequence of argillite and siltstone. Bedding is generally consistent at..... but is locally contorted subparallel to core axis. Core is generally blocky throughout with parting occurring along bedding planes. Local, narrow fault bx zones present between: {155.1-155.6} «Flt Bx», 163.2-165.7, 166.8-167.9m, and 198.4-199.0m. END OF HOLE.	70		Minor pyrite.	

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
BCD32415	52.90	53.90	1.00								117	103	29				86	86		3	0.4	36	
BCD32416	53.90	55.20	1.30								133	76	19				61	79		1	0.4	32	
BCD32417	59.70	61.30	1.60								118	29	21				56	143		3	0.1	9	
BCD32418	61.30	62.70	1.40								88	114	40				71	137		5	0.3	30	
BCD32419	62.70	63.10	0.40	.010	.331	.125	2.5	.04			993	3306	1254				103	120		11	2.5	40	
BCD32420	63.10	64.60	1.50								66	98	26				46	116		5	0.5	21	
BCD32421	64.60	66.10	1.50								67	145	21				56	138		2	0.1	27	
BCD32422	66.10	67.60	1.50								119	184	33				137	148		2	0.1	63	
BCD32423	98.90	100.40	1.50								48	73	11				24	121		1	0.2	2	
BCD32424	100.40	101.90	1.50								60	72	15				23	94		2	0.4	4	
BCD32426	127.90	129.40	1.50								119	50	14				31	24		4	0.1	1	
BCD32427	129.40	130.90	1.50								130	79	22				65	21		3	0.1	35	
BCD32428	130.90	132.40	1.50								230	237	161				172	22		2	0.1	40	
BCD32429	132.40	133.90	1.50								155	243	134				304	20		5	0.1	64	
BCD32430	133.90	135.40	1.50								128	350	87				2445	19		20	0.9	272	
BCD32431	135.40	136.90	1.50								192	716	81				629	23		9	1.6	220	
BCD32432	136.90	138.40	1.50								140	120	60				277	19		11	2.9	233	
BCD32433	138.40	139.90	1.50								186	524	44				377	28		10	2.6	188	
BCD32434	139.90	141.40	1.50								165	189	30				122	29		11	3.6	205	
BCD32435	141.40	142.90	1.50								150	131	8				77	35		8	1.5	110	
BCD32436	142.90	144.40	1.50								171	103	8				78	31		10	2.0	72	
BCD32437	144.40	145.90	1.50								133	101	4				98	37		9	0.9	42	
BCD32438	145.90	147.40	1.50								123	83	1				82	37		9	0.7	56	
BCD32439	147.40	148.90	1.50								126	113	4				83	46		7	0.5	54	

Sample	From (m)	To (m)	Length (m)	SIO2 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO2 %	TIO2 %	BA %	ZR %	CU PPM	ZN PPM	PB %	TOTAL %	AU PPB	BA PPM	AG PPM	PB PPM	P2O5 %	SR %	S %	TOTAL %	AS PPM	SB PPM
BCD32425	120.10	123.10	3.00	41.24	15.84	7.48	7.49	3.32	1.47	8.44	0.22	.87			62	63			5	16	0.1	1	.01		1.17	87.56	7	1

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: REA HORIZON

PLOTTING COORDS GRID: SAM
NORTH: 365.00N
EAST: 11035.00W
ELEV: 1033.00

ALTERNATE COORDS GRID: ESTIMATED
NORTH: 3+65N
EAST: 110+35W
ELEV: 1033.00

COLLAR DIP: -88° 0' 0"
LENGTH OF THE HOLE: 249.00m
START DEPTH: 0.00m
FINAL DEPTH: 249.00m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: July 5, 1991
DATE COMPLETED: July 7, 1991
DATE LOGGED: July 7, 1991

COLLAR SURVEY: NO
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: FRONTIER DRILLING
CASING: PULLED
CORE STORAGE: SAMEX CAMP

PURPOSE: TO FILLIN UNTESTED PORTION OF THE REA HORIZON. DOWN-DIP OF RG 290.

DIRECTIONAL DATA: (same pad)

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
81.40	-	-83° 0'	ACID	OK		-	-	-	-	-	
150.90	-	-81° 0'	ACID	OK		-	-	-	-	-	
217.90	-	-81° 0'	ACID	OK		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 24.30	«CSG»					
24.30 TO 46.70	«MAF TUFF»	Green. Fine grained. Interval is dark green, coarse ash; chlorite wisps are locally abundant. Possible altered glass shards; some stretching has taken place. Abundant white fe-calcite nodules, stringers, patches oriented parallel to the foliation at..... Matrix is aphanitic. Core is very blocky to 366m. Intermittant narrow fault breccia zones between 26.8-28.7m.	60	Core is strongly chloritic. 42.2-46.7m: Core is weakly to intensely bleached. Bleaching is associated with increased quartz/carbonate (20/80%) veining/flooding and pyrite.	Trace pyrite. 42.2-46.7m: 1% fine grained pyrite stringers and patches.	26.5-29.5m: 70% core recovery. 29.5-32.6m: 85% core recovery.
46.70 TO 64.90	«MAF ASH TU FF/TUFF»	Green. Fine grained. Rock alternate; between a near aphanitic but foliated ashy tuff (not lapilli sized). Locally there are fine interbeds of the two types. The coarser tuff contains chlorite spots-altered glassy clasts? and has been weakly epidotized. Approximately equal amounts of the two types. FOLIATION/BEDDING 5% white quartz/calcite/sericite (2/92/5%) stringers and veins. ‖49.6-50.6‖ «Flt Bx».	40	Core is chloritic and locally moderately epidote altered.	2% coarsely disseminated pyrite, local concentrations to 5% in vicinty of more intensely veined/flooded rock.	It is possible that there is mafic flows within the interval.
64.90 TO 99.00	«FELD? XTAL ? TUFF»	Green. Fine grained. Aphanitic green matrix supports up to 40% white to greenish grains of altered feldspar? Grains reach 5mm. Grains stain mauve with super-juice. Crystal structure difficult to identify. Foliation at 25-40 degrees to core axis. 3% white veining-predominantly calcite. 65.4-65.6m: Calcite vein. 67.3-67.6m: Calcite vein oriented at..... ‖81.3-88.5‖ intermittant «Wk Flt Bx»	20	Core is chloritic and calcareous. 96.8-99.3m: Core is weakly bleached.	Trace to 2% pyrite.	Crystals may be a secondary carbonate alt'n rather than primary feldspar.
99.00 TO 145.90 109-110.	«ALT MAF VO L»	Green, buff, grey. Fine grained. Relatively unaltered mafic tuffs and flows? comprise 60% of the interval. Unaltered core is green, chloritic locally massive, aphanitic (the flows?) or speckled dark green (chl) and pale brown in a weakly bleached matrix (tuff). Fault bx occurs between: 102.7-103m, 133.5-133.6m, 145.6-145.9m. Core between 111.8-114.7m and 118-125.4m is very blocky. Core contains 5% white quartz/carbonate (25/75%) veining, preferentially located in the		The relatively unaltered volc. are chloritic, and calcareous; minor epidote present. In altered zones core becomes bleached. Intensity of bleaching varies from weak to intense, resulting in a pale buff colour. Strongly altered core has intense fe-dol alt'n, weak to moderate yellowish sericite alt'n, no chlorite, is variably pyritiferous and contains at least minor	There is only minor pyrite in the unaltered volcanics. In the strongly altered core the pyrite content is as follows: 102.4-111.7m: 8% except ‖109.9-110.35‖ where there is «2.5% py» 128-129.7m: 3% pyrite. 139.7-145.9m: 5% pyrite. Pyrite is fine grained, coarsely disseminated in patches and discontinuous	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
139-145		mid to lower portion of the interval.		amounts of fuchsite;between 99.2-100.6m and 102.2-106.2m in moderate to intense alt volc there is 5-10% fuchsite. Quartz veinlets/flooding locally present. Intensely altered intervals occur between 102.4-111.7m, 128-129.7m, and 139.7-145.9m.	stringer in quartz.	
145.90 TO 183.60	«INTBED TUF F/FLOW»	Green. Fine grained. Interval consist of 25% aphanitic massive flows with up to 3% carbonate nodules; possibly some and 70% spotted foliated tuff? Tuff matrix is green, aphanitic and contains 35% white spots, some of which are elongate of carbonate, primarily calcite. FOLIATION is at 5% quartz/carbonate (5/95%) veining. ‖181.9-183.6‖ intermittant «Flt Bx». Alteration very gradual grades into lower unit.	50	Core is chloritic and strongly calcareous. 172.4-183.6m: Core becomes gradual bleached to a grey color with a green tint, except between 172.6-173.9m where there is a yellow sericite and quartz alteration zone. Amount of carbonate starts to decrease slightly.	Trace pyrite.	Core between 168.5-179m is very blocky.
183.60 TO 212.50 183-201 201-207	«PY ALT TUF F?/SED»	Grey. Fine grained. Core is very highly altered and bleached to a grey color. Local carbonate and minor fuchsite alteration reminiscent of volcanic origin except between 201.8-207.6m where there is some of what appears to be intensely silicified argillite. Alteration obscures any contacts. FOLIATION at ‖202.6-205.9‖ intermittant weak brittle «Flt Bx». Lower contact is oriented at.....	50 55	183.6-201.8m: Bleached, carbonatized with some quartz/carbonate flooded and veined zones. Core is phyllitic - grey sericite, between 199.6-201.8m there is 3% fuchsite. 201.8-207.6m: Core is weakly to moderately siliceous with weak fe-dol 3% pale brown sericite/leucoxene? 207.6-209.2m: Less siliceous than previously; weak fe-dol alt'n, very fine grained sericite. 209.2-212.5m: Moderate yellow sericite alt'n present.	Between 183.6-201.8m there is 8% very fine grained, coarsely disseminated pyrite overall with concentrations ranging between 5-10%. Zones of concentration within this subinterval are: 185-185.6m: 15% pyrite. 190.4-191m: 12% pyrite. These lighter concentrations occur in more siliceous zones. ‖201.8-207.6‖ «15% py» with concentrations to 25%. 207.6-212.5m: 10% pyrite.	
212.50 TO 249.00	«ARG/SILT/WACKE»	Black, grey. Fine grained. Core is predominantly well interbedded argillite and siltstone with minor wacke beds. Bedding is generally oriented at Between 236.3-249.0m bedding highly variable - frequently oriented subparallel to core axis. ‖212.5-216.9‖ «Flt Bx» 214.5-216.9m: 15% white quartz veining. Veins veins beedn fault breccia. Maxium vein width 15cm. 222.2-222.35m: White quartz vein.	50	Argillite in fault zones is graphitic. 216.9-217.4m: Weak to moderate yellowish grey sericite alt'n. 217.4-217.9m: Weak silicification. 217.9-218.5m: Weak grey sericite alt'n.	Trace pyrite, except 216.9-218.5m where there is 2% coarsely disseminated pyrite blebs.	Core between 212.5-220m & 239.7-247.1m is very blocky with local narrow, brittle fault bx.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		END OF HOLE.				

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB		COMMENTS
BCD32440	42.60	43.20	0.60								67	48	11				32	40		5	2.2	26		
BCD32441	108.70	110.20	1.50								70	29	11				73	96		6	1.3	19		
BCD32442	110.20	111.70	1.50								93	47	8				72	88		5	1.1	25		
BCD32443	139.60	141.10	1.50								72	32	14				56	77		6	0.9	38		
BCD32444	141.10	142.60	1.50								68	67	15				70	87		8	0.9	44		
BCD32445	184.40	185.90	1.50								74	44	7				70	27		9	0.7	78		
BCD32446	189.40	190.90	1.50								111	87	6				97	22		10	0.7	73		
BCD32447	200.50	202.00	1.50								59	51	6				70	38		7	0.1	28		
BCD32448	202.00	203.50	1.50								181	75	4				35	33		6	0.1	23		
BCD32449	203.50	205.00	1.50								145	90	10				48	47		9	0.1	65		
BCD32450	205.00	206.50	1.50								142	152	14				38	33		8	0.1	59		
BCD32451	206.50	208.00	1.50								135	47	19				40	40		13	0.2	82		
BCD32452	208.00	209.50	1.50	.017	.009	.003	0.3	.14			167	89	27				47	43		14	0.3	138		
BCD32453	209.50	211.00	1.50								121	29	26				91	46		13	0.2	91		
BCD32454	211.00	212.50	1.50								125	33	15				95	57		10	0.7	71		
BCD32455	214.20	215.70	1.50								44	47	19				61	240		5	1.3	37		

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: CREEK ZONE

PLOTTING COORDS GRID: SAM
NORTH: 980.00N
EAST: 11400.00W
ELEV: 1016.00

ALTERNATE COORDS GRID: ESTIMATED
NORTH: 9+80N
EAST: 114+ 0W
ELEV: 1016.00

COLLAR DIP: -60° 0' 0"
LENGTH OF THE HOLE: 380.10m
START DEPTH: 0.00m
FINAL DEPTH: 380.10m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: July 8, 1991
DATE COMPLETED: July 12, 1991
DATE LOGGED: July 10, 1991

COLLAR SURVEY: NO
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: FRONTIER DRILLING
CASING: PULLED
CORE STORAGE: SAMEX CAMP

PURPOSE: TO RETEST THE CREEK ZONE AND TEST "266-STYLE" SAM SEDS AT DEPTH IN THIS AREA. SAME PAD AS RG 55/60.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
43.30	-	-60° 0'	ACID	OK		-	-	-	-	-	
98.50	-	-59° 0'	ACID	OK		-	-	-	-	-	
169.80	-	-55° 0'	ACID	OK		-	-	-	-	-	
224.60	-	-55° 0'	ACID	OK		-	-	-	-	-	
282.50	-	-55° 0'	ACID	OK		-	-	-	-	-	
151.50	238° 0'	-56°30'	SING.SHOT	OK		-	-	-	-	-	
303.90	232° 0'	-54° 0'	SING.SHOT	OK		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 40.05	«CSG»					
40.05 TO 73.60	«MFLT»	Green, white, buff. Fine to 6cm. Aphanitic matrix supports up to 30% stretched lapilli sized clasts. Clasts have been preferentially altered to a buff colour. 7% white quartz/carbonate (20/80%) stringers, patches and veins. Carbonates are siderite, ankerite, fe-dol veins exhibit no preferential orientation. Quartz is commonly restricted to the carb veins which it crosscuts, although minor quartz veins are present.		Core is chloritic and calcareous. Lapilli clasts are preferentially sericitized to a buff colour.	The least veined core contains 2-3% fine grained, fine to coarsely disseminated pyrite. The overall pyrite content for the interval is 3-5%. In addition there is, overall, approximately 1% BM, plus minor tt and aspy. These sulphides occur within quartz/carbonate veins, where they are very fine to fine grained and generally coarsely disseminated. The major sulphide rich intersections are discribed below: ‖40.35-40.47‖ «3% sp, 3% gn, 1% 55» Sp is very pale in colour. Gn has spiderweb texture. 40.8-41m: 2% very fine grained, accicular to felted aspy occurs with pyrite as selvage in some veinlets. 42.8-43.5m: <1% gn, minor sp, cp disseminated in veins. ‖48.95-49.25‖ «4% cp, 2% gn, 1% sp min tt» 5% pyrite in veins. 64.2m: A 6cm wide q-c vein contains 3% sp, 10% gn, 7% cp, 10% py. ‖72.35-72.6‖ «3% cp, 1% sp+gn» gn>sp;8% pyrite. Sx on margin of a carb zone.	Note: samples are generally taken over larger intervals. An attempt was made to keep best mineralized material togetther.
73.60 TO 76.90	«TERT DYKE»	Dark, grey. Fine grained. Core is not aphanitic except in vicinity of lower contact and right at upper contact. Upper contact at Lower contact at Contacts are sharp. Rock is basaltic. Minor to 2% carbonate amygdules - trace quartz. Core is calcareous. 1% very fine grained olivine? crystals. Dyke is moderately magnetic.	70 20	Relatively unaltered.		
76.90 TO 83.00	«MFLT»	Green, grey, tuff, white. Fine to 3mm. Protolith is the same as in the interval 40.05-73.6m except that it has undergone more extensive and intensive alteration.		83-78.6m: Chlorite is a minor component of the interval; being replaced by yellow sericite. Interval is extremely calcareous-calcite, siderite, ankerite common throughout with 1% quartz veining. 78.6-79.3m: Chloritic.	3-5% fine grained, fine to coarsely disseminated pyrite. Trace galena.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
				79.3-83.0m: Chlorite content decreases downhole, yellowish sericite alt'n becomes more prevalent (weak) core becomes greyish in colour. Core is strongly calcareous, some carbonate is secondary.		
83.00 TO 106.10	«QTZ/SER/PY SCHIST»	Yellow, grey, white. Fine grained. Rock is extensively and pervasively altered which destroys original textures. Interval contains 35% white quartz/carbonate veins and flooding (95/5%). Qtz veins are grey to white, generally very irregular. Some quartz has diffuse indistinct boundaries. FOLIATION at 101.7-102.1m: subinterval is clastic at the top - possibly an altered het frag and silic argillite. Lower contact at.....	65 80	Pervasive moderate to interval yellowish sericite alt'n with associated qtz stringers. Minor grey sericite. 100-100.6m: intense sil. 102.3-106.1m: rock is certainly an alt yellow sericite, but primarily brownish sericite, patchy weak talc, and fe-dol.	There is approximately 10% fine grained pyrite in the interval. Pyrite can occur as fine disseminated but generally occurs as coarse dissemination in stringers/patches and bands in quartz pyrite concentration has wide range: 3-30% over 10cm widths. Between 83-101.5m there is approximately 2% combined base metal sulphides disseminated in quartz veins; gn>sp>cp. Sx are generally very fine to fine grained, and fine to coarsely disseminated. Principal mineralized zones occur as follows: 83-83.13m: 20% pyrite. {86.8-88.3} «2% sp, 2% gn, 1% cp» {92-92.2} «30% py, 6% sp» in quartz. {96.85-97.13} «20% py» in quartz. 99.6m: minor aspy, mixed in with pyrite in quartz.	At a guess the protolith was volcanic.
106.10 TO 119.50	«FLT'D TURB IDITE»	Black, grey, white. Fine grained. Core consists of finely laminated argillite and siltstone and sandy siltstone. Maxium bed thickness 8cm. Bedding is locally highly contorted with minor bullseye structures. At 111m general sense of BEDDING at..... CLEAVAGE at..... FOLIATION at..... Interval contains numerous, intermittant fault zones to 30cm. Approximately 25% of the interval has been affected by faulting. 5% massive white quartz/carbonate (90/10%) veining to 23cm.	70 60 50	Minor grey to silvery grey sericite development.	1% patchy pyrite.	
119.50 TO 136.70	«SED FLT BX »	Black, grey, white. Fine grained. Interval is strongly fault brecciated with local clayey gouge. Principal rock type is a silicified argillite. Interval contains 20% patchy white quartz veining and silicified zones.		Argillite are locally weak to intensely graphitic. Argillite has patchy moderate silicification.	5% pyrite overall. Pyrite is fine grained, and occurs in large patches - commonly in the vicinity of quartz. Pyrite content locally reaches 30%. Notable intervals are:	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		‡120.2-120.4‡ «Het Frag?» ‡123.05-124.6‡ «Het Frag?» Textures in the Het Frag intervals appear to be purely by faulting. Clast composition is primarily quartz, sed (arg) frags and minor sericite alt. clasts. Clasts are supported by an argilliceous to silty matrix which is locally pyritiferous. Clasts are angular to subrounded between the intervals.		Between the intervals 124.6-125.35m and 125.7-126m the core is grey, very siliceous with 12% talc, minor brownish sericite, 10% pyrite. Possibly an altered volcanic.	‡120.4-120.55‡ «30% py» ‡133.4-134.8‡ «10% py»	
136.70 TO 158.00	«SED/VOL? T RANS ZONE»	Grey, black, brown. Fine grained. The principal rock type as an altered volc? Volc? is grey in colour, is locally weakly siliceous and is weakly calcareous. Volc? is interbedded with 10% black argillite and between 148.4-158m a brown, dolomite veined wacke? Between 147.8-148.4m the core has a weak clastic texture supported by a brown wacke? matrix Het Frag? Argillite is similar to that in the overlying interval except that there is less quartz veining. Interval is weakly and intermittantly fault breccia. Faulting decreases downhole and is largely gone by 145.2m.		Volc? are bleached, calcareous with minor brownish sericite. Coarser seds are brown - sericite?	1-2% disseminated pyrite. ‡146.2-146.6‡ «3% sp, tr gn» coarsely disseminated in fault breccia quartz veined/silicified zone. ‡148-148.2‡ quartz/dolomite veined zone contains «10% py, 1% gn, 1% sp»	The volc? may be an altered sandy sediment in part, but seeing as underlying unit is volcanic, it is likely volcanics comprise a large proportion of this unit's altered core.
158.00 TO 190.00	«QTZ/DOL/SE R ALT VOL»	Grey, buff. Fine grained. Volcanics are intensely altered. Alt'n destroys original textures. 5% white quartz/carbonate veins cut core, locally veins are associated with sp, gn. 153.9-160.7m: Intermittant, weak fault breccia over 30% of the interval. ‡180-184‡ «Brittle Flt Bx» local fault gouge. Trace sed beds - very minor.		Core has undergone patchy bleaching due to carbonatization and minor silicification. Locally there is some silica flooding and minor overprinting. Patchy brown sericite alt'n is common. Between 166.5-168m there is 5% fuchsite in very bleached, altered core. Locally there is minor talc present. 184-190m: Core starts to become weakly chloritic with depth as the rock grades into the underlying unit.	There is 3-5% fine grained pyrite and 1% combined base metal sulphides coarsely disseminated throughout interval. Base metals are in quartz veins, locally in highly altered volc. Notable sx intersections occur as follows: ‡158.6-158.7‡ «30% py, 5% gn» in quartz vein. ‡161-161.25‡ «2% gn, 8% py» in silicified zone. 164-166.6m: 1% gn, 1% sp, 5% py in quartz veins. ‡172.8-173‡ «20% py» as blebs in quartz veins. ‡173.95-174.27‡ «20% py»	
190.00 TO 264.90	«CHL/DOL MA F VOL»	Green, grey, buff, white. Fine grained. Core consists of mafic volcanics of uncertain genesis tuffs?, flows?. Most original textures are indistinguishable, but core retains or has super imposed on it a foliation, which is primarily shown by streaky carbonate alteration. This foliation		Volcanics are generally chloritic throughout the interval but are mottled by patchy fe-dol/ankerite alt'n. The amount of carb alt'n is variable between 20-90%. Intensely carbed core is bleached to grey. Minor locallized	2-3% finely disseminated to blebs of pyrite. 217-264.9m: Quartz/carbonate veinlets contains minor amounts of disseminated galena, chalcopyrite. Gn>Cp.	The massive white quartz veins may be of the sam origin as veins hosting the `MBA' gold zone. Veins sampled. Core tends quite blocky between 205.5-225.5m.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		varies between 10-65 degrees to core axis. ‡207.2-211.9‡ «Maf Dyke?» core in this interval aphanitic with 5% white quartz/carbonate stringers Dyke? has a pale brownish colour. Broken core prevents identifying orientation of contacts. Local narrow fault brecciation. ‡211.6-218.9‡ «Brittle Flt Bx» ‡221.3-221.8‡ «Flt Bx» ‡235.8-240.2‡ intermittant «Flt Bx» over 30% of the interval. ‡262.8-264.1‡ intermittant «Flt Bx». There is approximately 3% white quartz/carbonate (80/20%) veining. Individual veins are generally <20cm. ‡201.9-203.3‡ «20% QDV» ‡255.35-256.35‡ «90% QDV» 20% quartz, 80% fe-dol/ ankerite. In this interval some of the quartz has been brecciated and then rehealed with carbonate, but in general both quartz and carbonate are coarse grained.		weak sericitic alt'n causes a brown/ buff colouration. Minor fuchsite ex-cept betweeen 198.7-200.2m where there is 5% fuchsite.		
264.90 TO 269.30	«TERT DYKE»	Dark grey. Fine grained. Tertiary basaltic dyke. Dyke is the same as that intersected between 73.6-76.9m. Between 166.7-167.4m core is bleached altered to brown sericite with quartz/carbonate - possibly a section of mafic to intermediate vol-canics. Weak shearing. 268.25-268.4m: Patchy brown sericite alt'n, weak shearing. ‡268.8-269.3‡ dyke is «Flt Bx» with strong clay gouge. Upper contact at..... Lower contact at..... 1% quartz/carbonate (90/10%) amygdules.	65 45	Core is weakly calcareous.		
269.30 TO 380.10	«MAFIC VOL»	Green, grey, white. Fine to 3cm. Interval con-sists of a thick sequence of mafic volcaniclastics and possible flows. Texturally volcanics range from aphanitic through granular tuff to lapilli tuff. The rock ranges from a very dark green chloritic volc. to a pale green or a dol altered grey. Interval contains ~5% white quartz/carbonate (85/15%). Veins are commonly <<30cm. Note worthy intervals are as follows: 269.3-269.6m and 270.37-270.65m contain core that has been strongly fault breccia brackets a silici-fied zone.		Core is generally at least weakly chloritic. Locally moderate chlorite. Core is calcareous, with local fe-dol alt'n bleaching the rock. 269.6-270.37m: Intense silicification.	Pyrite content ranges between minor to 2% 270.2-270.35m: 10% pyrite.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		‡273.4-279.7‡ strong «Flt Bx» 276.3-276.6m: Volc breccis, competent. 281-281.9m: Intermittant fault breccia. ‡299.15-300‡ «Qtz/Carb Vn». Upper contact is oriented at ..... Vein travells along the core axis. 305-307.9m: Core has large, irregular bleached sections of core which be representative of a blocky flow margin. 317.8-328.5m and 332.6-337.1m are intervals of mafic lapilli tuff with the clasts preferentially altered and bleached. 339.9-342.5m: 30% quartz/carbonate veining, but veins are running down the core axis. 346.6-353.2m: Clean, uniform, weakly calcareous, fine grained, granular volcanic - possibly sedimentary. Weak epidote alteration. ‡353.2-356.45‡ «Qtz/Carb Vn» quartz earbonate is coarse grianed vein contains 15% altered wallrock fragments. 359.1-359.5m: Fault breccia. ‡362.2-364.2‡ «Flt Bx» Breccia is poorly healed. Between 363-364.6m there is a 20% white quartz/carbonate. 365.4-365.7m: Fault breccia. ‡366.6-372.1‡ blocky «Brittle Flt Bx» ‡367.5-368.2‡ «Fe-Dol Vn» Vein is vuggy and fractured. END OF HOLE.	20	342.5-346.6m: Core has moderate to intense fe-dol alt'n with streaky brown sericite alt'n. Only minor chlorite present. 353.2-355.5m: Coutry rock is intensely altered to fuchsite. 356.45-380.1m: Core is strongly chloritic. 371.5-380.1m: There is coarse bladed dolomite crystals growths within the volcanics. Crystals are very abundant at top of subinterval decreases downhole.	299.95-300m: Margin and selvage of the vein contains 5% clots of cp. 353.2-355.5m: Vein is generally barren of sulphides outside of minor pyrite in the wallrock fragments. Trace galena. At 355.45m there is trace cp & a patch of smeared, fine grained sulphide. The sulphide is greyish bronze, has a hardness <4 - copper mineral? nicolite?. ‡363-363.5‡ «5% py, 1% gn» Sx are fine grained coarsely disseminated in quartz carbonate.	Sample between 354.75-355.5m is being tested for platinum group minerals and metallic gold.

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
BCD32461	40.05	41.00	0.95	0.101	0.39	0.24	9.7	0.40			838	2785	1379				1018	13		169	6.4		
BCD32462	41.00	42.80	1.80	.004	.015	.004	0.6	0.012			35	151	44				262	24		2	0.6	122	
BCD32463	42.80	43.50	0.70	.036	.122	.100	4.5	.484			363	1221	1002				859	14		55	4.5	484	
BCD32464	43.50	44.60	1.10								33	135	17				97	133		1	0.2	26	
BCD32465	44.60	45.60	1.00								21	132	22				77	18		1	0.4	71	
BCD32466	45.60	46.70	1.10								41	99	129				127	22		1	0.9	22	
BCD32467	46.70	47.80	1.10								36	250	210				107	19		1	0.8	48	
BCD32468	47.80	48.95	1.15								39	348	167				115	22		1	0.9	59	
BCD32469	48.95	49.25	0.30	.119	.184	.182	5.2	.134			1191	1843	1824				330	24		31	5.2	134	
BCD32470	61.00	63.10	2.10								118	672	231				74	69		2	1.1	20	
BCD32471	63.10	64.60	1.50								455	629	979				85	30		3	1.7	22	
BCD32472	71.80	73.20	1.40								194	683	566				41	101		1	1.3	20	
BCD32473	81.50	83.00	1.50	.016	.172	.050	0.8	.037			159	1721	496				258	218		1	0.8	37	
BCD32474	83.00	83.55	0.55								325	1798	1877				272	130		112	4.4	15	
BCD32475	83.55	85.20	1.65								65	783	710				172	342		15	1.3	22	
BCD32476	85.20	86.80	1.60	.009	.356	.172	2.1	.028			89	3558	1723				206	195		11	2.1	28	
BCD32477	86.80	88.30	1.50	.077	.962	.430	8.6	.080			765	9621	4299				289	132		23	8.6	80	
BCD32478	88.30	89.30	1.00	.028	.114	.071	2.0	.022			282	1143	711				170	157		9	2.0	22	
BCD32479	89.30	90.50	1.20								32	416	332				231	205		9	0.9	21	
BCD32480	90.50	92.00	1.50								13	75	108				179	180		9	0.4	4	
BCD32481	92.00	92.30	0.30	.010	.885	.132	3.2	.169			95	8854	1315				720	54		91	3.2	169	
BCD32482	92.30	94.70	2.40								33	611	517				443	152		25	2.1	60	
BCD32483	94.70	96.20	1.50								10	65	109				346	168		10	0.4	21	
BCD32484	96.20	96.85	0.65								18	267	297				224	221		15	0.6	25	
BCD32485	96.85	97.13	0.28								44	294	645				285	130		17	1.7	57	
BCD32486	97.13	98.50	1.37	.026	.337	.295	7.8	.088			258	3374	2948				196	230		139	7.8	88	
BCD32487	98.50	100.00	1.50								155	792	514				177	269		79	3.5	65	
BCD32488	100.00	100.60	0.60	.008	.105	.068	2.1	.168			84	1051	676				309	146		27	2.1	168	
BCD32489	100.60	102.10	1.50								57	128	62				147	192		5	1.1	19	
BCD32490	102.10	103.60	1.50								219	296	75				404	112		5	1.2	42	
BCD32491	103.60	104.80	1.20								82	309	248				405	105		6	1.5	56	
BCD32492	104.80	106.10	1.30								162	423	212				605	143		8	1.3	88	
BCD32493	106.10	106.80	0.70								163	254	196				217	77		8	2.6	50	
BCD32494	112.80	113.95	1.15					0.01			28	73	27				56	60		3	0.4		
BCD32495	119.50	120.90	1.40	.016	.042	.034	5.5	.181			162	415	343				739	245		34	5.5	181	
BCD32496	133.80	134.80	1.00								94	899	437				334	81		66	3.1	86	
BCD32497	146.10	146.60	0.50	.022	.754	.211	2.2	.015			222	7538	2109				181	30		42	2.2	15	
BCD32498	147.50	148.40	0.90								76	905	973				247	46		3	0.9	14	

Sample	From (m)	To (m)	Length (m)	CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB
BCD32499	158.60	158.90	0.30	.038	.330	1.320	12.1	.037			378	3295	13197				399	38		29	12.1	37
BCD32500	161.00	161.25	0.25	.016	1.053	1.036	8.0	.022			162	10525	10361				187	26		22	8.0	22
BCD32501	164.00	165.30	1.30					0.06			92	770	451				106	28		9	1.2	
BCD32502	165.30	166.60	1.30	.010	.216	.179	2.2	.027			101	2163	1787				186	30		6	2.2	27
BCD32503	166.60	168.10	1.50								35	98	64				74	31		3	0.2	2
BCD32504	172.80	173.20	0.40								356	209	415				204	19		1	0.1	42
BCD32505	173.95	174.27	0.32								163	100	296				130	30		1	0.1	19
BCD32506	183.80	184.30	0.50	.020	.593	.034	0.9	.036			195	5926	336				172	43		4	0.9	36
BCD32507	188.50	190.00	1.50								73	107	89				201	31		1	0.8	18
BCD32508	198.70	200.20	1.50					0.02			91	57	1				223	44		1	1.3	
BCD32509	201.90	203.30	1.40					0.01			29	42	9				117	49		2	0.6	
BCD32510	219.40	220.80	1.40								85	184	10				51	24		1	0.8	10
BCD32511	229.10	230.60	1.50								81	165	135				234	41		5	0.5	40
BCD32512	230.60	232.10	1.50	.032	.152	.075	1.1	.098			321	1515	751				295	74		8	1.1	98
BCD32513	243.00	244.40	1.40								85	480	291				97	58		3	1.3	20
BCD32514	254.10	255.35	1.25								85	285	339				284	99		3	0.6	42
BCD32515	255.35	256.35	1.00					0.06			19	56	152				134	134		269	1.0	
BCD32516	258.30	259.00	0.70								18	52	33				96	199		1	0.8	10
BCD32517	262.60	264.10	1.50								98	369	315				313	53		3	0.3	57
BCD32518	269.20	270.70	1.50								33	77	178				191	49		6	0.3	47
BCD32519	276.40	278.70	2.30								22	82	1				1	12		1	0.6	15
BCD32520	288.50	289.80	1.30	.104	.022	.019	7.0	.075			1044	218	187				64	21		228	7.0	75
BCD32521	297.30	297.80	0.50					0.03			43	80	114				35	96		1	0.6	
BCD32522	299.15	300.00	0.85	.24	.01	.01	2.9	0.02			2400	35	75				32	219		12	2.9	
BCD32523	330.50	331.30	0.80								52	47	1				2	11		1	1.0	10
BCD32525	339.90	341.10	1.20								67	180	1				73	61		1	1.4	2
BCD32526	341.10	342.70	1.60								47	170	1				1	134		1	3.6	1
BCD32524	353.10	353.90	0.80								63	177	13				1	16		1	2.5	10
BCD32527	353.20	354.75	1.55					0.01			29	101	1				24	37		1	0.5	
BCD32528	354.75	355.50	0.75					0.01			24	116	1				1	38		1	0.4	
BCD32529	355.50	356.45	0.95								42	89	1				1	30		1	0.6	3
BCD32530	363.00	364.50	1.50								95	203	33				53	57		2	1.9	17
BCD32531	364.50	366.00	1.50								81	301	392				80	64		1	0.6	10

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: MBA GOLD ZONE

PLOTTING COORDS GRID: SAM
NORTH: 674.00N
EAST: 11974.00W
ELEV: 1034.00

ALTERNATE COORDS GRID: ESTIMATED
NORTH: 6+85N
EAST: 119+75W
ELEV: 1045.00

COLLAR DIP: -78° 0' 0"
LENGTH OF THE HOLE: 237.40m
START DEPTH: 0.00m
FINAL DEPTH: 237.40m

COLLAR GRID AZIMUTH: 270° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 315° 0' 0"

DATE STARTED: July 13, 1991
DATE COMPLETED: July 15, 1991
DATE LOGGED: July 18, 1991

COLLAR SURVEY: NO
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: FRONTIER DRILLING
CASING: PULLED
CORE STORAGE: SAMEX CAMP

PURPOSE: OFF-AZIMUTH HOLE TO TEST `MBA' GOLD ZONE 25M ADJACENT TO BEST INTERSECTION. COLLARED 25M EAST

DIRECTIONAL DATA: OF RG400 COLLAR.

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
63.90	-	-79° 0'	ACID	OK		-	-	-	-	-	
123.10	-	-79° 0'	ACID	OK		-	-	-	-	-	
185.00	-	-79° 0'	ACID	OK		-	-	-	-	-	
91.40	310° 0'	-79° 0'	SING.SHOT	OK		-	-	-	-	-	
236.80	302° 0'	-79° 0'	SING.SHOT	OK		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 52.40	«CSG»					
52.40 TO 61.70	«SER/QTZ SC HIST»	Yellow, white. Fine grained. Protolith has been completely altered. Interval contains 10% white/ grey quartz veinlets and some patches. Some veins have diffuse margins. Veins are generally oriented parallel to foliation at 25-35 degrees to core axis. 60.7-61.7m: 20% patches and veins of quartz.		Interval has been intensely altered to yellow sericite. Between 60.7-61.7m, the sericite is more greenish to brown.	3% fine grained pyrite which occurs as fine disseminations to patches.	
61.70 TO 63.50	«HET FRAG»	Grey, brown, black. Fine to 5cm. A silty to fine sand matrix supports 50% rounded to subangular clasts. Clast composition is 15% quartz and chert 1% argillite, 84% variably altered sed/vol? clasts Alteration consists of bleaching, sericitization. Some rip up clasts at the base of interval indicate that tops are up hole.		Interval contains 5% white/grey fe-dol nodular porphyroblastic growths. Interval has been weakly sericitized. Sericite is grey to brown and its presence gives core phyllitic partings.	5% disseminated pyrite.	
63.50 TO 64.90	«SER CHERT»	Grey. Fine grained. Protolith was likely a chert with argillaceous partings.Currently the core consists of grey cherts with remnant bedding at 25-40 degrees to core axis. Bedding is locally ruptured. Interval has 5% patchy to irregular white quartz veining including one vein oriented at 20 degrees to core axis between 64.65-64.9m.		Argillite? material is altered to green or yellow sericite. Trace kaolinite.	1% fine grained disseminated pyrite.	
64.90 TO 93.60	«SER/QTZ AL T SED?»	Yellow, white, grey, green. Fine grained. Rock is intensively and extensively altered to the point where all original textures are destroyed. Foliation given by quartz/sericite banding varies but in general ranges between 20-40 degrees to core axis. Locally foliation subparallels the core axis. Bulls eye structures present between 77.1-77.4m. Minor fault breccia at 90.5 & 91.2m.		Interval contains up to 40% silica. Silica primarily occurs as veins/veinlets, but also as patehes and in the groundmass. Sericite is the primary mineral. Colour of the sericite varies between a pale yellow and a dark greenish grey. Both types occur together or seperately.	3% pyrite occurs as fine to coarse grains which are finely to coarsely disseminated. A 2cm vein at 90m contains 1% coarse grained galena. ‖91.7-91.95‖ «1%cp, 1%sp+gn» in quartz-carbonate vein.	
93.60 TO 100.20	«SIL CHT? & ARG/QV»	White, black, grey. Protoliths are chert? and argillite. Alteration destroyed bedding textures in the argillite but there is a weak, ghosted remnant in some of the chert. Bedding appears to be contorted. Quartz generally occurs as flooding but is also present as discrete veins up to 25cm long. The base of the intérval is such a vein. Interval contains 30% sil argillite, 15% discrete quartz veins 55% sil chert.		Interval is intensely silicified and quartz veined. Minor sericite present-occurs as alteration of partings in the cherts.	1% coarsely disseminated, fine grained pyrite except between 96.95-97.2m, where there is 10-30% fine to coarse grained pyrite in the quartz. In general the pyrite occurs in the argillite.	Entire interval sampled for metallics.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
100.20 TO 113.20	«QTZ/SER AL T SED?»	Yellow, greenish-grey, white. Fine grained. Interval has strong similarities to the core in the interval 64.9-93.6m. Intense alteration destroys all original textures. Protolith very uncertain. 10% discrete white to grey quartz veining. Veins contain wallrock fragments and are weakly fractured. There is a local wide spaced cleavage at..... Some quartz veinlets follow this cleavage. At 104.8m the sericite and quartz banding exhibits bullseye structures-after bedding?	80	There are two types of sericite present 60% of the sericite is pale yellow. These intervals can be very clean in that sericite comprises 80% of the rock and has a massive uniform appearance. The remainder of the sericite is a mixture of grey-green sericite. Which grades into and out of yellow sericite giving a mottled appearance. Locally sericite is banded with quartz.	There is 6% finely disseminated pyrite in the dark sericite altered core and 3-5% fine to coarse grained, patches and stringers of pyrite in the yellow sericite altered core.	
113.20 TO 126.20	«QV/CHT/SER ALT'N»	White, cream, grey, brown. Interval is heavily quartz veined and sericitically altered: 50% of the interval is quartz veining, 20% altered chert & 30% sericitically rock of indeterminant origin. Chert has remnant bedding planes which have been contorted but are at low angles to the core axis in general.		There is intense silicification in the interval, sil takes the form of quartz veins. Patchy moderate to intense sericite alt'n of the country rock. Sericite is generally greenish brown to pale brown in colour but locally (in cherts in particular) is grey to silvery grey.	Overall pyrite content of the interval is ~5%. Pyrite is fine to coarse grained and very coarsely disseminated. Pyrite occurs as bands, patches in quartz and at quartz-sericite contacts. Small amount of gn, cp, sp (in order of decreasing abundance) are disseminated in the quartz veins-eg. between 114.1-114.5m a 1-3cm wide quartz vein running parallel to the core axis contains 1-2% coarse grained blebs of galena. Overall the base metals comprise <1% of the interval except between ╢123.85-125.2╟ (MBA Zone?) where intense quartz veining contains 8% pyrite & marcasite «<3%cp, 2%gn, <1%sp»	83% core recovery between 120.1-123.1m. Marcasite is identified by radiating growth structure `marcasite dollars'.
126.20 TO 169.00	«QV + QTZ/S ER ALT SED»	Grey, yellow, white. Outside of minor intervals that may be altered cherts and two intervals of Het frag - 143.6-144.05m and 144.7-144.9m - the intense alteration of the rock destroys all original textures. The het frag intervals consist of quartz, sricite altered seds/vol?, and silicified argillite clasts supported by a pyritiferous matrix. Clasts comprise up to 80% of the intervals. The F/W contact of the lower HF unit is in fault contact with sericitic seds. The unit contains 10-70% white quartz veins up to 50cm long. These veins are locally dicrete but are commonly smaller irregular veins, veinlets and patches caught up by and containing wall rock clasts. Some veins contain 20% creamy Fe-carbonate. Many veins are barren except for some coarsely disseminated and		Interval is intensely sericite altered. Between 126.2-135.1m the sericite is predominantly yellow. Below 135.1m the sericite is predominantly greenish with subordinant patchy yellow and grey sericite. Silicification is minor most of the quartz is in veins. Some of the argillite is silicified.	Between 126.2-147.2m there is 4% fine grained pyrite. Pyrite is generally very coarsely disseminated or in patches and irregular discontinuous bands. Pyrite is commonly associated with quartz. No BM sulphides were seen in this subinterval except at 144.05-144.18m and 144.45-144.7m. These intervals consist of mineralized quartz/carbonate veins F/W and H/W to the two Het frag intervals (respectively). ╢144.05-144.18╟ «2%sp, 10%py+marc» Pyrite is cubic-fine to coarse grained. Marcasite is very fine grained and has framboidal texture. ╢144.45-144.7╟ «30%py, 1%sp, min cp»	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		patchy pyrite, others are intensely mineralized. A general sense of foliation, possibly after bedding is given by banding of sericite, quartz and pyrite. In general this foliation ranges between 40-60 degrees to core axis. Between 129.5-140.8m the foliation is contorted and is oriented subparallel to the core axis. Minor bullseye structures present. The core is generally competent except between 156.2-163.3m where numerous fault gouge zones <10cm wide affect 25% of the interval. Between 165.6-165.8m and 167.3-168.8m there is some patchy, weakly altered argillites.			Between 147.2-169m the pyrite content increases to ~7% overall, with local concentrations to 15%. Quartz veins in this interval may be barren of other sx ,contain trace to minor amounts of sp, cp, gn or be highly mineralized. Zones of mineralization are indicated below: {149.7-150} 30% py, 5% gn, 5% sp, 2% cp, 2% tt. Sx are fine to medium grained and very coarsely disseminated. ~1% tt is clearly visible and estimated 1% is very fine grained + difficult to distinguish from the galena. «30%py 12%BM 2%tt» Upper contact is irregular. Lower contact is at 65 deg. to the core axis. {154.0-156.3} a fairly continuously veined zone. Overall the interval contains 35% sx with subintervals containing up to 50% sx. Approximate sulphides content is 19% py, «10%sp 3%cp 2%tt 1%gn». Locally sphalerite can reach concentrations as high as 30% over 10cm. {156.3-157.1} A cleaner, fractured qtz-carbonate vein cutting altered rock hosts «4%py 2%sp+gn min tt» Sx occur as clots within the interval. Much of the core is relatively sx poor. {157.1-157.27} vein contains 50% sx, 7% py, 3% cp «38%BM 5%tt 7%py». Some galena has been warped - bent cleavage. {160.75-161.05} Quartz vein hosts 30% sulphides. Approximately sulphide content is 1% aspy, 12% py, 7% sp, 5% tt, 4% cp, 6% gn. «13%py+aspy 17%BM 5%tt» {166.8-167.3} «1%gn 3%py 5%aspy» in quartz veins and silicified argillite.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
169.00 TO 188.30	«HET FRAG»	Grey, white, black, buff. Fine to 10cm. The majority of the interval contains a well developed Het Frag textures. Clasts comprise 75-95% of the volume. Clasts are frequently framework supported. Clasts are rounded to subangular. Matrix appears to be silty, currently pyritiferous Clasts are quartz, argillite sericitically altered rock and possible minor pyrite lithoclasts (qtz> ser alt >arg > pyrite). Most of what looks like pyrite lithoclasts are likely to be caused by the preferential alteration of some clast types. Core is locally well indurnated with silica; distinct veins are rare, rather silica occurs in flooded +/- veined zones and patches. Between 175.4-180.4m core is subjected to intense silica flooding/veining - some possible replacement of host rock. Remnant country rock is strongly sericitized but looks to have been a bedded sediment with possible cherty beds rather than a het frag. Core is general quite competent. Minor narrow fault bx/gouge zones. 180.5-181.0m: Weak fault breccia and clay gouge. {186.1-188.3} intermittant «Flt Bx», faulting increases with depth. Veining? 15-25 degrees. Veins 45-70 degrees.	20 58	Argillite clasts are black, but have been strongly silicified. Patchy silicification associated with quartz vein/flooding. Weak sericite is developed through the interval greyish in colour except between 175.4-180.4m where there is intense very pale greenish sericite alteration. Minor talc.	Pyrite is ubiquitous throughout the unit. Pyrite is fine to medium grained. Pyrite occurs as fine to coarse disseminations, large patches and as (minor) lithoclasts. Pyrite concentration ranges between 5-25% over 10m lengths. Base metal, aspy and tetrahedrite primarily occur as indicated below. These minerals are all fine to (locally coarse grained and are coarsely disseminated in quartz. {169-170.5} Overall there is approximately 5% sp, 1% tt, minor gn, 1% aspy. The BM and tt are most concentrated below 169.8m. Aspy occurs primarily above 169.8m. «6%BM 1%tt 1%aspy» 5% pyrite. 174.1-174.2m: 3% sp, 1% gn, 5% aspy, 20% py. {175.2-176} «15%py 2%BM, <1%tt» The BM and tt are primarily concentrated within one 7cm wide band. BM are sp, gn, and trace cp. 176-177.8m: BM sx are sparse, <1% sp + gn, 12% py. {177.8-180.4} mineralization is rather patchy. Concentrated in some quartz veins, which are commonly oriented at 15-25 degrees to core axis. Overall sx content is approximately 3% tt, 4% gn, 3% sp, 1% cp. «3%tt, 8%BM» 5% pyrite. {180.4-181.4} interval is well mineralized quartz vein zone. Upper contact at 70 degrees to core axis. Lower contact is at 45 degrees to the core axis. «2%tt 10%sp 3%gn tr cp» 20% py. Interval contains a 12cm wide zone containing 30% sp.	
188.30 TO 201.00	«QTZ/SER AL T SED?»	Grey, yellow, green. Fine grained. Core is intensely altered. Alt'n destroys most original textures except for minor (sil) argillite beds which are only weak/patchily altered - predominantly towards base of the interval. Core is foliated at 30-40 degrees to core axis. 5% dis-		Rock is intensely sericitized. Sericite varies between a pure pale yellow and a greenish yellow colour. Sericite is banded by white to grey quartz.	3-5% fine grained pyrite occurs as patches and stringers in quartz.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		crete white quartz veins oriented subparallel to foliation. Core is very blocky between 192-193m and 199.9-200.4m. Lower contact is weakly fault brecciated.				
201.00 TO 218.05	«ARG»	Black, white, grey, yellow. Fine grained. Interval consists primarily of black bedded argillite. Locally the argillites become somewhat silty or are sericitically altered. BEDDING is at Unit contains 5% white quartz veinlets and stringers except between 210.8-212.4m where there is 50% quartz veining which brecciates the argillite. Veins contain 5% creamy dolomite. 207.9-208.7 «Flt Bx» 213.1-213.5 «Flt Bx» 214.6-214.9 «Flt Bx» Between 217.3-217.5m bedding is subparallel to core axis; cleavage at.....	40 45	There is minor silicification associated with quartz veining. Patchy zones of moderate sericitization-yellow and grey-green. Between 214.8-215.2m there is an intense yellow ser. zone. Upper contact is in a faulted area but lower contact is at 65 degrees to core axis. A sharp contact. Bedding in argillite is at 40 degrees to core axis therefore alteration is crosscutting bedding.	2% finely to coarsely disseminated pyrite.	The zone of veining between 210.8-212.4 corresponds the auriferous veins of the lower zone in RG 398.
218.05 TO 237.40	«ARG + QTZ/ SER ALT SD»	Yellow, black, grey, white. Fine grained. Interval consists of 45% bedded argillite and 55% quartz/sericite altered seds? General sense of bedding in the argillites is at..... Locally bedding is contorted. In these areas a well developed cleavage crosscuts the bedding at.. Foliation within the altered core appears to parallel bedding. 228.6-230.3m: Interval contains 15% white quartz veining. Interval contain 2-3% quartz veining overall. 221.9-222.2m: Fault bx. END OF HOLE	50 60	Sericite is greenish yellow in colour and is banded by quartz.	1% fine to coarsely disseminated pyrite	Core grades into and out of argillite and ser seds - a more rapid changing sequence of the previous two units.

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB	COMMENTS
BCD32532	69.50	71.00	1.50					.02			50	157	58				154	73		13	1.1	22	
BCD32533	79.90	81.00	1.10					.01			46	98	36				103	58		4	0.5	4	
BCD32534	89.30	90.10	0.80					0.10			23	55	73				147	82		2	0.4	100	
BCD32535	91.20	92.80	1.60					0.05			41	307	66				224	135		4	0.8	50	
BCD32536	92.80	93.60	0.80					.02			29	64	39				208	111		4	0.8	18	
BCD32537	93.60	95.25	1.65					0.02			7	143	31				97	121		3	0.4	20	
BCD32538	95.25	96.90	1.65					0.03			11	53	20				180	91		3	0.4	30	
BCD32539	96.90	98.55	1.65					0.10			25	28	23				275	65		5	0.5	100	
BCD32540	98.55	100.20	1.65					0.02			6	23	10				65	54		2	0.4	20	
BCD32541	109.45	110.35	0.90					0.16			9	73	27				100	82		2	0.3	160	
BCD32542	110.35	111.30	0.95					0.02			14	49	35				176	153		2	0.4	20	
BCD32543	113.20	114.70	1.50					0.04			20	55	217				215	101		3	0.6	40	
BCD32544	114.70	115.90	1.20					0.02			19	95	44				191	131		2	0.3	20	
BCD32545	115.90	117.10	1.20					0.03			22	133	49				175	179		3	0.6	30	
BCD32546	117.10	118.40	1.30					0.01			32	86	131				115	35		7	1.5	10	
BCD32547	118.40	119.90	1.50					0.02			157	151	75				107	49		10	2.4	20	
BCD32548	119.90	121.40	1.50					0.12			105	364	391				364	76		11	3.3	120	
BCD32549	121.40	122.40	1.00					0.02			28	35	451				170	44		10	3.6	20	
BCD32550	122.40	123.85	1.45					0.02			8	35	100				70	63		3	1.2	20	
BCD32551	123.85	125.20	1.35	.110	.26	.31	21.1	.22			1095	2559	3103				1015	53		53	21.1	220	
BCD32552	125.20	126.30	1.10	.071	.28	.07	16.8	.05			707	2763	742				505	77		34	16.8	52	
BCD32553	127.60	128.90	1.30					.01			55	90	52				153	60		5	0.9	6	
BCD32563	142.60	144.05	1.45	.019	.42	.01	2.3	.06			190	4185	126				475	96		14	2.3	60	
BCD32554	144.05	144.70	0.65	.042	.57	.05	9.6	.18			423	5658	506				1152	82		55	9.6	184	
BCD32564	144.70	146.20	1.50					.08			42	95	52				607	81		7	0.3	80	
BCD32565	146.20	147.20	1.00					.06			22	74	59				910	89		13	0.2	62	
BCD32566	147.20	148.20	1.00					.01			19	40	154				591	80		9	0.3	10	
BCD32567	148.20	149.70	1.50					.04			26	89	389				780	85		13	0.7	38	
BCD32555	149.70	150.00	0.30	1.00	2.98	3.90	160.2	0.78			9119	27954	35924				3544	69		3739	139.5	780	
BCD32568	150.00	151.00	1.00	.066	.32	.21	13.7	.29			663	3195	2116				2129	68		299	13.7	285	
BCD32569	151.00	152.50	1.50	.005	.01	.03	1.5	.10			45	143	343				1879	65		35	1.5	97	
BCD32570	152.50	154.00	1.50	.008	.01	.03	2.1	.16			75	137	305				1604	56		42	2.1	157	
BCD32556	154.00	155.45	1.45	.226	2.01	.32	14.5	.36			2260	20079	3189				2904	91		199	14.5	355	
BCD32557	155.45	156.30	0.85	.566	6.64	1.71	64.6	0.46			4838	58881	14719				3639	64		744	48.2	460	
BCD32571	156.30	157.10	0.80	.070	.19	.20	21.7	.33			706	1864	1997				2277	51		375	21.7	330	
BCD32572	157.10	157.27	0.17	1.330	10.10	27.53	63.60	1.78			10607	98650	191450				3947	13		3879	495.2	1780	
BCD32573	157.27	159.00	1.73	.042	.18	.26	15.2	.20			421	1842	2615				1523	77		234	15.2	195	
BCD32574	159.00	160.75	1.75					.06			24	79	199				395	58		7	0.3	59	

Sample	From (m)	To (m)	Length (m)	CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB
BCD32558	160.75	161.05	0.30	3.553	3.59	9.03	752.0	1.5			29961	31665	69800				13727	32		10519	594.4	1500
BCD32575	161.05	162.50	1.45					.08			32	187	275				1467	49		25	0.5	76
BCD32576	162.50	164.00	1.50					.06			25	89	69				1095	80		16	0.1	62
BCD32577	164.00	165.60	1.60					.04			20	100	56				1206	79		13	0.1	40
BCD32578	165.60	166.70	1.10	.003	.03	.03	0.6	.12			32	265	281				2098	71		29	0.6	122
BCD32579	166.70	167.70	1.00	.030	.48	.34	10.6	.35			300	4790	3407				4142	224		152	10.6	348
BCD32580	167.70	169.00	1.30	.006	.09	.05	3.3	.21			59	867	516				2661	82		54	3.3	212
BCD32581	169.00	169.80	0.80	.091	1.03	.20	42.0	.82			823	8675	1074				3306	45		409	35.9	820
BCD32559	169.80	170.50	0.70	.360	4.90	.59	159.0	1.67			3278	45592	5105				3876	56		1792	137.8	1670
BCD32582	170.50	172.15	1.65	.004	.01	.03	0.9	.20			39	144	310				2812	84		31	0.9	204
BCD32583	172.15	173.80	1.65	.004	.01	.01	0.8	.20			40	67	129				2604	98		32	0.8	197
BCD32584	173.80	175.20	1.40	.030	.08	.14	10.9	.32			303	829	1436				3037	91		157	10.9	320
BCD32560	175.20	176.00	0.80	.841	.78	1.15	229.0	1.26			8503	6729	10107				4116	85		4635	227.4	1280
BCD32585	176.00	177.50	1.50	.050	.06	.09	15.9	.12			496	590	938				2050	82		261	15.9	122
BCD32586	177.50	179.00	1.50	.520	.51	.70	143.7	.37			5202	5137	6972				2564	56		2756	143.7	370
BCD32587	179.00	180.40	1.40	.561	1.74	.76	119.7	.42			5076	15804	5853				1862	48		2139	105.6	420
BCD32561	180.40	181.00	0.60	.607	4.87	1.10	249.0	1.85			5621	47760	10177				3645	92		2911	229.1	1850
BCD32562	181.00	181.40	0.40	1.868	8.91	3.89	678.0	1.91			14280	80800	30742				3666	57		7517	514.8	1910
BCD32588	181.40	182.70	1.30	.009	.02	.08	2.5	.17			88	215	779				2230	86		52	2.5	174
BCD32589	182.70	184.20	1.50	.031	.30	.04	12.5	.20			309	2986	415				2312	114		173	12.5	196
BCD32590	184.20	185.70	1.50	.004	.01	.03	0.6	.34			38	148	297				3875	98		55	0.6	339
BCD32591	185.70	187.00	1.30					.07			40	127	327				337	104		10	0.8	72
BCD32592	187.00	188.20	1.20					.04			40	106	111				269	185		8	0.7	41
BCD32593	188.20	189.80	1.60	.002	.01	.01	0.2	.17			16	82	36				727	53		5	0.2	170
BCD32594	194.00	195.03	1.03					.11			13	68	36				1725	149		25	0.1	110
BCD32595	205.70	206.30	0.60					.19			8	58	22				200	138		2	0.1	190
BCD32596	209.40	210.90	1.50					.20			16	35	19				292	140		2	0.1	200
BCD32597	210.90	212.40	1.50	.003	.01	.01	0.3	.52			30	60	38				697	88		4	0.3	520
BCD32598	212.40	213.90	1.50					.08			9	44	15				212	181		1	0.1	80
BCD32599	213.90	214.80	0.90					.14			10	35	17				411	102		2	0.1	140
BCD32600	221.00	222.50	1.50					.01			6	52	20				182	115		1	0.1	5
BCD32601	228.30	229.80	1.50					.01			18	32	19				117	163		2	0.1	4
BCD32602	229.80	231.30	1.50					.02			16	31	19				107	85		1	0.1	20

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: SAM
PROJECT NUMBER: 240
CLAIM NUMBER:
LOCATION: SAM PIT-MAGAZINA RD.

PLOTTING COORDS GRID: estimated
NORTH: 1100.00N
EAST: 10235.00W
ELEV: 1260.00

ALTERNATE COORDS GRID: ESTIMATED
NORTH: 11+ 0N
EAST: 102+35W
ELEV: 1260.00

COLLAR DIP: -89° 0' 0"
LENGTH OF THE HOLE: 471.50m
START DEPTH: 0.00m
FINAL DEPTH: 471.50m

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 225° 0' 0"

DATE STARTED: July 16, 1991
DATE COMPLETED: July 21, 1991
DATE LOGGED: July 19, 1991

COLLAR SURVEY: NO
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: NO
HOLE SIZE: NQ

CONTRACTOR: FRONTIER DRILLING
CASING: PULLED
CORE STORAGE: SAMEX CAMP

PURPOSE: TEST BELOW BARITE ZONE, 150M DOWNDIP OF LAST PIERCE POINT WITH INTENSE SILICIFICATION.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
99.70	-	-85° 0'	ACID	OK		-	-	-	-	-	
175.80	-	-85° 0'	ACID	OK		-	-	-	-	-	
233.50	-	-83° 0'	ACID	OK		-	-	-	-	-	
273.40	-	-78° 0'	ACID	OK		-	-	-	-	-	
331.30	-	-76° 0'	ACID	OK		-	-	-	-	-	
383.10	-	-72° 0'	ACID	OK		-	-	-	-	-	
447.10	-	-68° 0'	ACID	OK		-	-	-	-	-	
152.40	189° 0'	-83° 0'	MULTISHOT	OK	SINGLE SHOT.	-	-	-	-	-	
304.80	207° 0'	-77°30'	MULTISHOT	OK	SINGLE SHOT	-	-	-	-	-	
457.20	208° 0'	-69° 0'	MULTISHOT	OK	SINGLE SHOT	-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 18.20	«CSG»					Started coring at 6.1m. At 14.0m the blockness of the core was causing problem so casing was pushed to 18.2m. Rock is the same as the first unit below.
18.20 TO 154.80	«MAF VOL»	Green, white. Fine grained. Volcanics consist of an aphanitic matrix which is streaked, spotted and veined by quartz/carbonate. (30/70%) carbonate is ankerite. Maxium vein length is 20cm. The veins exhibit general orientation at..... Narrow fault breccia zones present. {30.8-31.4} «Flt Bx + Gou» {110-110.2} «Brittle Flt Bx» {154-154.8} «Flt Bx» Lower contact at..... Between 154-154.3m core contains a section of faulted tertiary dyke running subparallel to the core axis.	40 70	Core strongly chloritic and moderately calcareous. Between 6.1-31.7m there is steaky pale green sericite (+ epidote?) alteration which very locally grades into a more yellow sericite. This sericite alteration may be due in part to veining.	1% disseminated pyrite.	Core is frequently relatively blocky to 56m. The veins may be oriented to a tuffaceous bedding plane.
154.80 TO 160.05	«TERT DYKE»	Dark grey to maroon. Fine grained. Dyke is basaltic. 3% carbonate amygdules. Core containing 5% feldspathic? crystals which are coarser than the aphanitic matrix 1% dark olivine? crystals (<1mm). {157.7-160.05} intense «Flt Bx»				
160.05 TO 167.25	«MAF VOL»	Green. Fine grained. Similar to the volcanics between 18.2-154.8m. Slightly more mottled coloration-possibly due to some coarser tuff clasts textures. 166.6-167.25m: Weak fault bx. Lower contact oriented at.....	50	Vol are strongly chloritic & moderately calcareous.		
167.25 TO 169.50	«TERT DYKE»	Dark grey to maroon. Fine grained. As in the previous tert, basalt dyke interval. Lower contact at ..... Between 168.7-169.1m there is a short interval of green chloritic mafic volcanics. Upper contact at 60 degrees to core axis. Lower contact at 75 deg.	20			

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
169.50 TO 233.00	«MAF VOL»	Green. Fine grained. Similar to the volcanis between 182-154.8m except that there are zones where core is weakly bleached, and not as chloritic. 189.6-195.8m: Aphanitic matrix is spotted by very fine grained carbonate + sericite - a seperate unit - tuff? Between 169.5-232.65m the core contains less qtz/carbonate veining than at the top of the hole, but quartz comprises 65% of the veins and some veins are 85% quartz. Quartz veins reach 40cm and are associated with minor base metal sulphides. 192.6-192.95m: Quartz/carbonate vein oriented at	50	Weak bleaching between 179.5-185.1m. Between 219.3-223.8m core is weakly bleached. Bleaching is associated with veining.	2% fine to coarsely disseminated pyrite Minor galena disseminated in quartz veins. Between 205.2-208.2m there is 1% cp + gn + sp (gn>sp=cp) which is coarsely disseminated and concentrated in quartz veins. ‡208.2-208.65‡ quartz vein contains «20%py5%sp10%cp5%gn» 221.9-222.3m: 1% cp, 1% gn, 4% py in quartz vein. ‡232.65-233‡ «4% gn, 4% py» in quartz.	
233.00 TO 372.95	«MFLT»	Green. Fine to 6cm. Core is distinct from the mafics above. Matrix is very chloritic, dark green. Matrix is aphanitic to fine grained and contains minor to 5% darker green chlorite clots to 1mm,-possibly altered glassy fragments. Interval contains up to 40% lapilli clasts. Clasts are paler than the matrix. Consistent plane of fracture parallels foliation/bedding? at..... There is 3% white fr-calcite patches and veins. Between 365-371m the clastic texture is sparse, but is still strongly chloritic. 371-372.95m: Core becomes a paler green color. Core again contains lapilli sized clasts. Clasts are preferentially sericitized.	60	Mafics are intensity chloritic and weakly calcareous.	Minor disseminated pyrite.	
372.95 TO 471.50	«MFLT/MAF VOL»	Green. Fine grained. Interval consists of beds of mafic lapilli tuff and fine grained mafic volcanics of uncertain genesis; possibly finer grained tuffs, no clean evidence of flows. Where rock type changes between MFLT and MAF VOL the contact zone is commonly bleached and may contain some quartz-carbonate veining. Zones of MFLT occur between 394.4-405.6m, 425.5-471.5m. MFLT is less chloritic and contains fewer clasts than in the interval 233-372.95m. Mafic vol tend to be more mottled than the MFLT due to variable alteration. Interval contains 6% white quartz/carbonate (25/75%) veining. Veins are somewhat preferentially concentrated in the Mafic vol units. Foliation is approximately perpendicular to the core axis. Between 435.3-465.6m there is abundant quartz-		Mafic vol are mottled by sericitic (weak) chlorite alteration. Local bleaching and veining.	Trace galena disseminated in quartz vein. There is up to 15% fine grained patches and dissemination of pyrite within and in the vicinity of quartz/carbonate veins. 1% pyrite in remainder of the core.	Minor galena. Which is very fine

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		carbonate veining. The veins are commonly oriented subparallel to at very low angles to the core axis. Veining comprises 15% of the interval. 436-436.35m: Quartz/carbonate vein may contain barite as well - core is very dense. ‡451.6-457.9‡ «Qtz/Carb Vn» runs subparallel to core axis. (80/20%). ‡464.4-465.6‡ «Qtz/Carb Vn» END OF HOLE.			‡451.6-457.9‡ «1% gn + cp» 456.9-457.2m: interval contains 1% gn, 2% cp, 8% py. ‡464.4-465.6‡ «Min tt, 1% gn, 1% cp»	grained, is disseminated in the quartz-carbonate veins.

Sample	From (m)	To (m)	Length (m)	ASSAYS CU %	ZN %	PB %	AG G/T	AU G/T	SB %	AS %	GEOCHEMICAL CU PPM	ZN PPM	PB PPM	S.G.	AG OZ/T	AU OZ/T	AS PPM	BA PPM	BA %	SB PPM	AG PPM	AU PPB		COMMENTS
BCD32603	202.20	203.70	1.50								25	199	154				48	62		1	0.9	26		
BCD32604	203.70	205.20	1.50								28	353	182				86	37		1	0.8	48		
BCD32605	205.20	206.70	1.50	.006	.36	.44	3.7	.07			55	3583	4416				61	34		1	3.7	65		
BCD32606	206.70	208.20	1.50	.006	.31	.78	5.6	.12			60	3184	7819				231	41		1	5.6	124		
BCD32607	208.20	208.65	0.45	.532	4.07	3.86	29.1	.46			5321	40740	38559				333	34		57	29.1	459		
BCD32608	219.30	220.30	1.00	.009	.05	.06	1.7	.04			93	541	612				103	35		1	1.7	44		
BCD32609	221.90	222.30	0.40	.030	.12	.24	3.8	.06			296	1229	2360				18	24		7	3.8	61		
BCD32610	232.65	233.00	0.35	.028	.70	.52	4.6	.13			277	7040	5209				222	24		8	4.6	127		
BCD32611	407.00	407.60	0.60								47	110	140				34	27		1	2.3	24		
BCD32612	408.70	409.30	0.60								64	524	429				159	33		3	2.8	66		
BCD32613	415.60	417.20	1.60								33	61	47				87	53		1	1.5	18		
BCD32614	418.20	419.70	1.50								47	72	118				94	35		1	1.4	22		
BCD32615	435.30	436.40	1.10								31	143	139				52	58		1	1.1	16		
BCD32616	439.60	441.00	1.40								18	95	68				33	18		1	0.9	9		
BCD32617	447.50	448.60	1.10								30	187	66				41	31		1	1.0	21		
BCD32618	448.60	450.10	1.50								17	116	167				38	33		1	1.0	10		
BCD32619	450.10	451.60	1.50								26	214	15				25	31		1	1.0	23		
BCD32620	451.60	453.10	1.50								12	138	89				3	17		1	1.1	8		
BCD32621	453.10	454.60	1.50								16	150	17				3	19		1	1.2	22		
BCD32622	454.60	456.10	1.50								13	73	239				33	49		1	1.1	20		
BCD32623	456.10	457.60	1.50	.027	.02	.13	6.4	.10			265	249	1286				118	34		7	6.4	102		
BCD32624	457.60	458.50	0.90								28	198	581				55	34		1	1.6	38		
BCD32625	461.40	462.90	1.50								32	264	268				97	36		1	1.3	37		
BCD32626	462.90	464.40	1.50	.005	.06	.13	2.2	.05			46	568	1337				153	40		1	2.2	46		
BCD32627	464.40	465.60	1.20	.084	.08	.11	3.4	.02			835	750	1081				1	34		7	3.4	19		
BCD32628	465.60	467.10	1.50								73	149	52				109	51		1	1.2	38		