### LOG INTERVAL

**DEPTHS:** 380' **TO** 6375'  
**DATES:** 10/25/10 **TO** 12/15/2010

### MUD TYPES

- Get/Water **TO** 6375'
- **TO**
- **TO**
- **TO**

### CASING DATA

<table>
<thead>
<tr>
<th>DEPTH</th>
<th>DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>30'</td>
<td>TO</td>
</tr>
<tr>
<td>20'</td>
<td>TO</td>
</tr>
<tr>
<td>13.375'</td>
<td>TO</td>
</tr>
</tbody>
</table>

### HOLE DATA

<table>
<thead>
<tr>
<th>DEPTH</th>
<th>DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>95'</td>
<td>TO</td>
</tr>
<tr>
<td>100'</td>
<td>TO</td>
</tr>
<tr>
<td>265'</td>
<td>TO</td>
</tr>
<tr>
<td>3154'</td>
<td>TO</td>
</tr>
<tr>
<td>6375'</td>
<td>TO</td>
</tr>
</tbody>
</table>

### SYMBOLS

- **Casing Shoe**
- **Sidewall Core Recovered**
- **Bit Trip**
- **Sidewall Core Unrecovered**
- **Wiper Trip**
- **Gas Show**
- **Oil Show**

### Lithology

- **Shale**
- **Calcite**
- **Pyrite**
- **Epidote**
- **Chlorite**
- **Pyritic**
- **Silicic**
- **Fe-Ti Oxides**

### ABBREVIATIONS

- **NB** New Bit
- **RRB** Re Run Bit
- **CB** Core Bit
- **Cnxn** Connection
- **TG** Trip Gas
- **SG** Survey Gas
- **SG** Swab Gas
- **WOB** Weight On Bit
- **RPM** Rotary RPM
- **PP** Pump Pressure
- **SPM** Strokes/Min.
- **MW** Mud Weight
- **VIS** Funnel Viscosity
- **PV** Plastic Viscosity
- **TP** Yield Point
- **FL** Fluid Loss
- **CI** ppb Chloride Ion
- **SOIL** Solids %
- **SD%** Sand %
- **MB** Methylene Blue
- **Ca** ppm Calcium
- **FC** Filter Cake thick
- **Rm** Mud Resistivity
- **Rm** Filtrate Resistivity
- **LAT** Lagged After Trip
- **LAS** Lagged After Survey
- **PR** Poor Returns
- **LC** Lost Circulation
- **AZI** Azimuth
- **CG** Cnxn Gas
- **TG** Trip Gas
- **SWG** Survey Gas
- **WOB** Weight On Bit
- **RPM** Rotary RPM
- **PP** Pump Pressure
- **SPM** Strokes/Min.
- **MW** Mud Weight
- **VIS** Funnel Viscosity
- **PV** Plastic Viscosity
- **TP** Yield Point
- **FL** Fluid Loss
- **CI** ppb Chloride Ion
- **SOIL** Solids %
- **SD%** Sand %
- **MB** Methylene Blue
- **Ca** ppm Calcium
- **FC** Filter Cake thick
- **Rm** Mud Resistivity
- **Rm** Filtrate Resistivity

### MUDLOG

- **COMPANY:** ORMAT NAVADA INC.
- **WELL:** Wister 12-27
- **FIELD:** Wister
- **REGION:** Niland, CA
- **COUNTRY:** USA
- **COORDINATES:** -700' S and 150' E of NW Section 27-T10S-R14E SBB&M
- **ELEVATION:** -15' MSL
- **API Index:**
- **Spud Date:** 10/25/10
- **Total Depth:** 6375'
- **Contractor:** GeoDrill
- **Rig/Type:** Rotary Triple
- **Logging Unit:** Unit 6
- **EDR:** DrillSense
- **Company Rep:** Bob Mueller
- **Engineers:** Tim Jayne, Terry Crowson
- **Loggers:** Jonathan Harris/Yosief Segid, Jack Breland/Simret Zerezghi

### MUD TYPES

- **NB** #1: 26 in., 3x18 ; Serial:B884444
- **WOB** 0' **KLBS** 30

### Penetration

<table>
<thead>
<tr>
<th>ROP</th>
<th>M. Depth</th>
<th>Hole Size</th>
<th>Sec Mnrsl</th>
<th>Gamma Ray</th>
<th>Resistivity</th>
<th>Porosity</th>
<th>Gas</th>
<th>Lithology Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>150</td>
<td>0<strong>FT/HR</strong></td>
<td>10 IN 25</td>
<td>Gamma-Ray</td>
<td>AT10 0.1 OHMM</td>
<td>DPHZ 0.7 CFCF</td>
<td>0 0</td>
<td>TOTALGAS 0</td>
<td>0</td>
</tr>
<tr>
<td>WOB</td>
<td>0' <strong>KLBS</strong></td>
<td>10 IN 25</td>
<td>0.65</td>
<td>Neutron Porosity</td>
<td>0.7</td>
<td>0</td>
<td>H2S 0</td>
<td>ppm 0</td>
</tr>
</tbody>
</table>

All depths driller's depths measured from kelly bushing.  
All lithology descriptions from wet cuttings unless noted. 
All gas calibrated to SPWLA standards. 
Started collecting 10 foot samples at the depth of 380 ft.  
Claystone: yellowish brown, large
Claystone: yellowish brown, light olive grey, chunky to blocky, gummy texture, sticking to shale screens, highly calcareous, traces of yellowish brown silty sand imbedded in clay cuttings.

Set 20 inch diameter Surface Casing @ approx 505 ft. N/U BOP, Pressure Test, RIH drill out shoe.

Claystone: yellowish brown, light olive grey, chunky to blocky, gummy texture, sticking to shale screens, highly calcareous, traces of yellowish brown silty sand imbedded in clay cuttings.

Claystone: light olive grey, traces of yellowish brown, chunky to blocky, gummy texture, sticking to shale screens, highly calcareous, traces of yellowish brown silty sand imbedded in clay cuttings.

Claystone: yellowish brown, light olive grey, chunky to blocky, gummy texture, sticking to shale screens, highly calcareous, traces of yellowish brown silty sand imbedded in clay cuttings.

Claystone: light olive grey, traces of yellowish brown, chunky to blocky, gummy texture, sticking to shale screens, highly calcareous, traces of yellowish brown silty sand imbedded in clay cuttings.

Clay: reddish brown to tan grey, large blocky clasts, moderately firm but pliable, sticky to earthy texture, calcite abundant, anhydrite nodules, slightly sandy in places, backing up on shakers.

Note: Drill to 757'. Circulate and survey. POOH for new BHA (RRB#2)

Clay: tan to brown, fine plastic clasts, sticky texture, anhydrite nodules, calcite.

Clay: reddish brown to tan grey, large blocky clasts, moderately firm but pliable, sticky to earthy texture, calcite, slightly sandy in places, backing up on shakers

Sandstone: dark grey, brown, fine grained, very hard, ferriferous, well cemented, interbedded off white soft silt layers, minor soft cohesive clay.

Clay: tan to brown, fine plastic clasts, sticky texture, anhydrite nodules, calcite.

Sand: light grey to medium grey, fine to coarse grained, sub angular to sub rounded, unconsolidated, poorly to moderately sorted.

Clay: light olive grey, traces of yellowish brown, chunky to blocky, gummy texture, sticking to shale screens, highly calcareous, traces of yellowish brown silty sand imbedded in clay cuttings.

Silt: off white to very light grey, soft, slightly consis, sucrosic texture, calcareous, interbedded in clay and sand layers as above.

Sandstone: plagioclase to predominate, light grey to medium grey, moderately hard to hard, calcitic, fine to coarse grained, overall well sorted, low echinoids, all subrounded to subangular.
Note: Drill to 1239', Circ, Wipe hole to shoe.

Clay: light olive grey, reddish brown, flaky, platy to blocky, glossy texture, sticking to shale screens, highly calcareous, tr of yellowish brown silty sand, layered and imbedded in clay cuttings.

Silt: off white to very light grey, soft, slightly crumbly, sucrosic tex., calcareous, interbedded in clay and sand layers as above.

Claystone: light grey to med. gray, occ platy, soft, slightly crumbly, smooth silt gritty texture, mostly massive/globular ctgs, good cohesion, weak-mod adhesion, dull earthy luster. soluble.

Note: Drill to 1/1648'. Wipe hole to shoe.

Clay: light grey, unconsol. w/ weak clay matrix suprt. f grn, sub rnd to rnd. well srt. predom frosted qtz. access. calcite, feldsp, mica. occ. chlorite, pyrite.

Sand: overall lt gy to gy. unconsol occ SST pieces. vf to f grn, subrnd to rnd, mod well to well srt. dom frosted qtz w/ plag feldsp, mica. sme secondary minerals (qtz, pyr). occ dolostone stringers.

Siltstone: med gray. faint dark flecks. easily friable to firm/friable.

Note: Drill to 1239', Circ, Wipe hole to shoe.

Note: Drill to 1239', Circ, Wipe hole to shoe.

Note: Drill t/1648'. Circ and survey, Wipe hole to shoe.

Clay: light olive grey, reddish brown, flaky, platy to blocky, glossy texture, sticking to shale screens, highly calcareous, tr of yellowish brown silty sand, layered and imbedded in clay cuttings.

Silt: off white to very light grey, soft, slightly crumbly, sucrosic texture, calcareous, interbedded in clay and sand layers as above.

Clay: light olive grey, reddish brown, tr yellowish brown, flaky, platy to blocky, glossy texture, sticking to shale screens, highly calcareous, tr of yellowish brown silty sand, layered and imbedded in clay cuttings.

Sand: overall gy. unconsol. w/ weak clay suprt. f grn, sub rnd to rnd. well srt. predom frosted qtz. access. calcite, feldsp, mica. occ dolostone stringers. scat. qtz and pyrite xtls.

Note: Drill to 1239', Circ, Wipe hole to shoe.

Sand: overall lt gy to gy. unconsol occ SST pieces. vf to f grn, subrnd to rnd, mod well to well srt. dom frosted qtz w/ plag feldsp, mica. sme secondary minerals (qtz, pyr). occ dolostone stringers.

Clay: light olive grey, reddish brown, tr yellowish brown, flaky, platy to blocky, glossy texture, sticking to shale screens, highly calcareous, tr of yellowish brown silty sand, layered and imbedded in clay cuttings.

Silt: off white to very light grey, soft, slightly crumbly, sucrosic texture, calcareous, interbedded in clay and sand layers as above.

Clay: light olive grey, reddish brown, tr yellowish brown, flaky, platy to blocky, glossy texture, sticking to shale screens, highly calcareous, tr of yellowish brown silty sand, layered and imbedded in clay cuttings.

Sand: overall lt gy to gy. unconsol. weak clay matrix suprt. f grn, sub rnd to rnd. well srt. predom frosted qtz. access. calcite, feldsp, mica. occ dolostone stringers. scat. qtz and pyrite xtls.

Note: Drill to 1239', Circ, Wipe hole to shoe.

Clay: light olive grey, flaky, platy to blocky, glossy texture, sticking to shale screens, highly calcareous, tr of yellowish brown silty sand, layered and imbedded in clay cuttings.

Silt: off white to very light grey, soft, slightly crumbly, sucrosic texture, calcareous, interbedded in clay and sand layers as above.

Clay: light olive grey, reddish brown, tr yellowish brown, flaky, platy to blocky, glossy texture, sticking to shale screens, highly calcareous, tr of yellowish brown silty sand, layered and imbedded in clay cuttings.

Sand: overall lt gy to gy. unconsol. weak clay matrix suprt. f grn, sub rnd to rnd. well srt. predom frosted qtz. access. calcite, feldsp, mica. occ dolostone stringers. scat. qtz and pyrite xtls.
Clay: lt gray to med gray. occ platy, soft, slightly crumbly, smooth silty/gritty texture, mostly massive/globular ctgs, good cohesion, weak-mod adhesion. dull earthy luster. soluble.

Note: Drill to 2244', POOH. Change bit (NB#3).

Claystone: med/dk gy to red/bn. firm to mod hd. massive to platy ctgs. smooth to sil waxy text, easily scored. occ laminae vis. calc.

Note: Drill to 2431', wipe hole to shoe.

Claystone: med gry to occ. gry/brn. firm, mod well indurated. blocky to platy ctgs. smooth to loc. gritty text, overall massive struct. w/ loc. laminae vis. mod calc.

Sandstone: lt gry to med gry to pale gry, indiv grains are clear to transl to mlky wht, vry fn to fn to loc crs, well to vry well srtd, subang to subrnd'd ang, low sheric, frosted to sli polished, predom qtz. weak to loc. mod calc.

Note: Drill to 2659'. Circ. POOH to inspect bit. (RRB#3)

Sandstone: lt gry to med gry to pale gry, indiv grains are clear to transl to mlky wht, vry fn to fn to loc crs, well to vry well srtd, subang to subrnd'd ang, low sheric, frosted to sli polished, predom qtz. weak to loc. mod calc.

Note: Drill to 2813'. Circ. POOH to inspect bit. (RRB#3)

Sand: wht to vry lt gry, indiv grains are clear to transl to mlky wht, vry fn to fn to loc crs, well to vry well srtd, subang to subrnd'd ang, low sheric, frosted to sli polished, predom qtz. weak to loc. mod calc.
Sandstone: lt gry to med gray, reddish brown, friable to moderately hard, medium to coarse green. Moderately sorted, rounded to subangular, low sphericity, crumbly to brittle, tabular to nodular clefts, habit, friable to moderately sparkling luster, gritty to sucrosic texture, massive structure, fair to locally calcite cement, mafic lithic fragments.

Note: Drill to 2964'. Circulate POOH to change bit. (NB#4)

Claystone/Marl: light gray to medium gray, occasional reddish brown; dominant very well hydrated, overall clumpy to sticky; occasionally firm to moderately hard, tabular to platy clefts, smooth to minor gritty texture, weak to faint laminated, increased amount of calcareous to marly layers F/3010 to 3020'. POOH at 3020' for stabilization. (RRB#4)

Claystone/Shale: gray to medium gray; fine smooth texture; occasional laminated; overall moderately hydrated, occasionally firm clefts; similar to above units; highly calcareous to marl.

Wipe hole 5 stands @ 3132'.

Claystone/Shale: F/3140' to 3165', dominant brownish red with minor medium gray; fine smooth texture; blocky to platy clefts, firm to moderately hard; dominantly hydrated to soft clay; adding calcite.

Drill to 3165'; Wipe hole to shoe; RIH and circ b/u, POOH for E-Log. Set 13 3/8'' casing @ 3154'. Cement. N/U BOP. Pressure test. Drill out shoe, drill ahead.

Claystone: medium gray to occasional gray, mod well indurated, blocky to platy clefts, smooth to slightly gritty texture, easily scored. Overall massive structure with occasional local fissility. Moderately calcite.

Note: Drill to 3246'. POOH, change BHA (RRB#5)

Sandstone: medium gray to white; upper medium to fine grained; moderately sorted and rounded; dominantly consolidated, easily friable w/occ firm carbonate cemented clefts; overall massive w/visible bedding structure becomes thinly bedded F/3310 to 3340'; mainly quartz, occasionally surfaces of conc black mica minerals; mixed with minor brown and dark gray claystone, similar to above units; slightly calcareous.

Claystone/Shale: medium gray to gray/brown, mod. well indurated, blocky to platy clefts, smooth to slightly gritty texture, easily scored, overall massive structure w/occ local fissility; moderately calcareous.

Note: Drill to 3442'. Circulate POOH to change BHA (RRB#5).

Claystone/Shale: medium gray to gray/brown, similar to above units; fine smooth texture; firm to moderately hard; dominantly hydrated to soft clay; mixed with minor mica and dark gray claystone, similar to above units; slightly calcareous.

Note: Drill to 3536'. Circulate and survey. POOH to change BHA (RRB#5).

Claystone/Shale: medium gray to dark gray, similar to above units; fine smooth texture; firm to moderately hard; dominantly hydrated to soft clay; mixed with minor mica and dark gray claystone, similar to above units; slightly calcareous.

Note: Wipe hole to shoe @ 3603'.

Sandstone: gray to grayer orange pink to.loc., pale red, rare greenish hues, moderate to locally friable. Very low f. gm. Observed in mid, mod well sorted, predom qtz w/access calcite, feldspar, lithic fragments, moderate calcite cement. Overall massive structure.

Note: Drilled to 2964'. Circulate POOH to change bit. (NB#4)
Claystone/Shale: med to drk gry; occ lt gry, similar to above units; vhd smooth tex; firm to mod hard; dom pebble size platy ctgs; over all thinly bedded with/com in bed lamin.

Sandstone: med gry to gryish orng pink, bleached apprnce when dry. overall mottled apprnce. mod hd to v hd. signific. appar. alteration. grain structure occ. not obvious. com qtz, pyrite xtals, some epidote. low to non calc.

Granitoid: slightly Altered, variegated colored; white, pink, lt greenish to slightly lt reddish; over all crystalline; intermediate grained, appears intrusive; mainly comp of feldspars, minor porphyry dacitic ctgs, wicom elongated to rectangular plagioclase incudated in fine ground mass. very hard to hard; occ slightly chloritized, with abundant microcrystalline pyrite.

Volcanics: porphyritic dacite/rhyolite. varieg color f/ dk brnsh rd t/ gy to grn. hd to vhd ctgs. porphyritic text, lath shaped feldsp. phenocrysts in aphanitic to vf xtalline groundmass. loc chloritization, scat pyrite xtals.

Granitoid: lt greenish to lt pink; com white patches; med grained; predom crystalline w/occ porphyritic text; comp of feldspars, qtz and minor mafic minerals; disseminated pyrite minerals throughout, minor reddish oxidized spots; over chloritized; minor thin calcite veins; weak to non calc.

Granitoid: as above, with loc. mineralized striations, com calcite xtals. apparent alteration to clay in places

Granitoid: similar to above units. lt grn to whitish, com pinkinsh. loc grysh red. fine to med xtalline, phaneritic text loc. discernable. dom small ctgs. predom feldsp, minor mafics, occ mica. scat pyr. com chloritized. some fractures/ minrlzd (qtz) veining vis.

Granitoid: over all pale green to white, com peppered white and deep green; med to fine crystalline tex; comp of qtz, feldsp, minor mafics, occ mica. scat pyr. com chloritized. some fractures/ minrlzd (qtz) veining vis.
Granitoid: It to med dark greenish peppered w/white, med to occ coarse grained; hard, comp of qtz, feldspars, amphiboles, b/m bitite; occ chloritized and epidotized cts. @ 5400' minor sheared cts w/ slight foliation surfaces; euhedral pyrite, calcite; minor pulverized w/ slickenside cts; shows minor change in comp and color with depth.

Granitoid/Granodiorite: overall olive gray to dusky gray, v. hd small, occ pulverized cts; med to very fine grained; hard, comp of qtz, plagioclase, chloritized biotite/mica from above units; becomes more felsic/tonalitic in comp with depth; minor pulverized w/ slickenside cts; euhedral pyrite, calcite; greenish cts dom chloritized, and epidotized; mod to weak calc.

Note: Drill @ 5578'. Changes H&A and bit (NB#11).

Silicified volcanics: It grey to grayish gray to light olive gray, v. hd small imp. cts; apparent silification, along w/ abundant calcite mineralization, difficult to make out any fabric or texture; possible vein fill. no epidote, minor chlorite specks, rare FF.

Note: Drill @ 5552'. POOH & L/D washed out drill bit.

Altered Granitoid: f/ 5878'-90'. v. lt to lt greenish gray to pa violent shifts in comp and color, with depth; v. few qtz; minor mafic component (scat mica), minor fractures filled w/quartz, calcite; minor pyrite crystals; complex intergrowth of pyrite crystals, @ 5876', prob epidotization; minor yellowish to reddish iron oxidation @ 5760', probable iron oxide fills; minor pyrite crystals; some chloritized; difficult to make out any fabric or texture. possible vein fill; some chloritized; shows parallel alignments of mica minerals, and clear steatite. indurated, hard, small irregular angular cts.

Note: Drill @ 5764'. POOH (L/D washed out DP @ 897'). Change BHA and bit (NB#2).

Granitoid: F/5510' to 5600'; overall very fine to fine grained; hard, comp of qtz, plagioclase, chloritized biotite/mica from above units; becomes more felsic/tonalitic in comp with depth; minor pulverized w/ slickenside cts; euhedral pyrite, calcite; greenish cts dom chloritized, and epidotized; mod to weak calc.

Note: Drill @ 5510'. POOH & L/D washed out drill bit.

Silicified volcanics: lt greenish gray to pale gray to light gray, v. few qtz; minor mafic component (scat mica), minor fractures filled w/quartz, calcite; minor pyrite crystals; complex intergrowth of pyrite crystals, @ 5580', prob epidotization; minor yellowish to reddish iron oxidation @ 5510', probable iron oxide fills; minor pyrite crystals; some chloritized; difficult to make out any fabric or texture. possible vein fill; some chloritized; shows parallel alignments of mica minerals, and clear steatite. indurated, hard, small irregular angular cts.

Note: Drill @ 5552'. POOH & L/D washed out drill bit.

Altered Granitoid: f/ 5515'-5600'. v. lt to lt greenish gray to pa violent shifts in comp and color, with depth; v. few qtz; minor mafic component (scat mica), minor fractures filled w/quartz, calcite; minor pyrite crystals; complex intergrowth of pyrite crystals, @ 5510', prob epidotization; minor yellowish to reddish iron oxidation @ 5500', probable iron oxide fills; minor pyrite crystals; some chloritized; difficult to make out any fabric or texture. possible vein fill; some chloritized; shows parallel alignments of mica minerals, and clear steatite. indurated, hard, small irregular angular cts.

Note: Drill @ 5510'. POOH & L/D washed out drill bit.

Silicified volcanics: lt greenish gray to pale gray to light gray, v. few qtz; minor mafic component (scat mica), minor fractures filled w/quartz, calcite; minor pyrite crystals; complex intergrowth of pyrite crystals, @ 5580', prob epidotization; minor yellowish to reddish iron oxidation @ 5510', probable iron oxide fills; minor pyrite crystals; some chloritized; difficult to make out any fabric or texture. possible vein fill; some chloritized; shows parallel alignments of mica minerals, and clear steatite. indurated, hard, small irregular angular cts.

Note: Drill @ 5552'. POOH & L/D washed out drill bit.

Altered Granitoid: f/ 5515'-5600'. v. lt to lt greenish gray to pa violent shifts in comp and color, with depth; v. few qtz; minor mafic component (scat mica), minor fractures filled w/quartz, calcite; minor pyrite crystals; complex intergrowth of pyrite crystals, @ 5510', prob epidotization; minor yellowish to reddish iron oxidation @ 5500', probable iron oxide fills; minor pyrite crystals; some chloritized; difficult to make out any fabric or texture. possible vein fill; some chloritized; shows parallel alignments of mica minerals, and clear steatite. indurated, hard, small irregular angular cts.

Note: Drill @ 5552'. POOH & L/D washed out drill bit.

Granitoid: F/5510' to 5600'; overall very fine to fine grained; hard, comp of qtz, plagioclase, chloritized biotite/mica from above units; becomes more felsic/tonalitic in comp with depth; minor pulverized w/ slickenside cts; euhedral pyrite, calcite; greenish cts dom chloritized, and epidotized; mod to weak calc.

Note: Drill @ 5510'. POOH & L/D washed out drill bit.

Silicified volcanics: lt greenish gray to pale gray to light gray, v. few qtz; minor mafic component (scat mica), minor fractures filled w/quartz, calcite; minor pyrite crystals; complex intergrowth of pyrite crystals, @ 5580', prob epidotization; minor yellowish to reddish iron oxidation @ 5510', probable iron oxide fills; minor pyrite crystals; some chloritized; difficult to make out any fabric or texture. possible vein fill; some chloritized; shows parallel alignments of mica minerals, and clear steatite. indurated, hard, small irregular angular cts.

Note: Drill @ 5552'. POOH & L/D washed out drill bit.

Altered Granitoid: f/ 5515'-5600'. v. lt to lt greenish gray to pa violent shifts in comp and color, with depth; v. few qtz; minor mafic component (scat mica), minor fractures filled w/quartz, calcite; minor pyrite crystals; complex intergrowth of pyrite crystals, @ 5510', prob epidotization; minor yellowish to reddish iron oxidation @ 5500', probable iron oxide fills; minor pyrite crystals; some chloritized; difficult to make out any fabric or texture. possible vein fill; some chloritized; shows parallel alignments of mica minerals, and clear steatite. indurated, hard, small irregular angular cts.

Note: Drill @ 5552'. POOH & L/D washed out drill bit.
**Granitoid:**
- F/ 6260' to 6290'; light to dark greenish to black, mixed with white,
  intermediate crystalline rock, composed of biotite, amphibole, plagioclase,
  and quartz; slightly chloritized, occasional faint foliation or alignment
  of minerals; calcite crystals, minor epidote and pyrite.

**Silicified Volcanics:**
- Dom yellowish gray/minor white and pale greenish varieties; felsic,
  crypto to microcrystalline, smooth texture; moderately hard;
  appears silicified with minor porphyry micas, microcrystals of pyrite and
  calcite crystals; pulverized cavings with slickenside; similar to upper
  volcanic units.

**POOH @ 6375' for E-Log.**
- Run E-log, conduct injection test on open hole at 1.52 strokes/min, 600 psi;
  Change over, L/D DP.

**TD @ 10:10 am 12/15/2010**

**TD @ 10:10 am 12/15/2010, 6200 6300 6400 M. Depth**

**WOB**

<table>
<thead>
<tr>
<th>Penetration</th>
<th>KLBS</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>20</td>
<td>0</td>
</tr>
<tr>
<td>30</td>
<td>0</td>
</tr>
<tr>
<td>40</td>
<td>0</td>
</tr>
<tr>
<td>50</td>
<td>0</td>
</tr>
</tbody>
</table>

**ROP**

<table>
<thead>
<tr>
<th>FT/HR</th>
<th>150</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>50</td>
<td>0</td>
</tr>
<tr>
<td>100</td>
<td>0</td>
</tr>
</tbody>
</table>

**Porosity**

<table>
<thead>
<tr>
<th>BIT SIZE</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>25</td>
</tr>
<tr>
<td>10</td>
<td>25</td>
</tr>
</tbody>
</table>

**Gamma-Ray**

<table>
<thead>
<tr>
<th>Sec Mnrls</th>
<th>SP</th>
<th>MV</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-70</td>
<td>20</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>20</td>
</tr>
</tbody>
</table>

**Gas**

<table>
<thead>
<tr>
<th>Total Gas Units</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>H2S PPM</td>
<td>0</td>
</tr>
<tr>
<td>CO2 %</td>
<td>0</td>
</tr>
</tbody>
</table>

**Resistivity**

<table>
<thead>
<tr>
<th>True Resistivity</th>
<th>OHMM</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1</td>
<td>10</td>
</tr>
<tr>
<td>0.2</td>
<td>2000</td>
</tr>
<tr>
<td>0.3</td>
<td>2000</td>
</tr>
<tr>
<td>0.4</td>
<td>2000</td>
</tr>
</tbody>
</table>

**Lithology Remarks**

- Granitoid F/ 6260' to 6290'; light to dark greenish to black, mixed with white,
  intermediate crystalline rock, composed of biotite, amphibole, plagioclase,
  and quartz; slightly chloritized, occasional faint foliation or alignment
  of minerals; calcite crystals, minor epidote and pyrite.

- Silicified Volcanics: dom yellowish gray/minor white and pale greenish varieties; felsic,
  crypto to microcrystalline, smooth texture; moderately hard; appears silicified with minor
  porphyry micas, microcrystals of pyrite and calcite crystals; pulverized cavings with
  slickenside; similar to upper volcanic units.

- POOH @ 6375' for E-Log. Run E-log, conduct injection test on open hole at 1.52 strokes/min, 600 psi;
  Change over, L/D DP.