50'  50%  White to light brown pumice lapilli and bombs. Mostly glass fresh, with local Fe-staining.

40%  Gray to black, fine grained hypocrystalline to holohyaline, silicic lava clasts. Textures are quite variable, much of this is quite vesicular. This material is mostly quite fresh but locally Fe-oxide stained. Much of this material is drill broken suggesting bomb or block size in situ.

10%  Dark gray to black, hypocrystalline basalt clasts, locally vesicular.

60'  95%  White to light brown pumice as above.

5%    mixed lithic clasts as above

70'  85%  Dark brown lapilli size clasts of highly vesicular basaltic glass with palagonite rims. This material is quite hard in the center of each clast. Some clasts contain undissolved vapor phase minerals in the vesicles.

10%  Dark grey hypocrystalline, microoporphyritic basalt, locally vesicular. This material is locally Fe-oxide stained, occasionally with much secondary hematite. These are drill broken and may represent bomb or blocks.

5%    Siliceous clasts as above.
80'  30%  Palagonite lapilli tuff a/a

70%  Various gray to black hypocrystalline to
dolohyaline lithic clasts of variable texture
and composition. Much of this may be
uphole slough from trapping.

90'  90%  Highly vesicular basaltic glass lapilli
with palagonite rinds as above.

10%  Variable lithic clasts as above.

100'  a/a  Fragments somewhat smaller (~1-3 mm)

110'  a/a

120'  95%  2 to 4 mm lapilli of highly vesicular
basaltic glass w/ palagonite rinds.
This material appears to be slightly
porphyritic. Vapor phase minerals are
common in the vesicles.

5%  Black gray hypocrystalline basalt lithic
clasts. Locally Fe-oxide stained, locally
with secondary hematite.

130'  25%  Basaltic Palagonite tuff as above

75%  Silicate volcanic material consisting mostly
of grayish fine grained hypocrystalline
to dolohyaline rhyolite, with minor white
pumice. Some of this could be slough.
<table>
<thead>
<tr>
<th>Depth</th>
<th>Obsidian</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>140'</td>
<td>75%</td>
<td>Medium gray, veined, glass with slight color variations and occasional banding. This appears to be locally pumiceous.</td>
</tr>
<tr>
<td>25%</td>
<td></td>
<td>up-hole slough</td>
</tr>
<tr>
<td>150'</td>
<td>85%</td>
<td>Medium gray to dark gray, veined, glass. About half of this material is finely very veined.</td>
</tr>
<tr>
<td>15%</td>
<td></td>
<td>up-hole slough</td>
</tr>
<tr>
<td>160'</td>
<td>a/u</td>
<td>Medium gray to dark gray, banded obsidian. This material is mostly massive, with less than 10% pumiceous component.</td>
</tr>
<tr>
<td>10%</td>
<td></td>
<td>up-hole slough</td>
</tr>
<tr>
<td>180'</td>
<td>95%</td>
<td>Obsidian a/u</td>
</tr>
<tr>
<td>5%</td>
<td>slough</td>
<td></td>
</tr>
<tr>
<td>Notes</td>
<td>Change to 20 foot samples</td>
<td></td>
</tr>
<tr>
<td>200'</td>
<td>a/u</td>
<td>Noticeably banded, locally with stretched vesicles.</td>
</tr>
<tr>
<td>220'</td>
<td>97%</td>
<td>Obsidian a/u</td>
</tr>
<tr>
<td>17%</td>
<td>slough</td>
<td></td>
</tr>
</tbody>
</table>
240'  50%  Gray massive obsidian with locally transmitted as above. This locally appears finely crystalline.

49%  Light grey pumiceous obsidian—part of the same material as above.

1%  Sough

250'  85%  Gray massive obsidian ap.

15%  Light grey pumiceous obsidian ap.

260'  *ap  W/ 90% glass, 10% pumice

N. M. Minor upheave sough

270'  *ap  Sough

280'  50%  Light to dark grey, finely transmitted obsidian. Laminations are increasingly common. This glass occasionally contains fine, leafy needles.

40%  Pumiceous glass from the above unit.

57%  Sough upheave

N.B. There are traces of very soft dark green phyllitic material (?) occurring on some surfaces. This, in one case noted, is associated with what appears to be a brown coating the same surface.
290'  80%  Light gray fine pumice, associated up the obsidian
18%  Massive obsidian apa
2%  uphole slugh

300  apa

310  90%  PUMICE
10%  OBSIDIAN

320  90%  Orange to gray in color, greasy, hard, very
        very hard, greasy black gyrite.

50  same as above
50  same as above
50  same as above

570  APA  same as above

770  10%  Tiny vesicles in dark glass (plagioclase) -
      in basalt and obsidian.  Some are amorphous
      green opx and plag.  Amorphous Vesicular
      amorphous with amorphous glasses together with
      obsidian. Some obsidian has gray to dark brown
      glasses.

16%  gray pumice - loose rings - presumably
      from up hole
300' Same as above

410' Same as above

430' 10% or even lower. It is to be noted that no "new" data is included.

460' 80% basaltic glass
20% altered material

470' 98% basaltic glass - very bright green
5% altered - no glass

490' Same as above

510 95% Dark brown, finely vesicular microphyric basaltic glass. Phenocryst assemblage includes clear plg. (n=5mm) and pale yellow opx, with minor green-brown opx. Vesicles are common, lined or filled by clear to white, cryptocrystalline or amorphous material.
This material is somewhat pristine with no phlogopite.

570 Gray to dark gray, fine aphanitic, microphyric, microvesicular basalt/skorza. Presumably from the same unit as the glass.

NB. It is difficult to determine the size of clasts in situ.
530'  0/a  Dark brown microvesicular porphyritic basaltic glass as above.

550'  70%  dull gray very fine aphanitic finely vesicular basalt.

Note: these are both part of a relatively unaltered basaltic tuff. No pahyognath is present. The fine aphanitic material probably represents bombs or other larger clasts.

2%  small

570  a/a  slightly higher % glass

580  a/a  Notice some of these clasts contain vesicle coatings of a dark green clay (4-15 microns) which appears to be stable. Traces of primary pyrite (vapor phase 2) are present on vesicle walls of some of the phric clasts.

600-650  0/a  95% DIABasic microvesicular Porph. Basaltic Glass

5% SCoria

680, 700, 740  0/a  appears fresher than above; less chlorophyllite (2) augite phenocrysts up to 2 mm; olivine fresh. Also gray to brown where previously it was tan.

760, 780, 800  0/a  1
Dark brown to greenish brown finely vesicular, microporphyritic basalt and glass. Vessels are often filled by secondary minerals or vapor phase minerals. Rock is quite fresh with no alteration. (As above)

25% Medium to dark gray fine ophitic, finely vesicular basalt. There is a variety of textures included in this group. Occasional clasts show intervesicular coatings of fairly soft, dark green amorphous material.

Note: Clasts of both groups show occasional soft green vesicular coatings. Some show soft rock material in vesicles as well. The phyllic material is clearly represented accidental fragments in the bulk, both can be seen in a single drill chip occasionally.

Phyllic material down to 10%.

Some of the phyllic fragments exhibit pervasive greenish clay alteration, often through out only 1/2 of the clast.
940  a/a  90 %  Dark brown mat on the surface, as above. Some few clasts show a prangy brown pervasive oxidation.

10 10  90 %  Physic fragment as above.

60  A/a  It appears as if there are numerous minute fragments included within this interval.

980  A/a

1000  a/a

1020  a/a  NB: There is an increase in the amount of greenish clay alteration, as well as an overall increase. There are a few fragments of clay-rich volcanic sandstone with fine disseminated pyrite. Some of the pyrite fills cracks at the contact between formational boundaries.

10  20 %  a/a

1030  20 %  a/a  Various volcanic sediments ranging from sandy siltstone to muddy clay-rich sandstones. This material ranges from fairly soft to moderately indurated. Most of the lithic and mineral fragments appear to be somewhat altered, but fresh appearing. This material is locally pyritic.

80 %  Silt in veining is present in minor amounts. Clear color.
10:20
95% Brownish gray to gray clay rich fine-grained volcanic sandstone, moderately indurated. Locally pyritic (inner)

Secondary calcite occurs as vein fillings

10:30
80%

10:50
80%

20%
Fine, reddish, friable, indurated mudstone

10:40
80%

10:60
80%

Orangeish to brownish gray, moderately indurated mudstone or siltstone. This is finely laminated by occasional sandy layers, and is locally fissile. Vein fillings of calcite and aragonite (Ar-Ar dates), often in dark green outer zones. (Note: these are dated and of possible fault origin.)

Green, clay with volcanic s.s. as above.

Note: There is a low amount of clay from this interval which is being lost to the drilling fluids.
1045 85% very soft greenish gray silty clay
1070 casing cement (light brown, calcareous)
5% moderately indurated fine volcanic sediments including clay rich sandstones and sandy siltstones

1050’ a/p w/ ~20% upright slough of basaltic tuff

1060 Shaker sample – same material a/p
w/ surface contamination

1070 NS

1080 NS

1090 90% white to very light gray devitrified silticic crystal lithic tuff. This rock is composed of white, fresh, soft cryptoclone mottled w/ 5-10% sub-mm exhaloval to sub-earth plag crystals and 5% exhalodal hexagonal plates of blue colored pyrophilite. Pelitic clastic texture is visible. Limited carbon is present, not as veins
10% upright slough

1100 80% a/p w/ increase in % of pyrophilite to ~1%

1570 light to medium gray siliciclastic devitrified tuff to nearly pure cryptoclone siltite. This material is somewhat variable and ranges from when the clastic texture is visible to where it is uniform and textureless. This may represent fracture controlled silica metasomatic
Sandia RDO-1

W/ less silica metasomatism. Texture is changing indicating a higher content of alterite layers. Clasts. Pyroclasts are decreasing, and pyrite is starting to be more common, usually as fine disseminations or sub mm aggregates. Still slightly calcareous locally. Relic pumice textures visible.

1150 30%
While 1. Very light grey devitrified altered tuff as above, occasionally has a greenish hue. Appears locally to be a tuff breccia.
Greenish to reddish grey altered lithic fragments and variable textures. From the above tuff, this clast stone from lapilli to probable bomb size. Hardness varies from hard to quite hard. Many have fine disseminated pyrite, the above tuff contains many surfaces. Veins are filled of pyrite, loose quartz, minor calcite or probable to hornblende. No clear associations.

Some surfaces are coated of light greenish clay. Cryptoclastic silt occurs as a vein (ill.)

Pyroclasts still present in minor amounts.
with a light greyish white devitrified, moderately indurated calcareous buff. The matrix can be easily scratched by the pick. Common primary crystals include quartz and feldspar, secondary minerals include epidote, epidote, greenish clays, micro-precipitated chlorite, magnetite, traces of amphibole (?), calcite, traces of apparently precipitated epidote, and iron of pyrite, pyrophosphate.

Various greenish to reddish gray lithic clasts of apparently mostly siliceous composition. These show variable degrees of alteration. Secondary minerals include epidote, silica, pyrite, chlorite (on surfaces and after termite), calcite, traces of epidote (after plagioclase), and locally hematite.

1210 ppm higher proportion of lithic clasts

1250 ppm proportion of Fe/Cr back up to 50+ %
The buff matrix is richer in small sub-um lithics here, and generally softer. The occurrence of chloride and epidote has dropped off.

NB: This was a very clay rich zone upon sampling.

1250 90 %

Matrix to dark grey, fine aphanitic, sparse plagioclase feldspar probably of dacite or rhyolite composition. The rock appears quite glassy in places. It locally shows finely distributed pyrite or magnetite. There are a few fracture surfaces on the rock which show apparently precipitated chlorite on the outsides of the fractures and tabular calcite on the underside. There are some possible relics involved also. There are also traces of hard white cryptocrystalline and clear botryoidal silica (is cristobalite?).
Lithic clasts of variable composition, texture, and degree of alteration. Many are pyritic, and many show surface coatings of calcite, chlorite, and occasionally quartz or β-cristobalite. Many show chlorite in veins and after leucocryptoglyphs. Clay is usually chlorite, dolomite is common, present occasionally as hankle layers surrounding.

20% Gray to brown gray, variable induration, cryptolithic fabric. The tuff is obviously clay rich with quartz and plagioclase along with chlorite. Cryptocryic silica, quartz, calcite, chlorite, green clays, mica, and minor hornfels are present as secondary minerals.

N.B. This interval contains a fair amount of pyrite, calcite, and apparently precipitated chlorite throughout. No epidote was observed.

Up quite an abundance of hydrothermally precipitated chlorite and calcite, an apparent increase in the intensity of pervasive alteration of the lithic clasts.
Gray to brown gray, hard, opalescent, yellowish, lustrous fragments. This material is identified and clay altered. Very sparse, many clay plates are altered to clay + chlorite (?) Many fracture surfaces are covered by calcite and soft botryoidal chlorite, and occasionally cryptocrystalline. Some traces of pyrite in the veins. Pyrite also occurs in the chlorite altered to fractures occasionally. Other lustrous fragments of similar alteration.

Whitish to greenish white altered lithic tuff matrix. Texturally variable, obviously elastic. Clay, chlorite, calcite, silica, and pyrite are present in the matrix also, and appear to be precipitated.

Trace of orange,ish hematite (?) present.

1310 a/p

See other description

1320 a/p

15 % white unaltered unaltered tuff matrix. Chalcedony present in matrix, but still present in the altered matrix. Note: much of the magnetite present here is going to hematite.

1330 a/p

40 % tuff, precipitation minerals have decreased, lithic clasts appear more silicic. There is a hard white fibrous soddy mineral, possibly calcite. (S. or? Spacing?)

[Sampled @ 1310]
Dark brownish gray, fine-grained, very hard, glossy, silicic flow rock or welded tuff. This rock has a thin amount of chlorite precipitated in veins, as well as an alteration product presumably of fensornog. Play is clear and fresh appearing. There is locally some of breccia around chloritized fenomog and play sites.

Other lithic clasts of similar alteration, fragments of tuff matrix as above. The tabular calcite and soft botryoidal precipitated chlorite do not appear to be present.
Reddish grey to grey mostly siliceous, lithic clasts of variable texture and composition. State of alteration is somewhat variable, though most are quite hard. Some of these may be welded till; many show chlorite and calcite + cryptocrystalline S:O2 in veins and on fractures. Many show bright orange hematite after staining around primary minerals occurs locally. Pyrite present locally. Transition evident after play are is noted on a few clasts.

White to greenish white to pinkish white, variably indurated, devitrified and lithic till matrix. Precipitated minerals not obvious, chlorite noticeable in small amounts.

Lithic clasts as above, up to 1% pop. animals

Transitional between non-welded above and welded below

Greenish white to pinkish white devitrified and lithic till. Much possible the disc Hematite locally. Light greenish clay fairly common usually as small sub-lithic clasts. Minor bell-shaped mounds of soft fibrous material are common on some fractures in the till. Occasional sub-mm exsolution of magnetite are present. Chlorite very present in trace amounts.

Purple grey, welded calcitic till. This unit is quite hard. Porphyritic or sub-micaceous, and presence sparse magmatic schelect. Product to chlorite. Some surfaces have a dull grey green material with clay or chlorite.
Purple gray, welded tuff as above.
Prep. required are very fine except the occasional dull gray glassy surface coating. Most calcite, calcite + magnetite alteration products of mafic phenocrysts.
Traces of pyrite present, traces of chlorite in tiny voids.

10% upholstery

1380 95% Tuff o/a
5% Slope

1390