Appendix B. Core Log for USGS 140
**Core Geological Profile**

### Lithologic Patterns
- Basalts
- Rhyolites
- Sedimentary Rock

### Soil Patterns
- Gravels - clean
- Gravels with fines
- Sands with fines
- Sands - clean

### Intervals in Absentia
- Surficial material
- Natural void
- Interval not cored
- Missing interval

### Igneous and Sedimentary Structure Symbols
- Basalts
- Rhyolites
- Sedimentary Rock

### Soil Structure Symbols
- Structureless - Single Grained
- Structureless - Massive
- Platy
- Granular
- Prismatic
- Blocky
- Columnar

### Description

- **SANDS WITH FINES:** USCS CLASSIFICATION: SM-Silty sand
- **COLOR:** 10 YR 5/4 Moderate yellowish brown silty sand
- **TEXTURE:** Poorly sorted
- **STRUCTURE:** Layer saturated with drilling mud, undetermined
- **CONSISTENCY:** Firm
- **CARBONATE REACTION:** Moderate
- **ROCKS:** Rare, rounded to semi-rounded pebble to gravel-sized rocks. Clasts are dark grey limestone, dark grey basalt, and light grey-green andesite
- **ROOTS/FOSSILS:** Roots of surface vegetation present.

**Description:** Surface soil consists of rounded to subrounded sand composed of quartz, basaltic lithic, and lithic sand-sized grains in a light brown silt matrix, with rare gravel clasts.

- **GRAVELS WITH FINES:** USCS CLASSIFICATION GM:
- **COLOR:** Dark grey limestone clasts, black chert clasts, green, red, or grey andesite clasts, black or dark grey basalt clasts, some clasts have coating of 10 YR 5/4 soil; fines mostly washed away by drilling mud
- **TEXTURE:** Poorly sorted, rounded to angular clasts
- **STRUCTURE:** Not determined, interval completely disturbed

### Fracture Frequency

<table>
<thead>
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<th>Mean Size (in.)</th>
<th>Volume Percentage</th>
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<tbody>
<tr>
<td>0</td>
<td>10</td>
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<tr>
<td>0.2</td>
<td>20</td>
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<tr>
<td>0.4</td>
<td>30</td>
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<tr>
<td>0.6</td>
<td>40</td>
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<tr>
<td>0.8</td>
<td>50</td>
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</table>

### Miscellaneous Text Lithologic Description

- SANDS WITH FINES: USCS CLASSIFICATION: SM-Silty sand
- COLOR: 10 YR 5/4 Moderate yellowish brown silty sand
- TEXTURE: Poorly sorted
- STRUCTURE: Layer saturated with drilling mud, undetermined
- CONSISTENCY: Firm
- CARBONATE REACTION: Moderate
- ROCKS: Rare, rounded to semi-rounded pebble to gravel-sized rocks. Clasts are dark grey limestone, dark grey basalt, and light grey-green andesite
- ROOTS/FOSSILS: Roots of surface vegetation present.
- DESCRIPTION: Surface soil consists of rounded to subrounded sand composed of quartz, basaltic lithic, and lithic sand-sized grains in a light brown silt matrix, with rare gravel clasts.

- GRAVELS WITH FINES: USCS CLASSIFICATION GM:
- COLOR: Dark grey limestone clasts, black chert clasts, green, red, or grey andesite clasts, black or dark grey basalt clasts, some clasts have coating of 10 YR 5/4 soil; fines mostly washed away by drilling mud
- TEXTURE: Poorly sorted, rounded to angular clasts
- STRUCTURE: Not determined, interval completely disturbed
CONSISTENCY: N/A interval totally disrupted by drilling, almost all fines washed out
CARBONATES: Strong reaction from limestone clasts
DESCRIPTION: Poorly sorted, loose, pebbles to cobbles, some clasts have coating of fine soil (cuttings indicate that fines were washed away in drilling mud). Clasts are sub-rounded to rounded river gravel largely comprised of limestone, chert, andesite, quartzite, and rare basalt clasts. Nearly all clasts show concussion marks. Incomplete recovery, 5 feet of sediment was recovered from this interval.
BASALT: COLOR: N5 Medium gray
TEXTURE: Aphanitic basalt, vesicular from 34 to 37.8 ft, massive to diktytaxitic from 37.8 to 53.5 ft increasingly vesicular to base at 56.2 ft. Flow structure and rubble at base. Subophitic, under hand lens magnification, 1 mm agglomerations of olivine phenocrysts are visible between lathwork plagioclase phenocrysts, 1-1.5 mm long. Matrix is dark gray, with <0.1 mm granules of a black mineral.
COMPOSITION: 60% euhedral plagioclase microphenocrysts up to 1.5 mm long 0.5 mm wide, 30% subhedral to anhedral 0.5-1 mm olivines, 5% anhedral black mineral, remainder is cryptocrystalline matrix.
XENOLITHS/AUTOLITHS: None noted
ALTERATION: 10 YR 8/2 very pale orange mineral encrusts some fractures, carbonate-rich reacts strongly to acid. Reddish oxidation on surfaces at base, non-carbonate white film on fracture surfaces and in vesicles at base.
BASALT: COLOR: 5YR 6/1 brownish gray
TEXTURE: Aphanitic, subophitic, basalt, with (large 2-10 mm), sparse vesicles. Spatter structure and rubble at base.
COMPOSITION: 35% euhedral to subhedral plagioclase microphenocrysts < 0.5 mm long, 25% anhedral olivine microphenocrysts
XENOLITHS/AUTOLITHS: None noted
ALTERATION: White non-calcareous film on fractures near base of interval, slight alteration of olivine to reddish iddingsite

MISSING INTERVAL: Missing, no other information
BASALT: COLOR: 5YR 6/1 Brownish gray
TEXTURE: Aphanitic, subophitic, basalt, top of interval is rubble, (large 2-10 mm), sparse vesicles to 63.2 ft. From 63.2 to 63.7 feet, core retrieved is rubble coated with non-calcareous white to cream-color, dull, massive mineral. From 63.7 ft to 65, vesicles decrease in size and number. At 65 ft, massive texture, increasingly vesicular from 66 ft to base of interval. Spatter structure and rubble at base coated with white non-calcareous film.
COMPOSITION: 35% euhedral to subhedral plagioclase microphenocrysts < 0.5 mm long, 25% anhedral olivine microphenocrysts
XENOLITHS/AUTOLITHS: None noted
ALTERATION: White non-calcareous film on fractures near top and base of interval, calcareous film on fracture at 65 ft, slight alteration of olivine to reddish iddingsite

MISSING INTERVAL
BASALT: COLOR: 5YR 6/1 Brownish gray
TEXTURE: Aphanitic, subophitic, basalt; top of interval is rubble, core retrieved is rubble coated with non-calcareous white to cream-color, dull, massive mineral.
COMPOSITION: 35% euhedral to subhedral plagioclase microphenocrysts < 0.5 mm long, 25% anhedral olivine microphenocrysts
XENOLITHS/AUTOLITHS: None noted
ALTERATION: White non-calcareous film on fractures near top and base of interval, slight alteration of olivine to reddish iddingsite
Note: This interval and the next interval contained mostly rubble, and depths may be off by as much as one foot.

BASALT: COLOR: N4 medium dark grey to N5 medium grey
TEXTURE: Aphanitic, subophitic, basalt; Flow structure at top of interval; rubble intervals at 72, 78, 84, 88, ft. Vesicular from 72 to 95.7 ft, diktytactic with megavesicles and vesicle planes from 95.7 to 104 ft, massive with vesicle planes from 104 to 119 ft, diktytactic from 119 to 139 ft, massive from 139 to 148.5 ft, increasingly vesicular from 145.8 ft to base of interval. Glomerocrysts of olivine microphenocrysts may be up to 5 mm. Spatter structure and rubble at base.
COMPOSITION: 50% euhedral to subhedral plagioclase microphenocrysts < 0.5 mm long, 30% anhedral olivine microphenocrysts, 10 % black anhedral mineral
XENOLITHS/AUTOLITHS: None noted
ALTERATION: Vesicle interiors, rubble coated with thin film of dull, white or buff mineral, material does not contain carbonate; reddish oxidation at base.
SANDS WITH FINES: USCS CLASSIFICATION: SM silty sand
COLOR: 10 YR 4/2 dark yellowish brown
TEXTURE: Sand with fines
STRUCTURE: Structureless
CARBONATE PRESENT: No reaction
ROCKS: No
ROOTS/FOSSILS: None noted

SANDS WITH FINES: USCS CLASSIFICATION: SM silty sand
COLOR: 5 YR 5/6
TEXTURE: Sand with fines
STRUCTURE: Platy
CONSISTENCY: Friable
CARBONATE PRESENT: No
ROCKS: None noted
ROOTS/FOSSILS: None noted

SANDS WITH FINES: USCS CLASSIFICATION: SM silty sand
COLOR: 5 YR 5/6 light brown
TEXTURE: Silty sand
STRUCTURE: Platy
CONSISTENCY: Friable
CARBONATE PRESENT: No
ROCKS: None noted
ROOTS/FOSSILS: None noted

SANDS WITH FINES: USCS CLASSIFICATION: SM silty sand
COLOR: 10 R 4/6 moderate reddish brown grading to 5 YR 5/6 light brown at base of interval
TEXTURE: Silty sand
Perkins, USGS

Composite sediment sample, K. Perkins, USGS

Perkins, USGS

Composite sediment sample, K. Perkins, USGS

Perkins, USGS

Composite sediment sample, K. Perkins, USGS

Perkins, USGS

Composite sediment sample, K. Perkins, USGS

Perkins, USGS

One foot section, K. Perkins, USGS

Perkins, USGS

One foot section, K. Perkins, USGS

Perkins, USGS

One foot section, K. Perkins, USGS

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One foot section, K. Perkins, USGS

Perkins, USGS

One foot section, K. Perkins, USGS

SANDS WITH FINES: USCS CLASSIFICATION: SM silty sand
COLOR: 10R 3/4 dark reddish brown
TEXTURE: Fine to very fine sand with silt
STRUCTURE: Blocky
CONSISTENCY: Firm
CARBONATE PRESENT: None at top, slight reaction at base of interval
ROCKS: No
ROOTS/FOSSILS: No

SANDS WITH FINES: USCS CLASSIFICATION: SM silty sand
COLOR: 10R 3/4 dark reddish brown
TEXTURE: Fine sand with silt
STRUCTURE: Blocky at top, platy at base
CONSISTENCY: Firm at top, friable at base
CARBONATE PRESENT: Slight reaction
ROCKS: No
ROOTS/FOSSILS: No

SANDS WITH FINES: USCS CLASSIFICATION: SM silty sand
COLOR: 10R 3/4 dark reddish brown
TEXTURE: Fine to very fine sand with silt
STRUCTURE: Blocky
CONSISTENCY: Firm
CARBONATE PRESENT: No
ROCKS: None noted
ROOTS/FOSSILS: None noted

SANDS WITH FINES: USCS CLASSIFICATION: SM silty sand
COLOR: 10R 3/4 dark reddish brown
TEXTURE: Fine sand with silt
STRUCTURE: Blocky at top, platy at base
CONSISTENCY: Firm at top, friable at base
CARBONATE PRESENT: Slight reaction
ROCKS: No
ROOTS/FOSSILS: No

SANDS WITH FINES: USCS CLASSIFICATION: SM silty sand
COLOR: 10R 3/4 dark reddish brown
TEXTURE: Fine sand with silt
STRUCTURE: Blocky at top, platy at base
CONSISTENCY: Firm at top, friable at base
CARBONATE PRESENT: Slight reaction
ROCKS: No
ROOTS/FOSSILS: No

SANDS WITH FINES: USCS CLASSIFICATION: SM silty sand
COLOR: 10R 3/4 dark reddish brown
TEXTURE: Fine sand with silt
STRUCTURE: Blocky at top, platy at base
CONSISTENCY: Firm at top, friable at base
CARBONATE PRESENT: Slight reaction
ROCKS: No
ROOTS/FOSSILS: No
SANDS WITH FINES: USCS CLASSIFICATION: SM silty sand
COLOR: 5 YR 6/4 light brown
TEXTURE: Fine sand with silt
STRUCTURE: Blocky to platy
CONSISTENCY: Firm
CARBONATE PRESENT: Slight reaction
ROCKS: No
ROOTS/FOSSILS: None noted

SANDS WITH FINES: USCS CLASSIFICATION: SM silty sand
COLOR: 10 R 4/6 moderate reddish brown
TEXTURE: Fine sand with silt
STRUCTURE: Platy
CONSISTENCY: Firm
CARBONATE PRESENT: Strong reaction
ROCKS: No
ROOTS/FOSSILS: None noted

SANDS - CLEAN: USCS CLASSIFICATION: Clean sand, SW
COLOR: 5 YR 5/2 pale brown
TEXTURE: Poorly graded, poorly sorted medium to coarse quartz
lithic sand, lithics include basalt, andesite, limestone, chert, and quartzite
STRUCTURE: Structureless
CONSISTENCY: Friable
CARBONATE PRESENT: No
ROCKS: Yes, pebbles up to 1.5 cm
ROOTS/FOSSILS: No

SANDS WITH FINES: USCS CLASSIFICATION: SM silty sand
COLOR: 5 YR 4/4 moderate brown at top of interval, grades to 10 YR 4/2 dark yellowish brown at base of interval
TEXTURE: Well sorted lithic sand, grains are rounded to subrounded
STRUCTURE: Blocky
CONSISTENCY: Firm
CARBONATE PRESENT: Yes, weak reactivity at top of interval, increasing to strongly reactive near base
ROCKS: No
ROOTS/FOSSILS: No
BASALT: COLOR: N4 medium dark grey
TEXTURE: Aphanitic basalt, vesicular from top to 197 ft, diktaxitic from 197 to 198 ft, massive to 202 ft, vesicular from 202 to 214.7, rubble at 204.8 and 208 ft, flow structure and spatter at base
COMPOSITION: 15 % anhedral to subhedral, 0.5 to 1mm, green olivine phenocrysts in a dark grey matrix
XENOLITHS/AUTOLITHS: None noted
ALTERATION: Reddish oxidation inside vesicles at base of interval, white to buff non-calcareous, dull, massive mineral on fracture surfaces
SANDS WITH FINES: USCS CLASSIFICATION: ML silt
COLOR: 5YR 6/4 light brown
TEXTURE: Silt with quartz and lithic grains
STRUCTURE: Blocky
CONSISTENCY: Friable
CARBONATE PRESENT: No
ROCKS: A few, 2-4 cm basalt clasts at top of interval
ROOTS/FOSSILS: None noted
MISSING INTERVAL: .
GRAVELS WITH FINES: USCS CLASSIFICATION: GM silty gravel
COLOR: 10 YR 6/2 pale yellowish brown
TEXTURE: Very poorly sorted gravel with medium sand, clasts are subrounded to subangular, range in size from medium sand to medium pebbles, interval only partially recovered. Clasts include basalt and quartzite
STRUCTURE: Structure disrupted by drilling fluid, unknown
CONSISTENCY: Firm
CARBONATE PRESENT: None noted
ROCKS: Yes, see above
ROOTS/FOSSILS: None noted
DESCRIPTION FROM SMALL SAMPLE, MOST OF INTERVAL NOT RECOVERED
SANDS WITH FINES: USCS CLASSIFICATION: SM silty sand
COLOR: 10 YR 6/2 Pale yellowish brown
TEXTURE: Fine quartz lithic sand with silt
STRUCTURE: Massive
CONSISTENCY: Friable
CARBONATE PRESENT: Slightly reactive
ROCKS: No
ROOTS/FOSSILS: None noted

CLAY: USCS CLASSIFICATION: CH-clay of high plasticity, becomes slightly silty at base of interval
COLOR: 10 YR Pale yellowish brown
TEXTURE: Clay
STRUCTURE: Massive
CONSISTENCY: Friable
CARBONATE PRESENT: No
ROCKS: None noted
ROOTS/FOSSILS: None noted
SANDS WITH FINES: USCS CLASSIFICATION: SC -clayey sand
COLOR: 10 YR 6/2 pale yellowish brown
TEXTURE: Moderately sorted very fine to fine quartz lithic sand
with silt and sparse granules and fine pebbles, quartz grains are
rounded, lithic grains are subangular to angular
STRUCTURE: Blocky
CONSISTENCY: Firm
CARBONATE PRESENT: No
ROCKS: A few granules and pebbles of subangular basalt
ROOTS/FOSSILS: None noted

BASALT: COLOR: N4 Medium dark grey
TEXTURE: Phaneritic, subophitic, porphyritic, basalt. Vesicular
from top to 250 ft, massive with a few large (1 cm) vesicles to
252.6 ft, vesicular with vesicles increasing in size and decreasing
in number to 258.7 ft, diktytaxitic with vesicle planes and
cylinders to 265 ft, then vesicular to base of interval. Megavesicle
at 242, 244, and 256.1 ft, flow mold at 254 ft. The massive section
has larger phenocrysts of all mineral phases, and some
glomerocrysts of plagioclase phenocrysts, and of olivine.
COMPOSITION: 65% white, euhedral, 0.5-1.0 mm plagioclase in
lathwork framework, with 25% 1-1.5 euhedral green olivine
phenocrysts and 1.5% black euhedral phenocrysts
XENOLITHS/AUTOLITHS: None noted
ALTERATION: White to tan massive non-calcareous mineral on
flow mold structure at 254 ft, and at 242 and 244 ft
SANDS - CLEAN: USCS CLASSIFICATION: SM silty sand
COLOR: 5 YR 5/6 light brown
TEXTURE: Well sorted quartz lithic silty sand. Quartz grains are
rounded, black lithic grains include basalt and obsidian, and are
subrounded to angular
STRUCTURE: Massive
CONSISTENCY: Firm
CARBONATE PRESENT: No
ROCKS: 5-7 mm angular basalt pebbles
ROOTS/FOSSILS: None noted

MISSING INTERVAL
SANDS WITH FINES: USCS CLASSIFICATION: SM silty sand
COLOR: 5 YR 3/2 Greyish brown
TEXTURE: Fine lithic quartz sand with silt, Pink, tan, black, and white lithics are subrounded to angular, quartz grains are rounded and in general smaller than the lithic grains
STRUCTURE: Granular
CONSISTENCY: Loose
CARBONATE PRESENT: yes
ROCKS: Large (10 cm) angular clasts of basalt
ROOTS/FOSSILS: No

BASALT: COLOR: N4 medium dark grey
TEXTURE: Aphanitic basalt, vesicular from top of interval, vesicles increase in size and decrease in number to 286.5 ft, basalt is diktytaxitic with a few large vesicles to 289 ft, then is diktytaxitic to 294 ft, and then increasingly vesicular to the base of the interval. Flow/mold structures found at base.
COMPOSITION: Randomly oriented subhedral to euhedral plagioclase laths surround rare euhedral to subhedral green olivine microphenocrysts and rare 1-2 mm euhedral white plagioclase phenocrysts in a dark grey groundmass
XENOLITHS/AUTOLITHS: Autolith at 291 ft
ALTERATION: White to buff massive non-calcareous mineral inside vesicles and on fracture surfaces

Sediment sample, K. Perkins, USGS
SANDS WITH FINES: USCS CLASSIFICATION: SM silty sand
COLOR: 10 YR 7/4 Greyish orange
TEXTURE: Fine to very fine-grained silty sand
STRUCTURE: Massive to blocky
CONSISTENCY: Firm
CARBONATE PRESENT: No
ROCKS: Cobbles and pebbles of angular basalt
ROOTS/FOSSILS: None noted

Composite sample, K. Perkins, USGS
MISSING INTERVAL: Core above and below very broken, depths from 324 ft and below may be off as much as one foot

BASALT: COLOR: N3 Dark grey
TEXTURE: Aphanitic, vesicular
COMPOSITION: Approximately equal amounts of tiny reddish subhedral olivine microphenocrysts and white plagioclase phenocrysts in a glassy dark grey matrix, with a few black microphenocrysts
XENOLITHS/AUTOLITHS: None noted
ALTERATION: Olivine exteriors altered to reddish iddingsite. Copious soil in fractures reacts slightly to acid at the top of the interval, increasing in strength with depth. This interval is a rubble zone, with many sub-horizontal and vertical fractures.
MISSING INTERVAL: Core above and below this interval is fragmented, and depth measurements may be inaccurate in these intervals.
BASALT: COLOR: N5 medium grey
TEXTURE: Barely phaneritic, subphotic basalt, vesicular from top of interval to 329 ft, diktysaxitic from 329 to 334 ft, vesicular from 334 to 341 ft, diktysaxitic from 341 to 347 ft, vesicular from 347 to 359 ft, diktysaxitic from 359 to 365 ft, vesicular from 365 to 376 ft, diktysaxitic from 376 to 379.2 ft, vesicular from 379.2 to 393 ft, diktysaxitic from 393 to 405 ft, massive from 405 to 406.5 ft, diktysaxitic from 406.5 to 425.5 ft, vesicular from 425.5 to base of interval, Flow structures present at 348.2, 350.3, 368.2, 380.5 ft, and at base of interval
COMPOSITION: 60% intergrown white lath-shaped, plagioclase microphenocrysts, with 35% anhedral green olivine microphenocrysts in the interstices of the plagioclase framework, 1-3% acicular black mineral that crosses the plagioclase framework,
XENOLITHS/AUTOLITHS: Xenolith at 467.4 ft
ALTERATION: Reddish oxidation surfaces of flow structures, greenish alteration mineral on fracture surfaces and inside vesicles near 366 ft.
BASALT: COLOR: 10R 4/2 grayish red at top of interval, gradually changing to N5 medium grey at about 435 ft
TEXTURE: Aphanitic, microphyllitic, vesicular from top to 431.3 ft, diktytaxitic with large vesicles from 431.3 to 433.7 ft, diktaxitic to 437 ft, increasingly vesicular to base, flow/mold structure at base
COMPOSITION: 70% sub-millimeter euhedral white plagioclase laths form a felted matrix with about 15% 0.5-1.0 mm subhedral green olivine microphenocrysts in spaces between plagioclase microphenocrysts, rest is reddish-grey groundmass
XENOLITHS/AUTOLITHS: None noted
ALTERATION: Blackish red oxidation at base of interval, non-calcareous very pale orange to buff film on fractures and inside vesicles at 428.5 ft, 433 ft, and at base of interval
MISSING INTERVAL

BASALT: COLOR: 10R 4/2 Greyish red at top changing gradually to N5 medium grey by 441.2 ft.
TEXTURE: Aphanitic, vesicular from top to 450 ft, diktytaxitic and vesicular from 444 ft to 458 ft with vesicles increasing in size and decreasing in number to 456 ft, diktytaxitic from 456 to base, increasingly vesicular from 456 ft to base, base of interval is...
COMPOSITION: Microporphyritic, randomly oriented 75% submillimeter euhedral plagioclase microphenocrysts form a felty matrix, 15% 1-2 mm green olivine microphenocrysts in plagioclase framework spaces

XENOLITHS/AUTOLITHS: Approximately 1.0 x 0.5 in greyish-white xenolith at 467.3 ft, non-calcareous

ALTERATION: Reddish oxidation at top and base, cream to tan clay in fractures and at top of interval
BASALT: COLOR: N3 dark grey
TEXTURE: Aphanitic, vesicular from top to 472, diktytaxitic to 474 ft, vesicular to base
COMPOSITION: 75% submillimeter white plagioclase randomly arranged in framework, with about 15% anhedral to subhedral green olivine microphenocrysts in framework space, olivine is in clumps of 8-15 microphenocrysts
XENOLITHS/AUTOLITHS: None noted
ALTERATION: Calcite at top of interval and inside vesicles at 471 and 472 ft, reddish oxidation inside vesicles to 471 ft, and at base of interval
BASALT: COLOR: 10R 4/2 at top of interval changing to N5 medium grey by 477.6 ft
TEXTURE: Aphanitic, glassy, vesicular from top of interval to 479 ft, diktotypic throughout, vesicular from 497.5 ft to base
COMPOSITION: 15-20% sub-millimeter to millimeter subhedral green olivine microphenocrysts in glassy matrix, which contains white plagioclase laths visible under 14x magnification
XENOLITHS/AUTOLITHS: None noted
ALTERATION: Calcite in vesicles at top, calcareous sediment in fractures at 475, 476-477 ft, 480.6 ft, 483, 483.6, 491.8, 495 ft, and at base. reddish oxidation at top
BASALT: COLOR: 5YR 4/1 brownish grey changing to 10R 4/2 at 535.3 ft
TEXTURE: Porphyritic, vesicular from top of interval to 519 ft, diktytaxitic with large vesicles to 533 ft, diktytaxitic to 533.2 ft, vesicular to 540 ft with vesicle size increasing and vesicle number decreasing, then diktytaxitic to total depth of well.
Note: The base of this flow was not penetrated, and may be much thicker than represented here.
COMPOSITION: Large (3-15 mm) white euhedral plagioclase phenocrysts in small (5 mm) or large (2 cm) somewhat stellate groups are found in a groundmass comprised of sub-millimeter microphenocrysts, up to 65% of which are euhedral white, randomly oriented plagioclase microphenocrysts and 15% are anhedral to subhedral brown to green olivine microphenocrysts,
which tend to be more prevalent in the stellate plagioclase phenocryst groups.

**XENOLITHS/AUTOLITHS:** None noted

**ALTERATION:** Calcareous clay in fractures at top of interval and at 522.5 and 526.6 ft, very pale orange non-calcareous film inside vesicles and on fractures at 532.2, 533.2, 539, and 540 ft.