

Drillers Notes
(7/25/2017 to 10/10/2017)

Well Name
TAN-2312

Rig
CS 1500; SD 300

Special Equipment
Sullair 900; Baroid 360

Drilling System

Diameter	Bit Type	Method	Rig	Depth
18-inch	Tricone	Air rotary, foam	SD 300	0–37 feet
15-inch	DHH	Air rotary, foam	SD 300	37–84 feet
13-inch	DHH	Air rotary, foam	SD 300	84–228 feet
10-inch	DHH	Air rotary, foam	SD 300	228–522 feet
3.87-inch	PCD core	Air/mist core	CS 1500	37–568 feet

Borehole Diameters

Diameter	Top Depth	Bottom Depth
18-inch	0 feet	37 feet
15-inch	37 feet	84 feet
13-inch	84 feet	228 feet
10-inch	228 feet	522 feet
3.87-inch	522 feet	568 feet (filled in with sluff)

Casing

Diameter	Top Depth	Bottom Depth	Slotted	Thickness
16-inch	+3 feet	37 feet	No	.250 – inch
14-inch	+1 feet	84 feet	No	REMOVED
10-inch	+2 feet	228 feet	No	.250-inch

Grout Seal

Material	Top Depth	Bottom Depth	Amount	Placement Method
Casing seal	0 feet	228 feet	179 bags, 50 lbs each (8,950 lbs total)	Pour and tag form land surface

Date (mm/dd/yyyy)	Depth (feet)	Driller Notes (Matt Gilbert – USGS) (Note of daily activity)
7/25/2017	36	Pre-job meeting, setup SD 300 and drill 18-inch to 36 feet which was first basalt contact, hole cleaned okay using drill foam.
7/26/2017	31	Hot work permit approved, set 16-inch casing to 31 feet and setup casing hammer to drive casing.
7/27/2017	37	Drive casing to 37 feet set solid into basalt, hammer gave us some problems with the actuator not dropping the anvil.
7/31/2017	37	Pour 9-50 lbs bags of casing seal bentonite around the 16-inch casing breakdown 18-inch bit and guide, setup CS 1500 for coring, install 5-inch casing with centralizers to 37 feet.
8/1/2017	137	Cored HQ (3.87-inch) hole from 37 to 137 feet cored well but encountered an unexpected interbed at 52 to 81 feet another small interbed at 111 to 114 feet injecting about 3 gpm water with the air. Took SD 300 to tire shop in Mud Lake for tires at end of day.
8/2/2017	217	Brought SD 300 back to well site with new tires, coring continues to go fine, mostly solid basalt, small interbed at 167 to 170 feet.
8/3/2017	227	Cored to 227 feet clean out hole, left bit on bottom and ran source logs with 9057 and 0024 tools, trip out HQ rods.
8/7/2017	84	Setup SD 300 and drill 15-inch to 84 feet, broke adjusting screw on the Petol breakout wrench while trying to break down hammer.
8/8/2017	84	Charlie took hammer and guide to Apex drilling for breakdown and install 13-inch bit, Set 14-inch casing to 84 feet.
8/9/2017	228	Drill 13-inch to 228 feet drilled fast and smooth, used stiff foam 30 viscosity and 7 quarts MCI foam, trip out of hole.
8/10/2017	200	Set 10-inch casing welding going slow.
8/14/2017	228	Set casing to bottom of drilled hole cleaned out with 9.87-inch tri-cone drill bit. Poured 96 bags of casing seal between 10-inch and 14-inch casing, pulled out 14-inch casing same day – came out fine.
8/15/2017	228	Pour 83 bags of casing seal into annular space so total of 179-50 lbs bags (8,950 lbs) of bentonite for seal. Set 5-inch casing with centralizers to 228 feet inside of 10-inch casing.
8/16/2017	238	Switch out rigs to CS 1500 and core HQ (3.87-inch) to 238 feet, spent several hours waiting on Flour waste services to approve us putting the drill cuttings into the supplied Frac tanks.
8/17/2017	308	Coring going okay getting more returns than expected.
8/22/2017	328	Spent most of the day on other tasks, coring okay.
8/23/2017	388	Coring okay.
8/24/2017	438	Coring okay still have returns hole is cleaning out okay, good core recovery.
8/28/2017	488	Coring okay still have returns hole is cleaning out okay, good core recovery.

Date (mm/dd/yyyy)	Depth (feet)	Driller Notes (Matt Gilbert – USGS) (Note of daily activity)
8/29/2017	528	Coring okay still have returns hole is cleaning out okay, good core recovery, Sullair compressor having problems replaced fuel filter at end of day.
8/30/2017	568	Never encountered the Q-R interbed at 530 feet (anticipated depth). Drilling through solid basalt flow from 482 and deeper – thin silt/clay bed encountered near 481 feet BLS. Changed out both fuel filters on the Sullair 900 again today.
9/5/2017	568	Gyro-deviation and source log through the HQ rods, trip out rods.
9/6/2017	254	Switch out drill rigs again, Setup SD 300, trip out 5-inch casing, trip in 10-inch hammer and drill to 214 feet using drill foam at 2 gpm, 30 viscosity and 7 quarts of foam, hole drilling fine.
9/7/2017	394	Drilling okay making about 30 gpm so filling Frac tank fast.
9/11/2017	494	Drilling slow due to water head pressures started using both compressors which helped the drilling penetration rate but increased the water production which filled the Frac tanks quickly, both frac tanks are now full. Stopped until more tanks come or other options approved.
9/18/2017	514	Another Frac tank was delivered today, set it up and drilled 20 feet at end of day, DHH is hitting softer as we get deeper and torque issue gets worse as it take more weight on bit to get hammer to hit hard enough to penetrate rock. DHH will not hit at all using 1 compressor using both it is drilling slow.
9/19/2017	518	Gave up on getting hammer to advance hole, thought maybe the foot valve had broken on DHH bit, tripped hammer out of hole and inspected nothing is wrong with it so it is definitely a drowned hammer issue, found crossovers and setup to drill with a 9 7/8-inch tricone bit, tripped in 100 feet and had to stop and work on winch line control valve. Also having problems with the table hydraulics not moving.
9/20/2017	522	Tripped the 9.875-inch bit to bottom, and drilled for 2 hours, only advanced 4 feet due to hardness of basalt, did not add foam as trying to clean/develop well at same time as we were expecting to be told to stop the reaming process. We then tripped the bit and rods back out of the well.
9/25/2017	522	Video well, water was very cloudy but slightly clearer between 420 feet and 520 feet, ran geophysical logs with 9804 acoustic tool, 9057 electric tool, EM flow meter tool.
9/26/2017	522	Set 5 hp 25 gpm pump to 340 feet on 1-inch stainless steel pipe and 280 feet of 1-inch stainless steel pipe to be used as an water level access line, the pump did not work when turned on so we pulled the pump back out. Installed a transducer and barometer in well for aquifer test.

Date (mm/dd/yyyy)	Depth (feet)	Driller Notes (Matt Gilbert – USGS) (Note of daily activity)
9/27/2017	522	Reset 5 hp 25 gpm pump to 340 feet on 1 SS pipe and changed the transducer setup. Ran 220 minute aquifer test at about 28 gpm had about 23 feet of drawdown. After test lowered the pump to 480 feet and pumped for additional 70 minutes for development purposes. Water cleared up nicely after development.
9/28/2017	522	Pulled pump and WL access line out of well welded cap on top and moved most of the equipment off the drill site.
10/10/2017	522	Ran well videos, water was clear. Waiting on decisions to be made before pump installation and sampling. Currently on hold until -