

DDH #3

841618

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Agassiz m-459

- 0-32 OVERBURDEN
- 32-70 LAPILLI ANDESITE TUFF
DARK GREEN ANGULAR FRAGMENTS IN A LIGHT GREY
APHANITIC SILICEOUS MATRIX;
- 70-76 ANDESITE FLOW
DARK GREEN ANDESITE WITH EPIDOTIZED FELDSPARS
IN A PORPHYRITIC TEXTURE
- 76-87 LAPILLI ANDESITE TUFF
DESCRIPTION AS FOR 32-70
- 87-111 ANDESITE FLOW (?)
87-97 1' CORE RECOVERED
97-107 3' CORE RECOVERED
WEATHERED & OXIDIZED APPEARANCE OF R_x PLUS
SHEARED AND COMMINUTED NATURE OF CORE RECOVERED
INDICATE DEEP WEATHERING IN A FAULT ZONE / NEAR
SURFACE CONDITIONS
- 111-213 LAPILLI ANDESITE TUFF TO ANDESITE BEECCIA
DARK GREEN LAPILLI TO B_x SIZE ANGULAR FRAGMENTS
IN A LIGHT GREY SILICEOUS MATRIX. DESCRIPTION
IDENTICAL TO 32-70. VARIABLE PROPORTIONS OF
FRAGMENTS (AND FRAGMENT SIZE) TO MATRIX
RESULT IN VARIABLE COLORS THROUGH SECTION
- 213-229 FAULT
LIGHT GREY TO MOTTLED LIGHT GREY AND GREEN TO
BLACK SERICITIZED, SILICIFIED CHLORITIZED
AND MYLONITIC ZONE. BANDS OF IRREGULARLY
SERICITIZED, CHLORITIZED, AND SILICIFIED
FINELY COMMINUTED GOUGE @ AN AVERAGE 70% A
DDH AXIS; A NUMBER OF BLACK, ANGULAR
CHERTY FRAGMENTS RESULT IN A BLACK AND
GREEN MOTTLED APPEARANCE OVER SECTION 229-229
- 229-236 ANDESITE VOLCANIC B_x
LAPILLI TO B_x FRAGS IN LIGHT GREY MATRIX; DESCRIPTIVE
SAME AS FOR 111-213
- 236-243 ANDESITE FLOW
DESCRIPTION SAME AS SECTION 87-111

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243 - 310

RHYOLITE BRECCIA

ANGULAR LAPILLI TO BRECCIA SIZED FRAGMENTS
OF RHYOLITE IN A DARKER GREY SILICEOUS
AND PYRITIC MATRIX. RHYOLITE FRAGMENTS FREQUENTLY
RIMMED BY Py. Py:Si FLUCTUATES THROUGHOUT BX
SO THAT SOMETIMES Py > Si BUT USUALLY Si > Py

DDH # 1

1

0-15 OVERBURDEN

15-403
(E.O.H.)

BANDED MARINE TUFF
INTERBEDDED & UNDIFFERENTIATED HORIZONS
OF BLACK SILTY TUFF TO BLACK CHERTY TUFF TO
LIGHT GREY CHERT & CHERTY TUFF; BANDING
VARIES FROM ~~TO~~ VERY CLOSELY SPACED LAMINAE
($\frac{1}{32}$ ") OF ALTERNATING COMPOSITION TO WIDTHS
OF SEVERAL FEET AS IN THE LIGHT GREY CHERT
INTERSECTION @ 154-168

RIPS THROUGHOUT THE HOLE ARE CONSISTENT
@ $\sim 50^\circ$ \pm Δ DDH AXIS ($\frac{1}{8}$ " TO $\frac{1}{4}$ ")
CARBONATE VEINLETS OF VARYING WIDTHS AND
AVERAGE FRACTURE DENSITY OF 1/INCH ARE PRESENT
THROUGHOUT THE SECTION, INTERSECTING THE CORE
@ $\sim 45^\circ$ \pm Δ DDH AXIS, ROUGHLY PERPENDICULAR
TO THE BEDDING PLANES OF THE TUFFS
BEDDED (SYNGENETIC) PY IS PRESENT IN ALL
HORIZONS EXCEPT THE "CLEANER" LIGHT GREY CHERTS
AND CONSTITUTES FROM $\sim 1\%$ TO $\sim 30\%$ OF
THE ROCK TYPES; THE SILTIER "SHALEY" TUFFS
CONTAIN A SIGNIFICANTLY HIGHER PERCENTAGE
OF PYRITE, NO DOUBT REFLECTING AN INTENSIFICATION
OF REDUCING CONDITIONS ACCOMPANYING AN
INCREASE OF ORGANIC MATERIAL IN THE SEDIMENTS,
PY VARIES FROM EXT. F.G. ~~TO~~ TO DISCRETE CUBIC
CRYSTALS ≈ 1 TO 2 MM IN DIAMETER; THE MAJORITY
OF THE PY OCCURS AS EXT. F.G. TO V.F.G. SYNGENETIC
BEDS WITH A SILTY ADMIXTURE BUT ~~UPPER PORTION OF~~
~~THE~~ ^{MINOR AMOUNTS OF} PY OCCURS IN DISCRETE CRYSTALS OR
BLEBS IN THE X-CUTTING CARBONATE VEINLETS

0-22 OVERBURDEN

22-27 FAULT ZONE

SHEARED AND COMMINUTED ROCK FRAGMENTS (PROBABLY DACITIC TUFF) IN A PYRITIZED SERICITE MATRIX WITH CALCITE & SERICITE FILLING FRACTURES.

27-49 DACITIC TUFF

MOTTLED GREENISH GREY, OCCASIONAL VISIBLE FRAGMENTS. UP TO 10% EXTREMELY FINE-GRAINED PYRITE IN FRACTURES & SMALL SHEARS; VERY MINOR (<< 1%) SPHALERITE & A SULFIDE TENTATIVELY IDENTIFIED AS PYRRHOTITE; PO MINERAL VARIES IN COLOR FROM A DULL SUBMETALLIC REDDISH BRASS COLOR TO THE CHARACTERISTIC PO COLOR; IT OCCURS AS "CORES" IN SPHALERITE BLEBS, POSSIBLY REPRESENTING EXOLUTION LAMINAE; SPHALERITE - PYRRHOTITE BLEBS VARY FROM < 1 mm TO 5 mm IN SIZE & APPEAR TO BE RELATED TO PYRITE MINERALIZATION IN FRACTURES, BUT COULD POSSIBLY BE FRAGMENTAL IN ORIGIN.

MORE
LIKELY
SIDERITE
OR
ANKERITIC CARBONATE

* OCCASIONAL LARGER FRAGMENTS OF RHYOLITE VISIBLE (43')

49-53

DARK GREEN vfg CHLORITIC(?) SHEARED ZONE; A SERICITE-CARBONATE FILLED SHEAR CUTS THE CHLORITIC GOUSE(?) ZONE AT $\sim 45^\circ$ @ 50

53-66

DACITIC TUFF

MOTTLED GREENISH GREY, OCCASIONAL VISIBLE FRAGMENTS, VERY SIMILAR TO SECTION 27-49, INCLUDING CALCITE FILLED VEINLETS CUTTING CORE AT $\sim 45^\circ$. Py OCCURS IN FRACTURES AND vfg DISSEMINATED PYRITE MAY COMPRISE 5-10% OF THE ROCK. V. MINOR Sphal. OCCURS IN CLEARLY FRACTURE CONTROLLED BLEBS IN THE CARBONATE VEINLETS; WHAT WAS TENTATIVELY IDENTIFIED AS PO IN SECTION 27-49 IS MORE LIKELY ANKERITIC CARBONATE OR A LIGHT BROWN VARIETY OF Sphal.

67-76

RHYODACITIC TUFF

LAPILLI TO LITHIC SIZE FRAGMENTS OF PINKISH RHYOLITE IN A GREEN (CHLORITIC?) MATRIX; PINK FRAGMENTS CONTAIN MINOR ($\sim 1\%$) DISSEMINATED Py AND OCCASIONAL (<< 1%) BLEBS OF DISSEM. Cpy. QTZ-CHLORITE MATRIX CONTAINS DISSEMINATIONS AND STRINGERS OF Py, Sphal, Cpy, AND SAME LIGHT BROWN MINERAL (SIDERITE? ANKERITIC CARBONATE?) OBSERVED IN SECTIONS 27-49 AND 53-66. THIS MINERAL IS ALWAYS ACCOMPANIED BY BLACk SPHALERITE AND USUALLY RIMMED BY IT OR OCCURS AS BLEBS (~ 1 mm) IN

A MATRIX OF BLACK Sphalerite.
 THERE IS AN ABUNDANCE OF vfg DISSEM Py THROUGHOUT
 THE MATRIX AND TOTAL SULFIDE CONTENT MAY BE
 5-10%; ESTIMATED AMOUNTS OF CU AND ZN ARE
 .1% CU AND 1% ZN; NO PO OBSERVED

76 - 79 RHYOLITE BRECCIA? FAULT ZONE?
 RHYODACITE SECTION INTERRUPTED BY PINKISH ZONE
 IN WHICH PINK RHYOLITIC CLASTS PREDOMINATE
 OVER vfg MEDIUM GREYISH GREEN CHLORITIC
 MATRIX; vfg Py OCCURS MAINLY ON FRACTURE
 PLANES, CONSTITUTING UP TO 5% OF ROCK. MINOR
 AMOUNTS OF Py OCCUR DISSEMINATED IN THE
 PINK CLASTS.

79 - 98 RHYODACITIC TUFF; DESCRIPTION SAME AS SECTION
 67-76. GREYISH GREEN TUFF OCCASSIONAL PINK CLASTS
 88-89 & 91-93. MINOR LIGHT GREY ZONES (RHYOLITE? ASH?) IN
 WHICH $\frac{1}{2}$ FINELY DISSEM. CUBES OF Py.

98 - ~~113~~ RHYOLITE Bx? FAULT ZONE?
 DESCRIPTION SAME AS SECTION 76-79. PINK
 CLASTS LAPILLI TO LITHIC SIZE PREDOMINATE OVER
 CHLORITIC MATRIX. Py, Sphal, Cpy. OCCUR MAINLY
 IN FRACTURES, BUT ALSO DISSEMINATED. ESTIMATED
 TOTAL Cpy < .5%, Sphal < 1%; TOTAL SULFIDES
 \approx 5%

116
 113 - ~~113~~

DACITIC TUFF

~~DESCRIPTION SAME AS SECTION 76-79~~

vfg ROCK LIGHT GREENISH-GRAY ROCK CUT BY
 CALCITE VEINLETS @ N 45° Py, Cpy, Sphal
 OCCURS MAINLY IN FRACTURES AND SMALL
 BLESS (< 1mm); Cpy < .5% Sphal < 1%;
 TOTAL SULFIDES, INCLUDING vfg Py \approx 5%

★ 116 - 122 LAPILLI DACITIC TUFF; MOTTLED GREENISH-GRAY, LIGHTER
 COLORED FR FRASS IN DARKER MORE GREENISH MATRIX
 122 - 123 KSPAR BRECCIA? WELDED TUFF?
 LAPILLI-SIZED, ELONGATE AND SUBANGULAR SALMON
 PINK KSPAR(?) CLASTS WITH PREFERENTIAL
 ORIENTATION @ N 20° A AXIS OF HOLE AND QTZ. RICH
 OR ALBITE RIMS ARE SET IN A MEDIUM TO DARK
 GREEN vfg CHLORITIC (?) MATRIX. A UNIQUE
 ROCK SO FAR IN THE HOLE AND ONLY OBSERVED
 IN THIS 1' SECTION; COULD THIS BE A FEEDER
 PIPE??

123 - 137

LAPILLI DACITIC TUFF
 MOTTLED GREYISH GREEN, LIGHTER COLORED
 GREYISH & GREENISH SUB FR FRASS IN DARKER
 GREEN MATRIX; USUAL Cpy, Py, Sphal.

DRH #2 L 375 - 11E

137-149 RHYOLITIC VOLCANIC BRECCIA, GREENISH SUBANGULAR RHYOLITIC LARGE ~~ANGULAR TO SUBANGULAR~~ CLASTS IN A MEDIUM GRAY APHANITIC MATRIX. THIS BRECCIA UNUSUALLY RICH IN CPY, CONTAINING UP TO 1% CPY. FRAGS ARE QUITE HARD, MOST LIKELY RHYOLITIC AND CONTAIN fg DISSEM. Py

149-151 FAULT DK. GREEN vfg WELL COMMUNITED CHLORITIC MATERIAL. ATYPICAL OF USUAL SERICITIC SHEARS ENCOUNTERED SO FAR IN SECTION

151-206 DACITIC TUFF MEDIUM GREENISH GREEN, GENERALLY APHANITIC AND HOMOGENOUS TUFF OCCASSIONALLY CUT BY CALCITE VEINLETS @ N 45° A AXIS OF HOLE. MINOR SHEARS & OCCASSIONAL ANOMALOUS CLAST, BUT GENERALLY AN UNINTERRUPTED SECTION OF DACITIC TUFF

(181-187) SHEARED SERICITIC SECTION IN DACITIC TUFF

(199-206) DACITE FLOW(?) DACITE IS DARKER GREEN WITH fg (< 1mm) EVENLY DISTRIBUTED BLESS OF EPIDOTE. ∴ FLOW TEXTURE SECTION IS STILL CUT BY CALCITE VEINLETS @ N 45° A AXIS OF HOLE & ENTIRE HOLE SO FAR HAS BEEN SPORADICALLY MINERALIZED WITH VARYING CONCENTRATIONS OF MAINLY FRACTURE-CONTROLLED Py, Cpy, & sphal SULFIDE MINERALIZATION; Py ALSO OCCURS FINELY DISSEMINATED THROUGHOUT & IT IS PROBABLE THAT WHAT HAS BEEN DESCRIBED HEREIN AS DISSEM. BLESS OF CPY & SPHAL ARE ACTUALLY FRACTURE CONTROLLED; THE ABSENCE OF A CONCENTRATION OF ANY SULFIDE MINERALIZATION IN A PARTICULAR HORIZON OR ROCK TYPE IS A STRONG ARGUMENT FOR THIS.

GENERAL COMMENTS

206-217 KSPAR BRECCIA(?), KSPAR SHEAR(?) FAULT(?) VERY SIMILAR ROCK TO THAT INTERSECTED AT 122-123 DACITE/ANDESITIC FLOW, OVER A THICKNESS OF 2', GRADUALLY CHANGES TO A ROCK CONTAINING AN INCREASING PERCENTAGE OF ELONGATE AND ROUNDED PINK CLASTS IN A GRASS GREEN CHLORITIC MATRIX. CALCITE VEINLETS @ N 70° A AXIS MAKE THE SECTION ~~DIFFERENT~~ V. CALCAREOUS

- 217-234 DACITIC TUFF
 MEDIUM GREYISH GREEN fg TUFF CONTAINING Py ON FRACTURE PLANES & FINELY DISSEM.
 ★★ MINOR (< 1%) BUBBLES OF SALENA NOTED FOR FIRST TIME, USUALLY ASSOC. WITH BUBB-LIKE CONCENTRATIONS OF vfg Py; LARGE vfg DARK GREY LITHIC FRAGMENTS OF CRYSTAL (?) TUFF OCCUR WITH INCREASING FREQUENCY STARTING @ 226 UNTIL ROCK TYPE CHANGES @ 234
- 234-239 VOLCANIC BRECCIA
 LARGE, LITHIC-SIZED SUBANGULAR FRAGMENTS OF A LIGHT-GREY RHYODACITE FLOW (EVENLY DISTRIBUTED LIGHT TAN FLECKS OF ALTERED - MONTMORILLONITE ? - FELDSPARS & SIMILAR DISTRIB. OF CHLORITIZED MAFICS) IN A DARKER, MEDIUM GREY MATRIX CONTAINING UP TO 20% ext. f.g. Py.
- ↓
 239-241 GRADING INTO
- ↓
 241-256 ANDESITE FLOW
 DARK GREEN MATRIX WITH fg (~1 mm) EPIDOTE SPECKS EVENLY DISTRIBUTED THROUGHOUT ROCK; OCCASSIONAL CONCENTRATIONS OF EPIDOTE FORM PYRITE-RICH CLOTS; LITHIC FRAGMENTS DESCRIBED IN SECTION 234-239 MIGHT BE ALTERED CLASTS OF THIS FLOW; EPIDOTE-CALCITE VUG @ 254
- 256-263 ANDESITE FLOW - ALTERED
 ABOVE-DESCRIBED FLOW GRADES INTO A SHEARED SERICITIZED ZONE IN WHICH FORMER EPIDOTE FLECKS ARE REPLACED BY LIGHT TAN MONTMORILLONITE (?) FLECKS; THIS ALTERED ZONE ENDS ABRUPTLY AGAINST A SERICITE-FILLED SHEAR @ 263
- 263-271 ANDESITE FLOW
 ROCK IDENTICAL TO SECTION 241-256
- 271-284 SHEAR ZONE
 LIGHT GREY SHEARED, SERICITIZED & CHLORITIZED ZONE OF OCCASSIONAL HARD LIGHT GREYISH GREEN AND LIGHT WHITISH-GREY RHYODACITIC & RHYOLITIC CLASTS, Py DISSEMINATED & ON FRACTURE PLANES THROUGHOUT.
- 284-296 MEDIUM GREYISH GREEN FINE GRAINED RHYODACITE TUFF
- 296-298 ANDESITE FLOW
 DARK GREEN, EPIDOTE SPECKLED ROCK IDENTICAL TO SECTIONS 241-256 & 263-271

DDH # 2 L 375-11E

298-307 MEDIUM GREENISH GREY RHYODACITIC TUFF

307-338 ANDESITE FLOW
DARK GREEN WITH EVENLY-DISTRIBUTED EPIDOTE FLECKS,
IDENTICAL TO SECTIONS 241-256, 263-271, 296-298

330-345 ALTERED ANDESITE FLOW
SHEARED, SERICITIZED FLOW CONTAINS REMNANT
TEXTURES, OR IS FINELY COMMUNITED TO A DARK GREY
MATERIAL CONTAINING SMALL QTZ. FRAGS, HIGHER PY

345-355 ANDESITE FLOW
DESCRIPTION AS ABOVE

355-360 ALTERED ANDESITE FLOW
DESCRIPTION AS ABOVE

360-386 ANDESITIC TUFF
DARK GREY PY ROCK, HETEROGENOUS TEXTURE, DARKER
FLECKS (SILICA?) WITH PY CORES EVENLY DISTRIBUTED

386-406 ANDESITE FLOW
DESCRIPTION AS ABOVE,

406-416 GRADING INTO

416-432 SHALE, POSSIBLE FAULT PLANE
BLACK, HIGHLY SHEARED, HIGHLY PYRITIC SHALE;
ELSEWHERE ON THE PROPERTY IT APPEARS (IN OUTCROP)
THAT SHALE HAS TAKEN UP THE FAULT MOVEMENT WHERE
THIN LAYERS OF IT SEPARATE TWO DIFFERENT MASSIVE
& COMPETENT ROCK TYPES; THIS WOULD PROBABLY
ACCOUNT FOR THE SOMEWHAT ANOMALOUS PRESENCE
OF SHALE IN THE (SO FAR) UNINTERRUPTED VOLCANIC
SECTION OF THIS DRILL HOLE.

* NO! THIS IS WRONG
LUMPS OF THE SHALE ARE VISIBLE IN THE LOWER PORTION
OF THE ANDESITE FLOW (406-416) OVER WHICH SECTION
THE FLOW BECOMES DARKER & MORE APHANITIC,
EVIDENTLY DUE TO BASAL CHILLING AND CHEMICAL
(Fe) CONTAMINATION OR ASSIMILATION WHICH
INCREASES TOWARDS THE SHALE CONTACT

432- MARINE TUFF ??
DESCRIPTION ON NEXT PAGE

- 432 - 437 MARINE TUFF (?)
LIGHT GREY SILICEOUS ROCKS WITH POSSIBLE (BUT VERY INDISTINCT) BEDDING PLANES @ 35° AN AXIS OF HOLE. SLIGHT COLOR CHANGES IN // BANDS MAY INDICATE COMPOSITIONAL VARIATIONS ACROSS BEDDING PLANES; ALSO PY OCCURS // TO THESE BANDS ⇒ BEDDED PY; PY ALSO OCCURS IN FRACTURE X BEDS.
- 437 - 439 BLACK SHALE
DISTINCTLY BEDDED PYRITIC BLACK SHALE WITH BEDDING PLANES @ 30° AN AXIS OF HOLE
- 439 - 440 SHEAR
LIGHT GREY FINELY COMMINUTED PYRITE-RICH SERPENTINE MATERIAL ENCLOSING SUB-ROUNDED QTZ. FRAGS UP TO 30mm IN DIAMETER.
- 440 - 455 BLACK SHALE
DISTINCTLY BEDDED & OCCASSIONALLY BRECCIATED PYRITIC BLACK SHALE WITH BEDS @ 30° AN AXIS OF DDH
- 455 - 466 RHYODACITIC ~~TUFF~~ FLOW
LIGHT GREEN ~~TO~~ ROCK CUT BY PYRITE, CALCITE-FILLED FRACTURES HAS EVENLY DISTRIBUTED ~~EPIDOTE~~ LIGHT TAN (KAOLINITE? MONTMORILLONITE?) SPECKS WITH CRYSTALLINE PY CORES.
- 466 - 471 ANDESITE FLOW
SHEARED, CHLORITIZED ANDESITE FLOW, BUT RECOGNIZABLY THE SAME ROCK TYPE DESCRIBED IN PREVIOUS SECTIONS OF DDH (DARK GREEN WITH EVENLY-DISTRIBUTED EPIDOTE FLECKS)
- 471 - 508 DACTIC TUFF
MOTTLED, MEDIUM GREYISH GREEN, WELL-PYRITIC (~5%) TUFF IN WHICH OCCASSIONAL WHITE QTZ CLASTS < 4mm DIAM ARE VISIBLE; MOST CLASTS, HOWEVER, ARE LIGHT WHITISH GREY FELSIC MATERIAL RANGING UP TO LAPILLI FRAGMENTAL SIZE; ROCK IS CUT BY SpH₂O & Cpy (BOTH V. MINOR < 1% BUT SpH₂O > Cpy) IN NARROW CALCITE VEINLETS @ ~45° AN AXIS OF DDH
THE ROCK BECOMES INCREASINGLY FELSIC (QTZ/SPAL CLASTS) TOWARDS THE BOTTOM OF SECTION, WITH LAPILLI SIZED PYROCLASTS CONSTITUTING ~60% OF THE ROCK; ∴ ⇒ GRADES INTO RHYODACITE LAPILLI TUFF

- 508-594 RHYOLITE/RHYODACITE TUFF
MEDIUM GREY TO SLIGHTLY GREENISH MEDIUM GRAIN
fg HETEROGENEOUS ROCK WITH ONLY SLIGHT COMPO-
SITIONAL & TEXTURAL CHANGES THROUGHOUT SECTION
EVENLY DISTRIBUTED SPECKS OF
- 594-602 ANDESITE FLOW
SHEARED, FRACTURED, SERICITIZED (IN PART) DARK
GREEN FLOW WITH EVENLY DISTRIBUTED EPIDOTE
FLECKS
- 602-607 FAULT
ANGULAR BLACK SHALE FRAGMENTS & SUBROUNDED
RHYOLITE FRAGMENTS, LAPILLI SIZE, IN A WELL
PYRITIZED (UP TO 20%) FINELY COMMINUTED DARK
GREY MATRIX. OCCASSIONAL BLEBS OF CRY (< 1%)
VISIBLE; RHYOLITE FRAGS PREDOMINATE @ 602;
SHALE FRAGS PREDOMINATE & HAVE BECOME LARGER
@ 607.
- 607-616 SHATTERED RHYODACITE (TUFF?)
LIGHT GREENISH GREY FELSIC ROCK CUT BY V. HIGH
NUMBER OF CALCITE VEINLETS (~ 10-20 PER INCH)
~ .25 mm IN WIDTH; vfg FRACTURE CONTROLLED &
V. MINOR (<<< 1%) CRY & SPHAL PRESENT.
★ THIS ROCK IS POSSIBLY A MARINE TUFF SIMILAR TO
THAT IN SECTION 432-437; CALCITE "VEINLETS"
MIGHT BE BANDS REPRESENTING COMPOSITIONAL
CHANGES IN BEDDING, BUT COULD JUST AS EASILY BE
TENSION FRACTURES RELATED TO FAULTING
- 616 - 631 BLACK SHALE / FAULT ZONE
FRACTURED & ANGULAR CLASTS OF BLACK SHALE
CONTAINING UP TO 20% PY IN A DARK GREY fg
MATRIX; ONLY 41 OF CORE PRESENT IN THIS
SECTION ⇒ V. POOR RECOVERY; CALCITE
VEINLETS ARE SUB // A AXIS OF DDH
- 631-636 DACITE TUFF? ALTERED DACITE FLOW?
LIGHT GREENISH GREEN, MOTTLED, FRACTURED &
SERICITIZED ROCK WITH EVENLY DISTRIBUTED
EPIDOTE FLECKS.
- 636-642 RHYOLITE
DESCRIPTION AND NEXT PAGE.

636-642

RHYOLITE

LIGHT GREY APLHANITIC HARD ROCK WITH EVENLY
DISSEMINATED Py (~2%)

NOTE: ONLY 4' OF RECOVERY OVER 6' SECTION.

642-655

DACITIC TUFF? ALTERED DACITIC FLOW?

RHYODACITE TUFF? / FLOW?

COMPOSITION, TEXTURES INCONCLUSIVE, BUT FAVOR A
DACITIC FRAGMENTAL EVEN THOUGH EVENLY-
DISTRIBUTED EPIDOTE FLECKS ⇒ FLOW TEXTUREENTIRE ROCK IS SOMEWHAT ALTERED (MAFICS → EPIDOTE
ROUNDED FELSIC FRAGMENTS, CHLORITIC MATRIX)OVERALL APPEARANCE: LIGHT GREYISH GREEN,
MOTTLED ROCK WITH EVENLY-DISTRIBUTED EPIDOTE
FLECKS. MOTTLED APPEARANCE DUE TO ANABUNDANCE (~40%) OF FELSIC & QUARTZOSE
FRAGS IN THE MATRIX. COLORED GREYISH GREEN
MATRIX. SIMILAR TO ROCK IN SECTION 631-636.SOME LIGHTER TAN COLORED (KAOLINITE?) FLECKS
ALSO VISIBLE, BUT EPIDOTE PREDOMINATES. DISSEM
Py & Py IN CORES OF EPIDOTE/KAOLINITE FLECKS
CONSTITUTES ~ 5-10% OF ROCK; MAY BE SOME
Po PRESENT.

655

END OF HOLE.

625-796

LAPILLI ANDESITE TUFF

DARK GREEN & PISTACHIO GREEN MOTTLED ROCK CONTAINING LIGHT-COLORED PARTLY EPIDOTIZED ANGULAR CLASTS IN A DARK GREEN f.g. ANDESITIC MATRIX

- SECTION IS CUT BY NUMEROUS f.g. DARKER COLORED INTERVALS OF 1-5' THICKNESS ~ PROBABLY BOLDS OR f.g. ASH HORIZONS REPRESENTING SOMEWHAT QUIETER PERIOD OF VOLC. ACTIVITY

796-818

ANDESITIC TUFF / LAPILLI TUFF

DARK GREEN & DARK GREYISH GREEN ANDESITIC ANGULAR & SUBANGULAR FRAGMENTS IN A LEUCOCRATIC BLuish GREY TO GREENISH GREEN MATRIX; BLuish-GREY SILICA RICH PORTION OF THE MATRIX IS SIMILAR TO THE MATRIX / STOCKWORK DESCRIBED FOR "SHATTERED RHYO-DACITE / POSSIBLE STOCKWORK ZONE" DESCRIBED IN SECTION 522-592

MINOR f.g. Py (< 1%) OCCURS IN SCATTERED BLEBS 1-2 mm IN DIAMETER.

★

NOTE THAT THIS ROCK IS VERY SIMILAR TO THE DACITIC VOLCANIC BRECCIA INTERSECTED HIGHER IN THE DRILL HOLE @ SECTIONS 15-262; THE ONLY SIGNIFICANT DIFFERENCE IS THE FINER FRAGMENTAL SIZE IN THE 796-818 INTERSECTION

818-867

ANDESITIC TUFF / LAPILLI TUFF

SIMILAR TO SECTION 625-796

TRANSITION?
ZONE

{ FROM 836-867 THE PROPORTION OF LIGHTER COLORED FRAGMENTS DECREASES & OCCASIONAL BANDS (< 12" THICK) CONTAINING DARK GREEN ANGULAR FRAGMENTS IN A LIGHT COLORED MATRIX

796 - 818 cont'd

matrix is light blue ^{grey} to grey green contain fine concentrated and matrix. blue grey portion is silica rich similar to "stockwork" in section 522-592

mineralogy in fine blebs 1-2 mm $Pg = < 1\%$
Rock is similar to Bx logged higher in this hole with the significant diff being fine frag size in the lower unit.

818 - 867 Andesite tuff - similar to 625-796.

high proportion of light ^{coloured} frags.

^{matrix} { @ 836-867 section has decreased light coloured lapilli frags. and occur dark green frags in light matrix

867 - 925 similar to 796-818

steaming 867-889 schiefperite/chl. gouge fractured @ 45° to 90°

925 - 932

shear zone - sericite + chlorite, med. grey-green contain occ. and oliv. (lapilli) and g₂ veins "veinlets" at ~ 20° to C.A. layered texture with .25 mm wide g₂ rims on the g₂ veinlets. Pg is 5-10% of Rock and is g₂ in stringers or stockwork

932 - 939

dark green andesite tuff, f.g. tuff as in blue grey to grey green silica rich matrix, section is cut by stringers and veinlets ~ 20° to C.A.

Pg is 5-10% of Rock and the Pg is associated to veinlet ^{rim} occurrence. is also disseminated in the tuff as frag. contact

939 - 941

shear, dark green and. tuff frags in ser/chl matrix fracture pyrite (cf 925-932) is 5-10% of the rock.

941 - 946

Brecciated Rhyolite - light grey-green & lapilli to Bx size rhyolite frags. in sulphid matrix composed of f.g. Pg .

dark grey aphanitic siliceous rim as visible around frags.

946 - 947

sericitic shear in rhyolite ~ 70° to C.A.

947 - 960

light grey v.f.g rhyolite contains v.f.g. disc. py. & pos. cpy.
Tot Sulphides ≈ 2-3%
occ. Nannos (1/4 mm) dark coloured siliceous veinlets with v.f.g. py.
veinlets cut the core @ 5° to 40° to C.A.
Main effects noted in fracturing with pyrite concentration along effects.

960 - 970

Rhyolite of similar composition with increased fracturing
fr 2/ft to ~ 60/ft. similar pyrite conc. as effects.
Tot Sulphides = 5%
possible decrease in disseminated Sulphides.

970 - 971.5

Shear, highly cemented rounded rhyolite clasts in a light grey
almost purely sericitic matrix.
≈ 5% py disseminated and as fine clasts.

971.5 - 973

Rhyolite as in 947-960

973 - 974

Shear as 970-971.5

974 - 982

Rhyolite 947-960

982 - 985

as above with further increase in vol of size of Qtz veinlets,
veinlets up to 10 mm wide cut C.A. @ 30°

@ 983 & 984 nannos (1/4 mm) sulphid vesicles (pyrite & ? black f. sub-metallic
mineral)
(Qtz veinlets = sericit)

985 - 1001

red grey ^{fractured} Rhyolite cut by acc. Qtz veinlets, (cf. section 982-985)
and darker coloured discontinuous siliceous fractures ~ 60° to C.A.
(possible v.f.g. tuff ??)

large Qtz veinlets are occasionally chaotic and appear affected by the
smaller fractures.

1001 - 1006

bedding @ 1001 is ~ 70° to C.A. in probable bedding.
Rhyolite tuff, v.f.g. red. grey, banded, cut by pyritic fractures
~ 15-20° to C.A.
also contains v.f.g. disc. pyrite constituting ~ 5% disc. py.

1006 - 1013

light grey fractured Rhyolite contains fracture controlled
& dis. sulphides. fracture contain f.g. pyrite.

dis. py is amorphous & subhedral cubes $\approx \frac{1}{2}$ mm ^{1/2 mm} across

1013 - 1050

f.g. ^{light greenish grey} Rhyolitic welded tuff contains approx 5%
pyrite in dissemination & bands // foliation of tuff.

the foliation of the tuff is $\approx 50^\circ$ to C.A.

1050 - 1051

Trace ~~tuff~~ black silty section within ^{the} welded tuff.
possible fragment. highly pyritic, marks the base
of the welded tuff.
pyrite is ? bedded. and is up to 15%

1051 - 1085

Med. grey rhyolite tuff. Mainly bedded.
some preferential alignment of sub-rounded & occasional elongated
particles are @ $\approx 50^\circ$ to C.A.
orientation is not as ~~very~~ distinct as previous welded tuff.

1085 - 1092

Black pyritic shale. py is up to 15% of Rock and
occurs v.g. bedded & in small blebs & concentration in fracture
cutting the core @ variable attitudes.
light grey tuffaceous horizons are intercalated with the black
shales.

1092 - 1097

light grey v.g. banded Rhyolitic tuff contains v.g. py in fracture
Banding cut C.A. @ $\approx 50^\circ$
py also occurs extensively f.g. dis. py.
tot py is 2-5%

1097 - 1169

Interbedded Black pyritic shale & f.g. leucocrinite tuffs similar to
Rhyolitic tuff described above.

Bedding (Banding) is 45° to C.A.

py content is variable from 0-15% and occurs as much v.g. blebs in
the shales but minor amounts occur in siliceous fracture cutting
C.A. at variable attitudes.

Core is cut by late calcite veins of variable orientation.

1169 - 1175

Mottled greenish grey Rhyolitic tuff contains f.g. py in blebs up
to 10 mm in dia within matrix, light grey frags in the a
darker grey-green matrix
frags constitute up to 80% of Rock.

1108 - 1109

Fragmental Horizon Rhyolite - lapilli sized in a black
silty matrix frags constitute 70% of Rock & show
weak preferential orientation // shale bedding.
up to 15% py is elongated blebs. This horizon looks
identical with Galena & Sphal bearing float found a lower level
and previously referred to as Rhyolite Bx.

1192 - 1199

description as for 1108 - 1109

Sulphide bearing Fragmental Horizon
Capilli to 13x sized, angular to rounded Matrix lithic
fragment

dominant clasts are light brown-grey ? feldspar rhyolite.

constituted =

occasional clasts consist of sub "L" or sub "O" white ^{78 units} calcite / lighter
coloured rhyolite.

also pyritic sulphide fragments.

practically controlled v.f.g. pyrite in blebs up to 10mm across.

constitutes 5-10% of Rock. appears to partly replace!! more highly
altered rhyolite clasts

Matrix is black calcareous shale similar to those
above & below

1199 - 1221

Intercalated black pyritic shales & light to medium grey
thin tuffaceous beds. show considerable deformation.

blocks of shale & greenish grey tuffs in fault contact
with each other.

apparent bedding at top of unit is Variable C.A. from 0° to 20°

from 1212 to E.O.H. Bedding is \approx // to C.A.

1221 -

Chlorite
re Chlorite

0-15 OVERBURDE

R & Rd Bx

15-98 VOLCANIC LAPILLI TO DARK GREEN LIGHT GREENING MORE DACTIC CL DEPTH OF BEARING 5 79-80 GENERALLY ROCK.

Tuff

Seds?

And flow?

DF
NTAN
DAL
0
TE
-73
-98

98-124 VOLCANIC THIS SECTIC ABOVE DES TEXTURAL THE APPEAR DACTIC TU & REDUCED IN SLIGHT

Rd welded tuff

frag sulfides
veinlet

R flow & Dk grey rock

SHATTERED Rd OR STOCKWORK ZONE

4B
2B
KENS
ION
SULT

124-143 VOLCANIC BRECCIA DESCRIPTION SAME AS SECTION 15-98, ONLY LESS SHEARED & ALTERED THAN SECTION 65-98.

143-189 FAULT? HIGHLY SHEARED & ALTERED (SERICITE & CHLORITE) VOLCANIC BRECCIA; SERICITIZATION V. STRONG IN AND AROUND SHEARS RESULTING IN LIGHT GREY COLOR WHICH GRADUATES INTO A DARKER GREEN AWAY FROM THE SHEARS; ZONE IS CUT BY STRINGERS VEIN LOTS OF CALCITE & vfg - fg Py; SECTION AS A WHOLE IS VERY SOFT AND COBED POORLY, RELICT TEXTURES OF VOLCANIC BX OCCASSIONALLY VISIBLE, BUT FRAGMENTS ARE A LIGHTER GREYISH GREEN AS COMPARED TO THE DARKER GREEN LITHIC FRAGMENTS OF SECTIONS 15-98 AND 124-143. ALSO CLAY ALTERATION HAS RESULTED IN KAOLINIZATION(?) OF vfg PSPACE (PROBABLY KSPACE) FRAGMENTS WITHIN THE LITHIC FRAGMENTS.

- 0-15 OVERBURDEN
- 15-98 VOLCANIC BRECCIA
LAPILLI TO LITHIC SIZE ANGULAR FRAGMENTS OF DARK GREEN DACITIC TUFF (LOW QZ.) IN A LIGHT GREYISH GREEN QUARTZOSE MATRIX CONTAINING MORE FINELY COMMINUTED INTERFRAGMENTAL DACITIC CLASTS; MINOR vfg Py; OXIDIZED TO DEPTH OF 64'; CHLORITIC SERICITIC, CALCITE BEARING SHEARS CUT SECTION @ 65-67, 70-73, 79-80, 82, 83, 86-87; SECTION FROM 65-98 GENERALLY WELL-FRACTURED, POORLY-CORING ROCK.
- 98-124 VOLCANIC BRECCIA
THIS SECTION CONTAINS VERY LARGE BLOCKS OF THE ABOVE DESCRIBED DACITIC TUFF, RESULTING IN A TEXTURAL CHANGE WHICH, IN PLACES, GIVES THE CORES THE APPEARANCE OF CUTTING THROUGH A HETEROGENEOUS DACITIC TUFF; SLIGHTLY STRONGER SERICITIZATION & REDUCED FRAGMENTAL SIZE OF MATRIX ALSO RESULT IN SLIGHT COLOR CHANGES IN THIS SECTION.
- 124-143 VOLCANIC BRECCIA
DESCRIPTION SAME AS SECTION 15-98, ONLY LESS SHEARED & ALTERED THAN SECTION 65-98.
- 143-189 FAULT?
HIGHLY SHEARED & ALTERED (SERICITE & CHLORITE) VOLCANIC BRECCIA; SERICITIZATION V. STRONG IN AND AROUND SHEARS, RESULTING IN LIGHT GREY COLOR WHICH GRADUES INTO A DARKER GREEN AWAY FROM THE SHEARS; ZONE IS CUT BY STRINGERS, VEINLETS OF CALCITE & vfg - fg Py; SECTION AS A WHOLE IS VERY SOFT AND COEDED POORLY, RELICT TEXTURES OF VOLCANIC Bx OCCASSIONALLY VISIBLE, BUT FRAGMENTS ARE A LIGHTER GREYISH GREEN AS COMPARED TO THE DARKER GREEN LITHIC FRAGMENTS OF SECTIONS 15-98 AND 124-143, ALSO CLAY ALTERATION HAS RESULTED IN KAOLINIZATION(?) OF vfg PSPACE (PROBABLY KSPACE) FRAGMENTS WITHIN THE LITHIC FRAGMENTS.

- 189-250 DACITIC TUFF / DACITIC LAPILLI TUFF / BRECCIA
DARK GREEN FRAG'S IN A LIGHT GREENISH GREEN MATRIX
OCCASSIONAL LITHIC-SIZE FRAG'S, COMPOSITIONAL SIMILAR
TO SECTIONS 15-98 & 124-143, BUT AVERAGE FRAGMENTAL
SIZE SMALLER;
- 250-256 FAULT
HIGHLY SHEARED, SERICITIZED & CHLORITIZED ZONE
- 256-262 DACITIC TUFF
DESCRIPTION SAME AS SECTION 189-250
- 262-278 RHYOLITE BRECCIA
LITHIC SIZED ANGULAR & SUBANGULAR LIGHT GREY
RHYOLITIC FRAGMENTS & LIGHT GREEN
RHYODACITIC FRAGMENTS IN A DARK GREY MATRIX
CONSISTING OF GRANITIC SILICEOUS (?) MATERIAL &
SMALLER 1 - 10MM LIGHT GREY SUBROUNDED RHYOLITE
FRAGS; VEINLETS OF PYRITE CONTAINING ~~MINOR QUARTZ~~
~~MINOR QUARTZ~~ FRAGMENTS & VEINLETS? CUT ROCK,
CONSTITUTING UP TO 5% ROCK
- 278-280 RHYODACITE BRECCIA
-DISTINGUISHED FROM ABOVE ZONE ONLY BY A
PREDOMINANCE OF LIGHT GREEN RHYODACITE FRAGS
OVER THE LIGHT GREY RHYOLITE FRAGS
- 280-281 RHYOLITE BRECCIA
DESCRIPTION SAME AS SECTION 262-278, WELL
PYRITIZED VEINLETS (5-15% OF ROCK)
- 281-282 RHYODACITE BRECCIA
DESCRIPTION SAME AS SECTION 278-280, ONE FRAGMENT
OBSERVED SHOWING CONTACT BETWEEN RHYOLITE & RHYODACITE
- 282-297 RHYODACITIC TUFF
ABOVE-DESCRIBED RHYODACITE BRECCIA GRADUES INTO
DARKER GREEN, MORE "EQUIFRAGMENTAL" ZONE IN
WHICH OUTLINES OF LARGE LITHIC SIZED, RHYODACITE
CLASTS ARE ONLY OCCASSIONALLY DISCEARNIBLE. SECTION
IS CUT BY A NUMBER OF PYRITE VEINLETS WHICH
~~WALL~~ WALL ROCK IS SERICITIZED FOR SEVERAL INCHES

- 298 - 298 RHYODACITE BRECCIA
DESCRIPTION SAME AS SECTIONS
WELL-PYRITIZED
- 298 - 299 RHYOLITE BRECCIA, PYRITE MATRIX
PY CUTS ROCK IN FRACTURES, BUT FORMS UP TO 40% OF
THE ROCK IN PLACES, SO THAT RHYOLITE FRAGS ARE IN A
PY MATRIX
- 299 - 301 RHYODACITE Bx
DESCRIPTION AS ABOVE, PYRITE VEINLETS
- 301 - 302 RHYOLITE Bx, PYRITE MATRIX
MASSIVE PY ~ 50% OF ROCK
- 302 - 304 RHYODACITE Bx, PYRITE VEINLETS
- 304 - 308 RHYOLITE Bx
LAPILLI TO CITRIC SIZE SUBANGULAR TO SUBBOUNDED RHYOLITE CLASTS IN
DARK GREY SILICEOUS MATRIX. FINELY DISSEM PY & KAOLINITE (?) FLECKS IN
FRAGS; WELL PYRITIZED VEINLETS UP TO 1/4" WIDE.
- 308 - 310 RHYODACITE Bx
- 310 - 325 FAULT ZONE
HIGHLY SHEARED, HIGHLY SERICITIZED, & CHLORITIZED ZONE.
ONLY 5' OF BADLY BROKEN & V. SOFT CLAYEY (SERICITIC)
CORE RECOVERED.
- 325 - 370 DACITIC TUFF / DACITIC LAPILLI TUFF
MOTTLED DARK GREENISH GREEN ESSENTIALLY HETEROGENEOUS
ROCK WITH TUFF - LAPILLI TUFF RANGES OF FRAGMENT SIZES.
FINER-GRAINED SIZES PREDOMINATE. PY IN STRINGERS AND IN
MORE MASSIVE BLESS IN CARBONATE FILLED CAVITIES. NOMEN-
CLATURE QUESTIONABLE SINCE \exists > 50% FELSIC CONSTITUENTS IN ROCK
- 370 - 384 RHYODACTIC TUFF / RHYOLITIC Bx
MEDIUM GREENISH GREY FINEGRAINED WITH OCCASIONAL
LAPILLI TO LITHIC SIZE FRAGMENTS OF WELDED RHYOLITIC TUFF.
THE LIGHT GREYISH GREEN FRAGMENTS CONTAIN A MYRMEXITIC
WAVY AND SUBPARALLEL INTERGROWTH OF SMALL (1-5 mm LONG)
CHLORITIZED MAFIC CLASTS; CLASTS CONTAIN DISSEM PY
& KAOLINITE (?) (OR PERHAPS V. LG LIGHT TAN SPHAL ??)
BOUNDARIES OF RHYOLITIC CLASTS ARE BLURRED AND
INDISTINCT.

384 - 425

RHYODACITE / WELDED RHYODACITE TUFF
 LIGHT GREEN, BRITTLE, ~~FRAGMENTED~~ HETEROGENEOUS
 ROCK CONTAINING 1/20 TO FG DISSEMINATED PY.
 SOME COMPOSITIONAL VARIATION EVIDENT IN A PREFERRED
 ORIENTATION @ $\sim 70^\circ$ \pm A AXIS OF DPH, BUT NOT DISTINCT
 ENOUGH TO CONSTITUTE BEDDING PLANES. TEXTURES
 RESEMBLE THOSE OF A WELDED TUFF, WITH FELSIC LIGHT
 GREY ~~FRAGMENTED~~ ELONGATED AND SUBPARALLEL CLASTS UP TO
 LITHIC SIZES IN A LIGHT GREEN FG HETEROGENEOUS
 MATRIX. V. POOR CORE RECOVERY IN BRITTLE
 SHATTERED ZONE @ 400 - 415. WATER RETURN
 COMPLETELY LOST & HOLE WAS CEMENTED AT THIS POINT

425 - 444

ANDESITE FLOW(?)
 DARK GREENISH GREEN OR GREENISH GREY FG ROCK
 CONTAINING RARE LAPILLI TO LITHIC SIZE FRAGMENTS
 OF DACITIC OR RHYODACITIC TUFF (UP TO 60% FELSICS)
 PYRITE & LIGHT TAN MINERAL EVENLY DISSEMINATED
 THROUGHOUT FLOW & DACITE FRAGMENTS

GENERAL
COMMENTS

★★

THE LIGHT TAN TO BUFF COLORED MINERAL DESCRIBED ABOVE
 HAS BEEN NOTED TO OCCUR PERVASIVELY THROUGHOUT THIS
 DPH, WITHOUT RESPECT TO ROCK TYPE, & USUALLY IN
 CLOSE ASSOCIATION / CONTACT WITH EVENLY DISSEM PY.
 IT WOULD BE UNUSUAL TO GET SUCH A CONSISTENT KADLINITIC
 OR MONTMORILLONITIC ALTERATION IN THE VARIETY OF ROCK
 TYPES LOGGED SO FAR, AND IT WOULD BE UNUSUAL, IF
 THIS MINERAL REPRESENTS HYDROTHERMAL OR DEUTERIC
 CLAY ALTERATION TO GET SUCH CONSISTENCY IN THE
 GRAIN SIZE (.1 - 1mm) THROUGHOUT THE SECTION.
 FINALLY, THE CLOSE ASSOCIATION WITH FG EVIDENTLY
 DISSEMINATED (BUT POSSIBLY FRACTURE CONTROLLED)
 PY SUGGESTS THAT THIS MINERAL IS LIGHT TAN TO BUFF
 COLORED VARIETY OF Sp₁ WHICH HAS SO FAR BEEN
 WRONGLY IDENTIFIED AS KADLINITIC ALTERATION.

444 - 457

SHEAR ZONE
 WELL SHEARED, SERICITIZED & CHLORITIZED SECTION CONTAINING
 FRAGMENTS AND BLOCKS (6" - 24" DIAM) OF DACITIC/
 RHYODACITIC TUFF (SEE DESCRIPTION BELOW)

457 - 512

~~RHYODACITE~~ RHYODACITIC ~~FRAGMENTED~~ LAPILLI ~~FRAGMENTED~~ / WELDED TUFF
 WHITE, LIGHT GREY, & LIGHT GREEN RHYOLITIC & RHYODACITIC
 FRAGMENTS (LIGHT GREEN RHYODACITIC FRAGMENTS BY FAR
 PREDOMINANT) IN A DARK GREEN FINE GRAINED MATRIX.
 PY OCCURS ONLY IN DISSEMINATIONS, INDISTINCT VEINLETS
 IN THE MATRIX. FRAGMENTS ARE ELONGATED & SHOW A
 PREFERRED ORIENTATION @ $\sim 30^\circ$ \pm A AXIS OF DPH. FINE, DISSEM
 LIGHT TAN MINERAL PRESENT THROUGHOUT.

496-512

FRAG-
MENTAL
SULFIDE
HORIZON



RHYODACITIC (LAPILLI) WELDED TUFF
 SAME DESCRIPTION AS ABOVE EXCEPT FOR SUDDEN
 APPEARANCE OF LAPILLI SIZED FRAGMENTAL
SULFIDES; Py & Po(?) & PERHAPS extfg Cpy(?)
 OCCUR IN ELONGATED LAPILLI SIZE FRAGMENTS
 @ $\sim 20^\circ$ \angle A AXIS OF DDH; THEY ARE EVERYWHERE
 PARALLEL TO LAPILLI SIZE RHYODACITE FRASS. THERE
 IS NO TEXTURAL CHANGE IN ROCK FROM 457-512
 HOWEVER, FROM 496-512 THERE IS AN INCREASE IN
 QTZ CONTENT RESULTING IN AN EVEN PALER LIGHT
 SEA GREEN COLOR IN THE ROCK; QTZ OCCURS IN
 PASSED BANDS & ^{WAVY} SUBPARALLEL ELONGATED
 BLENDS; IT DEFINITELY DOES NOT APPEAR TO BE FRACTURE
 CONTROLLED AND THERE IS A DEFINITE SPATIAL/GENETIC
 RELATIONSHIP BETWEEN % QTZ & % SULFIDES;
 AT 496, FRAGMENTAL SULFIDES CONSTITUTE
~~~10% OF ROCK~~ AND INCREASES TO  $\sim 15\%$  @ 512;  
 @ 508  $\exists$  SUDDEN INCREASE IN SILICA, CHLORITE &  
 WELDED TUFF IS CUT DISCORDANTLY BY 2" SULFIDE  
 VEINLET @  $\sim 75^\circ$   $\angle$  A AXIS OF DDH; 2 SULFIDE  
 MINERALS OBSERVED: fg XTALLINE Py & SPHERULITIC  
 (.5 - 1 mm) DULL BRASS COLORED Po; extfg Cpy  
 MAY BE PRESENT IN V. MINOR AMOUNTS; NOTE THAT  
 WALLROCK ALTERATION EXTENDS  $\sim 6"$  ON EITHER SIDE  
 OF SULFIDE STRINGER & @ 507.5  $\exists$  CALCITE FILLED  
 VUG.  
 MINERALIZED WELDED TUFF ENDS ABRUPTLY AGAINST  
 DENSE FG DARK GREY RHYOLITE FLOW(?) (SEE  
 DESCRIPTION NEXT PAGE)

DDH #4

6

512 - 522

RHYOLITE FLOW (?)  
~~DENSE~~ DENSE FINE-GRAINED DARK GREY RHYOLITE FLOW; CONTACT WITH RHYODACITE WELDED TUFF (a) V90° & A AXIS OF DDH, ONE LITHIC SIZE FRAGMENT ABOVE CONTACT (IN RHYODACITE TUFF) IS RIMMED WITH 1/8" SULFIDES; ~1% Py PRESENT IN VF9 BLEBS & DISSEMINATIONS; NARROW SERICITIZED FRACTURES.

522 - 592

SHATTERED RHYODACITE / POSSIBLE STOCKWORK ZONE RHYODACITE TUFF WITH RELECT WELDED TUFF TEXTURE (SEE DESCRIPTION FOR 457-512) CUT BY RANDOM NETWORK OF SILICEOUS VEINETS AND EYES; VEINETS CONSIST OF fg XTALLINE Py CORE WITH DARK GREY ARHANITIC SILICEOUS ENVELOPE (UP TO 50 mm WIRE & FINALLY A VERY NARROW PALE BLUE CHALCEDONIC CHILL ZONE WHERE IT IS IN CONTACT WITH RHYODACITE FRAGMENTS; EYES ARE SIMILAR

592 - 625

DACITIC TUFF  
DARK GREEN HETEROGENOUS TUFF CUT BY OCCASSIONALLY (.25/INCH FRACTURE DENSITY) ~~BY~~ NARROW (.1-2mm) CALCITE VEINETS. ~1% QTZ-CHALCEDONIC EYES AS DESCRIBED IN SECTION 522-592.

796  
625 - 748

BOTTOM OF HOLE @ 5:00 PM JUNE 1978

LAPILLI ANDESITE TUFF  
DARK GREEN & PISTACHIO GREEN MOTTLED ROCK CONTAINING LIGHT-COLORED PARTLY EPIDOTIZED ANGULAR ~~basic~~ CLASTS IN A DARK fg ANDESITIC MATRIX

730.5 - 732

FG. DARKER COLORED INTERSECTION, PROBABLY A BOMB, CONTAINING <sup>med.</sup> ~~med.~~ GRAINED (>3mm) EUMERIDA PYRITOHEDRONS

796  
748 - 818

ANDESITIC TUFF / LAPILLI TUFF  
DARK GREEN & DARK GREYISH GREEN ANDESITIC FRAGMENTS IN A LIGHTER <sup>grey green</sup> COLORED MATRIX

angular  
Sub L

Pyrite  
Tot. Sulphur  
m

748

52A - 2511

\$ 395.00 45-50 lbs.  
BLADE ~ 6" LONG  
7/8" TO 2 1/8"  
ROD CAP & EXTRA BLADE  
\$ 24.95 \$ 37.70



625-796

## LAPILLI ANDESITE TUFF

DARK GREEN & PISTACHIO GREEN MOTTLED ROCK CONTAINING LIGHT-COLORED PARTLY EPIDOTIZED ANGULAR CLASTS IN A DARK GREEN f.g. ANDESITIC MATRIX

- SECTION IS CUT BY NUMEROUS f.g. DARKER COLORED INTERVALS OF 1'-5' THICKNESS ~ PROBABLY BOLARS OR f.g. ASH HORIZONS REPRESENTING SOMEWHAT QUIETER PERIOD OF VOLC. ACTIVITY

796-818

## ANDESITIC TUFF / LAPILLI TUFF

DARK GREEN & DARK GREYISH GREEN ANDESITIC ANGULAR & SUBANGULAR FRAGMENTS IN A LEUCOCRATIC BLuish GREY TO GREYISH GREEN MATRIX; BLuish-GREY SILICA RICH PORTION OF THE MATRIX IS SIMILAR TO THE MATRIX / STOCKWORK DESCRIBED FOR "SHATTERED RHYO-DACITE / POSSIBLE STOCKWORK ZONE" DESCRIBED IN SECTION 522-592

MINOR f.g. Py (< 1%) OCCURS IN SCATTERED BLEBS 1-2 mm IN DIAMETER.

★★

NOTE THAT THIS ROCK IS VERY SIMILAR TO THE DACITIC VOLCANIC BRECCIA INTERSECTED HIGHER IN THE DRILL HOLE @ SECTIONS 15-262; THE ONLY SIGNIFICANT DIFFERENCE IS THE FINER FRAGMENTAL SIZE IN THE 796-818 INTERSECTION

818-867

## ANDESITIC TUFF / LAPILLI TUFF

SIMILAR TO SECTION 625-796

TRANSITION?  
ZONE

{ FROM 836-867 THE PROPORTION OF LIGHTER COLORED FRAGMENTS DECREASES & OCCASSIONAL BANDS (< 12" THICK) CONTAINING DARK GREEN ANGULAR FRAGMENTS IN A LIGHT COLORED MATRIX

867-925

## ANDESITIC TUFF / LAPILLI TUFF

SIMILAR TO SECTION 796-818

SHEAR @ 887-889; SILICA/SERICITE/CHLORITE SOUES AND PARALLEL SUBSIDIARY FRACTURING @ N45° A DDH AXI

925-932

## SHEAR / FAULT ZONE

MEDIUM GREYISH-GREEN HIGHLY SERICITIC & CHLORITIC ZONE CONTAINING OCCASSIONAL LAPILLI-SIZED ANDESITIC CLASTS AND QTZ. VEINING. VEINLETS @ N20° A DDH AXI UP TO 2mm WIDE WITH LAYERED TEXTURE ~ .25 mm KIM OF Py PRECEDING QTZ.; Py = 5-10% TOTAL ROCK &



OCCURS WITH OR WITHOUT QTZ. IN A STOCKWORK OF STRINGS

932-939

## ANDESITE TUFF

DARK GREEN FINE-GRAINED FRAGMENTALS IN A LIGHT BLuish GREY TO GREYISH GREEN SILICEOUS MATRIX SECTION IS CUT BY QTZ/PY STRINGS @  $\sim 70^\circ$  & A DDH AXIS PY  $\approx 5-10\%$  TOTAL ROCK & OCCURS AS RIMS ON VEINLETS & DISSEMINATED.

939-941

## SHEAR/FAULT ZONE

DARK GREEN ANDESITIC TUFF FRAGMENTS IN A SERICITE/CHLORITE MATRIX. FRACTURE CONTROLLED PY (SEE DESCRIPTION FOR SECTION 925-932) CONSTITUTES 5-10% OF THE ROCK

941-946

## RHYOLITE BRECCIA

LIGHT GREYISH-GREEN LAPILL TO BRECCIA SIZE RHYOLITE FRAGMENTS IN A SULFIDE MATRIX COMPOSED OF f.g. PY; DARK GREY APHANITIC ~~FRAGMENTS~~ SILICEOUS RIMS ARE VISIBLE AROUND FRAGMENTS

946-947

## SHEAR

SHEARED, SERICITIZED ZONE IN RHYOLITE  $\sim 70^\circ$  & A DDH AXIS

947-960

## RHYOLITE

LIGHT GREY APHANITIC RHYOLITE CONTAINING vfg DISSEMINATED PY (& POSSIBLE MINOR CPY); TOTAL SULFIDES  $\approx 2-3\%$ ; OCCASSIONAL NARROW (.25mm) DARK GREY SILICEOUS VEINLETS WITH vfg PY CUT @  $\sim 5^\circ-40^\circ$  & A DDH AXIS; MINOR OFFSETS ON VEINLETS WITH PY CONCENTRATIONS OCCURRING IN DILATED ZONES OF OFFSETS.

960-970

## RHYOLITE

DESCRIPTION AS FOR 947-960 BUT WITH FRACTURE DENSITY INCREASING FROM 2/FOOT TO  $\sim 60$ /FOOT; SIMILAR PY CONCENTRATIONS IN DILATIONS @ OFFSETS GIVE THE ROCK A CRUDE "GRAPHIC" TEXTURE; TOTAL SULFIDES  $\approx 5\%$ ; DECREASE IN DISSEMINATED PY COMPARED TO SECTION 947-960.

970-971.5

## SHEAR/FAULT ZONE

HIGHLY COMMINUTED AND ROUNDED RHYOLITE CLASTS IN A LIGHT GREY SERICITE GOUGE;  $\sim 5\%$  PY OCCURS DISSEMINATED AND IN SMALL BLEBS/CLASTS  $\sim 10$ mm IN DIAMETER

DDH # 4

9

971.5 - 973 RHYOLITE  
DESCRIPTION AS FOR SECTION 947-960

973 - 974 SHEAR  
DESCRIPTION AS FOR SECTION 970 - 971.5

974 - 982 RHYOLITE  
DESCRIPTION AS FOR SECTION 947-960

982 - 985 RHYOLITE  
DESCRIPTION SAME AS SECTION 947-960 BUT  
WITH SUDDEN INCREASE IN SIZE & NUMBER OF WHITE  
QUARTZ VEINLETS; VEINLETS UP TO 10MM WIDE  
CUT @  $\sim 30^\circ$   $\&$  A DDH AXIS; @ 983 & 984 NARROW  
(.25 mm) PYRITE VEINLETS;  $\&$  A SUBORDINATE BLACK  
MINERAL WITH SUBMETALLIC LUSTRE CUT CORE; QZ  
VEINLETS OCCUR  $\pm$  SERICITE

985 - 1001 RHYOLITE  
MEDIUM GREY WELL-FRACTURED RHYOLITE CUT BY  
OCCASSIONAL <sup>WHITE</sup> QUARTZ VEINLETS (SEE DESCRIPTION  
FOR SECTION 982-985); ALSO CUT(?) BY WAVY  
DISCONTINUOUS SILICEOUS FRACTURES(?) @  $\sim 60^\circ$   $\&$   
A DDH AXIS  
 $\Rightarrow$  POSSIBLE vfg WELDED TUFF  
LARGER QZ VEINLETS ARE OCCASSIONALLY CHLORITIC  
& SOMETIMES OFFSET BY THE SMALLER FRACTURES(?)

1001 - 1006 RHYOLITE TUFF  
LIGHT TO MEDIUM GREY BANDED RHYOLITE TUFF;  
BANDING IS AT  $\sim 70^\circ$   $\&$  A DDH AXIS; PYRITIC/  
FRACTURES @  $\sim 150-200^\circ$  A DDH AXIS; UP TO 5%  
vfg DISSEMINATED Py

1006 - 1013 RHYOLITE  
LIGHT GREY WELL-FRACTURED APLHANTIC RHYOLITE  
CONTAINS DISSEMINATED  $\&$  FRACTURE CONTROLLED  
Py; fg Py OCCURS IN FRACTURES  $\&$  DISSEM. Py  
CONSISTS OF vfg 'AMORPHOUS' BLEBS  $\&$  SCATTERED  
EUBHEDRAL CUBES .25 - .50 mm IN DIAMETER

DDH # A

1013-1050 WELDED RHYOLITE TUFF DISTINCTLY-FOLIATED  
LIGHT GREENISH-GREY, FINE-GRAINED WELDED  
RHYOLITE TUFF CONTAINING ~ 5% PY IN DISSEMINATION  
AND BANDS // AND SUB // TO FOLIATION OF TUFF  
@ ~ 50° & A DDH AXIS

1051-1051 SHALE  
BLACK SILTY SECTION AT BASE OF DISTINCTLY FOLIATED  
TUFF. HIGHLY PYRITIC (UP TO 15% BEDDED?? PYRITE  
BUT BEDDING INDETERMINATE => POSSIBLE FRAGMENT)

1051-1085 WELDED (?) RHYOLITE TUFF  
MEDIUM GREY MASSIVELY BEDDED TUFF, ~~MASSIVE~~ CLASTIC  
FRAGMENTS ARE SUBROUNDED AND OCCASSIONALLY  
ELONGATED & EXHIBIT SOME PREFERENTIAL  
ALIGNMENT @ ~ 50° A DDH AXIS. FOLIATION IS  
NOT AS DISTINCT AS SECTION 1013-1050.

1085-1092 SHALE  
BLACK PYRITIC SHALE; PYRITE CONSTITUTES UP TO  
15% OF THE ROCK. vfg Py OCCURS IN BEDS, IN  
SMALL BLENDS AND DISSEMINATIONS AND IN FRACTURE  
AT VARIABLE &'S A DDH AXIS. MINOR LIGHT GREY  
TUFFACEOUS HORIZONS ARE INTERCALATED WITH THE  
SHALES.

1092-1097 RHYOLITIC (?) TUFF  
LIGHT GREY FINE-GRAINED BANDED RHYOLITIC (?)  
TUFF CONTAINS vfg Py IN FRACTURES AND AS  
EXT. f.g. DISSEMINATIONS; Py = 2-5% OF ROCK

1097-1108 INTERBEDDED & UNDIFFERENTIATED SILTY & FELSIC TUFF  
PREDOMINANTLY A BLACK SILTY TO SHAALY PYRITIC SEDIMENT  
INTERBEDDED WITH LEUCOCRATIC TUFFS SIMILAR TO  
Tr SECTION 1092-1097. BANDING @ ~ 45° & A DDH AXIS  
Py CONTENT VARIES FROM < 1% TO 15%, OCCURRING  
MAINLY IN BEDS OF vfg Py IN THE SHALE HORIZONS,  
BUT ALSO IN MINOR AMOUNTS IN SILICEOUS FRACTURES  
WHICH CUT THE CORE @ A NUMBER OF DIFFERENT  
ATTITUDES. CORE IS ALSO CUT BY LATER CALCITE  
VEINLETS OF VARIABLE ORIENTATION.

1108-1109

FAULT ?? (SEE SECTION 1192-1199)  
 RHYOLITIC LAPILLI TUFF / FRAGMENTAL HORIZON  
 ANGULAR & SUBANGULAR LAPILLI-SIZED FRAGMENTS  
 IN A SILTY MATRIX; FRAGMENTS CONSTITUTE UP TO  
 70% OF THE HORIZON & EXHIBIT A WEAK PREFER-  
 ENTIAL ORIENTATION // TO OVERLYING SEDIMENTS  
 (@ N 45° & A DDH AXIS); UP TO 15% PY IN  
 ELONGATED (LAPILLI-SIZED) BLEBS; THIS HORIZON  
 LOOKS IDENTICAL TO THE GUL & SPHAL BEARING  
 FLOAT FOUND ON THE "LOWER" ROAD (VICINITY  
 OF L-20S-20W)

1109-1169

SILTY ~~TUFFS~~ AND FELSIC TUFFS, BLACK CHERTS  
 SIMILAR TO SECTION 1097-1108 WITH CHERTY  
 TUFFS PREDOMINATING OVER SILTY TUFFS BELOW 1125,  
 DARK SILTY TUFFS & DARK CHERTY TUFFS OFTEN  
 DISTINGUISHABLE ONLY BY DIFFERENCE IN HARDNESS

1169-1175

RHYOLITIC TUFF  
 MOTTLED GREENISH-GREY RHYOLITIC TUFF CONTAINING  
 f.g. Py IN BLEBS UP TO 10MM IN DIAM IN THE TUFF  
 MATRIX; LIGHT GREY WITHIC FRAGS. (CONSTITUTING  
 UP TO 80% OF ROCK) IN A DARKER GREENISH-GREEN  
 MATRIX

1175-1192

BLACK CHERTS, MINOR FELSIC TUFF HORIZONS  
 SIMILAR TO SECTION 1109-1169 WITH SILTY TUFFS  
 NOW ABSENT

1192-1199

SULFIDE-BEARING FRAGMENTAL HORIZON  
 MULTILITHIC LAPILLI TUFF / FAULT ZONE ??  
 ANGULAR TO ROUNDED, LAPILLI TO Bx-SIZED  
 MULTILITHIC FRAGS. / PREDOMINANT FRAGMENTS  
 ARE LIGHT BROWNISH-GREY PORPHYRITIC RHYOLITE  
 CONTAINING FELDSPAR PHENOCRYSTS AND CONSTITUTE  
 90% OF FRAGMENTALS (260% TOTAL ROCK); OTHER  
 CLASTS CONSIST OF SUBANGULAR TO SUBROUNDED  
 WHITE, SOFT, BARITE OR CALCITE FRAGMENTS AND  
 FRAGMENTS OF LIGHT-COLORED RHYOLITE APPARENTLY  
 DIFFERENT, COMPOSITIONALLY & TEXTURELLY, FROM  
 THE PORPHYRITIC RHYOLITE FRAGMENTS /  
 FRACTURE-CONTROLLED vfg Py OCCURS IN BLEBS  
 UP TO 10MM ACROSS IN A "PSEUDOFRAGMENTAL"  
 TEXTURE, CONSTITUTING 5-10% OF TOTAL ROCK &  
 PARTLY REPLACING THE MORE HIGHLY ALTERED RHYOLITE  
 FRAGS; MATRIX IS SILTY, CALCAREOUS.

SEE ALSO

Lt HORIZON IN  
 RHYOLITIZED TM  
 ON MINI GRID  
 DETAILED MAPPING

(VIC. MAJOR  
 FAULT @

L 21S-7+50W)



1199 - 1235 INTERBEDDED & UNDIFFERENTIATED BLACK CHERTS &  
BASALIC TUFFS  
BLACK, PYRITIC CHERTS AND THINLY BEDDED LIGHT  
TO MEDIUM GREY CHERTY TUFFS, EXHIBITING  
CONSIDERABLE BRITTLE DEFORMATION (BLOCKS  
OF BLACK CHERT & GREENISH GREY TUFFS IN  
DISCORDANT JUXTAPOSITIONS); APPARENT ORIENTA  
TION FROM 1199 TO 1212 VARIES FROM  $\sim 0^\circ$  TO  
 $20^\circ$   $\&$  A DDH AXIS; FROM 1212 TO 1235 (E.O.H.)  
BEDDING IS @  $0^\circ$   $\&$  A DDH AXIS (i.e. DRILLING  
DOWNDIP)

1235

E.O.H.

~ EXPERIENCED EXTREME DIFFICULTY IN CORING  
FROM  $\sim 1199$  TO E.O.H. ALTHOUGH RECOVERY  
WAS  $\sim 90\%$ ; NO WATER RETURN & CEMENTING  
FAILED TO IMPROVE CONDITIONS SO HOLE ABANDONED  
AT 1235'.