

DRILLING FLUIDS END OF WELL REPORT

WELL: AMUNGEE NW-2H

RIG: SILVER CITY 40

LOCATION: BEETALOO SUB BASIN



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AMUNGEE NW-2H WELL SUMMARY

Drilling Fluids End of Well Report

Operator: Tamboran Resources

Well Name: Amungee NW-H2

Location: Beetaloo Sub-Basin

Spud Date:		9-Nov-22		Contractor:		Silver City			Total Depth m			3833	
Well TD Date:		27-Dec-22		Project Engineer:		Cedric M Fernandes/ Andrew Bilton			Max Temp / Angle			106 C/ 90	
Field Area:		Beetaloo Sub-Basin		Mud Engineers:		Z Kurniawan, W McKay, V Mohmadi, Jason Brooks, Mehdi Saeedi, Anagha Subash			Max Mud Weight			11.6ppg	
Well Description:		Exploration/Appraisal							Chemicals Costs			AUD\$ 4880169.63	
Warehouse:		Darwin		Days Drilling:					Engineering Costs			AUD\$ 122449.6	
Well ID Number		0.1040030.01		Days On Well:		66 days			Total Cost			AUD\$ 610466.23	
Int No	Interval Dates		Int Days	Casing Size "	Casing Depth m	Interval Depth m	Hole Size "	Max Mud Wt ppg	Max Angl e °	Max Tem p °C	Fluid Type	Cost \$AUD	
	Start	End											
1	23/10/2022	12/11/2022	21	18 5/8	117	117	22	8.5	0	35	KCl /polymer	67,956.18	
2	13/11/2022	17/11/2022	5	13 3/8	483	486	17 ½	8.6	0.52	43	KCl /polymer	36,116.57	
3	18/11/2002	2/12/2022	15	9 5/8	1764	1768	12 ¼	9.5	0.52	72	KCl /polymer	169552.83	
4	3/12/2022	22/12/2022	19	5 ½	3877.3	3883	8 ½	11.6	90	106	KCl /polymer	336840.65	
5	23/12/2022	26/12/2022	4	5 ½	3877.3	3877.3	N/A	9.5	90	106	NaCl Brine		

INTRODUCTION:

The objectives of the Amungee NW-2H well have been established through the Basis of Well Design document (BoWD). The objective weighting are as follows:

Overall Well Technical Objectives	
Primary – Appraisal of the B shale of the Velkerri Formation Amungee Member for production potential and EUR estimations to potentially underpin further investment Secondary – Gather information to optimise future well design and evaluation the known hydrocarbon bearing zones	
Specific Objectives	
Weight	Objective
75 %	<ul style="list-style-type: none"> Drill the lateral well section within the B shale reservoir interval Successfully case the well with a quality cement job that facilitates successful fracture stimulation operations. The well should be as straight as possible (i.e. minimise dog legs/undulations) to reduce potential fluid accumulation within the lateral section that may hinder optimal post-fracture stimulation flowback <p>Target well length within B shale reservoir:</p> <p>Minimum – 1000 m</p> <p>Target – 1250 m (1000m lateral length able to be effectively stimulated – 250m allows buffer for minor reservoir exits in lateral and toe stage)</p>
25 %	Collect LWD logs within lateral section to enable structural complexity knowledge to facilitate completion design
100 %	Total

The Amungee NW-2H was spudded at 12:15 hours on 9th November 2022. The 22" conductor section was drilled with 22" PDC bit and 18-5/8" casing was ran & set at a depth of 117mMD/117mTVD and cemented.

The 17-1/2" surface section was drilled with 17.5" Tri-Cone bit and BHA to the depth of 486mMD/486mTVD. The 13-3/8" CSG was cemented at 483mMD.

The 12-1/4" intermediate section was drilled with 12.25" PDC bit and BHA to the depth of 1768mMD/1768mTVD. The 9-5/8" CSG was cemented at 1764mMD.

The 8-1/2" intermediate section was drilled with 8.5" PDC bit and BHA to the depth of 3883mMD/2437mTVD.

The 5-1/2" CSG was cemented at 3877.3mMD and well was displaced to NaCl brine prior to rig down.

KEY PERFORMANCE INDICATORS:

22" COST DISCUSSION:

The 22" sections costs were increase considerably due to extra chemicals being mixed when total losses were observed.

22" Section Costs			
KPI	Programmed	Actual	Difference %
Interval Drilling Fluid Cost \$	20,573.36	41966.58	103.99%
Net Non-Drilling Cost \$	N/A	25989.60	-
Meters Drilled m	258	117	-54.65%
Cost Per Meter \$	79.74	358.69	349.81%
Cost Per bbl Used \$	15.20	27.71	82.39%
Volume Received bbl	0	0	-
Volume Built bbl	1354	1514.31	11.84%
Volume Used bbl	1354	768.76	-43.22%
Volume Returned / Transferred bbl	0	745.55	49.23%
Volume Used bbl/m	5.2	6.57	25.20%

17 1/2" COST DISCUSSION:

The 17 1/2" interval costs were within the programmed figure but there was +/- 240bbl of mud left over which was carried over to the 12 1/4" section which helped keep costs below programmed.

17 1/2" Section Costs			
KPI	Programmed	Actual	Difference %
Interval Drilling Fluid Cost \$	35,410.40	26652.57	-24.73%
Net Non-Drilling Cost \$	N/A	9464	-
Meters Drilled m	227	369	62.56%
Cost Per Meter \$	155.99	72.23	-53.7%
Cost Per bbl Used \$	20.22	13.23	-34.58%
Volume Received bbl	505	745.55	47.63%
Volume Built bbl	1246	1269.02	1.85%
Volume Used bbl	846	1778	110.11%
Volume Returned / Transferred bbl	905	237	-73.81%
Volume Used bbl/m	3.73	4.82	29.26%



12 1/4" COST DISCUSSION:

12-1/4" interval was completed over budget at \$134,608.83 (43.57%)

12 1/4" Section Costs			
KPI	Programmed	Actual	Difference %
Interval Drilling Fluid Cost \$	93,757.09	134,608.83	43.57%
Net Non-Drilling Cost \$		34944	-
Meters Drilled m	1615	1285	-20.43%
Cost Per Meter \$	58.05	104.75	80.44%
Cost Per bbl Used \$	30.60	39.19	28.07%
Volume Received bbl	905	510	-43.65%
Volume Built bbl	2159	2925	35.48%
Volume Used bbl	2159	2470	14.40%
Volume Returned / Transferred bbl	1449	965	-33.40%
Volume Used bbl/m	1.34	1.92	43.79%

8 1/2" COST DISCUSSION:

8-1/2" interval was completed over budget at \$107814.18 due to increased lengths and unplanned trips leading to this increase. Also the completion brine costs are added to this section.

8 1/2" Section Costs			
KPI	Programmed	Actual	Difference %
Interval Drilling Fluid Cost \$	179,974.47	284788.65	58.24%
Net Non-Drilling Cost \$		52052	-
Meters Drilled m	1873	2113	12.81%
Cost Per Meter \$	96.09	134.78	40.27%
Cost Per bbl Used \$	77.51	289.42	273.40%
Volume Received bbl	1449	965	-33.40%
Volume Built bbl	873	984	12.71%
Volume Used bbl	956	1421	48.64%
Volume Returned / Transferred bbl	1366	528	-61.35%
Volume Used bbl/m	0.51	0.67	31.76%

Note: The completion chemicals consumption has been added to the 8.5" section, rebills and damaged chemicals have not yet been accounted for and will be added to recap when confirmed.

SECTION DISCUSSIONS:

Section #1	22" Interval	117m MD / 117mTVD	18 5/8" Casing At 117m
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DRILLING FLUID TYPE: KCl/Polymer

SECTION OPERATIONS:

Amungee NW-2H was spud at 12:15hrs on the 9th of November 2022. The mix water was supplied by water bore on location which had the following properties of pH: 8.0, Chlorides: 300 mg/L and Hardness: 200 mg/l.

Prior to spudding the well, 1,080bbl of 3% KCl/Polymer mud was prepared in all surface tanks with 80bbl of high viscosity mud built for sweeps while drilling ahead as required. This had a viscosity of 120 seconds.

A 22" bit was made up with 18 5/8" casing & drilling while commenced as directed by Weathered to 92m where total losses were encountered. Drilling continued to 109m where tight hole was observed. Due to the inability to work the string or rotate a SAPP pill was pumped & displaced with drill water where rotation was regained. The casing was retrieved to a shoe depth of 16m where it was observed that a casing centralizer was missing & presumed to be downhole. The casing was cut with a gas axe as all attempts to break out the float collar failed

Two unsuccessful fishing runs were carried out where a 22" tricone bit was RIH to grind the centralizer and push the centralizer pieces to the side. Drilled to 117m, pumped a high viscosity sweep & POOH reaming as tight spots were observed. Ran back to bottom, pumped a sweep & POOH to surface

A new casing while drilling assembly was made up, ran to bottom and drilled 0.4m where tight hole was encountered again. A 60bbl citric pill was spotted on bottom, let soak but no could not rotate or work the casing string.

A decision was made to call TD & the casing was cemented with the shoe at 117m. Due to cement slump two top up cement jobs required

DRILLING PROBLEMS:

No mud related problems were experienced while drilling the 22" section. However, total losses were seen at 92m where drilling continued to TD blind pumping high viscosity sweeps as required.

During both times where the casing string was stuck a SAPP pill worked the first time but when the casing became stuck the second time a citric pill did not help.

NON DRILLING PROBLEMS:

During the cement job no returns came back to surface which resulted in two top up jobs being required to get slurry to the cellar.

DRILLING FLUID PROPERTIES:

Drill Fluid Property	Programmed	Actual
Density, (ppg)	8.5	8.5 - 8.6
pH	9.0 - 9.5	9.0 - 10
MBT (lb/bbl)	<20	5.0
KCl (%)	3 %	3 - 4%
Sand (%)	0-1	0-1%

MUD AND TREATMENT:

A total of 1080bbls of 8.5ppg 3%KCl/Polymer mud were prepared on first stage of mixing. Mixing water was treated with Caustic Soda and Nuosept-78 prior to start mixing. After that, 70bbls of Hi-Vis pill was prepared by adding 3ppb of Duo-Vis for hole cleaning

Additional 200bbls of 3%KCL/Polymer mud were built up in order to maintain volume when experiencing tight hole at 105 m.

Due to tight hole issues between 105 and 109m, 40bbl of pills with 9%KCl and 6 ppb of SAPP were prepared and pumped assisting in release on stacked 18-5/8" casing and cleaning head of 22" conductor casing bit.

SOLIDS CONTROL:

Prior to spud 22" Conductor section three shale shakers were dressed with API 60's with the API 70's on the fourth slot.

The centrifuge was not used on this section.

OBSERVATIONS AND RECOMMENDATIONS:

#1: An increased concentration of KCL to +/- 8% may have assisted to keeping the formation from swelling which in turn may have solved the stuck casing. However, some tests would need to be carried out to confirm this

Section #2	17 1/2" Interval	486m MD / 486mTVD	13 3/8" Casing At 483m
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DRILLING FLUID TYPE: KCl/Polymer Then Water with High Viscosity Sweeps

DRILL FLUID PROPERTIES

Drill Fluid Property	Programmed	Actual
Density, (ppg)	8.7	8.5 - 8.6
pH	9.0-10.5	9.5 - 10.2
MBT (lb/bbl)	<20	0
KCl (%)	3-5%	0-5%
Sand (%)	0-1	0.1-0.15

SECTION OPERATIONS:

A 17 1/2" BHA was made up, RIH to tag cement at 102.5m. The cement, shoe track and rat hole were drilled while displacing to 8.6ppg KCL-Polymer mud. An increase in torque was observed so the BHA was worked but could not get back to bottom. The BHA was pulled back to surface where there was junk damaged seen on the bit.

Two fishing / clean out with magnets were conducted.

A new 17 1/2" BHA was RIH where drilling re-commenced to 226m when total losses were observed. Drilling continued blind while pumping high viscosity sweeps as directed to a section of 486m.

The BHA was POOH, 13 3/8" casing was ran & cemented using an isolation packer with a two stage cement job carried out. On the second stage cement returns were observed at surface. The casing shoe was set at 483m.

The two stage cement job sequence of events were as follows:

Stage 1:

Step No	Pump Used	Comments
#1	Rig Pump	Pumped 20bb of gel spacer
#2	Rig Pump	Pumped 40bbl of reactive gel spacer
#3	Rig Pump	Pumped 20bbl of gel spacer
#4	Cement Pump	Pumped 263.4bbl of 13.5ppf lead cement slurry
#5	Cement Pump	Pumped 53.6bbl of 15.8ppg tail cement slurry
#6	N/a	Released 1 st stage shut off dart
#7	Cement Pump	Displaced Dart with 225.7bbl of water, bumped plug & held pressure for 2 minutes
#8	Cement Pump	Held pressure then inflated the stage tool packer as directed

Stage 2:

Step No	Pump Used	Comments
#9	Rig Pump	Pumped 10bbl of gel spacer
#10	Cement Pump	Pumped 46.4bbl of 13.5ppg lead cement slurry
#11	Rig & Cement	Flushed rig & cement pumps
#12	Cement Pump	Released 2 nd stage closing dart
#13	Cement Pump	Displaced dart with 52.4bbl of water
#14	N/a	Released 1 st stage shut off dart
#15	Cement Pump	Displaced Dart with 225.7bbl of water, bumped plug & shut the pressure in
#16	Cement Pump	Gradually increased the pressure for a casing test & bled off to check the packer

MUD AND TREATMENT:

A total of 1260bbl of 8.6ppg mud was built until 226m where total losses were encountered. After that water was used to drill with a total of 190bbl of high viscosity sweeps pumped as directed

No real discussion pints are to be discussed as not maintenance treatments were required

DOWNHOLE LOSSES:

An estimated 14,700bbl of drill water was pumped down hole with no returns including pumps off time during connections

SOLIDS CONTROL:

All three shale shakers were dressed with 1 x 80 API and 2 x 120 API screen prior to spud this section. However due to total loss of circulation below 18-5/8" conductor casing shales shakers were used only during drilling out of cement and above 174m depth. Centrifuge was on standby for this section.

OBSERVATIONS AND RECOMMENDATIONS:

#1: When drilling through these troublesome formations there is not much that you can do regarding the drilling fluid but the KCL concentration of sweeps should be maintained as when running the casing there was minimal weight taken on the way in which was very good considering the depth drilled with no returns

Section #3	12 1/4" Interval	1768.11m MD / 1768.05mTVD	9 5/8" Casing At 1764m
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DRILLING FLUID TYPE: KCl-Polymer

DRILL FLUID PROPERTIES:

Drill Fluid Property	Programmed	Actual
Density, (ppg)	9.2	8.6 - 9.5
pH	9.5 - 10.5	9 - 10.2
MBT (lb/bbl)	<20	2.5 - 7.5
KCl (%)	4 - 5%	4.7 - 6.5%
Sand (%)	0-1	0.2 - 1

SECTION OPERATIONS:

Following wellhead installation, BOP was nipple up and tested as per program. Combo running tool was rigged down and wear bushing was installed. A pre job safety meeting was held, then, 12 1/4" drill out BHA was made up and run to tag cement above the packer at 105.66m. Top plug and stage tool were drilled out, followed by a flow check before pulling out to lay down drill out BHA. First 12 1/4" directional assembly was made and run to 420m. Following choke drill, a junk was tagged after washing down from 420 to 441m. Tried pumping 20 barrels high viscous sweep pill, repeated two more time in bathes of 10 barrels. Drilling was resumed to the top of collar at 458m and then the cement from 464m to 489m.

The water in the wellbore was displaced with 9.2ppg mud which was interrupted due to an issue with the cuttings bin, unable to pump the water out. The displacement was made with 1.5 circulation bottoms up while facing mud contamination with water in the casing and a drop in mud weight from 9.2ppg to 8.9ppg. Following pre job safety meeting, leak of test was performed using 8.9ppg mud to apply 16.4ppg equivalent mud weight. Following pre job safety meeting, equipment were tested and drilling was resumed after recording SCR. Meanwhile, mud was weighted up to 9.2ppg. While drilling, 15 barrels of high viscous sweep pills were pumped at 690m and 820m with no indication of poor hole cleaning with current mud properties and drilling parameter in this vertical section. Drilling was resumed to 1068m while having trouble with downhole tools due to tool shocking, unable to work on drilling parameters to improve ROP. Therefore, 10 barrels of high viscous pill was pumped, circulated out, followed by a flow check to pull out to lay down the BHA.

A new BHA was run to resume drilling from 1068m to 1389m while pumping high viscous pills at 1108m, 1152m, 1164m, 1171m, and 1178m with no indication of poor hole cleaning. 10 barrels of mud was gradually dumped from sand trap. There was only records of CO2 at 1205m and 1220m, otherwise zero. Drilling was resumed to 1552m while pumping high viscous pills at 1398m, 1405m, 1452m, 1481m, 1536m, and 1550m with no indication of poor hole cleaning. Meanwhile, performed Rig service at 1452m and 1518m and 20 barrels of mud was gradually dumped from sand trap. A pressure drop was observed due to initial transferring and mixing recipe which was resolved by setting a new practice. Drilling was resumed to 1585m, interrupted due to pump failure which was resumed and halted again, this time due to shale shakers' power loss. Drilling was resumed to 1603m which was stopped again at 1589m due to bad weather condition. Meanwhile, batches in 5 barrels of high viscous pills were pumped at 1563m 1589m, and 1603m with the indications of good hole-cleaning. Another 10 barrels of mud was gradually dumped from the sand trap with which mud weight was maintained in acceptable range.

While drilling at 1613m, due to observation of metal piece on shaker, it was decided to pull out of hole following a flow check to inspect the bit which was under gauge and resulted in waiting to receive instruction from town. Following a pre job safety meeting, a new directional assembly was made and run to 265m with shallow test and continued running and reaming down to bottom. Pumping another 10 barrels of high viscous pill indicated a good hole-cleaning practice. Drilling was resumed to 1642m, stopped for a Rig service, and resumed to 1768m, called section TD. Flow rate was mainly kept at about 800gpm. 5 barrels of high viscous sweep pill was circulated out

followed by another pill spotted on bottom. Then, following a flow check, drill string was pulled out to 1470m whence it was filled with slug and resumed pulling out to surface, with a flow check at casing shoe. 9 5/8" casing was run to 1764m. Active system was circulated for 1.5 times hole volume. Cement head was made up and surface line was pressure tested. Circulation was resumed while mixing slurry. Following a pre job safety meeting, 100 barrels of spacer was pumped at 5 barrels per minute. Pumping cement was stopped after pumping 11 barrels of cement which was displaced with 100 barrels of mud. Displacement was stopped to resume cement job. After the cement job, all cement equipment, running tools, and line were rigged down.

DRILLING FLUID AND TREATMENT:

The KCl/Polymer/PHPA mud for 12 1/4" section was prepared whilst waiting on the cement to set. System was built with 0.5 ppb Polyplus dry as encapsulation. After drill out cement, well was displaced with new mud of 9.2ppg including 5.5% potassium chloride. Mud weight was drop due to surface equipment failure during displacement. At the begging of the 12 1/4" hole section, there were a few factors causing interruption in drilling fluids related tasks including mud pump failure, centrifuge failure plus agitator failure, and shortage of manpower. Centrifuge was used to cut out low gravity solids and Duovis was used to acquire the desired properties.

Properties in the active system were maintained by bleeding with unweighted premix volume to keep mud weight in range. Caustic Soda & Safe Scav NA were mixed directly into active, 1 sax each every 8 hours to maintain pH, avoid bacterial and dissolved oxygen as DD requested. Losses of about 7 barrels per hour in this wellbore were mainly due to wet cutting at shaker, centrifuge, evaporation and discharged from sand trap. While drilling sandstone bearing interval, shale shakers were being observed, maintained, and changed to reusable one at every connection. Housekeeping on chemical area such as covering up the chemicals to protect from rain was an indispensable part of drilling fluids job day by day during the rainy season in the region. At the end of the section 11ppg slug pill was made to pull out dry.

SOLIDS CONTROL EQUIPMENT:

Shale shakers as the first defence was initially set with 100 API screen (shaker #2, 3, and 4), and 120 API screen for Derrick shale shaker, maintained to prevent solid entering the mud system at first point. Shale shakers were later mainly dressed with 140 API screen as the mud warmed up.

OBSERVATIONS AND RECOMMENDATIONS:

- #1: In order to avoid constant increase in mud weight it is recommended to dump 10-15bbl of mud from sand trap every connection in conjunction with constant dilution of active system with fresh KCL water premixes.
- #2: Dealing with mud foaming issues it is recommended to mix initial 5%KCl water with addition of 1.0-1.1ppb of Duo-Vis, which will assist in prevention of excessive foaming as foaming occurs mainly during slow increase of polymer content to 0.2-0.4 ppb and also treat the mud with Defoamer.
- #3: Solid control equipment need to be improved to avoid excess solid in system. Shaker need to be adjusted to avoid surface losses.
- #4: Mud weight on TD was not properly maintained due to unplanned TD Depth.

Section #4	8 1/2" Interval	3833 MD / 2437 mTVD	5.5" Casing At 3877m
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DRILLING FLUID TYPE: KCl/Polymer/PHPA

DRILL FLUID PROPERTIES:

Drill Fluid Property	Programmed	Actual
Density, (ppg)	9.2-11.4	9.2-11.5ppg
pH	9.5-10.5	9.4- 10.3
MBT (lb/bbl)	<10	<10
KCl (%)	3-5%	5-6%
Sand (%)	0-1	0.1

OPERATIONS:

After performing BOP test, the 9 5/8" casing was successfully pressure tested with cement unit to 3700psi. A new BHA was made up and run to 12.88m after a pre job safety meeting. The BOP, rams, lines, and accumulator were pressure tested before running in with 8 1/2" bit and BHA. Drilling assembly was run to 220m whence first corrosion ring was set on top of inertia sub to crossover at 03:00am while the second ring was set on top of seventh HWDP at 315m, 03:40am. Running in was resumed to 1066m where lower Kelly cock was tested. BHA was then run to the top of cement at 1648m to drill out cement and shoe track and three meters of new formation to 1771m where formation integrity test was conducted.

Drilling was resumed to 1983m, stopped to troubleshoot standpipe pressure drop. Drilling 8 1/2" borehole section was continued to 2061m whence weight up process began through adding barite directly into active pit number 2 which was open to the adjacent suction pit (active pit 1) through equalizer. While drilling, survey was being taken at half hour intervals. Drilling was resumed while mostly sliding at 500gpm with a very low rate of penetration to 2194m. Meanwhile, started increasing mud weight in the active system at 10pm on fifth of December. At 2181m, mud weight in and out was 10.8ppg at 6pm on sixth of December. Rig service was performed at 11:30pm as usual. Drilling was resumed to 2260m while sliding with 500gpm. 10 barrels of high viscous sweep was pumped before flow check.

After pre job safety meeting, started pumping out of hole to 2200m while monitoring displacement. Tripping out was resumed to 9 5/8" casing shoe at 1765m. Flow check was conducted as usual. Pulling the drill string was resumed to surface. 2nd corrosion ring out at 11:40pm. First corrosion ring out at 2:20am. A new BHA was run in hole with new corrosion rings installed. Well control drill was performed at 1437m while running. Bottoms up circulation was made on bottom through which observed one meter fill up after 48 hours static condition of mud in borehole. Meanwhile, tight hole were observed at 1944m, 2188m, and 2211m. 10 barrels of high viscous pill and directional drilling was resumed to 2342m at 600gpm with no rotation and only sliding to build up. Sliding was resumed to 2610m at 575gpm in 60-90 Inc. zone.

Mud weight was increased from 10.8ppg to 11.2ppg while drilling and sliding from 2540m to 2610m. Due to caving, mud weight increased from 11.2ppg to 11.4ppg. Carbide was dropped, estimated 9.7% over gauge borehole. A short wiper trip was run to 2246m, back to bottom. After pumping two Hi-Vis pills of 5 barrels each, string was pulled out to 2418m where 14 barrels of 13.7ppg slug was pumped and resumed trip to surface. Meanwhile, flow check was performed at 2610m, 2485m, and 2418m before pulling out further. Trip was resumed to surface to make up new BHA for horizontal section.

While running in with the new BHA for horizontal section, observed about 1 barrels per hour static loss through flow check. Running in was resumed to 1775m where tight spots caused 10 to 12 Kftlbs torque to 1789m also obstructions at 1836 and 1838m. Washing and reaming down was resumed with 450gpm, and 1 to 8 Kftlbs torque. At 1838m, 20 barrels of high viscous pill was pumped and circulated out with no increment in the infinitesimal cutting loads on shale shakers which was due to wash and reaming tight spots. Running in was resumed to 2610m with 2-12kftlbs torque at 400 to 450gpm. At 2429m, splintery shale cuttings were observed over the shakers which was stopped after circulation on bottom. Drilling was resumed to 3166m with 550-575gpm, 150rpm, 15-25 ROP while pumping Wellbore Strengthening Material (WSM), planned every 3-4 stands. At the same time, mud system was loaded with 1% by volume STARGLIDE to enhance ROP. Drilling 8 1/2" section was resumed to section TD at 3883m with 550gpm, 130-160rpm, 96 Celsius bottom-hole temperature. Wash and reaming out of borehole after two circulation bottoms up while working on tights from 2610m to 2260m due to high dogleg range from 5 to 11 degree.

The 5.5" production casing was run in the hole to 3877.3m and cemented with 13.6ppg lead and 15.8ppg tail cement.). The well was displaced with 268.2bbl of 9.5 ppg NaCl brine. Mud displacement mud, spacer and cement were dumped into the sump. Surface mud later was duped to the sump and tanks cleaned for rig released.

DRILLING FLUID AND TREATMENT:

While waiting on cement, centrifuge was run to remove low gravity solids of active pits with the intention to cut surface volume mud weight to 9.1ppg per capita to be able to balance the whole circulating system at about 9.3ppg. Reserve volume were also made with solution to keep surface volume full. Then, active system was pre-treated with sodium bicarbonate and citric acid prior to drill out cement. Mixing few more bags of sodium bicarbonate and citric acid after drilling cement, helped removing significant proportion of the cement contamination.

SAFESCAV NA and Caustic Soda were mixed into the system, every eight hours, to maintain dissolved oxygen and pH as per directional driller requirement. Centrifuge was run from 1771m to 2060m to remove drilled solid and to keep mud weight as per program, 9.2ppg to 9.5ppg. Conditioning surface volume was maintained with PolyPac UL to improve fluid loss, Duovis to enhance low end Rheology, PolyPlus Dry for encapsulation and potassium chloride to be maintained at a minimum of 5% in the system. At this stage slug pit was used to make soupy strong solution which was bled into the active system to help in maintaining mud properties in range as per program. Mud weight increment plan was launched in the active system at 10pm on fifth of December.

At 2181m, mud weight in and out was 10.8ppg at 6pm on sixth of December. The delay in weight up process was due to slow rate of penetration while foaming in active pit number 2 was also a barrier for monitoring any possible gain or loss precisely, as mentioned. Foaming in pit number 2, as a result of running mixing pump with an open hopper for almost 24 hours, was treated with de-foamer immediately after the mixing. Ideally, it was planned to weight up the mud in 10 hours in 200m drilling interval. Rig service was performed at 11:30pm as usual. Drilling was resumed to 2197m while sliding with 500gpm.

As the flow line temperature touched 150F as an indication of high downhole temperature, PTS-200 was used stepwise as a polymer temperature stabilizer initially at 0.2 pound per barrel, followed by another 0.2 pound per barrel in 12 hours intervals. While drilling to 2260m, in addition to the usual treatment for Rheology, fluid loss, pH, and dissolved oxygen, the 11.2ppg mud was made in premix#1 as reserve. Water streaming was maintained at 4 barrels per hour to make amend for evaporation. Possum belly and shaker header boxes were cleaned while making up new BHA. Fifty barrels new fresh solution was built with one salt and combining fluid loss controllers (POLYPAC UL and DUAL-FLO HT) while running in.

High salinity pill was mixed and slowly transferred into active. Afterwards, active system was treated with fluid loss controllers to keep it in range and Magnesium Oxide was mixed to maintain pH in range at high temperature downhole condition. As routine, continued monitoring shaker screens, streaming 2-4 barrel per hour water into shale shaker header box, and adding SAFESCAV NA as well as Caustic Soda to control dissolved oxygen and pH. Derrick centrifuge was run about 2.5 hours with 10.9ppg intake, 9.5ppg overflow, and about 5 barrels of solid removal resulted in the whole system mud weight cut back in and out to 10.8ppg for an active system of 1100 barrels mud.

The main problem at this point with 10.8ppg mud weighted up with Barite is lack of Barite recovery mode centrifuge which is causing low gravity solids to build up. Same treatment has been made to the mud as before while drilling to 2542m. And water streaming increased to 8 barrels per hour. After drilling to 2610m and before the trip, active system was treated with low end rheology modifier, fluid loss controller, and polymer temperature stabilizers. Water streaming was continued at 6 to 7 barrels per hour while drilling to 2610m to compensate for evaporation at 80 degree Celsius flow line temperature. While trip, 240 barrels of 11.7ppg surface volume including sand trap, desander, and shaker header box were dumped and remaining surface volume was mixed with new fresh volume adjusted at 11.4ppg.

Wash and reaming at 400gpm due to tight spots below 9 5/8" casing shoe at 1775m made it possible to condition the mud for a tighter fluid loss control and also maintaining Rheology and pH in range by adding Caustic Soda, POLYPAC UL, DUAL_FLO HT, and DUO-VIS, although the high torque while running in seems to be because of having a stiff BHA. From 2610m, beginning of the horizontal section, in addition to the usual treatment for pH, fluid loss, dissolved oxygen, and Rheology, a well strengthening material pill was made in slug pit including 31 pounds per barrel of sized calcium carbonate and G-Seal plus 8-16 pounds per barrel of STARGLIDE, to be pumped as one sweep pill as required.

Further while resuming drilling horizontal section from 2803m onwards, it was decided to load the system with STARGLIDE, 1% by volume which was resulted in foaming and aeration in the mud after circulation with 550gpm and 77 degree Celsius flow line temperature. Immediately, foaming treatment was resumed to minimize foaming at surface active volume. Rheology was also increased with increasing drilled solid and the addition of STARGLIDE. Fluid loss was also increased with the increasing drilled solid into the active system and resulted in an inevitable dump and dilution strategy.

Meanwhile, 24 hours mud volume record indicates no or insignificant downhole losses since pumping Wellbore Strengthening Material (WSM) sweep from 2803m onward which was recorded as 1 barrel per hour static loss from 2610m to 2803m. Treatment to minimise foaming and aeration was resumed in active system as well as partial dump and dilution to the mud system. Foaming issue was only partially mitigated with the ongoing de-foaming treatment and after about 300 barrels of fresh volume was substituted for the lost mud since the introduction of STARGLIDE into the mud system of 1300 barrels total active volume. In addition to the usual treatment for the pH, fluid loss, and dissolved oxygen, DESCO CF was added to the active system to relax the mud Rheology.

POLYPAC UL was used to directly treat active system fluid loss to about 5cc/30min before tripping out. Additional STARGLIDE was added to make up the whole system to 1.5% lubricant to ease off casing running. Foaming treatment was resumed after adding STARGLIDE to mitigate system foaming due to high downhole temperature at about 204F. Pumped 40 barrels tandem pill, 50% as 12.9ppg weighted pill, and 50% as high viscous sweep pill before washing and reaming out of the hole. While wash and reaming out, losses were observed over the shale shakers due to foaming and aeration.



While running 5.5" production casing, MW dropped to 11.3ppg possibly from circulating water through down hole tools when pulling out of hole, so increased MW by adding barite and maintained MW to 11.6ppg. While circulating bottoms up, treated active with 0.2ppb Desco to attain the rheology specification for cementing operation, to reduce YP to 15 to minimize lateral annular cement channelling. At this juncture, no abnormal whole mud loss or seepage noted. All returns from the cement job have been transferred to the sump. Added Safe Scav NA to brine directly before pumping to displace cement. Mix up SAPP pill in slug pit & use for jetting BOP after cement job.

SOLIDS CONTROL EQUIPMENT:

All of the 120API size screen were removed and dressed up with 140API screen while conducting formation integrity test. Then, shale shakers number#1, 3, and 4 were dressed with 170API screens at 70 degree Celsius flow line temperature, and 600gpm. From 2610m, shaker#2 was also dressed with 170API screens at 80 degree Celsius flow line temperature. The delay made for shaker#2 finer screen installation is because of the more flow on which it takes. In horizontal section from 2610m, shaker#4 became offline at 550gpm and 76 degree Celsius which is more suited to the flow of fluid over the shaker#1, 2, and 3, since the flow line ends in front of shaker#2.

OBSERVATIONS AND RECOMMENDATIONS:

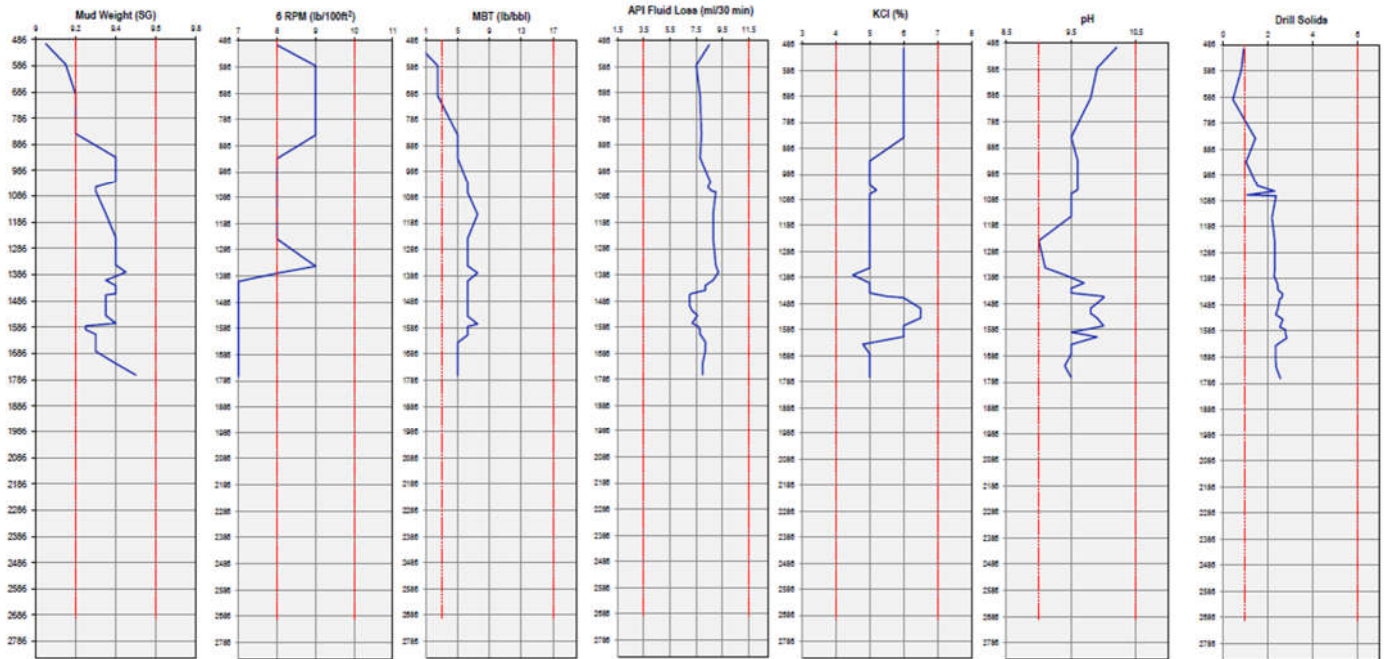
- #1: In order to avoid constant increase in mud weight it is recommended to dump 10-15bbl of mud from sand trap every connection in conjunction with constant dilution of active system with fresh KCL water premixes.
- #2: Dealing with mud foaming issues it is recommended to mix initial 5%KCl water with addition of 1.0-1.1ppb of Duo-Vis, which will assist in prevention of excessive foaming as foaming occurs mainly during slow increase of polymer content to 0.2-0.4 ppb.

PROPERTIES GRAPHS:
12 1/4" hole Section:

Mi SWACO
A Schlumberger Company

Mud Properties - 12 1/4" Amungee NW-2

tamboran
RESOURCES

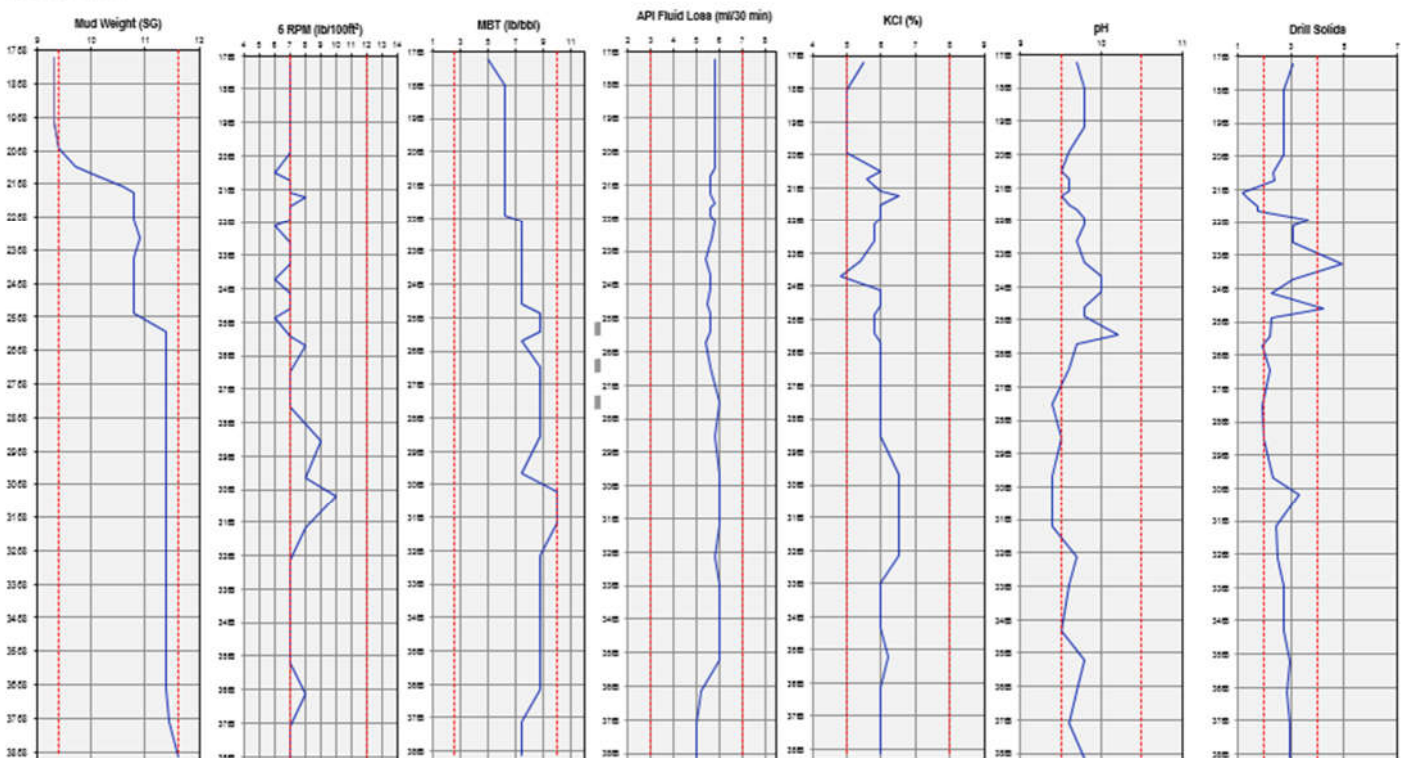


PROPERTIES GRAPHS:
8 1/2" Production Section:

Mi SWACO
A Schlumberger Company

Mud Properties - 8 1/2" Amungee NW-H2

tamboran
RESOURCES



CHEMICAL CONSUMPTIONS:



12 1/4" Section:



Cost Summary

A Schlumberger Company

Start Date: 18-Nov-22

End Date: 2-Dec-22

Operator : Tamboran Resources

Description / Field : Exploration - Appraisal / EP-98

Well Name : Amungee NW-2H

Report Date : 27/01/2023

Location: Betaloo

Logit Number : O.1040030.01

Engineering: \$32,760.00

Equipment:

Other Engineering related:

Screens:

Products: \$134,608.83

Taxes:

Total cost for period from 18-Nov-22 to 02-Dec-22 : \$167,368.83

Engineering Personnel Costs		Item Code	Unit Price	Qty Charged		Engineering			
MUD ENGINEER		R0081106	\$1,092.00	30		\$32,760.00			
Product Costs	Product Code	Unit Size	Unit Price	Start Qty	Qty Received	Qty Returned	Qty Used	On Location	Product Cost
Inventory & Consumption									
BARITE (BIG BAG)	M0011305	1.5 MT BG	\$895.96	53	69		31	91	\$27,774.76
CAUSTIC SODA	M0006731	25 KG BG	\$134.80	22	32		35	19	\$4,718.00
CITRIC ACID	M0006565	25 KG BG	\$68.88	35			4	31	\$275.52
DEFOAM A	M0003617	5 GA CN	\$162.29	43			8	35	\$1,298.32
DUO-VIS	M0002944	25 KG BG	\$202.29	127	160		92	195	\$18,610.68
MUD LAB	R0088103-001	1 Day EA	\$166.25				15		\$2,493.75
NUOSEPT 78	M0023645	25 KG CN	\$208.95	12	72		25	59	\$5,223.75
POLYPAC UL	M0006215	25 KG BG	\$153.90	183	160		138	205	\$21,238.20
POLY-PLUS DRY	M0006571	25 KG BG	\$141.21	89			34	55	\$4,801.14
POTASSIUM CHLORIDE (BIG BAG)	M0000413	1 MT BG	\$1,600.92	28	20		27	21	\$43,224.84
SAFE-SCAV NA	M0005014	5 GA CN	\$101.85		192		22	170	\$2,240.70
SAPP	M0006255	25 KG BG	\$112.82	28			3	25	\$338.46
SODA ASH	M0006886	25 KG BG	\$49.51	87			29	58	\$1,435.79
SODIUM BICARBONATE	M0006895	25 KG BG	\$66.78	46			14	32	\$934.92



8 1/2" Section:



A Schlumberger Company

Cost Summary

Start Date: 3-Dec-22

End Date: 26-Dec-22

Operator : Tamboran Resources

Description / Field : Exploration - Appraisal / EP-98

Well Name : Amungee NW-2H

Report Date : 27/01/2023

Location: Betaloo

Logit Number : O.1040030.01

Engineering: \$49,140.00

Equipment:

Other Engineering related:

Screens:

Products: \$284,788.65

Taxes:


Total cost for period from 03-Dec-22 to 26-Dec-22 : \$333,928.65

Engineering Personnel Costs		Item Code	Unit Price		Qty Charged		Engineering			
MUD ENGINEER		R0081106	\$1,092.00		45		\$49,140.00			
Product Costs		Product Code	Unit Size	Unit Price	Start Qty	Qty Received	Qty Returned	Qty Used	On Location	Product Cost
Inventory & Consumption		Product Code	Unit Size	Unit Price	Start Qty	Qty Received	Qty Returned	Qty Used	On Location	Product Cost
BARITE (BIG BAG)		M0011305	1.5 MT BG	\$895.96	91	63		109	45	\$97,659.64
CAUSTIC SODA		M0006731	25 KG BG	\$134.80	19	64	45	38		\$5,122.40
CITRIC ACID		M0006565	25 KG BG	\$68.88	31		18	13		\$895.44
CORROSION RINGS		R0086670	1 EA	\$931.00	12			6		\$5,586.00
DEFOAM A		M0003617	5 GA CN	\$162.29	35	24	18	41		\$6,653.89
DESCO CF		M0001021	25 LB BG	\$99.04		80	72	8		\$792.32
DRISTEMP		M0009805	50 LB BG	\$925.61	9	20	26	3		\$2,776.83
DUAL-FLO HT		M0001763	50 LB BG	\$153.99	105	35	35	105		\$16,168.95
DUO-VIS		M0002944	25 KG BG	\$202.29	195		160	35		\$7,080.15
G-SEAL FINE		M0008115	25 KG BG	\$140.80	56		54	2		\$281.60
G-SEAL PLUS		M0008069	25 KG BG	\$73.89	120		118	2		\$147.78
MAGNESIUM OXIDE		M0006576	25 KG BG	\$100.25	28		14	14		\$1,403.50
MUD LAB		R0088103-001	1 Day EA	\$166.25			1	20		\$3,325.00
NUOSEPT 78		M0023645	25 KG CN	\$208.95	59		48	11		\$2,298.45
POLYPAC UL		M0006215	25 KG BG	\$153.90	205		40	165		\$25,393.50
POLY-PLUS DRY		M0006571	25 KG BG	\$141.21	55		64	-9		-\$1,270.89
POTASSIUM CHLORIDE (BIG BAG)		M0000413	1 MT BG	\$1,600.92	21	20		22	19	\$35,220.24
PTS-200		M0005488	55 GA DM	\$1,233.92	8	8	8	8		\$9,871.36
SAFE-CARB 250		M0009145	25 KG BG	\$21.18	384		378	6		\$127.08
SAFE-CARB 40		M0002652	25 KG BG	\$21.18	520		502	18		\$381.24
SAFE-CARB 500		M0009146	25 KG BG	\$21.18		277	255	22		\$465.96
SAFE-CARB 750		M0015911	25 KG BG	\$21.18	134		128	6		\$127.08
SAFE-COR		M0004922	55 GA DM	\$1,002.73	8	4	8	4		\$4,010.92
SAFE-SCAV NA		M0005014	5 GA CN	\$101.85	170		120	50		\$5,092.50
SALT (BIG BAG)		M0006878	1 MT BG	\$761.22	40		12	26	2	\$19,791.72
SAPP		M0006255	25 KG BG	\$112.82	25		27	-2		-\$225.64
SODIUM BICARBONATE		M0006895	25 KG BG	\$66.78	32		18	14		\$934.92
STARGLIDE		M0000393	55 GA DM	\$1,825.09	24		4	19	1	\$34,676.71




VOLUME SUMMARIES:

22" Section:



Amungee NW-SH 22" Section Volumes





	Mud Volume Status (bbl) RIG					Mud Volume Built (bbl)						Mud Volume Lost (bbl)									
Date:	Depth	Hole	Active	Reserve	Total					Daily	Cumm.									Daily	Cumm.
2022	Metres	Volume	Volume	Volume	Volume	Mud Rec'd	Chemical Addition	Water Addition		Total	Built	Shakers	Centrifuge	Operational Discharge	Evaporation	Formation	Tripping	Displacement	Mud Transferred to Next section	Total	Lost
6-Nov	0				0					0	0									0	0
7-Nov	0		1005	78	1083		22.61	1060.39		1083	1083									0	0
8-Nov	0		0	1	1		0.21	0.79		1	1084									0	0
9-Nov	78		706.56	358	1064.56		0.31			0.31	1084.31	11								11	11
10-Nov	109		827.32	284	1111.32		13.99	226.01		240	1324.31					201.98				201.98	212.98
11-Nov	115		737.94	324	1061.94		0.63	69.37		70	1394.31					119.38				119.38	332.36
12-Nov	117		465.55	280	745.55		4.28	115.72		120	1514.31					436.39				436.39	768.75
13-Nov	117				0					0	1514.31								745.55	745.55	
						0	42.03	1472.28	0			11	0	0	0	757.75	0	0	0		

17.5" Section:

Amungee NW-SH 17/2" Section Volumes																					
Mud Volume Status (bbl) RIG						Mud Volume Built (bbl)						Mud Volume Lost (bbl)									
Date:	Depth	Hole	Active	Reserve	Total	Mud Rec'd	Chemical Addition	Water Addition		Daily	Cumm.	Shakers	Centrifuge	Operational Discharge	Evaporation	Formation	Tripping	Displacement	Mud Transferred to Next section	Daily	Cumm.
2022		Volume	Volume	Volume	Volume					Total	Built									Total	Lost
13-Nov	117		465.55	280	745.55	745.55	17.6	358.57		1121.72	1121.72									0	0
14-Nov	119				0					0	1121.72									0	0
15-Nov	254	-0.01	796.89	331	1127.88		0.41	146.89		147.30	1269.02	40		40		61.15				141.15	141.15
16-Nov	486		936.75	267	1203.75		4.58	14180		14184.58	15453.6					14108.71				14108.71	14249.86
17-Nov	486		619.27	237	856.27			265.22		265.22	15718.82					612.7				612.7	14862.56
						745.55	22.59	14950.68				40	0	40	0	14782.56	0	0	0		



12.25" Section:

<div>  <div>Amungee NW-SH 12 1/4" Section Volumes</div>  </div>																					
Date:	Mud Volume Status (bbl) RIG					Mud Volume Built (bbl)						Mud Volume Lost (bbl)									
	Depth	Hole	Active	Reserve	Total	Mud Rec'd	Chemical Addition	Water Addition		Daily	Cumm.	Shakers	Centrifuge	Operational Discharge	Evaporation	Formation	Tripping	Displacement	Mud Transferred to Next section	Daily	Cumm.
		Volume	Volume	Volume	Volume					Total	Built									Total	Lost
2022																					
18-Nov			237.27	272.00	509.27	509.27	0.98			510.25	510.25			347.98						347.98	347.98
19-Nov			237.27	483.79	721.06		11.79	200.00		211.79	722.04									0.00	347.98
20-Nov			836.76	159.66	996.42		4.66	270.70		275.36	997.40									0.00	347.98
21-Nov			877.95	211.95	1089.90		54.12	650.00		704.12	1701.52	303.64	5	302						610.64	958.62
22-Nov			991.12	427	1418.12		31.48	400		431.48	2133.00	37	34	30	2.26					103.26	1061.88
23-Nov			991.95	416	1407.95					0.00	2133.00	5					5.47			10.47	1072.35
24-Nov		-0.01	1122.34	324	1446.33		11.15	200		211.15	2344.15	95	33	40	4.47					172.47	1244.82
25-Nov			1136.54	345	1481.54		21.91	360		381.91	2726.06	234	46.70	60	6					346.70	1591.52
26-Nov			1207.00	242	1449.00		11.91	250		261.91	2987.97	192	45.45	50	7					294.45	1885.97
27-Nov			1283.32	190	1473.32		6.50	220		226.50	3214.47	120	26.00	50	6.19					202.19	2088.16
28-Nov			1235.59	166	1401.59					0	3214.47			25			46.73			71.73	2159.89
29-Nov		766	1235.59	166	2168		8.19	100		108	3322.66	56				34				90.44	2250.33
30-Nov		819	1292.48	131	2243		12.55	100		113	3435.21	38		64			6			108.37	2358.70
1-Dec		783	1303.41	104	2190					0	3435.21					16				16.10	2374.80
2-Dec		426	762	203	1391					0	3435.21			180						180.00	2554.80
						509.27	175.24	2750.70				1081	190	1148.93	26	51	58	0	0		



8.5" Section:

Amungee NW-SH 8 1/2" Section Volumes																					
Date:	Mud Volume Status (bbl) RIG					Mud Volume Built (bbl)						Mud Volume Lost (bbl)									
	Depth	Hole	Active	Reserve	Total	Mud Rec'd	Chemical Addition	Water Addition		Daily	Cumm.	Shakers	Centrifuge	Operational Discharge	Evaporation	Formation	Tripping	Displacement	Mud Transferred to Next section	Daily	Cumm.
		Volume	Volume	Volume	Volume					Total	Built									Total	Lost
2022																					
3-Dec		425	1009	186	1620	965	16			981	981									0	0
4-Dec	1771	382	947	228	1557		5			5	986	22								22	22
5-Dec	2082	453	650	190	1293		28	140		168	1154	41	10		3					54	76
6-Dec	2197	479	611	177	1267		76	16		92	1246	110	8							118	194
7-Dec	2260	537	1156	175	1868		36	61			1246	27			4		2			33	227
8-Dec	2260	527	1108	305	1940		3	85		89	1334	6								6	233
9-Dec	2342	512	1131	181	1824		13	22		35	1370	36	5		6					47	280
10-Dec	2542	557	1175	212	1944		27	156		183	1553	80			8					88	368
11-Dec	2610	590	1267	291	2148		64	144		208	1761	27			11					38	405
12-Dec	2610	606	1212	197	2015		11	80		91	1852			240						240	645
13-Dec	2610	587	1198	207	1992		7	15		22	1874				2	24				26	672
14-Dec	2803	628	1247	156	2031		8	79		87	1962	37			23	29				89	761
15-Dec	3166	714	1350	171	2235		41	235		276	2238	65	5	70	18					158	919
16-Dec	3542	804	1387	203	2394		60	223		284	2521	124		75	16					215	1134
17-Dec	3883	885	1415	260	2560		32	134		166	2687	65			16					81	1215
18-Dec	3883	912	1368	185	2465					0	2687	87		9	26					122	1336
19-Dec	3883	962	1410	57	2429					0	2687			86						86	1422
20-Dec	3883	934	1415	384	2733		35	297		332	3019									0	1422
21-Dec	3883	858	1327	393	2578			25		25	3044	1		101	2					104	1526
22-Dec	3883	264	264	74	602					0	3044			1369						1369	2895
23-Dec	3883	264	264	74	602					0	3044									0	2895
24-Dec	3883	264	264		528					0	3044			74							
						965	280	704				348	23	240	133	0	2	0	0		