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Date 2013/12/17
PERMIT NUMBER: P 6717
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Date 2013/12/17
PERMIT NUMBER: P 591
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

MGM – Shell East MacKay I-78

Well History Report

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WID	2078
UWI	300I786450125300

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MGM – Shell East MacKay I-78
Well History Report

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Introduction

The MGM - Shell East MacKay I-78 well was drilled in the winter of 2013 by MGM Energy Corp. (MGM) as the operator. Shell Canada (Shell) farmed in on the well to earn a working interest in the Exploration License. The well was drilled vertically. MGM had also applied to drill a horizontal well and implement a multi-stage hydraulic fracturing treatment. This application was referred to an environmental assessment by the Sahtu Land and Water Board (SLWB). Rather than enter into an undefined regulatory process with uncertain timelines and costs, MGM elected to withdraw its application and proceed with drilling the already approved vertical well.

The I-78 well is located in the Northwest Territories, approximately 50 km southeast of Norman Wells and 14 km southwest of the municipality of Tulita. The well was drilled to evaluate unconventional oil potential in the Bluefish and Canol shales.

The well was permitted to 2010m and actual total depth was 2001mKB. After 178mm production casing was run, both zones were hydraulically fractured and tested as described later in the report. At the time of writing, the well is suspended.

A “stick diagram” showing the casing setting points and other pertinent data “as built” is included in the Appendices.

The subsequent sections of this report and associated appendices provide the information required under section 88 of the Canadian Oil and Gas Drilling and Production Regulations (COGDPR) as the “Well History Report”.

The following items are included in the Appendices, as per National Energy Board Conditions:

- OA-1202-002 – Condition 6 – Seismic Monitoring – Appendix 17
- ADW WID#2078 – Condition 4 – Final well survey – Appendix 2
- ADW WID#2078 – Condition 5 – Report on potable water zones – Appendix 18
- AACW WID#2078 – Condition 3 – MSDS sheets for hydraulic fracturing chemicals – Appendix 14

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Pertinent Data Summary

Well Name:	MGM – Shell East MacKay I-78
Unit I	Section 78
Grid:	64°50’ 125° 30’
Operator	MGM Energy Corp.
Operating License	1202
Exploration License	EL 466
Operations Approval	OA-1202-002
WID	2078
UWI	300I786450125300
Water License	S12A-001 (SLWB)
Well Location	64° 47’ 42.1” N 125° 43’ 18.3” W NAD 27 – Zone 10 GL elevation 155.1 mASL KB elevation 161.5 mASL
Spud	Jan 27 2013
Rig Release	Feb 25 2013

Well outline:

Conductor	609 mm hole (auger) to 17.5mGL 406 mm pipe to 18m (pressure cement to surface)
Surface	311mm hole to 405mKB 244mm casing to 402mKB (cement to surface)
Production	222/216mm hole to TD (2001mKB) 178mm casing to 1988 (cement to surface)

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Location & Logistics (inc. weather)

Construction

The location was on the south ("left") side of the Mackenzie River, the opposite side to Tulita, Norman Wells, and the GNWT winter road. To enable an early start to the winter operations, initial equipment was brought in by barge in the summer of 2012 and staged at an existing site, just east of the mouth of the Little Bear River. Operations were suspended and equipment left unattended during the fall, except for routine inspections. The wellsite survey plat in the appendices shows the staging area and access route "as built".

Once the ground was sufficiently frozen (November 19, 2012) the camp was restarted and personnel were flown in by helicopter. Construction of a 20km access road to the I-78 location commenced, using existing seismic lines. A combination of favourable weather, advance planning (packing snow to allow frost penetration into soft areas), and utilization of previously cleared seismic lines allowed good progress. The majority of the cut lines had limited regrowth and these were easily walked down with a snowcat and a Delta 3. Closed to the location, some of the regrowth was heavier (75-100mm) and a cat was required to clear the line.

Pumps were used to fill water trucks from the Mackenzie River, resulting in significantly faster fill times than experienced on the Windy Island location in 2011. In addition, a high pressure snow making machine was included in the initial mobilization, in case there was little early season snow. Although there was reasonable snow cover, the availability of large amounts of "clean" (dirt & gravel free) snow facilitated construction. Ice rubble was harvested from the edge of the Mackenzie River and this was combined with natural and man-made snow to fill several significant ravines. Due to the lack of suitable water sources on the selected access route, the only identified water source was from the Mackenzie River. This resulted in long hauls to end of the road and the location. During construction, a flowing creek was discovered about halfway between the staging area and the location. If this had been discovered, tested, and permitted in time for winter use, it would have saved significant time and cost in building the access road and location.

As soon as river ice conditions permitted (November 27) construction of an ice road along the Mackenzie River commenced. This intersected with the GNWT winter road, approximately 4 km west of Tulita. A combination of natural ice growth and surface flooding resulted in sufficient ice thickness to bring in the drilling rig (100cm of ice for 60,000 kg loads based on a P6 rating) by January 15. Closure of the GNWT road due to deterioration from heavy initial use, resulted in a three day delay.

The final lease size was 180m X 150m. The apparently large area was necessitated by the spacing requirements for the rig and stimulation/testing components (well center, frac oil tanks, separators, flare stack, etc.) and the camp, generators, fuel tanks, etc from each other. The lease was located on an old burn site, covered with scrub spruce and willow. This was walked down with a snow machine and a cat. To minimize environmental

impact, a snow & ice fill construction method, rather than a standard "cut & fill" was used. In addition to the water hauled from the Mackenzie River, clean snow was harvested from a frozen muskeg area and used as cover material on the location. This "cover snow" minimized deterioration of the ice pad due to sunlight, and facilitated the detection of any incidental small spills.

Due to a previous decision by one of its competitors not to use sumps for the disposal of drill cuttings (even for water based drilling fluids), MGM received substantial pressure to do the same. For this reason, despite the success of this method at the Windy Island location, MGM elected not to use a sump for the disposal of drill cuttings or cement returns at I-78.

Logistics:

As previously described, the drilling location was across the Mackenzie River from the GNWT winter highway, and the towns of Tulita and Norman Wells. It would not have been possible to bring full loads (up to 60,000 kg) across the Mackenzie River ice until approximately January 15. Since this would have shortened the drilling season to the point where the objective of drilling, fracturing, and testing the well in one season would have been at risk, it was decided to stage sufficient equipment and supplies on the opposite side of the river, to permit operations to start as soon as the ground was frozen (approximately mid-November. This equipment included a construction spread (snowcats, Delta 3 water trucks, conventional water trucks, grader, etc.), a camp complex for approximately 65 persons (complete with water and sewage treatment systems), and 200,000 liter fuel farm. In addition, a water well drilling rig and a rathole rig were staged in the fall, to permit these operations to be completed before arrival of the drilling rig, after full freeze-up.

In addition to the equipment required for the early start, consumables, such as casing and mud products, and certain other rental items (e.g. wellsite units and solids control equipment) were brought in by barge and staged on location. This resulted in significant saving in transportation, as barging is cheaper than trucking, especially with loads that are over-width and require pilot cars. An additional benefit was a reduction in traffic on the winter road in peak times and reduced reliance on infrastructure that was stretched very thin.

The opening of the MGM section of road (across the Mackenzie River) to full loads, on January 15, unfortunately coincided with the closure of the GNWT highway for three days due to damage to the road from heavy traffic. The move in of the drilling rig (coming from the south) was delayed by this amount. Note that each of the three operators (MGM, Husky, and Conoco) contributed $400,000 toward early opening, upgrade, and ongoing maintenance of the winter road. The winter road was closed on two more occasions, once due to a storm and once due to multiple vehicle incidents.

Personnel generally travelled by commercial air to Norman Wells. Helicopters were used to transport personnel to the staging area during barging and at the beginning of the

season, until the river crossing was open to light traffic (mid-December). Once the roads were open, a local contractor transported personnel by ground transport to the staging area. There were no significant incidents with helicopter or ground transportation. Charter flights were investigated for the north/southbound travel, but were not deemed to be effective for regular personnel transport. One charter flight was arranged by a service provider to replace equipment that failed during a job.

The initial plan was to move the camp from the staging area, to the drilling location (20km). During operations, it was decided to leave the camp at the staging area and have personnel "commute" to the wellsite as needed. Six wellsite trailers and a four unit wet sleeper were used to provide "on call personnel" with accommodation on location. Despite the inconvenience of additional travel, on balance this decision worked well.

Due to concerns about the condition of the winter road at the end of the season, an auxiliary tank farm was established at Tulita to contain frac flowback and produced fluids, it the event that the winter road to the south closed early and it was not possible to ship out all the produced fluid. In actual fact, the road remained open sufficiently long for all fluid to be hauled out, and the tank farm was never used.

Weather

Cold weather and limited snow during the late fall, and continued cold weather (-20 to -30 C) in November and December helped road construction. Brief periods of ambient temperatures of -40C complicated operations slightly, due to increased freezing and equipment failure. As previously mentioned, a winter storm closed the winter road on one occasion, but this did not have major impact on operations, as critical material and equipment was typically brought in a few days early.

Communication

Primary voice and data (email, reporting, and data telemetry) communication was by satellite based broadband on the lease, and also at the camp/staging area. Dual systems provided additional bandwidth and redundancy in case of equipment failure. This service generally worked well, although there were some challenges using the multiline conference call systems with the satellite phone system.

During the project cellular phone service was instituted in Tulita. This system was available at the staging area, and subsequently coverage has increased such that there is no cellular coverage at the drilling location. As recommended after the Windy Island well, the use of text services was tested for emergency back-up purposes and worked well, but was somewhat slow and cumbersome. There were no significant incidents of solar flares during the project

VHF radios with LADD 1 & 2 were used for road control and on lease. Consideration should be given to obtaining a dedicated radio channel (or two) for communication on the lease. LADD 1 & 2 remain the best choice for communication on the road (both the

GNWT road and the MGM road), as essentially all commercial vehicles have this capability. An ongoing issue is that most private vehicles do not have radio communication and thus do not receive advance warning of oncoming vehicles. This will continue to be an issue, and one that only gets greater as the amount of traffic on the road increases.

Water Wells and Potable Water Studies

As part of its commitment during the permitting process, MGM committed to drill three water wells to a maximum depth of 122mGL. The operation proved quite challenging due to equipment failure and lack of preparation by the contractor for the prevailing conditions, but the wells were successfully drilled and cased. The lowest water bearing formation located was 66-74mGL. Geological samples were collected and a basic suite of electric logs was run. Samples were taken from all the wells and a deliverability test was run on one of them. The approval process requires water sample collection and analysis from the wells, and at different four times. One sample set was taken prior to the start of drilling operations, one at the end of the season, after frac'ing operations, and one during summer operations in 2013. A fourth set of samples will be taken in the summer of 2014 during the routine annual site inspection.

As part of the ground water study, the surface hole of the I-78 well was surveyed with electric logs and evaluated for potable water zones. Based upon log analysis and the Canadian Drinking Water Guideline requirements for salinity less than 500ppm, potable water aquifers exist in the sands between surface and 129 mGL.

A summary of the MGM Shell East Mackay I-78 Groundwater, Surface Water, and Water Supply Well Monitoring Report, July 2013 by AECOM is included in the appendices. The full report has been submitted to the Sahtu Land & Water Board for inclusion in a regional groundwater study and a copy has been supplied to the National Energy Board as per clause 5 of the Approval to Drill a Well for WID#2078 (I-78).

The wells were not used to supply camp or industrial water.

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Drilling Program Summary

Conductor Section

A 609mm conductor hole was auger drilled to 17.5mGL. The cuttings were collected, examined, and logged by the wellsite geologist, to augment the surficial geology information gathered from the water wells. Clay and organic matter at 5m was frozen and included small ice chips, indicating the presence of permafrost. Sandstone/siltstone bedrock was encountered at 7.5m. It is not possible to determine if "permafrost" (permanently frozen ground) exists below this depth, but as bedrock, rather than organics or ice was observed below 7.5m, the presence or absence of permafrost will not have any effect on well integrity.

The 406mm conductor pipe was run and cemented in place using 7 tonnes of permafrost cement. A pressure cementing technique was used. The complete report is contained in the appendices. A 1.8mm diameter by 1.5 m cellar cribbing was installed. The conductor was trimmed and a 508mm flange for the diverter was welded on.

Surface Hole

An impermeable membrane (Layfield LLDPE Enviroliner 4000 - 20 & 30 ml) was laid down and all rig equipment set on mats to eliminate any thawing of the ice pad or ground. The Akita 37 drilling rig was inspected, prior to mobilization, by ModuSpec at MGM's partner's request. A number of modifications were made to the rig. Most notably, a pony substructure and additional accumulator capacity were installed to permit the use of a set of rental shear blind rams. This equipment was necessitated by the partner's internal policies regarding BOP configuration, and not by any perceived risk related to the well or local geology. In addition, a tear down of the choke manifold indicated wear and corrosion issues that were not readily correctable and the contractor elected to replace the choke manifold prior to move in of the rig. Several additional modifications were made to the high pressure piping, to eliminate threaded connections. Although no problems occurred, in hindsight, some of these could have complicated certain unscheduled operations (e.g. thawing frozen lines, free-point and back-off, etc.) and consideration should be given in future to replacing all welded connections with alternate systems (hammer unions, flanges, etc.).

Surface hole was drilled with a 311mm tooth bit to a total depth of 405m without significant incident, using a water based mud and diverter. Drill water from the water well drilling and testing operations was successfully reused as part of the makeup water. (No additional water was produced from the water wells for drilling of camp purposes.) Minor losses were encountered @ 46m when the hole packed off. Coal cavings were circulated out at that depth with increased mud viscosity. Additional cavings were noted on the wiper trip prior to running casing. There was no significant increase in MBT during the drilling of this hole section, indicating a lack of reactive clays/shales.

A combination logging run (hdil/xmac/dual-zdl/cn/gr/ttrm - induction/acoustic/density/ neutron/gamma ray) was performed without incident. Little fill or cuttings were noted on cleanout after this logging run.

244mm casing was run, landed at 402mKB, and cemented in place with 18.8 tonnes of RFC cement and 2% CaCl2. 3.5 m3 of good cement returns were observed. The well head assembly included a 278mm 35mPa (11" 5000#) Cameron casinghead designed to be run through the rotary table and diverter element, and landed in the diverter flange. The bolthole section of the 278mm 35mPa flange was subsequently installed using an Acme thread on the casing flange. This allowed the top joint of casing to be welded to the casinghead in the shop, resulting in better quality control and faster nipple up. In addition, the casing head was landed before the diverter was removed, increasing the safety of the operation.

A Class IV 279mm 35mPa BOP system was installed and pressure tested. The BOP had just been returned from its 1000 day inspection and the choke manifold was new. No problems were encountered in the testing.

Main Hole

The casing was drilled out and a Formation Integrity Test was run with no leak-off at 26.25kPa/m. A copy of the plot is contained in the Appendices

A fresh water polymer amine mud system was used to drill the main hole, with the polymer sheared in a premix tank prior to incorporation in the active mud system. The water was successfully stripped out of the surface hole mud (during cementing and nipple up) and used (along with treated, cement contaminated drillout water) as make up water, reducing disposal cost, as all fluid and cuttings had to be hauled out of the NWT to disposal in Alberta. There was little caving, except at 1820m where some 25-35mm shards were observed on the shaker.

The section was drilled to core point @ 1820mKB using one PDC bit. A Baker Hughes TruTrak system was used in an attempt to have the main hole section as straight and vertical as possible for coring. There was no significant deviation, with most of the hole at less than 1 degree deviation. Two cores were cut in the Canol formation and one in the Bluefish. Results were disappointing, with significant fracturing and subsequent jamming off of the core barrel. One section of tight hole was encountered from 2001 to 1800 when pulling out after drilling to TD. No lost circulation or other hole problems were encountered during drilling. No H2S was detected. Deviation was consistently less than 1 degree until 1870m. (The Baker TruTrak was run from surface casing to core point at 1820m.) From 1870m to 1941 (last survey) deviation was 2-3 degrees. The well was cored and logged (see evaluation section) and 178mm casing run to 1988mKB. The casing was cemented to surface with full returns.

Geological Summary

The well was drilled to evaluate the unconventional hydrocarbon potential in the Bluefish and Canol Shales.

A table of formation tops from the wellsite geologist's report is located below. Further details are located in the Geological Report and Lithology Log previously submitted to the NEB and included in the appendices.

FORMATION TOPS

MGM - SHELL EAST MACKAY I - 78

3001786450125300

K.B.(m): 161.0 **G.L.(m):** 155.0

			SAMPLE			high(+)
FORMATION	TVD(m)	SS(m)	TVD(m)	SS(m)	ISO(m)	low(-)
East Fork	10.0	151.0	129.0	32.0	635.0	-119.0
Little Bear Upper	732.0	-571.0	764.0	-603.0	123.0	-32.0
Little Bear Middle	872.0	-711.0	887.0	-726.0	274.0	-15.0
Little Bear Lower	1145.0	-984.0	1161.0	-1000.0	27.0	-16.0
Slater River	1175.0	-1014.0	1188.0	-1027.0	221.0	-13.0
Slater Radioactive Shale	1406.0	-1245.0	1409.0	-1248.0	25.0	-3.0
Arctic Red Upper (Mahny Lk)	1415.0	-1254.0	1434.0	-1273.0	48.0	-19.0
Basal Cretaceous Unconform.	1464.0	-1303.0	1482.0	-1321.0	0.0	-18.0
Devonian, Imperial Lower	1464.0	-1303.0	1482.0	-1321.0	218.0	-18.0
Canyon Sandstone	1717.0	-1556.0	1700.0	-1539.0	31.0	17.0
Base Canyon	1736.0	-1575.0	1731.0	-1570.0	89.0	5.0
Canol Upper	1824.0	-1663.0	1820.0	-1659.0	35.0	4.0
Canol Middle	1857.0	-1696.0	1855.0	-1694.0	5.0	2.0
Canol Lower	1861.0	-1700.0	1860.0	-1699.0	58.0	1.0
Hare Indian	1920.0	-1759.0	1918.0	-1757.0	19.0	2.0
Bluefish	1945.0	-1784.0	1937.0	-1776.0	20.0	8.0
Hume Upper	1965.0	-1804.0	1957.0	-1796.0	44.0	8.0
Total Depth	2020.0	-1859.0	2001.0	-1840.0	-	19.0

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Evaluation

Samples:

Drill cutting samples were collected from surface to total depth at 5 m intervals. During drilling of the conductor hole samples were caught and logged by the wellsite geologist. A representative sample was submitted to the National Energy Board. Sample descriptions are included in the lithology log in the appendices.

Mud Logging

The mud was analyzed from drillout of conductor pipe to total depth for total gas and chromatographic analysis. Gas readings in the Canol during coring were 100-150 units and up to 200 units while conventionally drilling the lower section of the Canol. Gas readings during the coring of the Bluefish were 40-80 units.

Isotube gas samples were collected at 50m intervals from 50mKB to 1750mKB and at 10m intervals from1750 to total depth.

The mud returns were continuously monitored for H2S but none was detected.

Coring

In order to maximize recovery of the core with a long (54m) sleeved barrel, a reduced bit size (216mm vs. 222mm bit above core point) was selected and a Baker TruTrak assembly was run to minimize any deviation or doglegs.
Three cores were cut in the Canol. The intervals were 1820m-1834m (14.0m cut / 12.7m recovered), 1834-1851.6 (17.6m cut / 17.3m recovered), and 1851.6-1874.2 (22.6m cut / 21.4m recovered). The recovered core was significantly rubblized. Opinions differ as to whether these were drilling induced fractures or not. In any case, despite the use of the Jambuster technology, all three cores jammed off with 25-50% of the 54m core barrel filled. It is possible that the choice of bit, WOB, and/or coring rpm was too aggressive for the formation.

The core was recovered at a reduced rate to allow percolation and release of expanding gas in order to prevent damage to the core from gas expansion (ref. SPE Paper 78156).

The recovered core was left in the aluminum sleeves and cut into 1.5m sections. One chip sample was removed for onsite sample description and the 1.5m sections were end capped. The capped sleeves were placed in specially designed transport boxes and transported to the laboratory in a temperature controlled air-ride truck to prevent fracturing or degradation of the core during transport.

One core was cut in the Bluefish from 1938 – 1960mKB where it jammed off (cut 22.5m cut / 21.5m recovered). The core was handled as above.

Once the cores arrived at the lab, they were left in their tubes to be CT scanned, followed by a complete Spectral Gamma Ray profile. The cores were then de-tubed, placed in core boxes and photographed under normal and UV light. After being photographed, the core was immediately wrapped in 7 layers of plastic cellophane and stored in a refrigerated core storage room to help preserve both its physical and chemical components. MGM Energy and its partner Shell then completed an extensive set of core tests and analyses, some were destructive. In between sampling and analyses, the core remained wrapped in 7 layers of cellophane in a refrigerated storage room at Weatherford Labs Calgary.

This report includes the results of the testing and analyses listed below, and this data can be found in the appendices.

- Complete Spectral Gamma Ray profile of the core while in the tubes
- Complete photography (Normal and UV light) of the core once it was laid out in the boxes
- Total Gamma Ray logging of the core once it was laid out in the boxes
- Conventional Rock Property determination on selected plugs (Phi, K and Sw)
- Shale Rock Properties (SRP) analysis of selected core and cuttings samples for determination of porosity and saturation information. This is equivalent to the Gas Research Institute (GRI) crushed rock protocol for evaluating shale petrophysical parameters.

In addition to the above, additional crushed core GRI analysis will be completed by CoreLabs after the submission of this report. Once these tests are complete, the results will be included as an amendment to this report.

Electric Logs

The following logs were run as one combination wireline run upon reaching surface casing point (405mKB).

- Gamma Ray
- Dual Density
- Neutron
- Induction (HDIL-SP)
- Sonic (multi-pole)

At total depth (2001mKB), the following logs were run HDIL (induction)

Run #1 (note tools pulled tight on bottom(1996mKB) and stuck for 30 minutes @ 1973mKB)

- Gamma Ray
- Dual Density
- Neutron
- Induction (HDIL-SP)
- Sonic (multi-pole)

Run #2 (re-run TD to 1600m due to tool failure)

- Spectral Gamma Ray
- Induction (HDIL-SP)
- Sonic (multi-pole)

Run #3 (fill @ 1980mKB – bridge @ 1820mKB on repeat pass)

- Spectral Gamma Ray
- Image Log (STAR/CBIL)

Run #4 (start @ 1980mKB - did not attempt to tag bottom)

- Spectral Gamma Ray
- FLEX – MREX (Formation Lithology and Nuclear Magnetic Resonance)

Standard auxiliary curves (caliper, gamma ray, and temperature) were recorded as well. Digital copies in LAS format have been submitted to the National Energy Board under separate cover.

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Completion, Stimulation and Testing

Completion Design

The completion on the I-78 well was designed to meet numerous conflicting criteria. These included:

1. Short season length – completions had to fit into a window with a mean length of three weeks, but could be as short as two weeks.
2. Heavy equipment (drilling rig, frac spread, etc.) needed to be moved out as early as possible
3. No service rig was available – due to cost in mobilizing from the south & additional rig up time to install rig, BOPs, etc.
4. Deteriorating winter road conditions due to warmer weather and heavy end of season traffic could limit hauling of produced fluid. (All fluid had to be trucked to Alberta as there were no suitable facilities to receive it in the NWT.)
5. A need to minimize standby on frac spread and coiled tubing.
6. The need to maximize information from the Canol and Bluefish (secondary target) before spring breakup, but place emphasis on Canol as primary zone.
7. The necessity to initiate production without a service rig and therefore without a bottom hole pump.

Outline Completion Program

1. Drill 222mm hole to TD – core and perform openhole wireline logging as required.
2. Run and cement 178mm casing.
3. Run bond log to ensure zonal isolation.
4. Perforate 178mm casing for all zones of interest (1 in Bluefish and 3 in Canol).
5. Run tubing and completion assembly with ball actuated ports and isolation packers to permit fracturing individual zones, to facilitate the independent testing of the Bluefish and Canol, and to allow rig-less (wireline) abandonment of the well, if needed.
6. Fracture the Bluefish
7. Flow and evaluate the Bluefish
8. Fracture the Canol in three separate stages (3 zones)
9. Flow and evaluate the Canol.
10. Run production log(s) to determine the contribution of each zone in the Canol. Record bottomhole pressure buildup in the Canol.

Completion Operations

The well was drilled with unweighted mud, logged and cased and cemented without incident. KCl brine was used to displace the cement to ensure that the well was in an overbalanced condition when the casing was perforated.

The following intervals were perforated

- Bluefish: 1946 - 1948mKB- 127mm ERHSC with 25gr Connex Charges @ 17 SPM - 60^0 Phasing
- Lower Canol – Zone 1: 1882 - 1884mKB - 127mm ERHSC with 25gr Connex Charges @ 17 SPM - 60^0 Phasing
- Lower Canol Zone 2: 1869 - 1871mKB - 127mm EHRSC with 25gr Connex Charges @ 17SPM - 60^0 Phasing
- Upper Canol – Zone 3: 1847 - 1849mKB & 1840 - 1842mKB - 79mm ERHSC with 22.7gr Prospector Charges @ 10 SPM - 120^0 Phasing (to allow fracturing of both intervals through limited entry fracturing).

A completion assembly consisting of ball actuated sleeves and isolation packers was run on 114mm tubing to allow each of the above zones to be stimulated separately. The annular space opposite the perforations and the tubing volume was displaced to frac oil, and the packers were set, the wellhead installed, and the drilling rig removed and demobilized to Norman Wells.

Drawings of the completion assembly and wellhead are located in the appendices.

Bluefish Formation

A Diagnostic Fracture Integrity Test (DFIT) was attempted on the Bluefish Zone by injecting 5 m3 of frac oil at 1 m3/min. The formation broke down at 36 MPa; after shut down, the instantaneous shut in pressure was 20 MPa, equivalent to a fracture gradient of 17.8 kPa/m. During the more than fourteen hours of shut-in, the fracture did not close; therefore no estimates of other reservoir properties could be made from the DFIT.

The well was fracture stimulated with 28 tonnes of 30/50 sand in 83m3 of frac oil (gelled with Baker Super Rheo-Gel 6). The fluid was energized with 100-120scm/m3 of nitrogen. Break down pressure was 38.9MPa, rate averaged 3.5 m3/minute (combined) at 31MPa. The instantaneous shut pressure was 29 MPa; this corresponds to a fracture gradient of 21.5 kPa/m (with some uncertainty due to the nitrogen in the displacement).

The well was opened immediately at controlled rates to close the fracture, and then shut in to allow time for the gel to break. Flow back recovered 42m3 of frac oil (25%) in 11 hours. When the well ceased to flow, the zone was suspended with a wireline set plug.

Canol Formation

Due to time constraints, it was decided to fracture all three Canol zones sequentially using the ball-drop system and then evaluate them comingled, rather than evaluate them separately. Consideration was given to using a tracer system to estimate flow from each section, but the tracer materials proposed by the supplier did not meet MGM's expectations regarding toxicity and none were run.

A Diagnostic Fracture Injection Test (DFIT) was conducted on the Lower Canol - Zone 1(1882 - 1884 mKB) by injecting 6.4 m3 of frac oil at 1 m3/min. The formation broke down at 27 MPa; after shut down, the instantaneous shut in pressure was 17.6 MPa, equivalent to a fracture gradient of 17.6 kPa/m. After five hours the pressure recording was compromised and no further analysis could be undertaken.

Zone 1 was fracture stimulated with 23 tonnes of 30/50 sand in 107 m3 of frac oil gelled with Baker Super Rheo-Gel 6 and nitrified at 77 scm/m3 ; after seating the ball at 21.5 MPa and breaking down the formation at 29.3 MPa, rate averaged 3.5 m3/minute combined at 25.6 MPa. The instantaneous shut pressure was 21.3 MPa. Zone 2 was fracture stimulated with 35 tonnes of 30/50 sand in 148 m3 of frac oil gelled with Baker Super Rheo-Gel 6 and nitrified at 77 scm/m3 ; after seating the ball at 37.3 MPa and breaking down the formation at 26.3 MPa, rate averaged 3.5 m3/minute combined at 25.1 MPa. The instantaneous shut pressure was 21.8 MPa. Zone 3 was fracture stimulated with 25 tonnes of 30/50 sand in 92 m3 of frac oil gelled with Baker Super Rheo-Gel 6 and nitrified at 75 scm/m3 ; after seating the ball at 38.3 MPa and breaking down the formation at 29.6 MPa, rate averaged 3.5 m3/minute combined at 24.6 MPa. The instantaneous shut in pressure was 21.3 MPa. See below for details of planned and matched geometry.

Created fracture geometry using the GOHFER™ three dimensional fracture model:

					Planned			History Matched		
Zone	Sand (tonnes)	Frac oil (m3)	Break down (kPa)	Ave. (kPa)	Height (m)	Propp'd Height (m)	Propp'd Length (m)	Height (m)	Propp'd Height (m)	Propp'd Length (m)
Upper Canol	25	92	29.6	24.6	20	20	245	20	18	221
Middle Canol	35	148	26.3	25.1	40	28	245	36	28	313
Lower Canol	23	107	29.3	25.6	38	27	185	36	28	163
Bluefish	28	83	38.9	33.1	24	15	219	24	15	223

The Canol formation was shut in for three hours for formation stress relief and to allow the gel to break. The well was opened and 219 m3 of fluid, mostly fracturing oil, flowed back in 36 hours. Since the fracturing balls were not recovered, flow back was stopped and coiled tubing rigged up. The three fracturing balls and seats were milled out, then the mill pulled and removed; during the milling process fluid gain was 6 m3. To initiate flow again, the coiled tubing with a jetting nozzle was run in and the well lifted intermittently with nitrogen. The use of nitrogen to lift unfortunately masks the production of burnable gas from the well. The nitrogen dilutes methane to the extent that it will not burn. The fluid often slugged and inflow was not continuous which is another disadvantage. During the nitrogen lifting from March 10th to 14th an additional 66 m3 was recovered. Later production showed colour and odor indicative of mixing with formation derived crude oil. The fracturing oil is clear and almost odorless. A total of 291 m3 of liquid was recovered in 9 days before the well was shut-in due to seasonal constraints. From March 10 to March 14 a total of 22m3 of fluid was recovered with N2 lift.

The Appendices contain the Post Fracture Stimulation Reports, the MSDS Sheets of the chemicals used, and a summary extracted from the Tester's Notes for both the Canol and Bluefish formations.

Fluid and Gas

Fluids and gas samples recovered during the completion and testing of the East MacKay I-78 well underwent standard compositional analysis. These results are found in the appendices.

Production Logging

A production logging suite measuring formation gamma rays, tubing collars, flow with spinner, temperature, fluid density, and pressure was run on coiled tubing, in memory mode. This prevented real-time viewing of the results, but was required to permit the nitrogen lifting of fluids. Two downward passes were made without lifting across the Canol zones. The well was then gas lifted until fluids were recovered at surface; lifting was stopped and two downward passes were made to determine inflow. Finally a single downward pass from above the zones while lifting with nitrogen was made. Due to the limited flow rate, interpretation was difficult. The analysis estimated that 1% of the flow came from the Lower Canol, 78% from the Middle Canol, and 21% from the Upper Canol. The production log is included in the Appendices.

Pressure Buildup

The well was shut in at noon on March 15th. Recorders were run and set just above the Upper Canol frac port. The well was suspended by running a wireline plug above the gauge hanger and pressure tested with oil. A back pressure valve was also run. All equipment was demobilized prior to spring breakup.

The recorders were recovered in September 2013 using a helicopter transported slickline unit. After a shut-in period of 188 days, the pressure was recorded as 13,638kPa.

The static gradient and build up reports are included in the Appendices.

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Seismic Event Monitoring

Condition 6 of the Operations Authorization for this project required MGM Energy to report any suspected seismic event while conduction work of activities. In addition it required immediate notification of any disruption or safety shutdown resulting from a suspected seismic event.

No such event we observed or suspected during drilling, hydraulic fracturing or production testing.

To obtain background data on seismic activity, MGM monitored the Earthquakes Canada "Yukon and Northwest Territories" database from Natural Resources Canada for the first quarter of 2013 (the operations period for the project). There was only one seismic event in the Northwest Territories in that period that was strong enough to be "felt" at surface. That event occurred February 2, 2013 and was located approximately 177km east of Norman Wells, at a depth of 10,000 meters. This was also the closest event to the wellsite detected during the entire project period. The timing and location of this event, the only one that was felt in the NWT during the project, indicate clearly that it was not in any way connected with MGM's operations.

Reports extracted from the Earthquakes Canada "Yukon and Northwest Territories" database from Natural Resources Canada for the first quarter of 2013 showing all seismic events of a magnitude 0.9 or greater is included in the Appendices.

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Suspension and Reclamation

After recovery of the recorders, the well was not abandoned and was suspended with a tubing plug set at in the 93.7mm R nipple at 1813mKB and an FMC back pressure valve installed in the dognut. The recorders that were recovered in September 2013 were rerun and are located in the 93.7mm R nipple at 1833mKB. The wing valves on the well head were removed to facilitate installation of the wireline unit and these were not replaced. The well is secured on surface with double master valves and all openings sealed with bullplugs. Note: Tapped plugs and 12mm needle valves were installed to permit the monitoring and, if needed, release of trapped pressure.

The tubing is full of frac oil and the annulus is full of 3% KCl water with a frac oil cap to prevent freeze-back.

During the summer inspection, two bags of liner and miscellaneous debris were removed from the drilling location. There was no sign of rutting or erosion of the access road, as far as could be determined from the air. The staging area was also inspected and two areas of oil stain were noted. No spills had been reported in these areas and it is suspected that this may have been drips from equipment parked during the fall shutdown. The contaminated areas were dug out and hauled to landfill for disposal. The disturbed areas were re-graded. Remaining sections of the liner from the fuel storage berm were removed. All debris and garbage was shipped to landfill in the south.

In addition to the I-78 well, there are three water wells. MGM's license requires additional testing on these wells. Once these obligations are complete these wells may be left for monitoring the ground water condition or may be plugged and abandoned.

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Cuttings and Drilling Fluid Disposal

The total drilling fluid volume was minimized as much as compatible with drilling efficiency and safety. Additional dry (sacked) barite was provided on location (rather than pre-mixed) in case it became necessary to increase mud weight during drilling operations. This minimized the volume for disposal. No highly bentonitic formations were encountered, the selected drilling fluid (amine/polymer) was sufficiently inhibitive, and the dual centrifuges worked well when required, so little dilution was required, limiting the fluid for disposal.

MGM elected not to use as sump for disposal of drill cuttings, spent drilling mud and cement. Upon completion of the surface hole section, the water was stripped from spent drilling mud and reused, along with the treated cement drillout water as make-up fluid for the main hole drilling fluids. Due to the three fold cost differential for disposal of water vs. drilling mud, as much water as possible was stripped from the drilling fluid before disposal and trucked separately to a southern disposal location. The cuttings and centrifuge underflow were mixed with sawdust in a steel shale bin prior to transport. During freezing, the cuttings and sawdust mixture was repeatedly stirred and broken up to retain a granular consistency, rather than allowed to become a frozen block. This worked well and material was easily loaded and emptied from the end-dump trailers that were used to transport material to disposal.

On the previous Windy Island J-39 location, the mixing process was done on an ice pad. Due to concerns about cuttings residue inhibiting the regrowth of vegetation on the J-39 site (subsequently shown to be unfounded in the following summer), all mixing took place inside steel shale bins.

Liquid cement returns were placed in a surplus steel tank and allowed to harden. The entire tank and its contents were trucked to the Pembina Area Landfill, operated by Secure Energy.

In the long term, local disposal solutions for drilled solids (cuttings) and stripped water need to be found. Filtrate from the J-39 well was analyzed after the fact for possible land spreading on future operations (e.g. to build ice roads). While it was chemically acceptable for this purpose, the Desco dispersant used to thin the mud prior to cementing coloured the drilling fluid filtrate (water) orange. While this does not violate any of the disposal criteria, it is likely that this would be an aesthetically unacceptable solution. In future a colourless thinner should be considered for stripping water for land spreading

Drill Waste volume calculations

Surface Hole			
Diameter:	311mm	Depth: 17-405m	Volume (gauge hole): 30m3
			Volume (caliper): 35m3
Main Hole			
Diameter:	222mm	Depth: 405-1820m	Volume (gauge hole): 55m3
			Volume (assumed): 60m3
	216mm	Depth: 1820-2001m	Volume (gauge hole): 7m3
			Volume (caliper): 7m3

Cuttings Volume
Estimated rock volume drilled (assuming gauge hole per calipered sections) was 92m3 or 250 tonnes
Actual drilled solids (cuttings plus sawdust, associated drilling fluid, and stripped mud solids) hauled to Tervita's Rainbow lake Class II landfill was 525 tonnes

Mud volume
Total mud volume at casing point was 40m3 - all liquid was stripped & reused
At TD total mud volume (in hole & active system) was 107m3
A total of 250m3 of stripped drilling fluids, cement drillout water, etc. was hauled to Tervita's disposal facility at Silverberry

Incidents (Spills, Near Misses, and Accidents)

A more detailed analysis is contained in the 2013 Environmental Summary Reports submitted to the NEB under separate cover. The following provides a brief summary of the 2012/13 season.

- There were three regulatory reportable spills during the course of the project. All of these were camp effluent and involved mechanical failure and/or freezing of the collection and treatment system. All material was picked up from the ice surface and disposed of. No impact was noted when the lease was inspected this summer.
- There were no reportable spills of fuel, or drilling or produced fluids.
- There were a total of 44 small spills (average volume of 11 liters) during the operation. The majority of these involved small glycol or hydraulic leaks from mobile equipment or waste water from the camp system.
- A summer inspection was made of the lease and staging area. No further issues were noted on the lease, but there were two locations on the staging area where the gravel was discolored and a hydrocarbon odour was noted. These two locations do not correspond to any recorded spill (reportable or not) and is it surmised that some oil may have seeped out of equipment while it was parked during the pre-season shutdown and then been covered with snow prior to the return of the crews. These have been excavated and the contaminated material hauled to a landfill.
- There was one incident of property damage. An electrical failure in a sewage lift station or sewer line heat tracing started a fire in the ABS sewer line. The fire travelled back along the line and into a wellsite trailer. The smoke alarm sounded and the occupant of the trailer extinguished the fire with a handheld extinguisher. The remaining heat tracing and lift stations were inspected and no sign of similar problems was detected. The connection between the sewer lines and all units on the location were modified to include a fire break in case of a reoccurrence.
- There was one reportable injury, where the camp cook cut her finger while preparing food in the kitchen.
- There were no vehicle accidents, medical aid incidents, or lost time accidents.
- On November 24, 2012, during construction operations a worker was medevac'd due to a non-work related illness. As there were no roads in place, transport was done by 212 helicopter.

Appendices

MGM – Shell East MacKay I-78 Well History Report

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Appendix A01 Stick Diagram (as built)

Drilling Curve

Final Downhole Configuration (completion diagram)

Original Wellhead

Wellhead – as Suspended

Wellhead Photo

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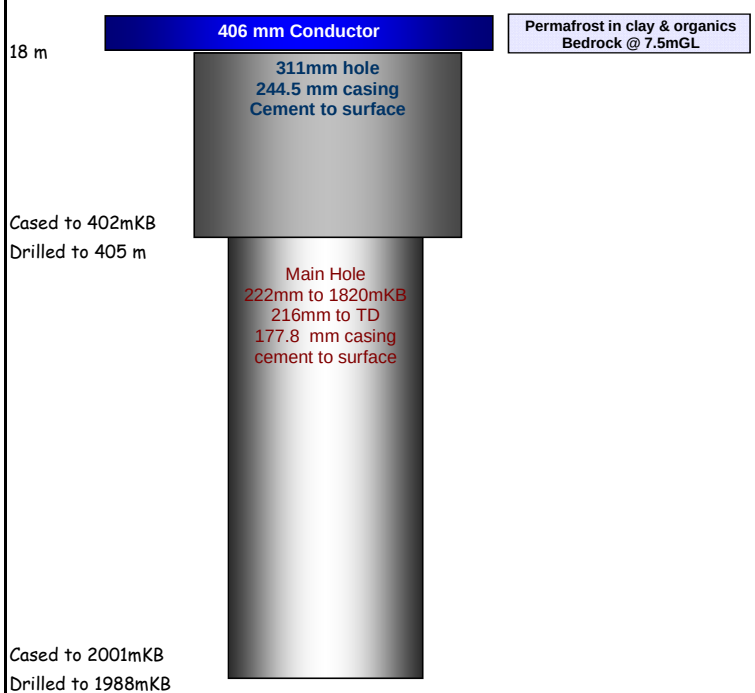
MGM-Shell East MacKay I-78

Exploration - Oil

"As Built"- Nov 2013

Elevations / Depths / Rig details

Rig = Akita 37		Rated depth	3200m	Drawworks	TSM 7000	Winter loads	29 +	Pump 1	National 9P-100	Shakers	2 - Swaco Mongoose
Ground Level	155.1m	KB to Ground	6.4m (inc ice)	KB Elev.	161.5 m	Mud Tank Volume	125m3	Pump 2	National 9P-100	Top Drive	250 Ton



Working Interest & Project Details

MGM Energy Corporation	100%	UTM NAD 27 Zone 10	N: 7188196.19	E: 370694.01	Licence No:
Exploration Licence	466	UTM NAD 83 Zone 10	N:7188403.92	E: 370615.72	AFE: 12D0006

Formation Tops

	MD (m) KB	SS (m)
Cretaceous:		
Little Bear upr unit	764	-603
Little Bear mid u/c	887	-726
Little Bear lwr unit	1,161	-1,000
Slater River	1,188	-1,027
Slater River Shale	1,409	-1,248
Arctic Red upper unit	1,434	-1,273
Devonian:		162
Imperial Lower unit	1,482	-1,321
Top Canyon ss	1,700	-1,539
Base Canyon ss	1,731	-1,570
*** Canol Upr**	**1,820**	-1,659
*** Canol Mid**	**1,855**	-1,694
*** Canol Lower**	**1,860**	-1,699
Hare Indian	**1,918**	-1,757
Bluefish	**1,937**	-1,776
Hume Upr	1,957	-1,796

Note: Core interval
1820-1874mKB
1938-1960mKB
Formation permeability to low to determine definative pressure during drilling

TD	**2,001**	-1,840

*** Primary Target**

Casing Program

	Surface	Production	Test String
Hole Size	311.2 mm	222 mm	
Hole Depth MD	405 mTVD	2001 mMD	1962m
Casing Size	244.5 mm	177.8 mm	114.3 mm
Drift	222.25 mm	156.2 mm	96.4 mm
Casing Weight	59.5kg/m	38.7kg/m	20.09kg/m
Casing Grade	L-80	L-80	P110
Coupling	TB- coupled	TB- coupled	LTC
Make up Torque	21,500 N-m	12,200 N-m	4960 N-m
Burst Pressure	39,600kPa	49,900kPa	85,500kpa
Collapse Pressure	21,300kPa	37,300 kPa	73.700kpa
Joint Strength	410,000dN	270,000daN	150,000daN

Logs

Surface: Run 1-1: G/ R - Dual Density – Neutron - Induction (HDIL-SP) - Sonic (multi-pole)

Main Hole:
Run 2-1 : G/ R - Dual Density – Neutron - Induction (HDIL-SP) - Sonic (multi-pole)
Run 2-2: Spectral Gamma Ray - Induction (HDIL-SP) - Sonic (multi-pole)
Run 2-3 Spectral Gamma Ray - Image Log (STAR/CBIL)
Run 2-4 Spectral Gamma Ray - FLEX – MREX (Formation Lithology and NMR)
Run 3-1 GR-CBL-VDL (178mm cased hole, TBD)
Standard auxiliary curves (caliper, gamma ray, and temperature) were recorded as well.

Cores / DST's

Cores	Core #1-3 (1820-1874m) conventional (216mm x 89mm)
	Core #4 (1938-1960m) conventional (216mm x 89mm)
DST	None Planned

Drilling Fluids

Section	Interval	Mud System	Density	Funnel Vis	YP	Temperature
Surface	0-405m	Fresh H2o Gel-chem	1050-1155kg/m3	34-61 sec	4-15	25.5 deg. C
Main Hole	405-2001m	Fresh H2O Polymer Amine	1025-1080kg/m3	38-56 sec	4-14	59 deg. C

Cement

Surface	Cement	Density	Additives		Excess
0-405m	RFC lite	1740 kg/m3	2% CaCl2	19.7 tonnes	Caliper + 30%

Production	Cement	Density	Additives		Excess
0-1480m Lead	Hilite 1400	1400 kg/m3	3.0% Extender .2% Anti-foam .5% Retarder	22.5 tonnes	Caliper +30%
1480-2001m Tail	Class G	1990 kg/m3	0.3% FL, 0.5% Dispers 0.2% Anti Foam, 0.3% Retard	19.5 tonnes	

Additional Information

Max H2S = 0.00%
BH Temp 59deg. C

Summary:

Set & cmemented 406mm (16") conductor@ 18m - cemented with 7 tonnes permafrost cement. (permafrost 5mGL to 7.5mGL?
Install 540mm 14000kPa diverter. Drill 311mm sfc. Hole to 405m. Run electric logs.
Run 244.5mm csg. & cmt. full length. Install 279 mmx 35mpa Bops. Drill out & run LOT.
The main hole was drilled to 1820KB, 216mm cores cut, drilled 216mm to TD. Logged, cased and cemented full length.
A Fresh water based mud system will be used on surface and main hole. Amine inhibitor on main hole
Permafrost cement was used in the conductor section to ensure protection of the possible permafrost zone.
Mud Logging: A mud logging unit with chromatograph and H2S detecter was used on surface and main hole to TD. No H2S was detected.

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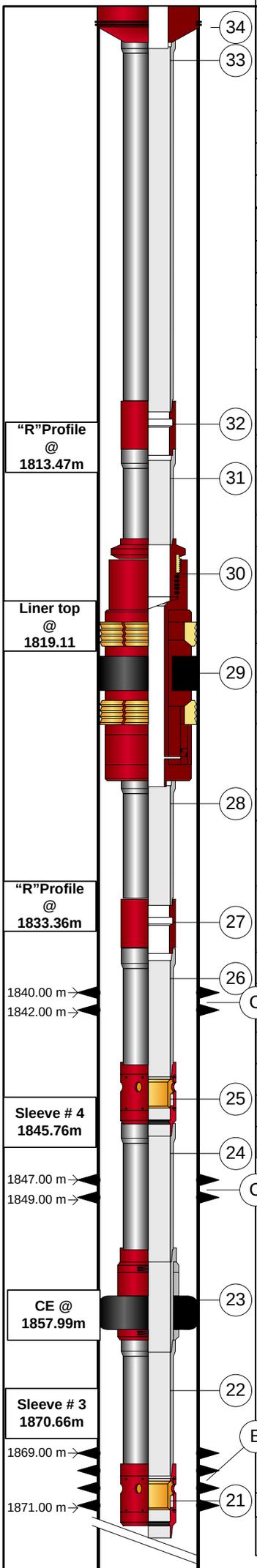
MGM East MACKAY I-78

Final Well Completion

Company	Shell / MGM			**Reference**	ZS12852.JG Rev4
Prepared for	Clint Muray	**Phone**	(403)-648-0847	**Location**	I-78
Prepared by	Jamie Godlonton	**Sales Rep**	Jamie G		
Service Centre	Grande Prairie 1-888-844-0301	**Drawn by**	QuintenJohnson	**Date**	3/1/2013
				Page	1

TUBULAR	Size (mm)	Weight (kg/m)	Grade	Thread	Notes
Casing	177.8	38.69	L-80	LT&C	1978
Liner	114.3/88.9	20.09/13.84	P-110/L-80	LT&C/EUE	1962.30
Frac String	114.3	20.09	P-110	LT&C	1818.80

ITEM	DESCRIPTION	I.D. (mm)	O.D. (mm)	Length (m)
B. C.	Lower Canol Casing Perforations 1869m-1871m Upper Canol Casing Perforations 1847m-1849m 1840m-1842m			
21.	114.3mm Weatherford ZS-XL ZoneSelect Ball Actuated Frac Sleeve #3 c/w **83.31mm Ball Seat ID and Requires a 85.85mm Ball**	98.43	139.7	1.23
22.	114.3mm, 20.09kg/m P-110 LT&C Liner Casing #4	99.57	127.0	12.10
23.	114.3mm Weatherford “ARES™” Hydraulic Set Open/Cased Hole Packer c/w 20.09kg/m P-110 Mandrel and 1.51m Handling Pup 69MPa Rated.	99.57	147.32	3.57
24.	114.3mm, 20.09kg/m P-110 LT&C Liner Casing (2 x3.07, 1.86m)	99.57	127.0	8.0
25.	114.3mm Weatherford ZS-XL ZoneSelect Ball Actuated Frac Sleeve #4 c/w **86.49mm Ball Seat ID and Requires a 89.03mm Ball**	98.43	139.7	1.23
26.	114.3mm, 20.09kg/m P-110 LT&C Liner Casing #5	99.57	127.0	12.00
27.	114.3mm Genuine Otis “R” Landing Nipple c/w 93.68mm Profile **HARD KOTE** – LT&C Box x Pin Connections – **Gauges to be Hung off Lock after Frac**	93.68	127.0	0.40
28.	114.3mm, 20.09kg/m P-110 LT&C Liner Casing Joint #6	99.57	127.0	12.09
29.	177.8mm x 114.3mm Weatherford “UltraPak HU” Upper Bore Hydraulic Set Double Grip Liner Top Packer c/w 120.65mm Upper Bore. P-110 Material – 69 MPa Rated. 114.3mm LT&C Pin Down	98.43	149.23	2.16
30.	Weatherford “LSA” Latch Seal Assembly c/w 120.65mm Seal OD and 99.57mm Min ID. 4 Bonded HNBR Seals. Right Hand Release 114.3mm LT&C Box Up Connection	99.57	146.05	2.17
31.	114.3mm, 20.09kg/m P-110 LT&C Liner Pup Joint (3.07m)	99.57	127.0	3.07
32.	114.3mm Genuine Otis “R” Landing Nipple c/w 93.68mm Profile **HARD KOTE** – LT&C Box x Pin Connections	93.68	127.0	0.40
33.	114.3mm, 20.09kg/m P-110 LT&C Liner Casing Joints 7-156	99.57	127.0	1808.49
34.	Tubing hanger			0.20
	15,000 daN Compression			-0.53
	KB- CHF			5.31



NOTES

Frac string landed in 15,000 daN of compression (0.53m)
Well circulated to 795 kg/m frac oil below line hanger and inside of liner to surface
1050 kg/m brine water in the annular of the tie back string.
Liner packed off to 22,000 kPa.
Annular pressure tested to 21,000 kPa.
Toe Sleeve to open @ 24,800 kPa.

Zone #1 displacement – 15.15 m3
Zone #2 displacement - 14.66 m3
Zone #3 displacement - 14.56 m3
Zone #4 displacement - 14.37 m3

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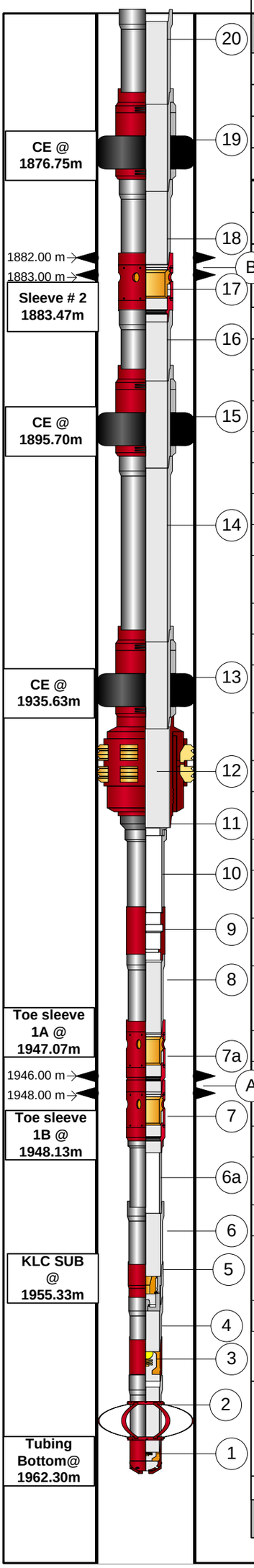
MGM East MACKAY I-78

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Service Centre	Grande Prairie 1-888-844-0301	Drawn by	QuintenJohnson	Date	3/1/2013
				Page	2

TUBULAR	Size (mm)	Weight (kg/m)	Grade	Thread	Notes
Casing	177.8	38.69	L-80	LT&C	1978.50
Liner	114.3/88.9	20.09/13.84	P-110/L-80	LT&C/EUE	±1950
Frac String	114.3	20.09	P-110	LT&C	±1790

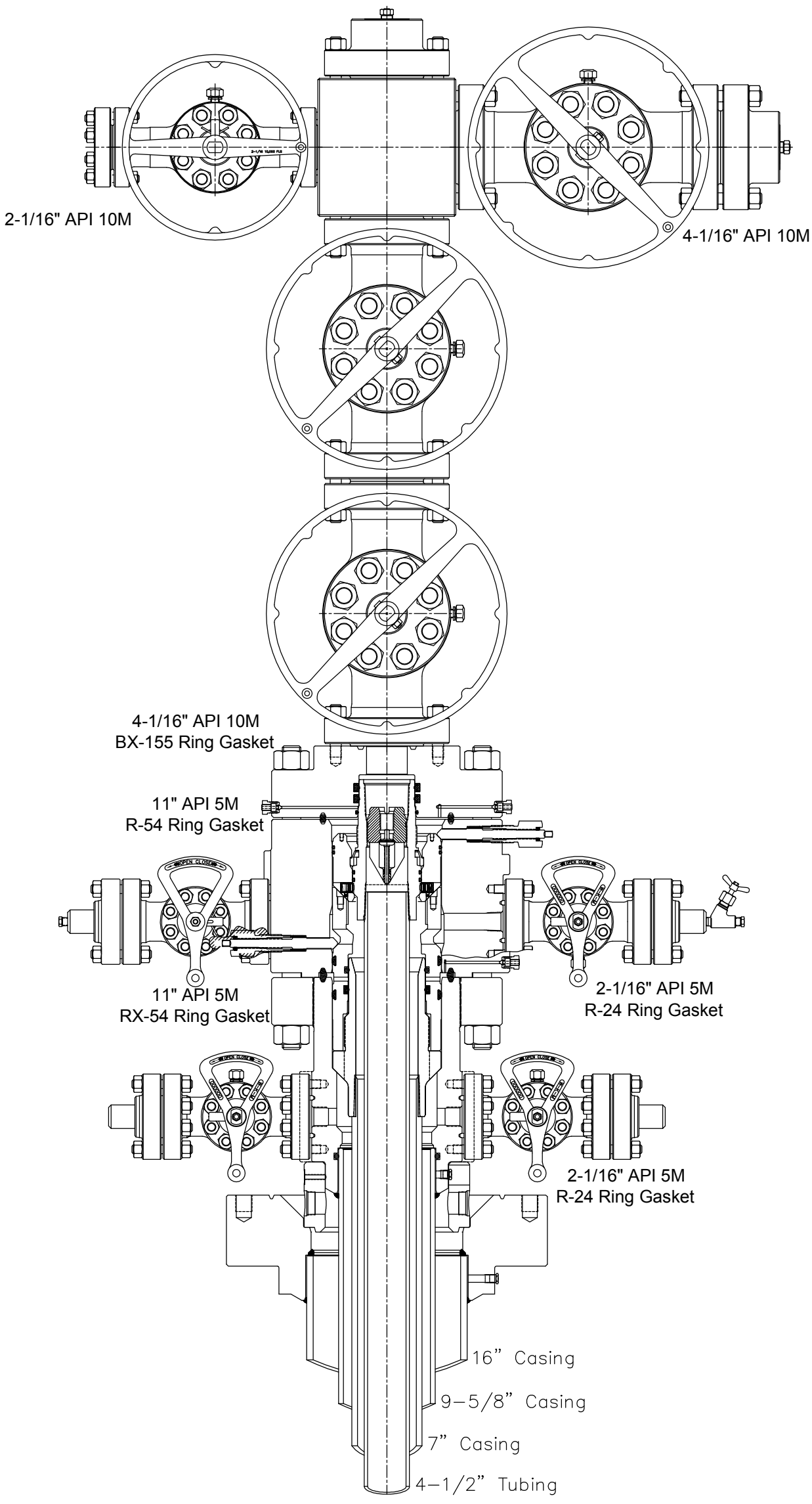
ITEM	DESCRIPTION	I.D. (mm)	O.D. (mm)	Length (m)
A.	Proposed Blue Fish Casing Perforations 1946m-1948m			
B.	Proposed Lower Canol Casing Perforations 1882m-1883m			
1.	88.9mm EUE Weatherford Single Valve Float Shoe (L-80 Material)		114.3	0.34
2.	88.9mm L-80 EUE Pup Joint	76.0	114.3	3.05
3.	88.9mm EUE Weatherford Single Valve Float Collar (L-80 Material)		114.3	0.25
4.	88.9mm L-80 EUE Pup Joint	76.0	114.3	3.05
5.	88.9mm Weatherford “KLC” Locking Landing Collar – 69MPa Rated L-80 EUE Box x Pin c/w 20.65mm Stainless Steel Ball	0.68	114.7	0.24
6.	88.9mm L-80 EUE Pup Joint	76.0	114.3	3.07
6a.	88.9mm L-80 EUE Pup Joint	76.0	114.3	3.07
7.	88.9mm Weatherford “ZTA” 1A Hydraulic Actuated Toe Sleeve c/w 24.8Mpa Differential Opening Pressure (10 Pins)	59.69	114.3	1.06
7a.	88.9mm Weatherford “ZTA” 1B Hydraulic Actuated Toe Sleeve c/w 24.8Mpa Differential Opening Pressure (10 Pins)	59.69	114.3	1.06
8.	88.9mm L-80 EUE Pup Joint	76.0	114.3	3.07
9.	88.9mm Genuine Otis “RN” Landing Nipple c/w 65.07mm Profile and 59.16mm No/Go - **HARD KOTE.** **Gauges to be Hung off Lock**	59.16	114.3	0.53
10.	88.9mm L-80 EUE Pup Joint c/w Bow Spring Centralizer	76.0	114.3	3.07
11.	88.9mm EUE Pin x 114.3mm LT&C Box Crossover Sub **(Supplied by Weatherford)**	76.0	127.0	0.27
12.	114.3mm x 177.8mm Weatherford “Atlas” Anchor Assembly c/w 16.1MPa Activation Pressure (6 Pins)	76.0	146.05	3.87
13.	114.3mm Weatherford “ARES™” Hydraulic Set Open/Cased Hole Packer c/w 20.09kg/m P-110 Mandrel and 1.57m Handling Pup 69MPa Rated. 14.0MPa Activation Pressure	99.57	147.32	3.63
14.	114.3mm, 20.09kg/m P-110 LT&C Liner Casing Joints 1-3	99.57	127.0	36.29
15.	114.3mm Weatherford “ARES™” Hydraulic Set Open/Cased Hole Packer c/w 20.09kg/m P-110 Mandrel and 1.58m Handling Pup 69MPa Rated.	99.57	147.32	3.64
16.	114.3mm, 20.09kg/m P-110 LT&C Liner Casing (2 x3.07m, 1.87m)	99.57	127.0	8.0
17.	114.3mm Weatherford ZS-XL ZoneSelect Ball Actuated Frac Sleeve #2 c/w **80.14mm Ball Seat ID and Requires a 82.68mm Ball**	98.43	139.7	1.23
18.	114.3mm, 20.09kg/m P-110 LT&C Liner Casing (2x 3.07m)	99.57	127.0	6.14
19.	114.3mm Weatherford “ARES™” Hydraulic Set Open/Cased Hole Packer c/w 20.09kg/m P-110 Mandrel and 1.52m Handling Pup 69MPa Rated.	99.57	147.32	3.58
20.	114.3mm, 20.09kg/m P-110 LT&C Liner Casing (1.86m)	99.57	127.0	1.86



NOTES

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powerDRAW.net



REV
01

NOTE:

THIS IS A PROPOSAL DRAWING AND DIMENSIONS SHOWN ARE SUBJECT TO CHANGE DURING THE FINAL DESIGN PROCESS.

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DO NOT SCALE

DRAWN BY	KEN REED	DATE	2013FEB07
CHECKED	T. TAYLOR	DATE	2013FEB07
APPROVED		DATE	

INITIAL USE B/M

ZONE:

SHEET 1 OF 1

SD–045856–11–01

CAMERON

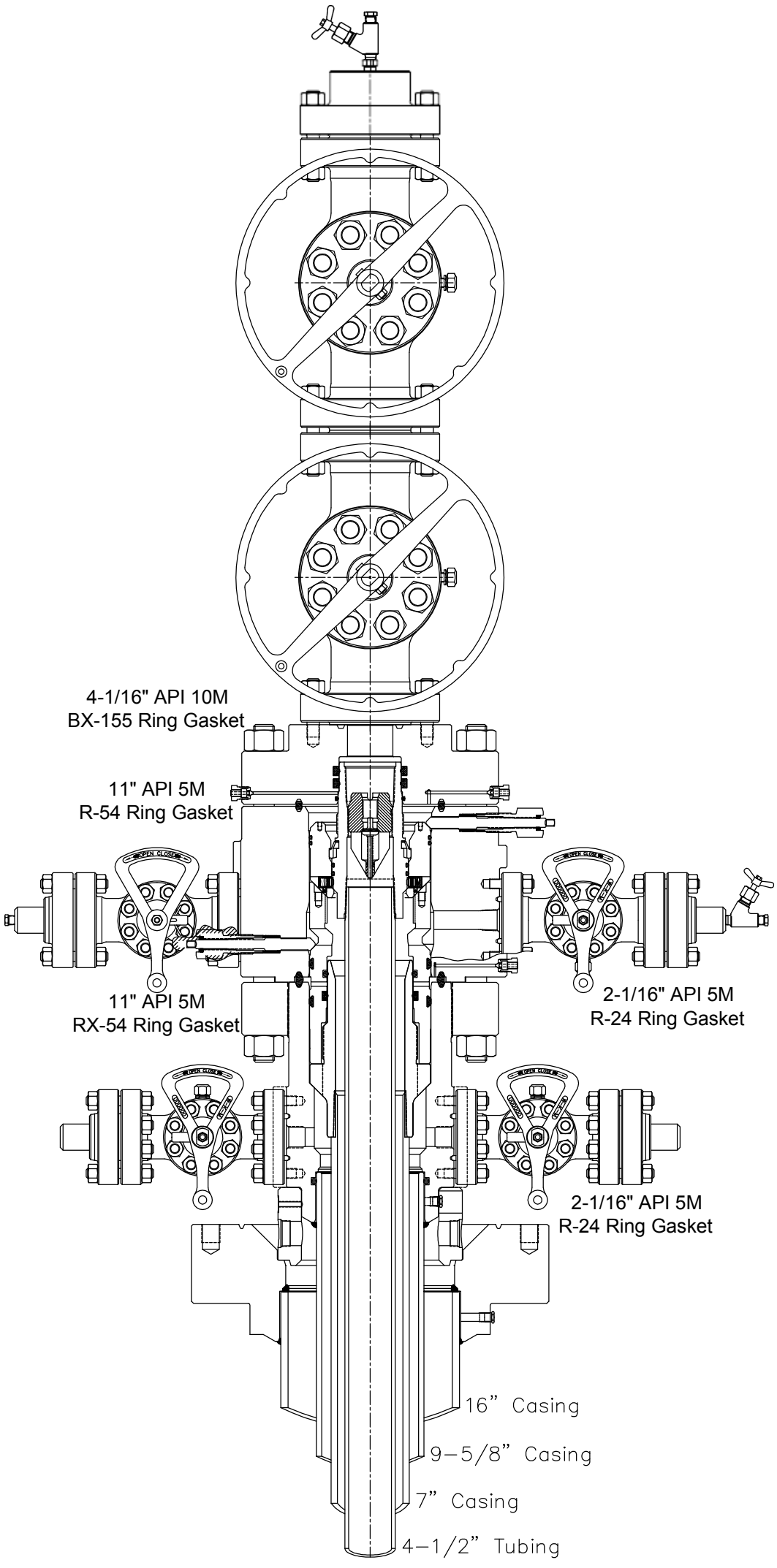
Cameron International
Surface Systems, DPS
PO Box 1212
Houston, TX 77251–1212

PROPOSAL DRAWING

MGM ENERGY CORP

11" 5K 'MBS' WELLHEAD FRAC SYSTEM

CASING PROGRAM: 16" X 9–5/8 X 7" X 4–1/2""



01
REV

NOTE:
THIS IS A PROPOSAL DRAWING AND DIMENSIONS SHOWN ARE SUBJECT TO CHANGE DURING THE FINAL DESIGN PROCESS.

Updated to indicate removal of wing valves
D Heenan - 20131114

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DRAWN BY	KEN REED	DATE	2013FEB07
CHECKED	T. TAYLOR	DATE	2013FEB07
APPROVED		DATE	

INITIAL USE B/M

ZID:

CAMERON
Cameron International
Surface Systems, DPS
PO Box 1212
Houston, TX 77251–1212

PROPOSAL DRAWING

MGM ENERGY CORP

11" 5K 'MBS' WELLHEAD FRAC SYSTEM

CASING PROGRAM: 16" X 9–5/8 X 7" X 4–1/2""

SHEET 1 OF 1

SD–045856–11–01

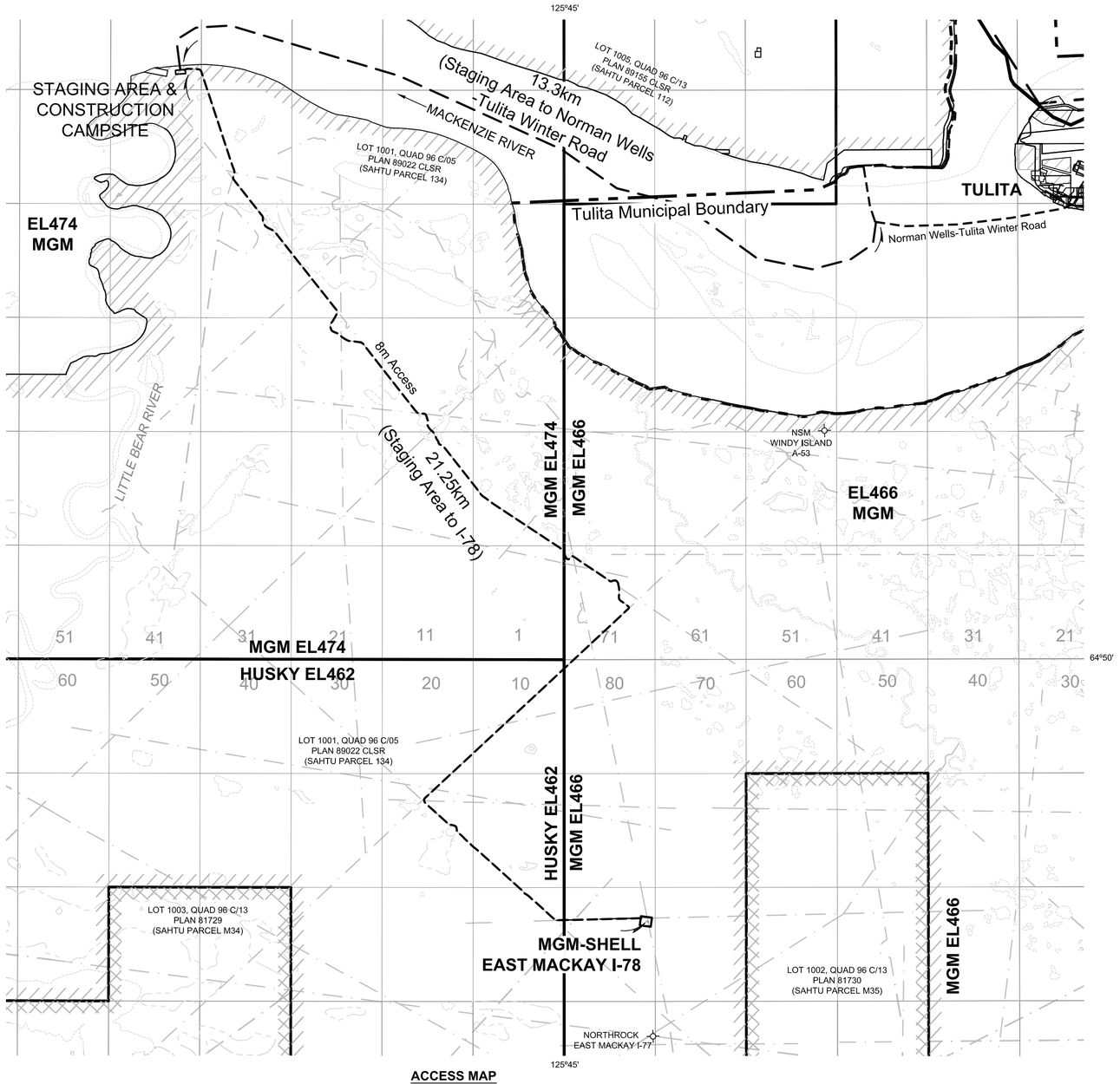

EAST MACKAY I 78
N 64 47 421
E 125 43 191
403
781-7809

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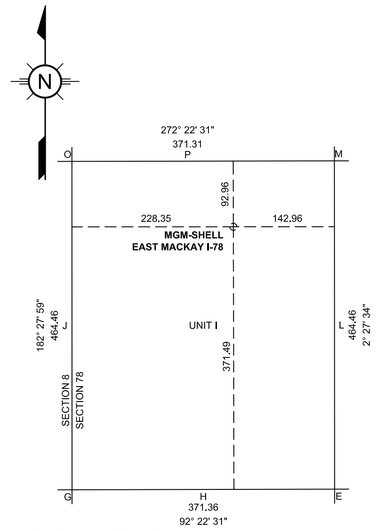
Appendix A02 Survey Plat

Final Plan (as submitted to Canada Land Surveys)

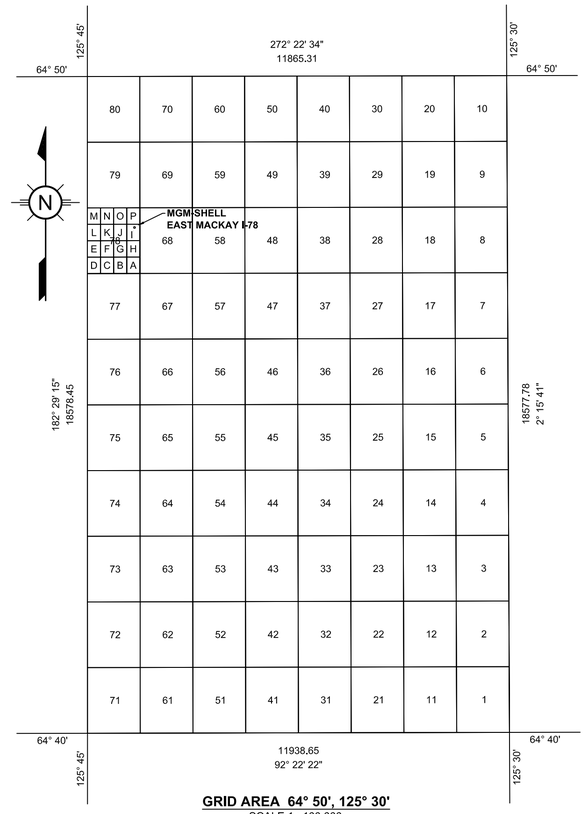
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ACCESS MAP
SCALE 1 : 50 000

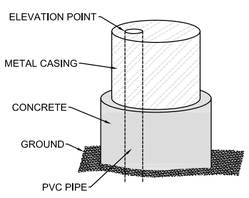


SURFACE UNIT DETAIL
SCALE 1 : 5000

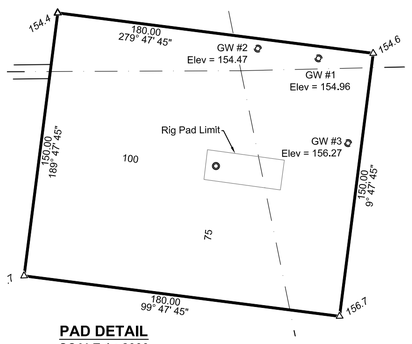


GRID AREA 64° 50', 125° 30'
SCALE 1 : 100 000

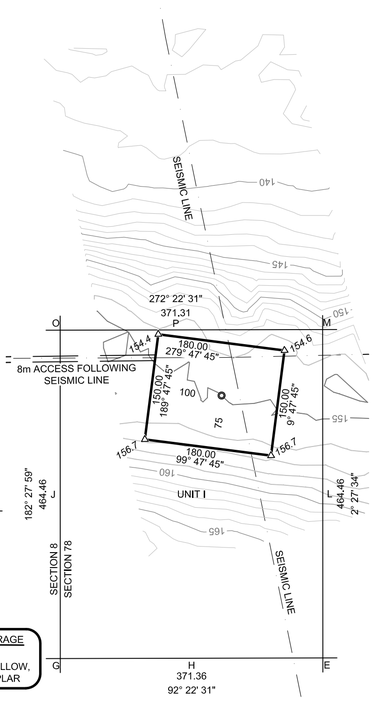
NOTES:	NO	YES
-The proposed well is at least 300m from any privately owned land or structures.	☐	☒
-The proposed well is at least 100m from the ordinary high water mark of a permanent water body.	☐	☒
-The proposed well and related areas are 100m from an archaeological/historical/traditional land use site.	☐	☒



GROUND WATER WELL DIAGRAM
NOT TO SCALE



PAD DETAIL
SCALE 1 : 2000



WELLSITE DETAIL
SCALE 1 : 5000

WELLSITE COVERAGE
OLD BURN
SCRUB SPRUCE, WILLOW, TAMARACK & POPLAR

REVISION NOTES:			
No.	DATE	DESCRIPTION	By
4	2013-03-26	AS-BUILT OF WELLSITE	MB
3	2013-02-06	ADDED MONITORING WELLS, PAD & FLANGE ELEVATIONS	MB
2	2012-10-25	UPDATED WELL NAME	MB
1	2012-10-16	ADDED UTM ZONE 9 COORDINATES FOR WELL CENTRE	MB
0	2012-09-17	PLAN ISSUED	MB

Sahtu Geomatics Ltd.

CHALLENGER GEOMATICS LTD

EDMONTON	(780) 424-5511
CALGARY	(403) 253-8101
FORT MCMURRAY	(780) 743-8697
WHITEHORSE	(867) 668-6940

MGM ENERGY CORP.

AS-BUILT WELLSITE PLAN (MARCH 2013)
OF
MGM-SHELL EAST MACKAY I-78
IN UNIT I, SECTION 78
GRID AREA 64°50', 125°30'
EXPLORATION LICENCE 466

SAHTU SETTLEMENT AREA, TULITA DISTRICT
2012 NORTHWEST TERRITORIES RON ROBINSON C.L.S.

AREAS
WELL SITE = 2.70 ha.

ELEVATIONS
ORIGINAL GROUND AT WELL LOCATION =155.1m
PAD ELEVATION =155.92m
AT TOP OF FLANGE =155.9m

SURVEY DATES
AUGUST 18-19, 2012 & FEBRUARY 2-3, 2013

UTM CO-ORDINATES
AT WELL CENTRE

NAD 27 (UTM Zone 10)	NAD 83 (UTM Zone 10)
N. 7188196.19	N. 7188403.92
E. 370694.01	E. 370615.72
NAD 27 (UTM Zone 9)	**NAD 83 (UTM Zone 9)**
N. 7189449.02	N. 7189648.73
E. 655726.91	E. 655635.83

GEOGRAPHIC CO-ORDINATES
AT WELL CENTRE

NAD 27	NAD 83
LAT. : 64°47'42.1" N.	LAT. : 64°47'42.4" N.
LONG. : 125°43'18.3" W.	LONG. : 125°43'24.7" W.

LEGEND
- Lands to be Dealt with outlined thus
- Proposed MGM Access shown thus
- Aboriginal Surface Rights shown thus.
- Aboriginal Sub-Surface Rights shown thus.
- 0.25m spikes placed shown thus
- Ground water monitoring wells are shown thus. GW #3

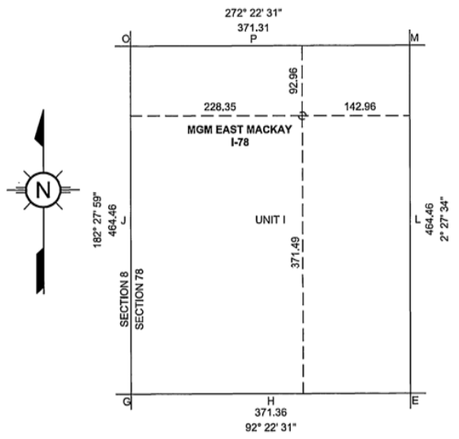
NAD 27 UTM coordinates are converted from surveyed NAD 83 values and are derived from NRCAN Precise Point Positioning (PPP) website.
Elevations are orthometric and were derived using the HTv2.0 geoid model.
Bearings are UTM grid (NAD 27) Zone 10 and are referred through C.M. 123° W.
Distances are in metres and decimals thereof.
Contour interval is 1.0m
Position of foreign wells is based on NEB records.

OPERATOR: MGM ENERGY CORP.

WITNESS

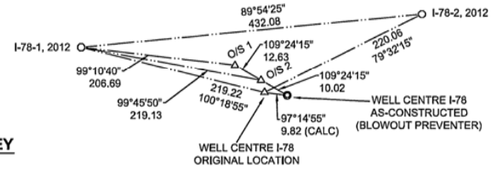
RON ROBINSON
CANADA LANDS SURVEYOR

SCALE:	DRAWN/CHECKED :	DATE :	CALC NO. :
AS SHOWN	MB/IC/RR	2012-09-17	39002
			ACAD NO. : 39002_I-78



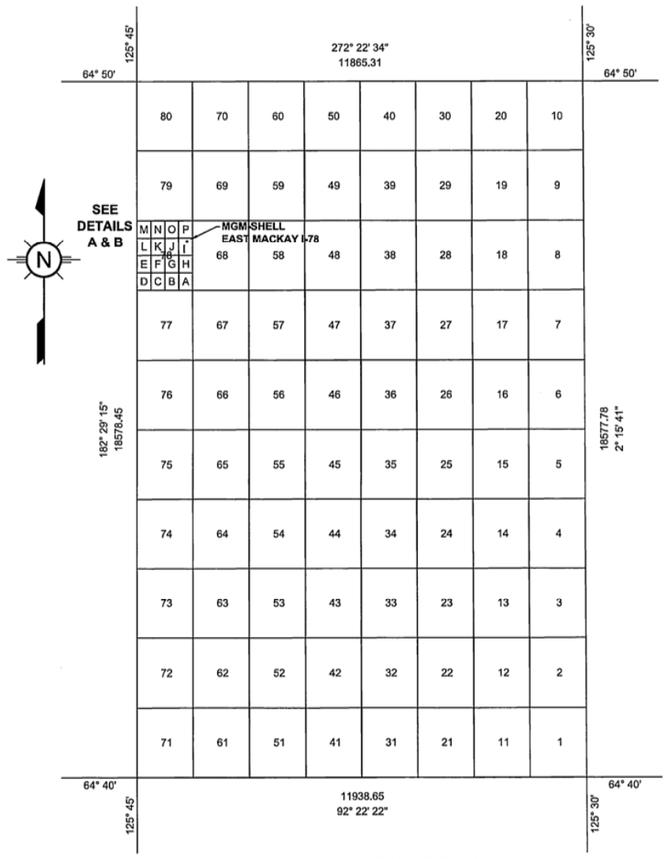
UNIT I, SECTION 78
-Bearing and distances are UTM NAD 27, Zone 10.

DETAIL A: SURFACE UNIT
SCALE 1 : 5000



DETAIL B: G.P.S SURVEY
NOT TO SCALE

-BEARINGS ARE UTM NAD27, ZONE 10.
-DISTANCES ARE REDUCED TO THE HORIZONTAL AT GENERAL GROUND LEVEL.



-Bearing and distances are UTM NAD 27, Zone 10.

GRID AREA 64° 50', 125° 30'
SCALE 1 : 100 000

TABLE OF CO-ORDINATES

STATION	U.T.M. ZONE 10, C.M. 123 (NAD83)		UT.M. ZONE 10, C.M. 123 (NAD27)		GEOGRAPHIC CO-ORDINATES (NAD27)	
	NORTHING	EASTING	NORTHING	EASTING	LATITUDE	LONGITUDE
SURVEYED CO-ORDINATES - Derived Using NRCAN PPP Website						
CLS 77 I-78-1, 2012	7188444.40	370390.35	7188236.68	370468.64		
CLS 77 I-78-2, 2012	7188445.12	370822.33	7188237.38	370900.62		
GRID AREA						
N.E.			7192028.98	381393.42	64°50'	125°30
N.W.			7192520.91	369538.32	64°50'	125°45'
S.E.			7173465.68	380660.37	64°40'	125°30'
S.W.			7173959.97	368731.95	64°40'	125°45'
I-78 N.E.			7188283.14	370840.84	64°47'45.08"	125°43'07.49"
I-78 N.W.			7188298.53	370469.85	64°47'45.07"	125°43'35.62"
I-78 S.E.			7187819.11	370820.91	64°47'30.08"	125°43'07.49"
I-78 S.W.			7187834.50	370449.86	64°47'30.07"	125°43'35.62"
WELL CENTRE						
I-78	7188403.92	370615.72	7188196.19	370694.01	64°47'42.07"	125°43'18.32"

CANADA LANDS SURVEYS RECORDS
101975
Date: June 24 ,2013

PLAN AND FIELD NOTES
OF SURVEY OF

EXPLORATORY WELL

MGM-SHELL EAST MACKAY I-78
IN UNIT I, SECTION 78
GRID AREA 64° 50', 125° 30'

EXPLORATION LICENCE 466

NORTHWEST TERRITORIES
CANADA OIL AND GAS LAND REGULATIONS

100 50 0 100 200 metres
SCALE 1 : 5000

SURVEYED FOR
MGM ENERGY CORPORATION
BY: R. ROBINSON, C.L.S.
2013

-NAD 83 UTM COORDINATES ARE COMPUTED FOR ZONE 10, CENTRAL MERIDIAN 123°W. BEARINGS WERE DERIVED FROM GPS OBSERVATIONS.
-DISTANCES ARE EXPRESSED IN METRES AND DECIMALS THEREOF.
-DISTANCES SHOWN IN G.P.S. TRAVERSE ARE MEASURED DISTANCES REDUCED TO THE HORIZONTAL AT GENERAL GROUND LEVEL UNLESS SHOWN OTHERWISE.
-FOR THE COMPUTATION OF COORDINATES MEASURED DISTANCES HAVE BEEN REDUCED TO THE UTM PLANE BY MULTIPLYING THEM BY AN AVERAGE COMBINED SCALE FACTOR OF 0.999783.
-NAD 83 UTM COORDINATES ARE CONVERTED TO NAD 27 USING NATIONAL TRANSFORMATION VERSION 2.

-DISTANCES SHOWN ON GRID AREA SUBDIVISIONS ARE UTM PLANE.

C.L.S. 77 TYPE MONUMENTS FOUND. ..... ●
C.L.S. 77 TYPE MONUMENTS PLACED. ..... ○
TEMPORARY TRAVERSE POINTS SHOWN THUS (SPIKE 8") ..... △

REFER TO FB_____ CLSR FOR THE SURVEY REPORT PERTAINING TO THIS SURVEY.
FB39825

GROUND ELEVATION AT WELL CENTRE IS **155.1 metres.**
PAD ELEVATION IS **155.9 metres.**
ELEVATION AT TOP OF FLANGE IS **155.9 metres.**

ELEVATIONS WERE DERIVED FROM GPS OBSERVATIONS.

THIS SURVEY WAS EXECUTED DURING THE PERIOD
AUGUST 18th to AUGUST 19th, 2012 & FEBRUARY 2nd to FEBRUARY 3rd, 2013
BY RON ROBINSON, C.L.S.

MGM ENERGY CORPORATION
(SIGNATURE, TITLE) Richard Heenna, Drilling Manager
(SIGNATURE) R. Heenna
WITNESS
2013/06/04
DATE

Certified Correct and completed on the 20th day of February, 2013

RON ROBINSON C.L.S.
April 4th, 2013

Ron Robinson
Comm. No. 1013

CHALLENGER GEOMATICS LTD.
300-6940 FISHER ROAD S.E.
CALGARY, ALBERTA T2H 0W3
PH (403) 253-8101
www.challengergeomatics.com
Email:calgary@chalgeo.com

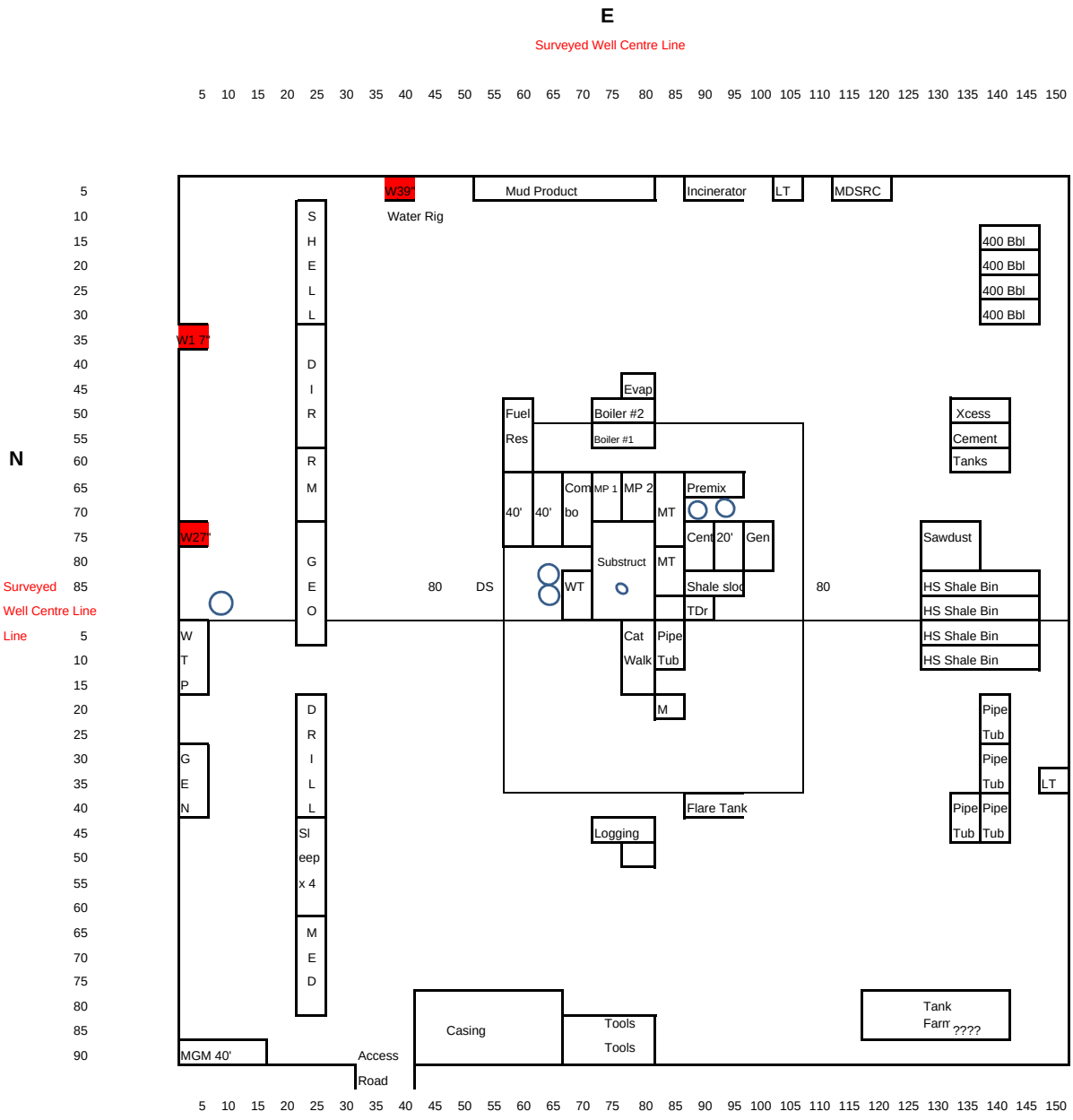
File: _____
Item: 2013-18-007
Examined: _____
Date:
Reviewed: OK, DS
Date: JUNE 21/2013

Appendix A03 Lease layout

MGM - Shell East Mackay I-78 Wellsite Layout

Moved Well Center 7.5m straight east to provide for most level drilling pad area

Location of Water Wells



Appendix A04 Conductor Drilling Report

Conductor Lithology

Cancor Rathole Inc.
Phone: 250-787-5555
Fort St. John, BC

CONDUCTOR REPORT

CUSTOMER: MGM
DATE: JAN. 17/13
L.S.D.: I-78 FAST MAKAY
TIME: 4:00 pm
CONDUCTOR SIZE & LENGTH:
TEMP: -30°C.
IS CONDUCTOR HOLE A NEAT, CLEAN, DRY AND CENTERED HOLE? ☑ YES ☐ NO
IF "NO" EXPLAIN:

CEMENT PROCEDURE DONE:
- ☐ REGULAR CEMENT
- ☑ PRESSURE CEMENT
- ☐ NEW 1800 WEIGHT TOP CEMENT
- ☐ CALCIUM PERCENTAGE _____ %

DONE BY: Schlumberger

CEMENT WEIGHT

1st Mix	2nd Mix	3rd Mix	4th Mix	5th Mix

SOILS REPORT:
0 - 18" ICE
18" - 4' FROZEN MUSKEG
4' - 32' FROZEN CLAY WITH ROCKS
32' - 60' SHALE

24" dia hole
16" .375 wall pipe

NOTES OR RECOMMENDATIONS TO CUSTOMER

CANCOR REP: ADAM SCOBIE
CUSTOMER REP:

CANCOR RATHOLE INC.

Box 6646, Fort St. John, BC V1J 4J1
Ph (250) 787-5555 Fax (250) 787-0553

M6m

AFE STAMP 12D0006

DATE: Jan 10-18/13 JOB NO: 13-55

RIG NO: _____ PO NO: _____

L.S.D.: I-78 East Mckay

OPERATORS: 505 & 611

QUANTITY	PARTICULARS	UNIT PRICE	AMOUNT
18.5m	16" dia .375wall conductor pipe	$280.00/m	$5180.00
18.5m	24" dia conductor hole	$90.00/m	$1665.00
5m	24" dia mouse hole	$90.00/m	$450.00
5m	20' dia Mousehole liner	$230.00/m	$1150.00
5'x6'	cellar crib		$575.00
5'x6'	cellar hole		$650.00
1set	pressureblob, nipples valves	$750.00/set	$750.00
	yard welder - weld conductor to lenght in yard		$500.00
1	LOA - 3men Simpson	$250.00	$750.00
8day	supervisor & pickup 14, 12, 12	$1200.00/day	$9600.00
38hrs	crew travel - 2 men - Jan 10, 12, 13	$100/hr/ea	$3800.00
20	rock tooth	$105.00	$2100.00
	Permits NWT		$1000.00
60hrs	rig time Jan 14 - 18 total 68hrs	$490.00/hr	$29400.00
	Adding Error.		61370.00
			~~62,620.00~~
	SUBTOTAL		
	TOTAL		

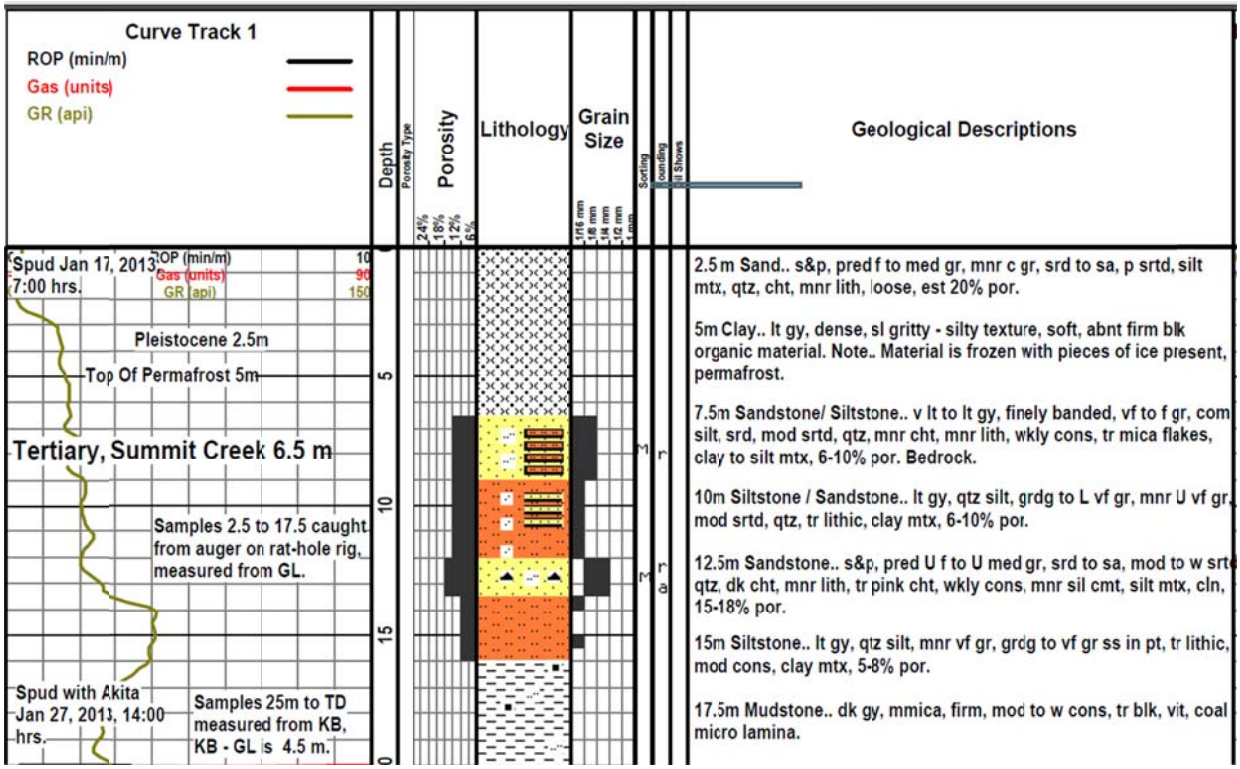
Adam Stubbs
FOREMAN

SIGN _____
APPROVED

20458

PLEASE PRINT _____

MGM – Shell East MacKay I-78
Conductor Hole Lithology



Appendix A05 Bit Record

MGM ENERGY CORP.

BIT RECORD

WELL NAME : MGM-Shell East Mackay I-78

U.W.I. :

Lic.# : 1202-002 **AFE#** 12D0006

Drilling Consultant: Trevor Mitchell / Jason Duckworth

Drilling Rig & Number: Akita 37 **Toolpusher :** Guy Cusitar **Spud:** Jan 27,2013 @ 14:00 **Release:** Feb.25, 2013 @ 16:00

PUMP DATA

	TYPE	LINER (MM)
# 1	9P-100	152
# 2	9P-100	152
# 3		

No.	Size (mm)	Type	Serial #	Jets (mm)	Depth In	Depth Out	Meters Drilled	Bit Hours	Accum Drill Hours	Meters Per Hour	Weight (daN)	RPM	Vert. Dev.	Pump Press.	S.P.M. #1	S.P.M. #2	S.P.M. #3	MUD WT	MUD VIS	MUD WL	DULL CODE Ti	DULL CODE To	DULL CODE MDC	DULL CODE Loc	DULL CODE B	DULL CODE Gage	DULL CODE ODC	Reason Pulled	Bit Cost	Cost Per Meter
1	311	GX--C03	5204676	0open	21	405	384	25.50	25.50	15.06	5	140	1	10000	95	95		1130	60		2	1	WT	A	E	1	NO	TD		
2	222	QD505X	7131618	7 x 9.5	405	1820	1415	50.50	50.50	28.02	12	75	.5	11500	115			1070	47	7.6	2	2	CC	G	X	1	NO	BHA		
3	216	BHC606C	7103687	6 x 7.9	1820	1834	14	6.25	6.25	2.24	4	70	.5	5800	84			1070	46	7.2	1	2	CC	G	X	1	NO	PR		
4	216	GX-20MDX	5202128	3 x 15.9	1834	1834						45	.5	3000	85			1070	46	7.2	1	1	NO	NO	E	1	NO	BHA		
5RR	216	BHC606C	7103687	6 x 7.9	1834	1851.6	17.6	6.25	12.50	2.82	4	70	.5	6800	94			1070	55	6.8	1	2	CC	G	X	1	NO	PR		
6	216	BHC409C	7137198	7 x 11.1	1851.6	1874.24	22.64	5.50	5.50	4.12	4.5	45	.5	6900	95			1075	54	7	1	1	NO	NO	X	1	NO	PR		
7RR	216	GX-20MDX	5202128	3 x 15.9	1874.24	1938	63.76	7.25	7.25	8.50	14	125	.5	7900	120			1075	55	7	1	2	WT	A	E	1	NO	CP		
8RR	216	BHC409C	7137198	7 x 11.1	1938	1960.5	22.5	7.50	13.00	3.00	5	60	.5	7300	120			1075	54	7	1	1	NO	NO	X	1	NO	PR		
9RR	216	GX-20MDX	5202128	3 x 15.9	1960.5	2001	40.5	9.50	22.50	4.26	14	125	.5	7900	120			1075	55	7	1	2	WT	A	E	1	NO	TD		
10	216	GT-1	5196907	3 x 15.9	2001	2001			22.50																					
11RR	216	GT-1	5196907	3 x 15.9	2001	2001			22.50																					
12RR	216	GT-1	5196907	3 x 15.9	2001	2001			22.50																					
13RR	216	GT-1	5196907	3 x 15.9	2001	2001			22.50																					

Appendix A06 Deviation Record

SURVEY REPORT

MGM - SHELL EAST MACKAY I - 78

Data from Wireline Image Log
Note: TruTrak run to 1820mKB

3001786450125300

Total Depth 2001MKB

Measured	Incl		TRUE	DRIFT	DRIFT	COORDINATE		
Depth	Angle	Azimuth	Vertical	Station	Station	Total	Total	DOGLEG
Meters	Deg	Deg	Depth	N-S	E-W	N-S	E-W	SEVERITY
401.0	0.5	207.8	401.0	0.00N	0.00E	0.00N	0.00E	0.0
411.0	0.4	101.3	411.0	0.03S	0.05E	0.03S	0.05E	6.5
421.0	0.3	72.4	421.0	0.01N	0.06E	0.03S	0.10E	1.7
431.0	0.2	80.9	431.0	0.02N	0.03E	0.01S	0.14E	1.5
441.0	0.3	80.6	441.0	0.01N	0.05E	0.00S	0.18E	1.0
451.0	0.2	73.4	451.0	0.01N	0.04E	0.01N	0.22E	0.6
461.0	0.1	82.0	461.0	0.01N	0.02E	0.02N	0.25E	0.9
471.0	0.2	104.7	471.0	0.01S	0.04E	0.01N	0.28E	1.1
481.0	0.2	16.2	481.0	0.01N	0.03E	0.03N	0.31E	3.2
491.0	0.2	1.5	491.0	0.06N	0.00W	0.08N	0.31E	0.6
501.0	0.3	146.1	501.0	0.01S	0.02E	0.08N	0.33E	5.1
511.0	0.1	124.8	511.0	0.05S	0.03E	0.03N	0.36E	2.0
521.0	0.2	330.7	521.0	0.01N	0.01E	0.03N	0.37E	3.1
531.0	0.1	131.5	531.0	0.01N	0.00E	0.04N	0.37E	3.1
541.0	0.3	153.2	541.0	0.03S	0.02E	0.01N	0.39E	1.7
551.0	0.1	120.9	551.0	0.02S	0.01E	0.01S	0.40E	2.2
561.0	0.2	154.7	561.0	0.01S	0.00E	0.02S	0.41E	1.1
571.0	0.2	132.0	571.0	0.03S	0.02E	0.04S	0.42E	0.7
581.0	0.1	71.6	581.0	0.01S	0.02E	0.05S	0.44E	1.7
591.0	0.3	351.0	591.0	0.04N	0.00E	0.01S	0.44E	2.6
601.0	0.1	136.8	601.0	0.00N	0.01E	0.01S	0.45E	3.9
611.0	0.1	127.2	611.0	0.02S	0.02E	0.04S	0.46E	0.3
621.0	0.1	54.2	621.0	0.00S	0.01E	0.04S	0.48E	1.5
631.0	0.1	149.6	631.0	0.01N	0.01E	0.03S	0.49E	1.5
641.0	0.2	171.6	641.0	0.03S	0.01E	0.06S	0.50E	1.2
651.0	0.0	260.4	651.0	0.01S	0.00W	0.07S	0.49E	2.1
661.0	0.1	320.7	661.0	0.02N	0.00W	0.05S	0.49E	0.9
671.0	0.0	218.1	671.0	0.00S	0.01W	0.06S	0.48E	1.2
681.0	0.1	355.4	681.0	0.00N	0.00W	0.05S	0.48E	1.1
691.0	0.2	341.0	691.0	0.03N	0.00E	0.03S	0.48E	1.1
701.0	0.2	222.4	701.0	0.00S	0.02W	0.03S	0.47E	3.0
711.0	0.1	134.2	711.0	0.02S	0.01W	0.05S	0.46E	2.1
721.0	0.1	10.6	721.0	0.01N	0.00W	0.05S	0.46E	1.7
731.0	0.0	220.6	731.0	0.00N	0.01W	0.04S	0.45E	1.5
741.0	0.2	161.2	741.0	0.03S	0.00W	0.07S	0.45E	1.9
751.0	0.0	352.3	751.0	0.01S	0.00E	0.08S	0.45E	2.5

761.0	0.1	293.1	761.0	0.02N	0.01W	0.06S	0.44E	1.2
771.0	0.1	192.4	771.0	0.00S	0.01W	0.06S	0.43E	1.6
781.0	0.1	295.8	781.0	0.00S	0.00W	0.06S	0.43E	1.0
791.0	0.2	298.5	791.0	0.02N	0.02W	0.05S	0.41E	1.3
801.0	0.0	107.3	801.0	0.00N	0.01W	0.04S	0.40E	2.4
811.0	0.1	319.2	811.0	0.01N	0.00E	0.04S	0.41E	1.5
821.0	0.3	276.8	821.0	0.02N	0.03W	0.01S	0.38E	1.9
831.0	0.2	155.6	831.0	0.01S	0.02W	0.03S	0.36E	3.7
841.0	0.3	86.3	841.0	0.01S	0.03E	0.04S	0.40E	2.7
851.0	0.0	127.0	851.0	0.01N	0.03E	0.03S	0.42E	2.5
861.0	0.1	199.3	861.0	0.01S	0.00W	0.04S	0.42E	1.4
871.0	0.2	76.2	871.0	0.01S	0.02E	0.05S	0.44E	3.4
881.0	0.2	21.3	881.0	0.03N	0.04E	0.02S	0.47E	2.1
891.0	0.1	269.5	891.0	0.02N	0.01W	0.00N	0.46E	2.8
901.0	0.1	67.9	901.0	0.00N	0.00E	0.01N	0.46E	1.8
911.0	0.3	36.2	911.0	0.03N	0.03E	0.04N	0.49E	2.4
921.0	0.1	278.0	921.0	0.02N	0.01E	0.06N	0.50E	3.6
931.0	0.1	165.7	931.0	0.03S	0.02W	0.03N	0.49E	2.0
941.0	0.3	48.3	941.0	0.00N	0.02E	0.04N	0.51E	3.6
951.0	0.1	355.5	951.0	0.03N	0.02E	0.06N	0.53E	2.4
961.0	0.0	194.8	961.0	0.00S	0.01W	0.06N	0.52E	1.1
971.0	0.2	56.2	971.0	0.01N	0.01E	0.06N	0.53E	2.3
981.0	0.2	357.9	981.0	0.04N	0.02E	0.10N	0.55E	1.9
991.0	0.3	241.1	991.0	0.00N	0.02W	0.10N	0.53E	4.1
1001.0	0.0	234.9	1001.0	0.03S	0.03W	0.07N	0.50E	2.3
1011.0	0.2	14.5	1011.0	0.01N	0.00E	0.09N	0.51E	2.1
1021.0	0.0	332.6	1021.0	0.02N	0.01E	0.10N	0.51E	1.4
1031.0	0.1	186.4	1031.0	0.01S	0.00W	0.09N	0.51E	1.4
1041.0	0.1	2.8	1041.0	0.00N	0.00E	0.10N	0.51E	1.7
1051.0	0.0	164.4	1051.0	0.02N	0.00E	0.11N	0.51E	0.7
1061.0	0.1	198.9	1061.0	0.00S	0.00E	0.11N	0.52E	1.0
1071.0	0.1	15.5	1071.0	0.00S	0.00E	0.11N	0.52E	1.7
1081.0	0.1	294.7	1081.0	0.02N	0.00W	0.13N	0.52E	0.9
1091.0	0.2	210.6	1091.0	0.01S	0.02W	0.11N	0.50E	2.4
1101.0	0.0	344.8	1101.0	0.01S	0.01W	0.10N	0.49E	2.7
1111.0	0.2	17.0	1111.0	0.03N	0.01E	0.13N	0.50E	1.6
1121.0	0.0	225.4	1121.0	0.01N	0.00E	0.14N	0.50E	2.3
1131.0	0.0	20.3	1131.0	0.01S	0.01W	0.12N	0.50E	0.9
1141.0	0.2	27.5	1141.0	0.02N	0.01E	0.14N	0.50E	1.9
1151.0	0.1	85.9	1151.0	0.03N	0.02E	0.17N	0.52E	2.1
1161.0	0.0	46.8	1161.0	0.01N	0.01E	0.18N	0.53E	0.4
1171.0	0.1	47.0	1171.0	0.01N	0.01E	0.19N	0.54E	0.5
1181.0	0.1	81.0	1181.0	0.00N	0.02E	0.19N	0.55E	0.6
1191.0	0.1	53.0	1191.0	0.01N	0.01E	0.20N	0.57E	0.5
1201.0	0.1	81.3	1201.0	0.01N	0.02E	0.21N	0.58E	0.7
1211.0	0.1	77.1	1211.0	0.01N	0.02E	0.22N	0.61E	0.0

1221.0	0.1	63.8	1221.0	0.01N	0.02E	0.23N	0.63E	0.3
1231.0	0.2	59.2	1231.0	0.01N	0.02E	0.24N	0.65E	0.2
1241.0	0.1	60.6	1241.0	0.01N	0.02E	0.25N	0.67E	0.3
1251.0	0.1	64.9	1251.0	0.01N	0.02E	0.26N	0.70E	0.0
1261.0	0.1	55.5	1261.0	0.01N	0.02E	0.27N	0.72E	0.3
1271.0	0.1	64.6	1271.0	0.01N	0.02E	0.28N	0.74E	0.2
1281.0	0.1	84.6	1281.0	0.01N	0.02E	0.28N	0.76E	0.5
1291.0	0.1	61.8	1291.0	0.01N	0.02E	0.29N	0.78E	0.5
1301.0	0.1	79.4	1301.0	0.01N	0.02E	0.29N	0.80E	0.4
1311.0	0.2	72.3	1311.0	0.01N	0.02E	0.30N	0.82E	0.4
1321.0	0.1	70.3	1321.0	0.01N	0.02E	0.31N	0.84E	0.6
1331.0	0.1	67.6	1331.0	0.01N	0.02E	0.32N	0.86E	0.0
1341.0	0.2	75.8	1341.0	0.01N	0.02E	0.33N	0.89E	0.7
1351.0	0.1	65.5	1351.0	0.01N	0.02E	0.33N	0.91E	0.3
1361.0	0.2	75.5	1361.0	0.01N	0.02E	0.35N	0.93E	0.3
1371.0	0.1	65.9	1371.0	0.01N	0.02E	0.36N	0.96E	0.3
1381.0	0.1	66.1	1381.0	0.01N	0.02E	0.37N	0.98E	0.0
1391.0	0.1	68.2	1391.0	0.01N	0.02E	0.38N	1.01E	0.0
1401.0	0.1	68.9	1401.0	0.01N	0.02E	0.39N	1.03E	0.0
1411.0	0.1	73.4	1411.0	0.01N	0.03E	0.40N	1.06E	0.0
1421.0	0.2	71.0	1421.0	0.01N	0.03E	0.41N	1.09E	0.6
1431.0	0.3	68.8	1431.0	0.01N	0.04E	0.42N	1.12E	0.6
1441.0	0.3	64.2	1441.0	0.02N	0.04E	0.44N	1.17E	0.7
1451.0	0.3	62.0	1451.0	0.02N	0.04E	0.46N	1.21E	0.5
1461.0	0.2	59.8	1461.0	0.02N	0.04E	0.48N	1.26E	0.5
1471.0	0.3	63.3	1471.0	0.02N	0.04E	0.50N	1.29E	0.6
1481.0	0.3	72.2	1481.0	0.02N	0.04E	0.52N	1.33E	0.5
1491.0	0.2	66.7	1491.0	0.02N	0.04E	0.54N	1.37E	0.4
1501.0	0.2	64.6	1501.0	0.02N	0.03E	0.55N	1.41E	0.5
1511.0	0.3	72.7	1511.0	0.01N	0.04E	0.57N	1.45E	0.7
1521.0	0.3	69.4	1521.0	0.02N	0.04E	0.58N	1.49E	0.2
1531.0	0.2	76.5	1531.0	0.02N	0.04E	0.60N	1.52E	0.4
1541.0	0.2	74.2	1541.0	0.01N	0.04E	0.61N	1.56E	0.0
1551.0	0.3	71.4	1551.0	0.02N	0.05E	0.63N	1.61E	0.3
1561.0	0.3	69.9	1561.0	0.02N	0.05E	0.65N	1.66E	0.7
1571.0	0.4	73.6	1571.0	0.02N	0.06E	0.66N	1.72E	0.7
1581.0	0.3	69.7	1581.0	0.02N	0.06E	0.69N	1.77E	0.7
1591.0	0.3	67.6	1591.0	0.02N	0.05E	0.71N	1.83E	0.0
1601.0	0.4	70.5	1601.0	0.02N	0.06E	0.73N	1.88E	0.3
1611.0	0.3	75.8	1611.0	0.02N	0.06E	0.75N	1.94E	0.4
1621.0	0.2	65.7	1621.0	0.02N	0.05E	0.76N	1.99E	1.1
1631.0	0.2	302.2	1631.0	0.02N	0.02E	0.78N	2.01E	3.8
1641.0	0.3	294.3	1641.0	0.02N	0.05W	0.80N	1.96E	0.9
1651.0	0.1	25.7	1651.0	0.02N	0.01W	0.82N	1.95E	3.0
1661.0	0.6	72.4	1661.0	0.02N	0.05E	0.84N	1.99E	5.0
1671.0	0.9	77.2	1671.0	0.03N	0.13E	0.86N	2.12E	3.4

1681.0	1.0	80.5	1681.0	0.03N	0.16E	0.89N	2.29E	1.0
1691.0	0.8	78.3	1691.0	0.03N	0.15E	0.92N	2.44E	1.8
1701.0	0.3	79.3	1701.0	0.02N	0.10E	0.95N	2.54E	4.7
1711.0	0.3	76.1	1711.0	0.01N	0.04E	0.96N	2.58E	0.7
1721.0	0.4	82.3	1721.0	0.01N	0.06E	0.97N	2.64E	1.1
1731.0	0.4	78.3	1731.0	0.01N	0.07E	0.98N	2.71E	0.7
1741.0	0.5	71.3	1741.0	0.02N	0.08E	1.00N	2.79E	0.6
1751.0	0.5	67.4	1751.0	0.03N	0.08E	1.03N	2.87E	0.8
1761.0	0.5	70.2	1761.0	0.03N	0.09E	1.06N	2.96E	0.3
1771.0	0.6	72.0	1771.0	0.03N	0.09E	1.09N	3.05E	0.4
1781.0	0.5	69.0	1781.0	0.03N	0.09E	1.12N	3.14E	0.5
1791.0	0.6	65.9	1791.0	0.03N	0.09E	1.15N	3.23E	0.5
1801.0	0.6	69.6	1801.0	0.04N	0.09E	1.19N	3.32E	0.3
1811.0	0.6	70.6	1810.9	0.03N	0.09E	1.22N	3.41E	0.0
1821.0	0.6	70.7	1820.9	0.03N	0.09E	1.26N	3.50E	0.0
1831.0	0.6	71.3	1830.9	0.03N	0.10E	1.29N	3.60E	0.3
1841.0	0.6	68.1	1840.9	0.04N	0.10E	1.33N	3.70E	0.5
1851.0	0.7	68.7	1850.9	0.04N	0.11E	1.37N	3.80E	0.3
1861.0	0.9	70.7	1860.9	0.05N	0.13E	1.42N	3.93E	2.3
1871.0	1.3	74.5	1870.9	0.06N	0.19E	1.48N	4.12E	4.5
1881.0	1.9	78.2	1880.9	0.07N	0.27E	1.55N	4.39E	5.6
1891.0	2.4	81.0	1890.9	0.07N	0.38E	1.62N	4.76E	5.2
1901.0	2.7	83.3	1900.9	0.06N	0.44E	1.68N	5.20E	3.0
1911.0	3.0	83.9	1910.9	0.05N	0.49E	1.73N	5.70E	3.2
1921.0	3.1	83.3	1920.9	0.06N	0.53E	1.79N	6.23E	1.4
1931.0	2.7	83.1	1930.9	0.06N	0.52E	1.85N	6.75E	4.2
1941.0	2.0	79.9	1940.9	0.06N	0.40E	1.91N	7.15E	7.6

The first point information

400.96 0.5 207.8 400.96 0.00N 0.00E 0.00N 0.00E

The last point information

1940.96 2 79.9 1940.87 0.06N 0.40E 1.91N 7.15E

Final East West Drift = 7.15 E
Final North South Drift = 1.91 N
Final Drift Distance = 7.40 M
Final Drift Direction = N 75.04 E

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Appendix A07 Drilling Fluids Recap

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WELL SUMMARY: MGM - SHELL East Mackay I-78 - Tulita Area

FORMATION	TVD/mMD
LITHOLOGY	
Shale	
Sandstone	
Coal	
Limestone	
Tops from stick diagram provided	
Ground	*155.1*
Estimate KB	*159.6*
East Fork	*0.1*
SURFACE CASING	*400*
Upper Lite Bear	*671*
Mid Little Bear	*811*
Lower Little Bear	*1084*
Slater River	*1114*
Radioactive Shale	*1355*
Upper Arctic Red	*1364*
Lower Imperial	*1412*
Canyon	*1703*
Base Canyon	*1722*
CUT CORES	*1810-1944*
Canol Upper	*1811*
Canol Middle	*1844*
Canol Lower	*1848*
Hare Indian	*1906*
Blue Fish	*1922*
Upper Hume	*1942*
TOTAL DEPTH	*1980*

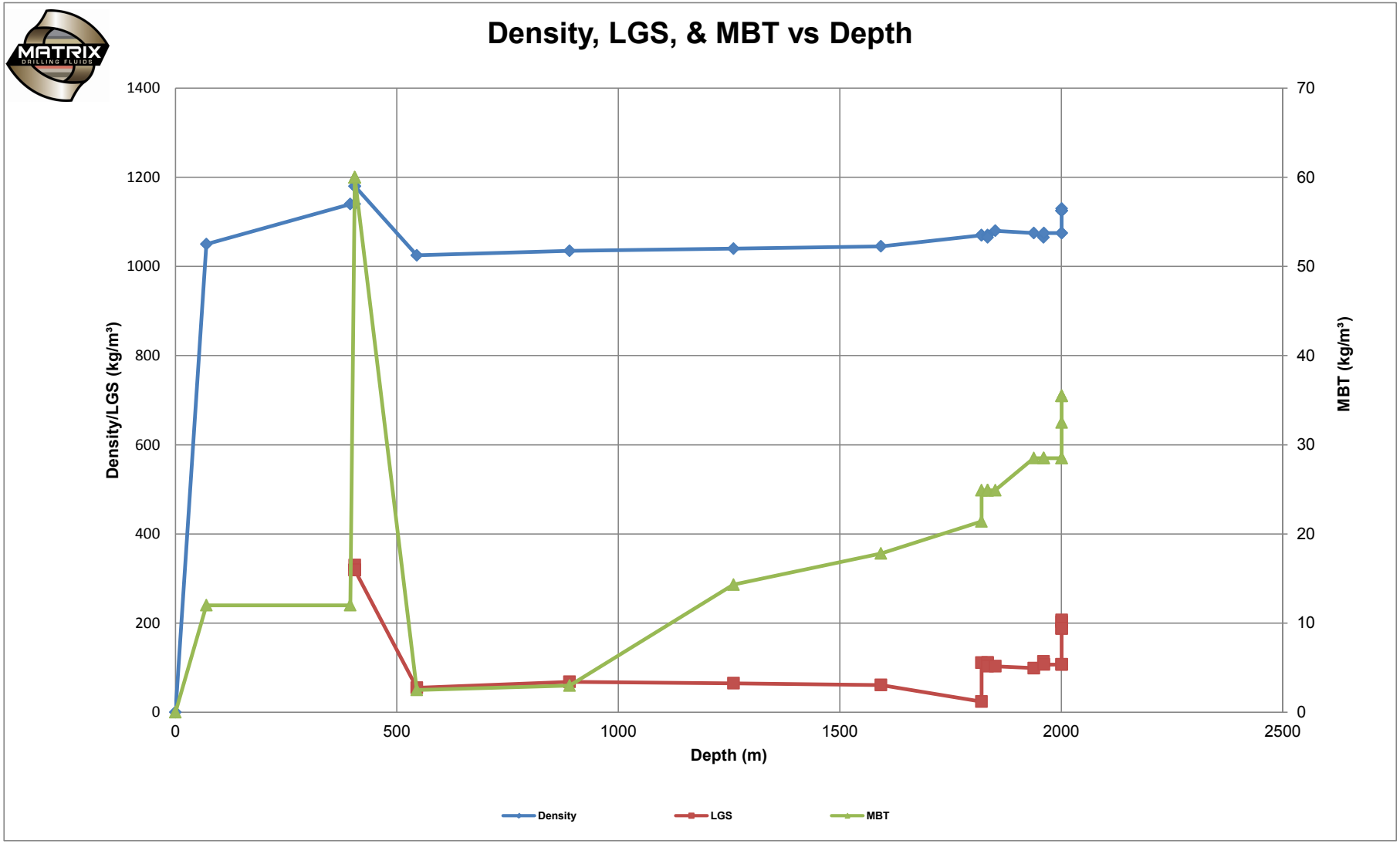
STICK

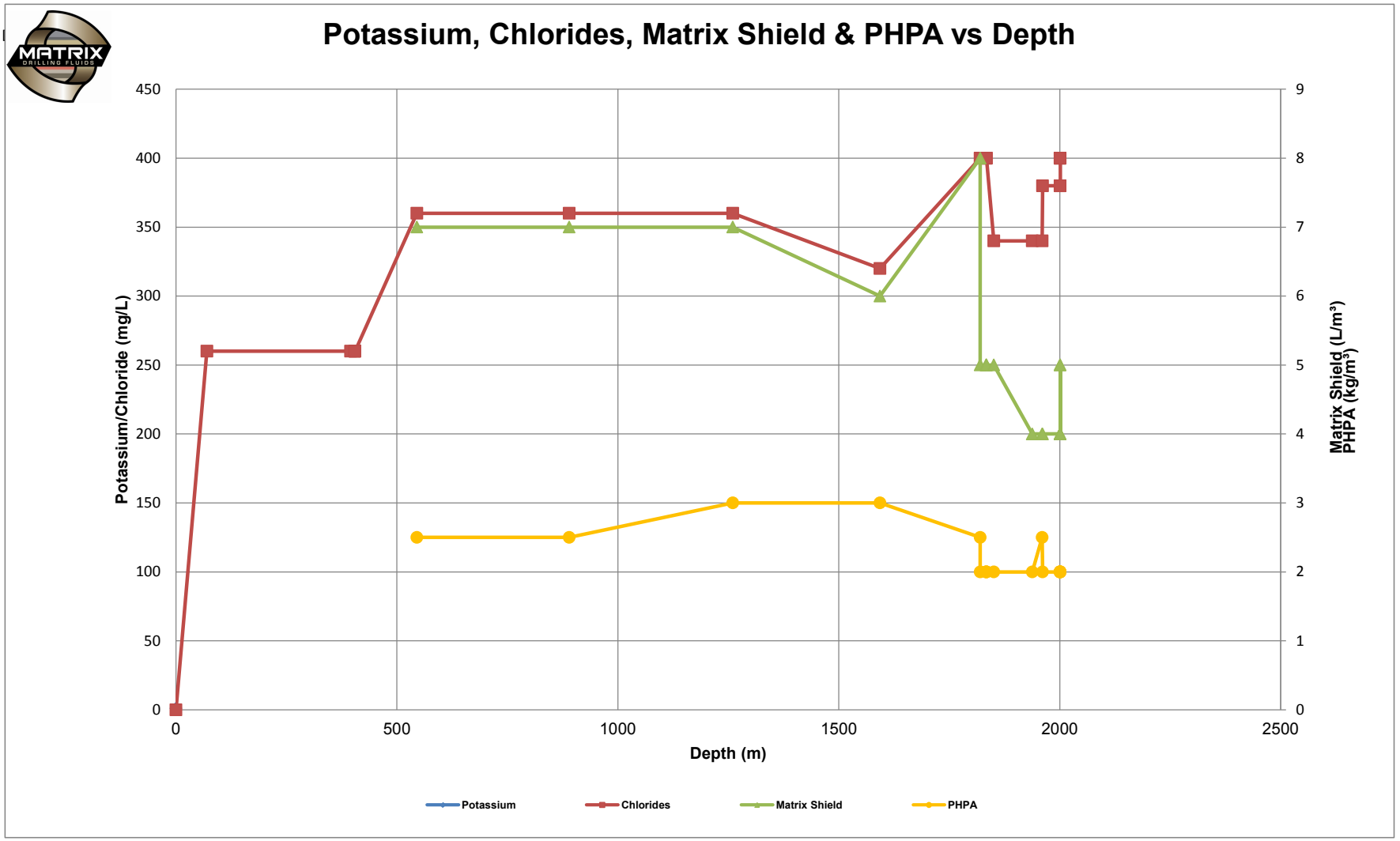
TIME ANALYSIS

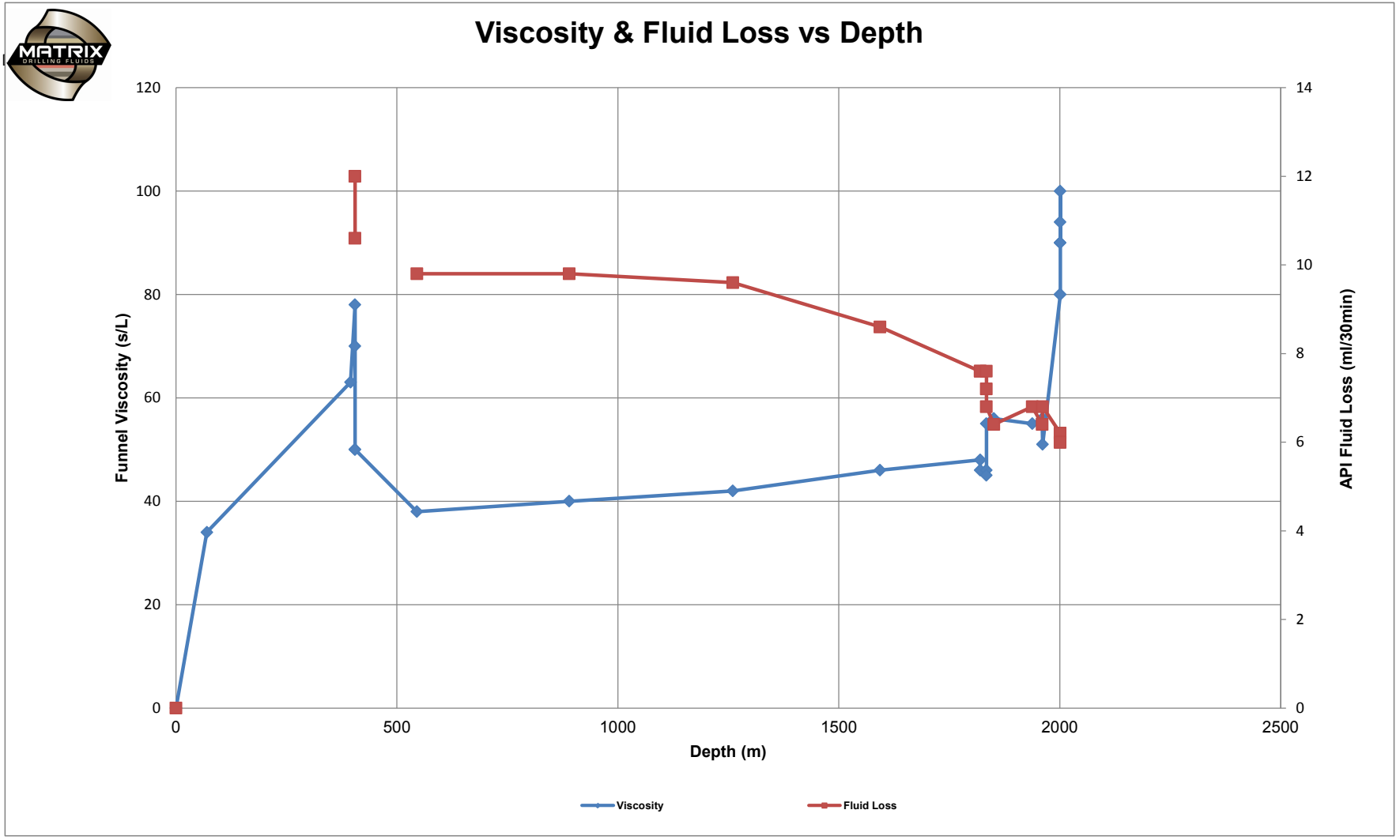
NO PROBLEMS REPORTED
MINOR PROBLEMS REPORTED
MODERATE PROBLEMS REPORTED
SEVERE PROBLEMS REPORTED

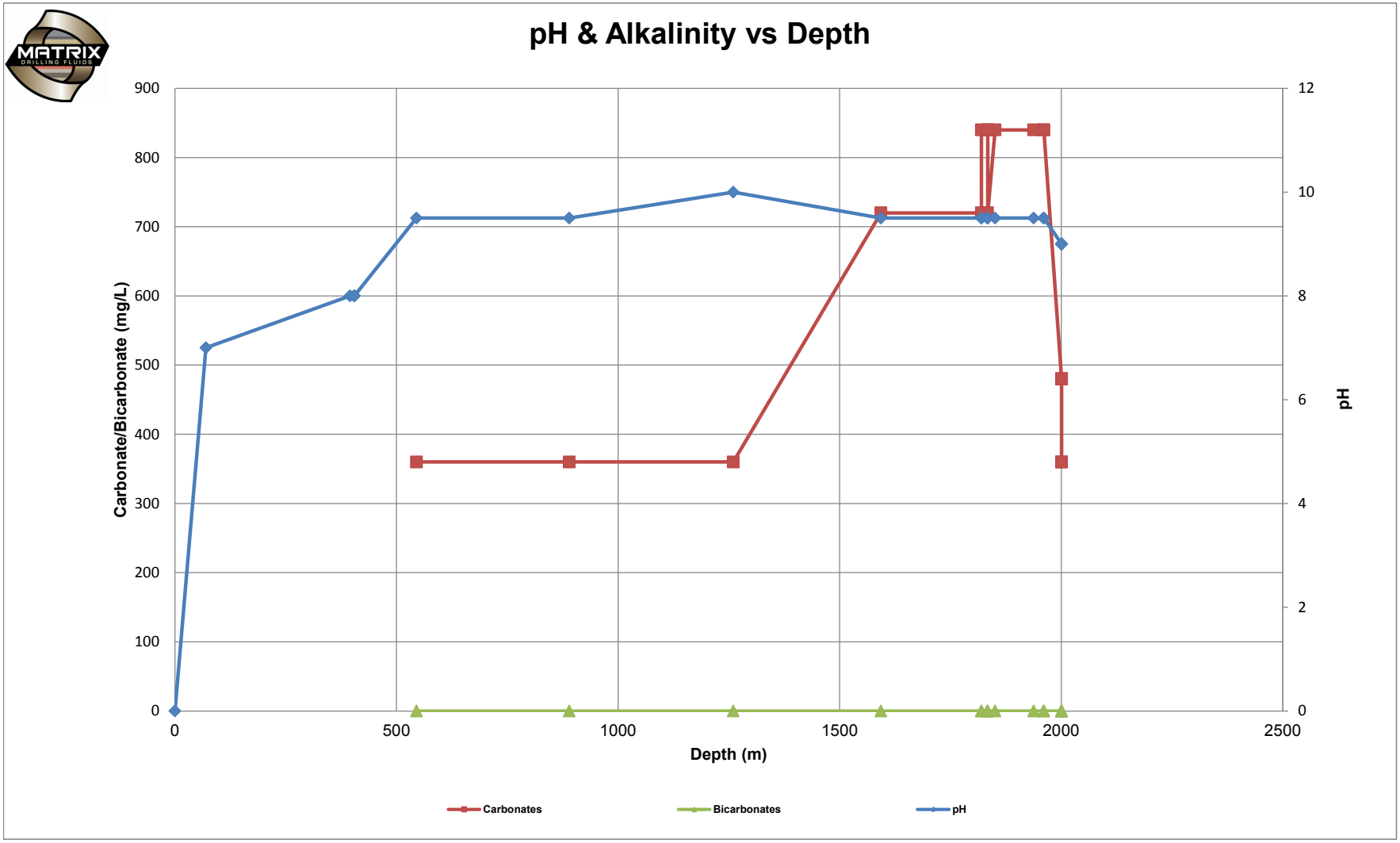
LOSSES	REAMING	CIRC. & COND.	FISHING	TIGHT HOLE

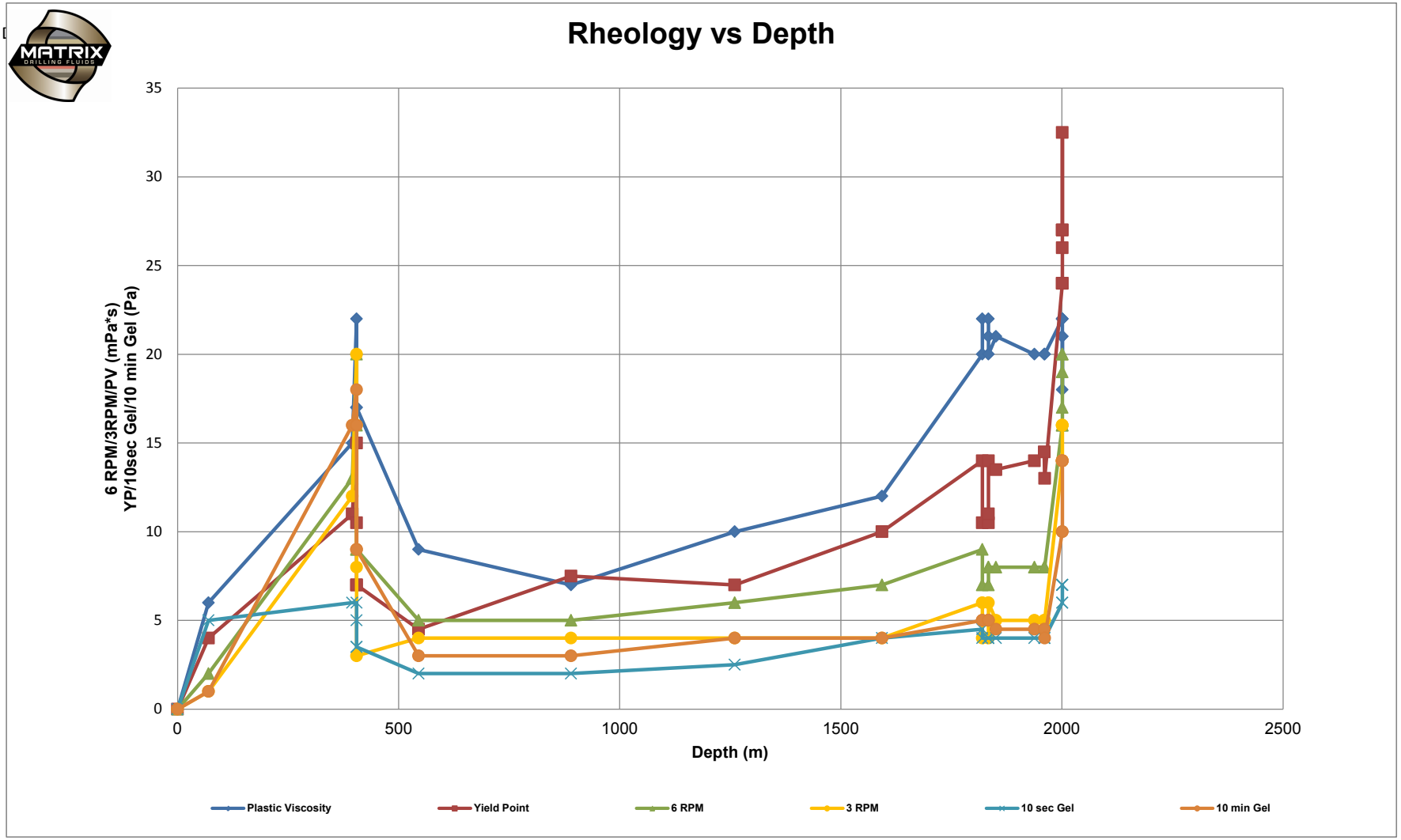
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Density, LGS, & MBT vs Depth
Density/LGS (kg/m³)
MBT (kg/m³)
Depth (m)
0
200
400
600
800
1000
1200
1400
0
10
20
30
40
50
60
70
0
500
1000
1500
2000
2500
Density
LGS
MBT


Potassium, Chlorides, Matrix Shield & PHPA vs Depth
Potassium/Chloride (mg/L)
Matrix Shield (L/m³)
PHPA (kg/m³)
Depth (m)
0
50
100
150
200
250
300
350
400
450
1
2
3
4
5
6
7
8
9
500
1000
1500
2000
2500
Potassium
Chlorides
Matrix Shield
PHPA


Viscosity & Fluid Loss vs Depth
Funnel Viscosity (s/L)
API Fluid Loss (ml/30min)
Depth (m)
0
20
40
60
80
100
120
0
2
4
6
8
10
12
14
0
500
1000
1500
2000
2500
Viscosity
Fluid Loss


pH & Alkalinity vs Depth
Carbonate/Bicarbonate (mg/L)
900
800
700
600
500
400
300
200
100
0
12
10
8
6
4
2
0
pH
0
500
1000
1500
2000
2500
Depth (m)
Carbonates
Bicarbonates
pH


Rheology vs Depth
6 RPM/3RPM/PV (mPa*s)
YP/10sec Gel/10 min Gel (Pa)
35
30
25
20
15
10
5
0
0
500
1000
1500
2000
2500
Depth (m)
Plastic Viscosity
Yield Point
6 RPM
3 RPM
10 sec Gel
10 min Gel

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Appendix A08 Casing & Cementing Reports

MGM ENERGY CORP. SURFACE CASING & CEMENTING REPORT

WELL NAME :	MGM-Shell East Mackay I-78	Hole Size (mm):	311	DATE:	Jan.30, 2013

CASING STRING RUN (BOTTOM TO TOP): **CASING TYPE** (Surf, Int, Prod, Liner, etc.)**:** **SURFACE**

Casing or Equipment Type:	Size (mm)	Weight (kg/m)	Thread	T&C	Grade	Torque (N.m)	Make	# Of Joints	String Length	Interval (mKB) Bottom	Top
Float Shoe	244.5		Tenaris		L-80		Weatherford		0.50	401.79	401.29
Casing	244.5		Tenaris		L-80			1	13.40	401.29	387.89
Float Shoe	244.5		Tenaris		L-80		Weatherford		0.47	387.89	387.42
Casing	244.5		Tenaris		L-80			28	380.31	387.42	7.11
Landing Tool	244.5		Tenaris		L-80		Cameron	1	8.21	7.11	-1.10
										-1.10	-1.10
										-1.10	-1.10
										-1.10	-1.10
										-1.10	-1.10
										-1.10	-1.10
										-1.10	-1.10
							Total No. of Joints:	30	402.89	**Total String Length**	
									401.79	**Depth Landed (mKB)**	
									1.10	**Stick-Up (above KB)**	

Casing Assecories

ITEM	MAKE	#	INSTALLATION DETAILS (DEPTHS, TYPE, ETC.)
Centralizer	Weatherford	10	Joints 1,4,7,10,13,16,19,22,25,28
Stop Collar	Weatherford	10	Middle of each joint above

STAGE 1 PREFLUSH:

#1	FLUID TYPE: Water		VOLUME (m3): 5	DENSITY (kg/m3): 1000	
#2	FLUID TYPE:		VOLUME (m3):	DENSITY (kg/m3):	

STAGE 1 CEMENT: **CEMENT COMPANY:** Schlumberger

	Type (ie. 1:1:2)	Additives	Density (kg/m3)	Mix Water Req'd(m3/t)	Design Interval Bottom	Top	Ann Vol (m3/m) OR Log Vol	Excess (%)	Yeild (m3/t)	Quantity Required Cement m3	Tonne	Mix Water (m3)
Scavngr												
Lead1 (OpnHole)	RFC	2.0% CaCl2, 0.20% Ati-Foam	1740	0.593	23		0.07		0.93	1.63	1.75	1.04
Lead2	RFC	2.0% CaCl2, 0.20% Ati-Foam	1740	0.593	405	23	0.03	50	0.93	16.67	17.93	10.63
Tail												
										18.31	**19.68**	**11.67**

STAGE 1 DISPLACEMENT:

FLUID TYPE:	Water	DENSITY(kg/m3)	1010	CALC VOL (m3):	15.31	ACTUAL VOL (m3):		AVE DISPL RATE (m3/min):	0.8
FLUID TYPE:		DENSITY(kg/m3)		CALC VOL (m3):		ACTUAL VOL (m3):		AVE DISPL RATE (m3/min):	

STAGE 1 RETURNS:

ESTIMATED FLUID RETURNS THROUGHTOUT JOB (%) :	100	CEMENT RETURNS TO SURFACE (m3):	3.5
FLUID LEVEL IN ANNULUS STATIC AT END OF JOB (YES/NO):	Yes	ANNULUS DROPPED (m3):	No

START MIX (time)	MAX PUMPING PRESSURE	5500	(kPa)	TOP PLUG USED?(YES/NO)	Yes	TEMP(C):	
FINISH MIX (time)	PLUG BUMP PRESSURE	8500	(kPa)	BOTTOM PLUG USED?(YES/NO)	No	CEMENT:	
START DISPL (time)	LINES PUMPED OUT?	No		TOP OF MARKER JT AT (mKB)		WATER :	
FINISH DISPL (time)	FLOATS HELD?	Yes		PLUG BACK DEPTH (mKB):	387.42	SLURRY :	
	HOOKLOAD WHILE CEMENTING (daN):		35	SLIPS SET WITH:		daN TENSION	
PIPE MOVEMENT (when, rpm, stroke length, etc.):				CASING CHAINED DOWN (when, etc.):		Yes	

STAGE 1 REMARKS : (re-cement from top, problems, etc.**)**

COMPANY REPRESENTATIVES:	Trevor Mitchell / Jason Duckworth	TOOL PUSH:	Guy Cusitar

MGM ENERGY CORP. PRODUCTION CASING & CEMENTING REPORT

WELL NAME :	MGM-Shell East Mackay I-78	Hole Size (mm):	222/216	DATE:	Feb 21,2013

CASING STRING RUN (BOTTOM TO TOP): **CASING TYPE** (Surf, Int, Prod, Liner, etc.)**:** **PRODUCTION**

Casing or Equipment Type:	Size (mm)	Weight (kg/m)	Thread	T&C	Grade	Torque (N.m)	Make	# Of Joints	String Length	Interval (mKB) Bottom	Top
Shoe	177.8	38.69	TB		L-80	12,200	Weatherford		0.44	1988.25	1987.81
Casing	177.8	38.69	TB		L-80	12,200	Tenaris	1	11.97	1987.81	1975.84
Float collar	177.8	38.69	TB		L-80	12,200	Weatherford		0.34	1975.84	1975.50
Casing	177.8	38.69	TB		L-80	12,200	Tenaris	17	235.89	1975.50	1739.61
Casing	177.8	38.69	TB		L-80	12,200	Tenaris	1	4.04	1739.61	1735.57
Casing	177.8	38.69	TB		L-80	12,200	Tenaris	126	1726.60	1735.57	8.97
MBS Hanger	177.8	38.69	Acme		L-80		Cameron	1	3.28	8.97	5.69
Landing Tool	177.8	38.69	Acme		L-80		Cameron	1	6.69	5.69	-1.00
										-1.00	-1.00
										-1.00	-1.00
										-1.00	-1.00
							Total No. of Joints:	147	1989.25	**Total String Length**	
									1988.25	**Depth Landed (mKB)**	
									1.00	**Stick-Up (above KB)**	

Casing Assecories

ITEM	MAKE	#	INSTALLATION DETAILS (DEPTHS, TYPE, ETC.)
Stop collars	weatherford	10	2,4,6,8,10,12,14
Centralizers	weatherford	50	2 to 14, every 3 to surface

STAGE 1 PREFLUSH:

#1	FLUID TYPE:	H2O	VOLUME (m3):	5	DENSITY (kg/m3):	1000
#2	FLUID TYPE:	Polymer Mud Push	VOLUME (m3):	3.08	DENSITY (kg/m3):	1250

STAGE 1 CEMENT: **CEMENT COMPANY:** Schlumberger

	Type (ie. 1:1:2)	Additives	Density (kg/m3)	Mix Water Req'd(m3/t)	Design Interval Bottom	Top	Ann Vol (m3/m) OR Log Vol	Excess (%)	Yeild (m3/t)	Quantity Required Cement m3	Tonne	Mix Water (m3)
Scavngr												
Lead1 (OpnHole)	HiLite 1400	3.0% Extender, 0.20% Anti-Foam, 0.50% Retarder	1400	0.822	402		5.9000		1.30	5.90	4.54	3.73
Lead2	HiLite 1400	3.0% Extender, 0.20% Anti-Foam, 0.50% Retarder	1400	0.822	1480	402	18.0000	30	1.30	23.40	18.00	14.80
Tail	Class G Cement	0.030% Fluid Loss, 0.50% Dispersant, 0.20% Anti-Foam,	1920	0.434	1990	1480	11.4000	30	0.76	14.82	19.50	8.46
										44.12	**42.04**	**26.99**

STAGE 1 DISPLACEMENT:

FLUID TYPE:	KCL Brine w/ Inhibitor	DENSITY(kg/m3)	1070	CALC VOL (m3):	39.5	ACTUAL VOL (m3):	39.5	AVE DISPL RATE (m3/min):	0.96
FLUID TYPE:		DENSITY(kg/m3)		CALC VOL (m3):		ACTUAL VOL (m3):		AVE DISPL RATE (m3/min):	

STAGE 1 RETURNS:

ESTIMATED FLUID RETURNS THROUGHTOUT JOB (%) :	100	CEMENT RETURNS TO SURFACE (m3):	8
FLUID LEVEL IN ANNULUS STATIC AT END OF JOB (YES/NO):	yes	ANNULUS DROPPED (m3):	no

START MIX (time)	17:28	MAX PUMPING PRESSURE	13500	(kPa)	TOP PLUG USED?(YES/NO)	yes	TEMP(C):		
FINISH MIX (time)	18:54	PLUG BUMP PRESSURE	17500	(kPa)	BOTTOM PLUG USED?(YES/NO)	yes	CEMENT:	20	
START DISPL (time)	19:00	LINES PUMPED OUT?	yes		TOP OF MARKER JT AT (mKB)		WATER :	21	
FINISH DISPL (time)	19:50	FLOATS HELD?	yes		PLUG BACK DEPTH (mKB):	1629.64	SLURRY :		
		HOOKLOAD WHILE CEMENTING (daN):		85	SLIPS SET WITH:		daN TENSION		
PIPE MOVEMENT (when, rpm, stroke length, etc.):		.5m			CASING CHAINED DOWN (when, etc.):				

STAGE 1 REMARKS : (re-cement from top, problems, etc.**)**

COMPANY REPRESENTATIVES:	Trevor Mitchell / Jason Duckworth	TOOL PUSH:	Guy Cusitar

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Appendix A09 Geological Report

Geological Strip Log (Lithology)

Core Analysis

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MGM

MGM - SHELL EAST MACKAY I – 78

3001786450125300
NWT

PERMIT TO PRACTICE
RPS ENERGY CANADA LTD.

Signature _____

Date _____

PERMIT NUMBER: P 4348
The Association of Professional Engineers, Geologists and Geophysicists of Alberta

GEOLOGICAL REPORT

ON

MGM - SHELL EAST MACKAY I – 78
3001786450125300

FOR

MGM

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February 2013

Dave Prior, M.Sc, P.Geol
Wellsite Consultant

RPS ENERGY CANADA LTD. (RPS)
Suite 1400, 800 – 5th Avenue SW., Calgary, Alberta Canada T2P 3T6

WELL DATA SUMMARY

WELL NAME	MGM - SHELL EAST MACKAY I - 78
UNIQUE WELL I.D.	3001786450125300
BOTTOM LOCATION	I 78 64 50 125 30
SURFACE LOCATION	I 78 64 50 125 30
FIELD/REGION	NWT mainland
OPERATOR	MGM

SITE DATA

BOTTOMHOLE Lat / Long	Lat 64 deg, 47' 42.1"; Long 125 deg, 43' 19.1"		
SURFACE Lat / Long	Lat 64 deg, 47' 42.1"; Long 125 deg, 43' 19.1"		
BOTTOMHOLE COORDINATES	UTM Zone 10, 370684.26 m East, 7188197.43 m North, NAD 27		
SURFACE COORDINATES	UTM Zone 10, 370684.26 m East, 7188197.43 m North, NAD 27		
WELL CLASSIFICATION	Exploratory	WELL LICENSE #	1202
AFE NUMBER	12D0006	WELL TYPE:	Vertical
DRILLING CONTRACTOR	Akita 37		

ELEVATIONS

GROUND LEVEL	155.00	(m)
KELLY BUSHING	161.20	(m)

DRILLING DATES

SPUD DATE	January 27, 2013	**TIME**	14:00	Hours
TD DATE	February 15, 2013	**TIME**	09:45	Hours
RIG RELEASE DATE	N/A			

HOLE SIZE & MUD TYPE

SURFACE	311.0 mm, water, casing set at 401.8
MAIN	222.0 mm to 1820.0 m, 216.0 mm, 1820.0 to 2001.0 m, Gel Chem

CASING DATA

SURFACE	I-80, 244.5 mm OD, 224.0 mm ID, 59.53 kg/m, 29 joints, length
	402.9 m, kb-casing head 5.21 m, set at 401.8 m kb
INTERMEDIATE	156.0 mm (7"), planned
PRODUCTION	N/A

GEOLOGICAL DATA

SAMPLE INTERVAL	Surface to Total Depth
GAS DETECTION INTERVAL	25.0 m to Total Depth
CORES	Canol and Bluefish formations
LOGGING SUITE	MWD Gamma 25.0 to 1810.0 m.
WIRELINE LOGGING SUITE	Surface, Gamma Ray, Density, Neutron, Resistivity, SP, Sonic,
	Main - Spectral GR, Dual Density, Neutron, Induction, Caliper,
	SP, Multi-pole Sonic, Image Logs FLEX, MREX.
DRILL STEM TESTS	N/A
ISOTUBE GAS SAMPLES	50.0 m intervals 50.0 to 1750.0 m; 10.0 m intervals 1830.0 to Total Depth

WELL STATUS **Cased.**

FORMATION TOPS

MGM - SHELL EAST MACKAY I - 78

3001786450125300

K.B.(m): 161.0 **G.L.(m):** 155.0

			SAMPLE			high(+)
FORMATION	***TVD(m)***	***SS(m)***	***TVD(m)***	***SS(m)***	***ISO(m)***	***low(-)***
East Fork	10.0	151.0	129.0	32.0	635.0	-119.0
Little Bear Upper	732.0	-571.0	764.0	-603.0	123.0	-32.0
Little Bear Middle	872.0	-711.0	887.0	-726.0	274.0	-15.0
Little Bear Lower	1145.0	-984.0	1161.0	-1000.0	27.0	-16.0
Slater River	1175.0	-1014.0	1188.0	-1027.0	221.0	-13.0
Slater Radioactive Shale	1406.0	-1245.0	1409.0	-1248.0	25.0	-3.0
Arctic Red Upper (Mahny Lk)	1415.0	-1254.0	1434.0	-1273.0	48.0	-19.0
Basal Cretaceous Unconform.	1464.0	-1303.0	1482.0	-1321.0	0.0	-18.0
Devonian, Imperial Lower	1464.0	-1303.0	1482.0	-1321.0	218.0	-18.0
Canyon Sandstone	1717.0	-1556.0	1700.0	-1539.0	31.0	17.0
Base Canyon	1736.0	-1575.0	1731.0	-1570.0	89.0	5.0
Canol Upper	1824.0	-1663.0	1820.0	-1659.0	35.0	4.0
Canol Middle	1857.0	-1696.0	1855.0	-1694.0	5.0	2.0
Canol Lower	1861.0	-1700.0	1860.0	-1699.0	58.0	1.0
Hare Indian	1920.0	-1759.0	1918.0	-1757.0	19.0	2.0
Bluefish	1945.0	-1784.0	1937.0	-1776.0	20.0	8.0
Hume Upper	1965.0	-1804.0	1957.0	-1796.0	44.0	8.0
Total Depth	2020.0	-1859.0	2001.0	-1840.0	-	19.0

DEVIATION SURVEYS

MGM - SHELL EAST MACKAY I - 78

3001786450125300

Wireline surveys on surface hole

Depth	*Inclination*
45.0	1.0
80.0	0.7
110.0	0.7
140.0	0.6
180.0	0.5
220.0	0.5
250.0	0.7
280.0	0.9
310.0	0.8
350.0	0.3
376.0	1.0

SURVEY REPORT

MGM - SHELL EAST MACKAY I - 78

3001786450125300

Vertical Main Hole

Measured Depth Meters	Incl Angle Deg	Azimuth Deg	TRUE Vertical Depth	Vertical Section Meters	N-S Meters	E-W Meters	Dogleg Severity Deg/30
0.0	0.0	128.7	0.0	0.0	0.0	0.0	0.0
6.2	0.0	128.7	6.2	0.0	0.0	0.0	0.0
405.0	0.0	0.0	405.0	0.0	0.0	0.0	0.0
410.7	0.4	128.7	410.7	0.0	0.0	0.0	2.1
459.0	0.1	157.2	459.0	-0.2	-0.2	0.2	0.2
507.1	0.6	168.0	507.1	-0.4	-0.4	0.2	0.3
555.6	0.2	324.8	555.6	-0.6	-0.6	0.2	0.5
603.9	0.6	184.3	603.9	-0.8	-0.8	0.2	0.5
652.1	0.4	4.4	652.1	-0.9	-0.9	0.2	0.6
700.3	0.6	194.4	700.3	-1.0	-1.0	0.1	0.6
748.5	0.4	353.3	748.5	-1.0	-1.0	0.0	0.6
796.5	0.3	197.7	796.5	-1.0	-1.0	0.0	0.4
844.7	0.4	47.4	844.7	-1.0	-1.0	0.1	0.4
892.8	0.5	222.2	892.8	-1.0	-1.0	0.0	0.6
941.0	0.6	22.8	941.0	-1.0	-1.0	0.0	0.7
988.8	0.6	214.1	988.8	-0.9	-0.9	-0.1	0.8
1036.9	0.3	8.9	1036.9	-1.0	-1.0	-0.2	0.6
1085.1	0.4	207.9	1085.1	-1.1	-1.1	-0.2	0.4
1133.4	0.4	33.9	1133.4	-1.1	-1.1	-0.2	0.5
1181.6	0.2	170.6	1181.6	-1.0	-1.0	-0.1	0.4
1229.8	0.2	60.6	1229.8	-1.1	-1.1	0.0	0.2
1277.9	0.2	103.1	1277.9	-1.0	-1.0	0.1	0.1
1326.1	0.1	355.9	1326.1	-1.0	-1.0	0.2	0.2
1374.2	0.2	34.9	1374.2	-0.9	-0.9	0.3	0.1
1422.4	0.4	49.1	1422.4	-0.7	-0.7	0.4	0.1
1470.5	0.4	55.2	1470.5	-0.5	-0.5	0.7	0.0
1518.6	0.3	68.0	1518.6	-0.4	-0.4	1.0	0.1
1566.9	0.6	60.4	1566.9	-0.2	-0.2	1.3	0.2
1615.2	0.5	84.1	1615.2	0.0	0.0	1.7	0.2
1663.2	1.0	79.6	1663.2	0.1	0.1	2.3	0.3
1711.3	0.2	153.7	1711.3	0.1	0.1	2.8	0.6
1759.2	0.7	73.2	1759.2	0.1	0.1	3.1	0.4
1799.0	0.6	62.7	1799.0	0.2	0.2	3.5	0.1
1820.0	0.5	60.1	1820.0	0.3	0.3	3.7	0.1

SURVEY REPORT

MGM - SHELL EAST MACKAY I - 78

3001786450125300

Total Depth

Measured	Incl		TRUE	DRIFT	DRIFT	COORDINATE		
Depth	Angle	Azimuth	Vertical	Station	Station	Total	Total	DOGLEG
Meters	Deg	Deg	Depth	N-S	E-W	N-S	E-W	SEVERITY
401.0	0.5	207.8	401.0	0.00N	0.00E	0.00N	0.00E	0.0
411.0	0.4	101.3	411.0	0.03S	0.05E	0.03S	0.05E	6.5
421.0	0.3	72.4	421.0	0.01N	0.06E	0.03S	0.10E	1.7
431.0	0.2	80.9	431.0	0.02N	0.03E	0.01S	0.14E	1.5
441.0	0.3	80.6	441.0	0.01N	0.05E	0.00S	0.18E	1.0
451.0	0.2	73.4	451.0	0.01N	0.04E	0.01N	0.22E	0.6
461.0	0.1	82.0	461.0	0.01N	0.02E	0.02N	0.25E	0.9
471.0	0.2	104.7	471.0	0.01S	0.04E	0.01N	0.28E	1.1
481.0	0.2	16.2	481.0	0.01N	0.03E	0.03N	0.31E	3.2
491.0	0.2	1.5	491.0	0.06N	0.00W	0.08N	0.31E	0.6
501.0	0.3	146.1	501.0	0.01S	0.02E	0.08N	0.33E	5.1
511.0	0.1	124.8	511.0	0.05S	0.03E	0.03N	0.36E	2.0
521.0	0.2	330.7	521.0	0.01N	0.01E	0.03N	0.37E	3.1
531.0	0.1	131.5	531.0	0.01N	0.00E	0.04N	0.37E	3.1
541.0	0.3	153.2	541.0	0.03S	0.02E	0.01N	0.39E	1.7
551.0	0.1	120.9	551.0	0.02S	0.01E	0.01S	0.40E	2.2
561.0	0.2	154.7	561.0	0.01S	0.00E	0.02S	0.41E	1.1
571.0	0.2	132.0	571.0	0.03S	0.02E	0.04S	0.42E	0.7
581.0	0.1	71.6	581.0	0.01S	0.02E	0.05S	0.44E	1.7
591.0	0.3	351.0	591.0	0.04N	0.00E	0.01S	0.44E	2.6
601.0	0.1	136.8	601.0	0.00N	0.01E	0.01S	0.45E	3.9
611.0	0.1	127.2	611.0	0.02S	0.02E	0.04S	0.46E	0.3
621.0	0.1	54.2	621.0	0.00S	0.01E	0.04S	0.48E	1.5
631.0	0.1	149.6	631.0	0.01N	0.01E	0.03S	0.49E	1.5
641.0	0.2	171.6	641.0	0.03S	0.01E	0.06S	0.50E	1.2
651.0	0.0	260.4	651.0	0.01S	0.00W	0.07S	0.49E	2.1
661.0	0.1	320.7	661.0	0.02N	0.00W	0.05S	0.49E	0.9
671.0	0.0	218.1	671.0	0.00S	0.01W	0.06S	0.48E	1.2
681.0	0.1	355.4	681.0	0.00N	0.00W	0.05S	0.48E	1.1
691.0	0.2	341.0	691.0	0.03N	0.00E	0.03S	0.48E	1.1
701.0	0.2	222.4	701.0	0.00S	0.02W	0.03S	0.47E	3.0
711.0	0.1	134.2	711.0	0.02S	0.01W	0.05S	0.46E	2.1
721.0	0.1	10.6	721.0	0.01N	0.00W	0.05S	0.46E	1.7
731.0	0.0	220.6	731.0	0.00N	0.01W	0.04S	0.45E	1.5
741.0	0.2	161.2	741.0	0.03S	0.00W	0.07S	0.45E	1.9
751.0	0.0	352.3	751.0	0.01S	0.00E	0.08S	0.45E	2.5

761.0	0.1	293.1	761.0	0.02N	0.01W	0.06S	0.44E	1.2
771.0	0.1	192.4	771.0	0.00S	0.01W	0.06S	0.43E	1.6
781.0	0.1	295.8	781.0	0.00S	0.00W	0.06S	0.43E	1.0
791.0	0.2	298.5	791.0	0.02N	0.02W	0.05S	0.41E	1.3
801.0	0.0	107.3	801.0	0.00N	0.01W	0.04S	0.40E	2.4
811.0	0.1	319.2	811.0	0.01N	0.00E	0.04S	0.41E	1.5
821.0	0.3	276.8	821.0	0.02N	0.03W	0.01S	0.38E	1.9
831.0	0.2	155.6	831.0	0.01S	0.02W	0.03S	0.36E	3.7
841.0	0.3	86.3	841.0	0.01S	0.03E	0.04S	0.40E	2.7
851.0	0.0	127.0	851.0	0.01N	0.03E	0.03S	0.42E	2.5
861.0	0.1	199.3	861.0	0.01S	0.00W	0.04S	0.42E	1.4
871.0	0.2	76.2	871.0	0.01S	0.02E	0.05S	0.44E	3.4
881.0	0.2	21.3	881.0	0.03N	0.04E	0.02S	0.47E	2.1
891.0	0.1	269.5	891.0	0.02N	0.01W	0.00N	0.46E	2.8
901.0	0.1	67.9	901.0	0.00N	0.00E	0.01N	0.46E	1.8
911.0	0.3	36.2	911.0	0.03N	0.03E	0.04N	0.49E	2.4
921.0	0.1	278.0	921.0	0.02N	0.01E	0.06N	0.50E	3.6
931.0	0.1	165.7	931.0	0.03S	0.02W	0.03N	0.49E	2.0
941.0	0.3	48.3	941.0	0.00N	0.02E	0.04N	0.51E	3.6
951.0	0.1	355.5	951.0	0.03N	0.02E	0.06N	0.53E	2.4
961.0	0.0	194.8	961.0	0.00S	0.01W	0.06N	0.52E	1.1
971.0	0.2	56.2	971.0	0.01N	0.01E	0.06N	0.53E	2.3
981.0	0.2	357.9	981.0	0.04N	0.02E	0.10N	0.55E	1.9
991.0	0.3	241.1	991.0	0.00N	0.02W	0.10N	0.53E	4.1
1001.0	0.0	234.9	1001.0	0.03S	0.03W	0.07N	0.50E	2.3
1011.0	0.2	14.5	1011.0	0.01N	0.00E	0.09N	0.51E	2.1
1021.0	0.0	332.6	1021.0	0.02N	0.01E	0.10N	0.51E	1.4
1031.0	0.1	186.4	1031.0	0.01S	0.00W	0.09N	0.51E	1.4
1041.0	0.1	2.8	1041.0	0.00N	0.00E	0.10N	0.51E	1.7
1051.0	0.0	164.4	1051.0	0.02N	0.00E	0.11N	0.51E	0.7
1061.0	0.1	198.9	1061.0	0.00S	0.00E	0.11N	0.52E	1.0
1071.0	0.1	15.5	1071.0	0.00S	0.00E	0.11N	0.52E	1.7
1081.0	0.1	294.7	1081.0	0.02N	0.00W	0.13N	0.52E	0.9
1091.0	0.2	210.6	1091.0	0.01S	0.02W	0.11N	0.50E	2.4
1101.0	0.0	344.8	1101.0	0.01S	0.01W	0.10N	0.49E	2.7
1111.0	0.2	17.0	1111.0	0.03N	0.01E	0.13N	0.50E	1.6
1121.0	0.0	225.4	1121.0	0.01N	0.00E	0.14N	0.50E	2.3
1131.0	0.0	20.3	1131.0	0.01S	0.01W	0.12N	0.50E	0.9
1141.0	0.2	27.5	1141.0	0.02N	0.01E	0.14N	0.50E	1.9
1151.0	0.1	85.9	1151.0	0.03N	0.02E	0.17N	0.52E	2.1
1161.0	0.0	46.8	1161.0	0.01N	0.01E	0.18N	0.53E	0.4
1171.0	0.1	47.0	1171.0	0.01N	0.01E	0.19N	0.54E	0.5
1181.0	0.1	81.0	1181.0	0.00N	0.02E	0.19N	0.55E	0.6
1191.0	0.1	53.0	1191.0	0.01N	0.01E	0.20N	0.57E	0.5
1201.0	0.1	81.3	1201.0	0.01N	0.02E	0.21N	0.58E	0.7
1211.0	0.1	77.1	1211.0	0.01N	0.02E	0.22N	0.61E	0.0

1221.0	0.1	63.8	1221.0	0.01N	0.02E	0.23N	0.63E	0.3
1231.0	0.2	59.2	1231.0	0.01N	0.02E	0.24N	0.65E	0.2
1241.0	0.1	60.6	1241.0	0.01N	0.02E	0.25N	0.67E	0.3
1251.0	0.1	64.9	1251.0	0.01N	0.02E	0.26N	0.70E	0.0
1261.0	0.1	55.5	1261.0	0.01N	0.02E	0.27N	0.72E	0.3
1271.0	0.1	64.6	1271.0	0.01N	0.02E	0.28N	0.74E	0.2
1281.0	0.1	84.6	1281.0	0.01N	0.02E	0.28N	0.76E	0.5
1291.0	0.1	61.8	1291.0	0.01N	0.02E	0.29N	0.78E	0.5
1301.0	0.1	79.4	1301.0	0.01N	0.02E	0.29N	0.80E	0.4
1311.0	0.2	72.3	1311.0	0.01N	0.02E	0.30N	0.82E	0.4
1321.0	0.1	70.3	1321.0	0.01N	0.02E	0.31N	0.84E	0.6
1331.0	0.1	67.6	1331.0	0.01N	0.02E	0.32N	0.86E	0.0
1341.0	0.2	75.8	1341.0	0.01N	0.02E	0.33N	0.89E	0.7
1351.0	0.1	65.5	1351.0	0.01N	0.02E	0.33N	0.91E	0.3
1361.0	0.2	75.5	1361.0	0.01N	0.02E	0.35N	0.93E	0.3
1371.0	0.1	65.9	1371.0	0.01N	0.02E	0.36N	0.96E	0.3
1381.0	0.1	66.1	1381.0	0.01N	0.02E	0.37N	0.98E	0.0
1391.0	0.1	68.2	1391.0	0.01N	0.02E	0.38N	1.01E	0.0
1401.0	0.1	68.9	1401.0	0.01N	0.02E	0.39N	1.03E	0.0
1411.0	0.1	73.4	1411.0	0.01N	0.03E	0.40N	1.06E	0.0
1421.0	0.2	71.0	1421.0	0.01N	0.03E	0.41N	1.09E	0.6
1431.0	0.3	68.8	1431.0	0.01N	0.04E	0.42N	1.12E	0.6
1441.0	0.3	64.2	1441.0	0.02N	0.04E	0.44N	1.17E	0.7
1451.0	0.3	62.0	1451.0	0.02N	0.04E	0.46N	1.21E	0.5
1461.0	0.2	59.8	1461.0	0.02N	0.04E	0.48N	1.26E	0.5
1471.0	0.3	63.3	1471.0	0.02N	0.04E	0.50N	1.29E	0.6
1481.0	0.3	72.2	1481.0	0.02N	0.04E	0.52N	1.33E	0.5
1491.0	0.2	66.7	1491.0	0.02N	0.04E	0.54N	1.37E	0.4
1501.0	0.2	64.6	1501.0	0.02N	0.03E	0.55N	1.41E	0.5
1511.0	0.3	72.7	1511.0	0.01N	0.04E	0.57N	1.45E	0.7
1521.0	0.3	69.4	1521.0	0.02N	0.04E	0.58N	1.49E	0.2
1531.0	0.2	76.5	1531.0	0.02N	0.04E	0.60N	1.52E	0.4
1541.0	0.2	74.2	1541.0	0.01N	0.04E	0.61N	1.56E	0.0
1551.0	0.3	71.4	1551.0	0.02N	0.05E	0.63N	1.61E	0.3
1561.0	0.3	69.9	1561.0	0.02N	0.05E	0.65N	1.66E	0.7
1571.0	0.4	73.6	1571.0	0.02N	0.06E	0.66N	1.72E	0.7
1581.0	0.3	69.7	1581.0	0.02N	0.06E	0.69N	1.77E	0.7
1591.0	0.3	67.6	1591.0	0.02N	0.05E	0.71N	1.83E	0.0
1601.0	0.4	70.5	1601.0	0.02N	0.06E	0.73N	1.88E	0.3
1611.0	0.3	75.8	1611.0	0.02N	0.06E	0.75N	1.94E	0.4
1621.0	0.2	65.7	1621.0	0.02N	0.05E	0.76N	1.99E	1.1
1631.0	0.2	302.2	1631.0	0.02N	0.02E	0.78N	2.01E	3.8
1641.0	0.3	294.3	1641.0	0.02N	0.05W	0.80N	1.96E	0.9
1651.0	0.1	25.7	1651.0	0.02N	0.01W	0.82N	1.95E	3.0
1661.0	0.6	72.4	1661.0	0.02N	0.05E	0.84N	1.99E	5.0
1671.0	0.9	77.2	1671.0	0.03N	0.13E	0.86N	2.12E	3.4

1681.0	1.0	80.5	1681.0	0.03N	0.16E	0.89N	2.29E	1.0
1691.0	0.8	78.3	1691.0	0.03N	0.15E	0.92N	2.44E	1.8
1701.0	0.3	79.3	1701.0	0.02N	0.10E	0.95N	2.54E	4.7
1711.0	0.3	76.1	1711.0	0.01N	0.04E	0.96N	2.58E	0.7
1721.0	0.4	82.3	1721.0	0.01N	0.06E	0.97N	2.64E	1.1
1731.0	0.4	78.3	1731.0	0.01N	0.07E	0.98N	2.71E	0.7
1741.0	0.5	71.3	1741.0	0.02N	0.08E	1.00N	2.79E	0.6
1751.0	0.5	67.4	1751.0	0.03N	0.08E	1.03N	2.87E	0.8
1761.0	0.5	70.2	1761.0	0.03N	0.09E	1.06N	2.96E	0.3
1771.0	0.6	72.0	1771.0	0.03N	0.09E	1.09N	3.05E	0.4
1781.0	0.5	69.0	1781.0	0.03N	0.09E	1.12N	3.14E	0.5
1791.0	0.6	65.9	1791.0	0.03N	0.09E	1.15N	3.23E	0.5
1801.0	0.6	69.6	1801.0	0.04N	0.09E	1.19N	3.32E	0.3
1811.0	0.6	70.6	1810.9	0.03N	0.09E	1.22N	3.41E	0.0
1821.0	0.6	70.7	1820.9	0.03N	0.09E	1.26N	3.50E	0.0
1831.0	0.6	71.3	1830.9	0.03N	0.10E	1.29N	3.60E	0.3
1841.0	0.6	68.1	1840.9	0.04N	0.10E	1.33N	3.70E	0.5
1851.0	0.7	68.7	1850.9	0.04N	0.11E	1.37N	3.80E	0.3
1861.0	0.9	70.7	1860.9	0.05N	0.13E	1.42N	3.93E	2.3
1871.0	1.3	74.5	1870.9	0.06N	0.19E	1.48N	4.12E	4.5
1881.0	1.9	78.2	1880.9	0.07N	0.27E	1.55N	4.39E	5.6
1891.0	2.4	81.0	1890.9	0.07N	0.38E	1.62N	4.76E	5.2
1901.0	2.7	83.3	1900.9	0.06N	0.44E	1.68N	5.20E	3.0
1911.0	3.0	83.9	1910.9	0.05N	0.49E	1.73N	5.70E	3.2
1921.0	3.1	83.3	1920.9	0.06N	0.53E	1.79N	6.23E	1.4
1931.0	2.7	83.1	1930.9	0.06N	0.52E	1.85N	6.75E	4.2
1941.0	2.0	79.9	1940.9	0.06N	0.40E	1.91N	7.15E	7.6

The first point information

400.96 0.5 207.8 400.96 0.00N 0.00E 0.00N 0.00E

The last point information

1940.96 2 79.9 1940.87 0.06N 0.40E 1.91N 7.15E

Final East West Drift = 7.15 E
Final North South Drift = 1.91 N
Final Drift Distance = 7.40 M
Final Drift Direction = N 75.04 E

WELLSITE BIT RECORD

MGM - SHELL EAST MACKAY I - 78

3001786450125300

SPUD DATE: January 27, 2013

T.D. DATE: February 15, 2013

SURFACE CASING: I-80, 244.5 mm OD, 224.0 mm ID, 59.53 kg/m, 29 joints, length

BIT #	***1a***	***2***	***3***	***4***	***5RR***	***6***
SIZE (mm)	311.0	222.0	216.0	216.0	216.0	216.0
MAKE	Western	HC	Baker H.	Baker H.	Baker H.	Baker H.
TYPE	GX-C03	PDC	BHC606c	GX-20MDX1	BHC606c	409c
SERIAL #	5204676	7131618	7103687	5202128	7103687	7137198
DEPTH IN	0.00	405.00	1820.00	1834.00	1834.00	1851.60
DEPTH OUT	405.00	1820.00	1834.00	1834.00	1851.60	1874.20
METRES	405.00	1415.00	14.00	0.00	17.60	22.60
HOURS	17.00	54.75	5.50	0.00	5.75	6.25
ACC. HRS.	17.00	71.75	77.25	77.25	83.00	89.25
ROP (m/hr)	23.8	25.8	2.5	0.0	3.1	3.6
FOB	4	5-10	3.4	-	6	4.5
RPM	140	0 + 75	66	-	60	35
PP	10000	11000	5900	-	6900	6900
DEN	1140	1045	1065	-	1070	1075
VISCOSITY	43	45	51	-	57	54
MAX DEV.°	1.0°	0.6°	0.6°	-	0.6°	1.3°
REMARKS	***B/G/O/RP***	***B/G/O/RP***	***B/G/O/RP***	***B/G/O/RP***	***B/G/O/RP***	***B/G/O/RP***
	Tri-cone	Mud Motor	Core 1	Circulated	Core 2	Core 3

WELLSITE BIT RECORD

MGM - SHELL EAST MACKAY I - 78

3001786450125300

SPUD DATE: January 27, 2013
T.D. DATE: February 15, 2013

SURFACE CASING: I-80, 244.5 mm OD, 224.0 mm ID, 59.53 kg/m, 29 joints, length

BIT #	***RR4***	***RR6***	***RR4***
SIZE (mm)	216.0	216.0	216.0
MAKE	Baker H.	Baker H.	Baker H.
TYPE	GX-20MDX1	409c	GX-20MDX1
SERIAL #	5202128	7137198	5202128
DEPTH IN	1874.20	1938.00	1960.50
DEPTH OUT	1938.00	1960.50	2001.00
METRES	63.80	22.50	40.50
HOURS	7.25	7.75	9.25
ACC. HRS.	96.50	104.25	113.50
ROP (m/hr)	8.8	2.9	4.4
FOB	13	5	15
RPM	120	55	100
PP	8500	7500	8300
DEN	1095	1085	1085
VISCOSITY	56	55	51
MAX DEV.°	3.1°	2.0°	2.0°
REMARKS	***B/G/O/RP***	***B/G/O/RP***	***B/G/O/RP***
	Tri-cone	Core 4	Tri-cone

DAILY DRILLING SUMMARY

MGM - SHELL EAST MACKAY I - 78

3001786450125300

	24:00 hrs		Drilling	ROP	Mud Properties				
Date	Depth	Progress	Hours	(m/hr)	Density	Vis	WL	pH	Operations Summary
25-Jan-13	0.0	-	-	-	-	-	-	-	Geologist returned, Akita # 37 rigged up.
26-Jan-13	0.0	-	-	-	-	-	-	-	Rigged up.
27-Jan-13	100.0	100.0	4.0	25.0	1045.0	34.0	-	-	Finished rig up, spudded at 14:00 hours, tagged cement at 21.0 m, drilled and surveyed.
28-Jan-13	395.0	295.0	12.5	23.6	1140.0	43.0	-	-	Drilled to 395.0 m, circulated hole clean, blew out top drive and kelly hosed, wiper tripped.
29-Jan-13	405.0	10.0	1.3	8.0	1160.0	66.0	-	-	Wiper tripped to surface, ran in hole, drilled to 405.0 m, surface Total Depth, circulated hole clean, tripped out, rigged up loggers, logged with Baker.
30-Jan-13	405.0	-	0.0	-	1100.0	70.0	-	-	Rigged out loggers, ran in hole, circulated and conditioned, tripped out, ran casing to 401.8 m.
31-Jan-13	405.0	0.0	0.0	-	-	-	-	-	Circulated casing, cemented casing, plugged down at 3:50 hours, rigged out cementers, removed diverter, nippled up BOP's, installed rams.
1-Feb-13	405.0	0.0	0.0	-	-	-	-	-	Nippled up BOP's, function tested BOP's, pressure tested BOP's and accumulator, modified flow T for wear bushing.
2-Feb-13	405.0	545.0	5.0	109.0	1020.0	31.0	18.0	8.0	Laid down collars, made up BHA, ran in, drilled float and shoe, FIT, 6500 kpa surface pressure, no leak off, displaced from cement water to Polymer, drilled main hole from 15:30 hours.
3-Feb-13	890.0	485.0	12.5	38.8	1035.0	38.0	11.0	9.5	Drilled and surveyed.
4-Feb-13	1260.0	370.0	13.5	27.4	1040.0	41.0	10.0	9.4	Drilled and surveyed.
5-Feb-13	1600.0	340.0	13.5	25.2	1045.0	47.0	8.0	9.5	Drilled and surveyed.
6-Feb-13	1820.0	220.0	10.3	21.5	1050.0	48.0	8.0	9.5	Drilled to Core point at 1820.0 m, circulated hole clean, blew top drive, started trip out.
7-Feb-13	1820.0	-	19.3	-	-	-	-	-	Tripped out, laid down directional tools, picked up 6 core barrels and bit, tripped in.

8-Feb-13	1834.0	14.0	5.5	2.5	1065.0	51.0	7.0	9.5	Tripped to 1820.0 m, cut core to 1834.0 m, tripped out, recovered core, began to make up core barrels, waited on replacement part of core tools.
9-Feb-13	1834.0	-	0.0	-	-	-	-	-	Laid down core tools, picked up bit and sub, ran in to 450.0 m, pulled back to circulate at shoe, pulled out of hole, made up core assembly, started running in hole.
10-Feb-13	1851.0	17.0	5.8	3.0	1050.0	60.0	7.0	9.5	Ran to bottom, washed down last stand, cut core #2 to 1851.6 m, torque dropped, jammed off, circulated bottoms up, pulled out of hole, laid down core barrel sleeves, recovered core, reassembled coring equipment, started in hole.
11-Feb-13	1871.0	20.0	6.3	3.2	1075.0	54.0	7.0	9.5	Ran in hole, circulated on bottom, cut core # 3 from 1851.6 to 1874.2 m, jammed off, pulled out of hole, laid down sleeves, recovered core.
12-Feb-13	1938.0	67.0	7.3	9.2	1075.0	56.0	7.0	9.5	Recovered core, racked back core assembly, picked up bit and collars, drilled to 1938.0 m, circulated, tripped out.
13-Feb-13	1960.0	22.0	7.0	3.1	1085.0	55.0	7.0	9.0	Picked up core assembly, tripped in, cut core.
14-Feb-13	1960.0	-	14.5	-	1080.0	51.0	7.0	9.0	Cut core to 1960.5 m at 00:45 hours, jammed off, tripped out, handled core barrels, recovered core, tripped in with drill bit, reamed from 820.0 to 1960.0 m.
15-Feb-13	2001.0	41.0	9.5	4.3	1085.0	51.0	7.0	9.0	Drilled to Total Depth at 2001.0 m, circulated, wiper tripped to 1800.0 m, circulated, tripped out, rigged up wireline tools, began log run 1.
16-Feb-13	2001.0	-	14.0	-	1075.0	80.0	6.5	9.0	Ran wireline tools to bottom, tight, stuck until 07:30 hours, pulled free, logged to surface, rigged out logging tools, tripped in with pipe to 1825.0 m, reamed to 1830.0 m.
17-Feb-13	2001.0	-	-	-	1125.0	95.0	6.0	9.0	Reamed to bottom, filled from 1992.0 to 2001.0 m, circulated, performed two wiper trips to 1800.0 m, rigged up wireline log #2, ran log #2, rigged up log #3.
18-Feb-13	2001.0	-	-	-	-	-	-	-	Ran in to 1980.0 m with image logging tools (run #3), logged up, tried to repeat at bottom, bridged at 1820.0 m, logged up to 1650.0 m, pulled out, rigged out tools, ran in with drill string, circulated and conditioned hole, tripped out, rigged up wireline log # 4.
19-Feb-13	2001.0	-	-	-	-	-	-	-	Ran FLEX-MREX log, rigged out loggers, ran in with pipe for clean out, circulated, tripped out and laid down drill pipe.

WELLSITE LOGGING REPORT

SURFACE HOLE

MGM - SHELL EAST MACKAY I - 78

3001786450125300

HOLE DATA			*MUD DATA*		*LOGGING COMPANY*	
Hole Size:	311.0	mm			**Logging Co.:**	Baker Hughes
TD Driller:	405.0	m	**Type:**	Gel-Chem	**Engineer:**	Ivan Zaleskikh
Strap:	-	m	**Density:**	1190	**Truck No.:**	Zoo8672
TD Logger:	404.0	m	**Viscosity:**	75	**Start Date:**	29-Jan-13
Casing Driller:	23.0	m	**W.L.:**	N/A	**Start Time:**	16:30 Hours
Casing Logger:	24.0	m	**pH:**	N/A	**End Date:**	30-Jan-13
Hole Condition:	Good				**End Time:**	02:00 Hours

LOGGING SEQUENCE

Run Number	Logged Interval From	To	Hours	Logs	Remarks
one	23.0	404.0	3.5	Gamma Ray, Dual Density,	logging time
				Neutron, Caliper, HDIL-SP,	
				multipole sonic	
		Total Hours:	3.5		

LOGGING OPERATIONS SUMMARY

Date	Start	End	Elapsed	Description of Operation
				Arrived at location on January 28, 2013.
	16:30	19:00	02:30	Rigged up.
	19:00	19:40	00:40	Ran in hole.
	19:40	21:00	01:20	Re-booted system, due to spurious data from a tool.
				Being used to support a centalizer.
	21:00	21:30	00:30	Repeated.
	21:30	22:30	01:00	Logged to surface.
	22:30	00:00	01:30	Washed and removed tools, produced logs.
	00:00	02:00	02:00	Rigged out, printed logs, transmitted logs.

REMARKS & COMMENTS

Tool was 2.0 m long, rig up and rig down were time consuming.

WELLSITE LOGGING REPORT

MAIN HOLE

MGM - SHELL EAST MACKAY I - 78

3001786450125300

HOLE DATA			*MUD DATA*		*LOGGING COMPANY*	
Hole Size:	222.0/216.0	mm			**Logging Co.:**	Baker Hughes
TD Driller:	2001.0	m	**Type:**	Gel-Chem	**Engineer:**	Colier - Zaleskikh
Strap:	-	m	**Density:**	1075	**Truck No.:**	Zoo8672
TD Logger:	1996.0	m	**Viscosity:**	80	**Start Date:**	15-Feb-13
Casing Driller:	401.8	m	**W.L.:**	6.5	**Start Time:**	12:00 Hours
Casing Logger:	402.2	m	**pH:**	9	**End Date:**	16-Feb-13
Hole Condition:	Poor				**End Time:**	19:00 Hours

LOGGING SEQUENCE

Run Number	Logged Interval From	To	Hours	Logs	Remarks
1	1960.0	402.0	11.0	Gamma Ray, Dual Density,	
				Neutron, Caliper, HDIL-SP,	
				multipole sonic	
	402.0	0.0		neutron, sonic, (	
		Total Hours:	11		

LOGGING OPERATIONS SUMMARY

Date	Start Time	End	Elapsed	Description of Operation
2/15/2013	23:00	24:00	1.0	Rigged up.
2/16/2013	24:00	00:30	0.5	Tested tools.
	00:30	03:00	2.5	Ran to bottom.
	03:00	07:30	4.5	Stuck at 1973.0 m.
	07:30	14:00	6.5	Logged to surface.
	14:00	16:00	2.0	Rigged out tools.
	16:00	19:00	3.0	Prepared logs.

REMARKS & COMMENTS

Tools to bottom at 1996.0 m uncorrected depth, tight on bottom, pulled up with caliper closed, stuck at 1973.0 m, pulled free, logged from 1960 to surface. Spectral Gamma failed at 600.0 m, spliced in downhole data.

WELLSITE LOGGING REPORT

MAIN HOLE

MGM - SHELL EAST MACKAY I - 78

3001786450125300

HOLE DATA			*MUD DATA*		*LOGGING COMPANY*	
Hole Size:	222.0/216.0	mm			**Logging Co.:**	Baker Hughes
TD Driller:	2001.0	m	**Type:**	Gel-Chem	**Engineer:**	Colier - Zaleskikh
Strap:	-	m	**Density:**	1125	**Truck No.:**	Zoo8672
TD Logger:	1999.0	m	**Viscosity:**	95	**Start Date:**	17-Feb-13
Casing Driller:	401.8	m	**W.L.:**	6	**Start Time:**	16:15 Hours
Casing Logger:	402.2	m	**pH:**	9	**End Date:**	17-Feb-13
Hole Condition:	Good				**End Time:**	22:00 Hours

LOGGING SEQUENCE

Run Number	Logged Interval From	To	Hours	Logs	Remarks
2	1999.0	1600.0	3.0	Spectral Gamma Ray,	
				HDIL-SP,	
				multipole sonic	
	402.0	0.0		Gamma Ray, soni	
		Total Hours:	3		

LOGGING OPERATIONS SUMMARY

Date	Start Time	End	Elapsed	Description of Operation
2/17/2013	16:15	17:15	1.00	Rigged up.
	17:15	17:30	0.25	Tested tools.
	17:30	18:15	0.75	Ran to bottom.
	18:15	21:00	2.75	Logged to surface.
	21:00	22:00	6.50	Rigged out tools.

REMARKS & COMMENTS

Good logging run, no problems. The logs were run from Total Depth to 1600.0 m to collect data from the bottom of the well that was missed on the first run.

WELLSITE LOGGING REPORT

MAIN HOLE

MGM - SHELL EAST MACKAY I - 78

3001786450125300

HOLE DATA			*MUD DATA*		*LOGGING COMPANY*	
Hole Size:	222.0/216.0	mm			**Logging Co.:**	Baker Hughes
TD Driller:	2001.0	m	**Type:**	Gel-Chem	**Engineer:**	Colier - Zaleskikh
Strap:	-	m	**Density:**	1120	**Truck No.:**	Zoo8672
TD Logger:	1980.0	m	**Viscosity:**	90	**Start Date:**	17-Feb-13
Casing Driller:	401.8	m	**W.L.:**	6	**Start Time:**	21:45 Hours
Casing Logger:	402.2	m	**pH:**	9	**End Date:**	18-Feb-13
Hole Condition:	Poor				**End Time:**	05:00 Hours

LOGGING SEQUENCE

Run Number	Logged Interval From	To	Hours	Logs	Remarks
3	1980.0	1650.0	3.0	Spectral Gamma Ray,	
				STAR/CBIL (image logs)	
		Total Hours:	3		

LOGGING OPERATIONS SUMMARY

Date	Start Time	End	Elapsed	Description of Operation
2/17/2013	21:45	22:15	0.50	Rigged up.
	22:15	22:30	0.25	Tested tools.
	22:30	23:45	0.75	Ran to bottom.
	23:45	24:00	0.25	Began logging.
2/18/2013	00:00	0:30	0.50	Finished repeat (1925.0 to 1820.0 m)
	0:30	4:00	3.50	Logged well, attempted to return to bottom,
				bridged 1820.0 m.
	4:00	5:00	1.00	Rigged out tools.

REMARKS & COMMENTS

Hit bottom fill at 1980.0 m, logged up. Hit a bridge at 1820.0 m while trying to return to bottom to get another pass.

WELLSITE LOGGING REPORT

MAIN HOLE

MGM - SHELL EAST MACKAY I - 78

3001786450125300

HOLE DATA			*MUD DATA*		*LOGGING COMPANY*	
Hole Size:	222.0/216.0	mm			**Logging Co.:**	Baker Hughes
TD Driller:	2001.0	m	**Type:**	Gel-Chem	**Engineer:**	Colier - Zaleskikh
Strap:	-	m	**Density:**	1130	**Truck No.:**	Zoo8672
TD Logger:	1980.0	m	**Viscosity:**	100	**Start Date:**	18-Feb-13
Casing Driller:	401.8	m	**W.L.:**	6	**Start Time:**	22:15 Hours
Casing Logger:	402.2	m	**pH:**	9	**End Date:**	19-Feb-13
Hole Condition:	Good				**End Time:**	06:15 Hours

LOGGING SEQUENCE

Run Number	Logged Interval From	To	Hours	Logs	Remarks
4	1980.0	1815.0	4.3	Spectral GR, FLEX - MREX	
	1450.0	1385.0	0.5	Spectral GR, FLEX - MREX	
		Total Hours:	4.75		

LOGGING OPERATIONS SUMMARY

Date	Start Time	End	Elapsed	Description of Operation
2/18/2013	22:15	23:00	0.75	Rigged up.
	23:00	23:15	0.25	Tested tools.
	23:15	24:00	0.75	Ran in to 1980.0 m.
2/18/2013	00:00	02:00	2.00	Main pass.
	02:00	03:15	1.25	Finish repeat.
	03:15	04:45	1.50	Logged upper section, pulled to surface.
	04:00	06:15	1.50	Rigged out tools.

REMARKS & COMMENTS

Did not attempt to tag bottom, stopped running in at 1980.0 m and began logging up.

WELLSITE CORING REPORT

MGM - SHELL EAST MACKAY I - 78

3001786450125300

HOLE DATA			*MUD DATA*		*CORING COMPANY*	
Hole Size:	216.0	mm			**Coring Co.:**	Baker Hughes
Top Core:	1820.0	m	**Type:**	Gel-Chem	**Core Driller:**	Richard Rooney
Bottom Core:	1834.0	m	**Density:**	1065	**Core Driller.:**	Jeremy Leavitt
Interval :	14.0	m	**Viscosity:**	51	**Start Date:**	8-Feb-13
Recovery:	12.7	m	**W.L.:**	7	**Start Time:**	01:30 Hours
Sleeved:	Yes	m	**pH:**	9.5	**End Date:**	8-Feb-13
Hole Condition:	Good				**End Time:**	06:45 Hours

CORING SEQUENCE

Run Number	Core Interval From	To	Hours	Cut / Recovery	Core Bit
1	1820.0	1834.0	5.5	Cut 14.0 m, recovered 12.7 m.	BHC606c
		Total Hours:	5.5		

CORING OPERATIONS SUMMARY

Date	Start	End	Elapsed	Description of Operation
07 Feb 13	10:00	15:00	5.00	Made up 54.0 m core barrel assembly, and bit.
07 Feb 13	15:00	00:00	9.00	Slipped and cut, ran in.
08 Feb 13	00:00	01:30	1.50	Ran to bottom.
	01:30	05:50	3.30	Cut core.
	05:50	05:55	0.10	Rig powered off, no coring, pumps off.
	05:55	07:00	1.10	Cored, jammed off.
	07:00	09:00	2.00	Circulated.
	09:00	15:30	6.50	Pulled out of hole.
	15:30	20:30	5.00	Handled core barrels, recovered core, inspected bit.

REMARKS & COMMENTS

The core was cut into 1.5 m sections, chip sampled and packed in a transport box in a temperature controlled reefer van to prevent freezing.

WELLSITE CORING REPORT

MGM - SHELL EAST MACKAY I - 78

3001786450125300

HOLE DATA			*MUD DATA*		*CORING COMPANY*	
Hole Size:	216.0	mm			**Coring Co.:**	Baker Hughes
Top Core:	1834.0	m	**Type:**	Gel-Chem	**Core Driller:**	Richard Rooney
Bottom Core:	1851.6	m	**Density:**	1070	**Core Driller.:**	Jeremy Leavitt
Interval :	17.6	m	**Viscosity:**	57	**Start Date:**	10-Feb-13
Recovery:	17.3	m	**W.L.:**	7	**Start Time:**	02:45 Hours
Sleeved:	Yes	m	**pH:**	9.5	**End Date:**	10-Feb-13
Hole Condition:	Good				**End Time:**	08:30 Hours

CORING SEQUENCE

Run Number	Cored Interval From	To	Hours	Cut / Recovery	Core Bit
2	1834.0	1851.6	5.75	Cut 17.6 m, recovered 17.3 m.	RR- BHC606c
		Total Hours:	5.75		

CORING OPERATIONS SUMMARY

Date	Start	End	Elapsed	Description of Operation
09 Feb 13	14:45	20:00	5.25	Made up 54.0 m core barrel assembly, and bit.
09 Feb 13	20:00	24.00	4.00	Ran in.
10 Feb 13	0:00	2:45	2.75	Ran to bottom, circulated clean.
	2:45	8:30	5.75	Cut core, jammed off.
	8:30	17:00	8.50	Pulled out of hole.
	17:00	20:00	3.00	Laid down core sleeves, recovered core.

REMARKS & COMMENTS

The core was cut into 1.5 m sections, chip sampled and packed in a transport box in a temperature controlled reefer van to prevent freezing.

WELLSITE CORING REPORT

MGM - SHELL EAST MACKAY I - 78

3001786450125300

HOLE DATA			*MUD DATA*		*CORING COMPANY*	
Hole Size:	216.0	mm			**Coring Co.:**	Baker Hughes
Top Core:	1851.6	m	**Type:**	Gel-Chem	**Core Driller:**	Richard Rooney
Bottom Core:	1874.2	m	**Density:**	1075	**Core Driller.:**	Jeremy Leavitt
Interval :	22.6	m	**Viscosity:**	54	**Start Date:**	11-Feb-13
Recovery:	21.4	m	**W.L.:**	7	**Start Time:**	07:15 Hours
Sleeved:	Yes	m	**pH:**	9.5	**End Date:**	11-Feb-13
Hole Condition:	Good				**End Time:**	13:30 Hours

CORING SEQUENCE

Run Number	Cored Interval From	To	Hours	Cut / Recovery	Core Bit
3	1851.6	1874.2	6.25	Cut 22.6 m, recovered 21.4 m.	BHC409c
		Total Hours:	6.25		

CORING OPERATIONS SUMMARY

Date	Start	End	Elapsed	Description of Operation
10 Feb 13	20:00	24:00	5.25	Made up 54.0 m core barrel assembly, and started in.
11 Feb 13	00:00	07:15	7.25	Ran to bottom, circulated clean.
	07:15	13:30	6.25	Cut 22.6 m, jammed off.
	13:30	23:00	9.50	Pulled out of hole.
	23:00	24:00	1.00	Laid down core.
	00:00	02:00	2.00	Recovered core.
	02:00	03:00	1.00	Removed core assembly.

REMARKS & COMMENTS

The core was cut into 1.5 m sections, chip sampled and packed in a transport box in a temperature controlled reefer van to prevent freezing. Core assembly was racked back and a drilling assembly installed to drill to the next core point.

WELLSITE CORING REPORT

MGM - SHELL EAST MACKAY I - 78

3001786450125300

HOLE DATA			*MUD DATA*		*CORING COMPANY*	
Hole Size:	216.0	mm			**Coring Co.:**	Baker Hughes
Top Core:	1938.0	m	**Type:**	Gel-Chem	**Core Driller:**	Richard Rooney
Bottom Core:	1960.5	m	**Density:**	1085	**Core Driller.:**	Jeremy Leavitt
Interval :	22.5	m	**Viscosity:**	55	**Start Date:**	13-Feb-13
Recovery:	21.5	m	**W.L.:**	7	**Start Time:**	16:45 Hours
Sleeved:	yes	m	**pH:**	9	**End Date:**	14-Feb-13
Hole Condition:	good				**End Time:**	00:45 Hours

CORING SEQUENCE

Run Number	Cored Interval From	To	Hours	Cut / Recovery	Core Bit
4	1938.0	1960.5	7.75	Cut 22.5 m, recovered 21.5 m.	BHC409c
		Total Hours:	7.75		

CORING OPERATIONS SUMMARY

Date	Start	End	Elapsed	Description of Operation
13 Feb 13	04:00	08:30	4.50	Made up 54.0 m core barrel assembly.
	08:30	16:45	8.25	Ran to bottom, circulated clean.
	16:45	24:00	7.25	Cut core.
14 Feb 13	00:00	00:45	0.75	Cut core, jammed off.
	00:45	09:00	8.25	Tripped out with core.
	09:00	13:00	4.00	Handled core barrels and recovered core.

REMARKS & COMMENTS

The core was cut into 1.5 m sections, chip sampled and packed in a transport box in a temperature controlled reefer van to prevent freezing.

WELL SUMMARY AND FORMATION EVALUATIONS

MGM SHELL EAST MACKAY I – 78
3001786450125300

The hole was drilled to test for oil in the Canol and Bluefish formations. Total Depth was 2001.0 m, in the Hume Formation.

A rathole was drilled on January 17, 2013 with a rathole rig, setting a conductor to 18.0 m, with samples collected at 2.5 m intervals. Permafrost was observed at the 5.0 m depth.

The well was spudded with Akita 37 on January 27, 2013 with a 311.0 mm insert bit and drilled with water and mud to surface casing depth at 405.0 m on January 29, 2013. Surface hole was logged with Baker Hughes in one run. Casing size was 244.0 mm, (9 5/8”), landed at 401.8 m. It was cemented on January 31, 2013.

BOPs were installed and tested and the main hole was started on February 1, 2013 with a 222.0 mm PDC bit. It was drilled to core point at 1820.0 m. The pipe was tripped and a 54.0 m coring assembly installed. Core run number 1 was done on February 8, 2013 and cut from 1820.0 to 1834.0 m with a 12.7 m recovery. Core number 2 was cut on February 10, 2013 from 1834.0 to 1851.6 m, with a 17.3 m recovery. Core number 3 was cut on February 11, 2013 from 1851.6 to 1874.2 m with a 21.4 m recovery. The coring was done with 216.0 mm bits. The hole was drilled from the end of core 3 to the start of core 4 at 1938.0 m with a 216.0 mm tricone bit. The final core was cut from 1938.0 to 1960.5 m, with a 21.5 m recovery. This core ended in the Hume Formation. The hole was drilled to a final Total Depth of 2001.0 m on February 15, 2013 at 09:45 hours.

The first wireline log, a quad combo, was run to bottom, encountered tight hole when the calipers were opened. Calipers were closed, pulled up to 1972.0 m, and the tools stuck there for a few hours until pulling free. The calipers were opened about 1965.0 m, and the log was run to surface. Data was not collected near the bottom of the well. A cleanout trip was done and the mud weight increased. The second log run, consisting of sonic, induction and spectral Gamma, had no problems. A third run with imaging tools reached 1980.0 m, logged to 1650.0 m, returned to bottom for a repeat and encountered a bridge at 1820.0 m. The log run was completed and a cleanout trip was run with drill pipe. A planned run with neutron and density tools was cancelled because most of the hole had been covered with the first run. The final logging run was the Flex-MREX with spectral Gamma over the Bluefish, Canol and Slater River radioactive shale. The hole was cased and cemented prior to completion operations.

Samples were caught from surface, beginning with the conductor hole, to Total Depth at 2001.0 m. A Continental gas detector and chromatograph were run from 25.0 m to Total Depth. The hole was drilled with Akita Drilling rig 37, supervised by Guy Cusitar and Cody Hart. Baker Hughes directional tools and pulsed Gamma were used from 405.0 to 1820.0 m to keep the hole vertical and to provide Gamma data to correlate with offset well I-77. Baker Hughes logged the hole at surface casing depth and at final Total Depth with wireline tools. Baker Hughes core drillers Richard Rooney and Jeremy Leavitt cut four cores. Continental mudloggers Nouman Afzal and Ukeme Dan collected isotube samples from 50.0 m to 1750.0 m at 50.0 m intervals, and 10.0 m intervals from 1820.0 to 2000.0 m. The drilling supervisors were Trevor Mitchell and Jason Duckworth. John Williams was the on-site drilling superintendent. Shell Canada on-site representatives Andrew Hyde and Nathan Tuckwell assisted with handling of the core. MGM chief geologist Paul Price was on site to pick core points and supervise the coring operation.

FORMATION EVALUATIONS

OVERBURDEN

The first few metres from surface is a fine to medium grained sand. This is underlain by silty clay with abundant black organic matter. The clay and organics are frozen, indicating permafrost.

TERTIARY, SUMMIT CREEK 12.5 m KB, 6.5 m below ground surface

The Summit Creek Formation is a mixture of interbedded fine to medium grained, silica cemented, quartz sandstone, quartz siltstone and mudstone. There are thin coal seams in the mudstone between 25.0 and 30.0 m.

CRETACEOUS, EAST FORK 129.0 m KB, 32.0 m SS

The East Fork Formation is a mudstone with interbedded siltstone and sandstone. The sandstone is predominantly fine to medium grained quartz with minor chert and lithic grains. There is silica cement, some calcareous cement, and generally a silty matrix. Porosity is estimated at 6 to 12%. The siltstone is moderately consolidated, slightly calcareous, composed of quartz with minor lithic content and a clay matrix. Porosity is estimated at trace to 3%, with some 3 to 6% porosity. The mudstone is medium grey, firm, moderately consolidated, and very slightly micromicaceous. The samples to 600.0 m contained soft clay that washed away during the washing process indicating the mudstone is plastic and soft in water.

There is a thin marlstone at 195.0 m. There is a sandstone at 300.0 m with a chert conglomerate at the base. Porosity is estimated at 6 to 12%. The sand is underlain by soft mudstone. There is a fine to medium grained sandstone from 360.0 to approximately 390.0 m. Surface casing was set at 402.0 m. The interval from 440.0 to 550 m is predominantly fine to medium grained quartz and chert sandstone with 6 to 12% porosity. A fine to coarse grained sandstone occurs from 605.0 to 620.0 m with 5 to 8% porosity. This is underlain by interbedded sandstone and medium grey siltstone and shale. There is a very fine to fine grained sandstone from 660.0 to 680.0 m with 5 to 8% porosity. This is underlain by medium grey mudstone with interbedded siltstone and sandstone lenses to the top of the Little Bear Formation.

Gas readings were very low in the East Fork Formation. The gas detector zero base line drifted from –5 to 12 units. There were a few short intervals from 300.0 to 400.0 m of 12 to 20 units. From 400.0 to 625.0 m the gas background was 20 to 50 units. From 625.0 m to the top of the Little Bear the gas readings were 10 to 20 units. Several butane tests were performed to ensure the gas detector was functioning properly.

LITTLE BEAR 764.0 m KB, -603.0 m SS

The Little Bear Formation is a series of thick sandstones separated by thick sequences of mudstone with some siltstone and sandstone beds. The upper sandstone occurs from 764.0 m to 865.0 m with minor mudstone intervals. The sandstone is predominantly fine grained with some medium grains. It is composed of quartz with some grey to black chert. There are localized chert beds of very coarse grains and granules to small pebbles. The grains are generally loose in sample with a few consolidated chips. Silica is the main cementing agent with some clay matrix. Porosity is estimated at 6 to 12% with some 8 to 14% beds. The sandstone is underlain by medium grey mudstone with some sandstone to the top of the Little Bear Middle Sandstone.

Gas readings were 10 to 20 units.

The Little Bear Middle Sandstone occurs from 887.0 to 990.0 m with minor interbedded mudstone. The sandstone varies from fine to medium grained, to very fine to fine grained, in what may be coarsening upward cycles. It is mainly quartz with some black chert giving a salt and pepper appearance. There is a clay to silt matrix and 6 to 12% porosity. There is interbedded sandstone, mudstone and siltstone to the top of the Lower Little Bear Sandstone.

Gas readings were 10 to 15 units from 890.0 to 1000.0 m, then gradually increased into the 20 to 30 range from 1000.0 to 1160.0 m.

The Lower Little Bear Sandstone occurs from 1161.0 to 1184.0 m. It is fine to coarse grained at the top, decreasing in grain size with depth to very fine grained, in a coarsening upward sequence. It is quartz and dark chert at the top, becoming quartzose and argillaceous at the base. It has silica cementation, a clay matrix, 6 to 12% porosity, decreasing to 5 to 8% porosity at the base. This sandstone is underlain by mudstone with interbedded sandstone to the top of the Slater River Formation.

Gas readings were 20 to 30 units.

SLATER RIVER 1188.0 m KB, -1027.0 m SS

The Slater River Formation is predominantly mudstone. It is medium grey, blocky, micromicaceous, locally silty with some interbedded argillaceous siltstone and very fine grained quartz sandstone. The mudstone grades from medium to dark grey, and becomes increasingly hard towards the top of the radioactive shale bed. It appears to grade from mudstone to shale between 1360.0 and 1400.0 m. The mudstone – shale contains some greyish brown silicified or sideritic lenses.

Gas readings were 20 to 40 units from 1190.0 to 1300.0 m, 40 to 80 units from 1300.0 to 1350.0 m, and 60 to 120 units from 1350.0 to 1400.0 m.

The Slater River Radioactive Shale is very dark grey, becoming greyish brown in part. It is firm to hard, micromicaceous, platy, slightly fissile, has traces of pyrite and locally white phosphatic specks. There are trace amounts of bluish grey clay that may be phosphatic. There are minor silty and sandy lenses and rare fossil fragments.

Gas readings peaked at 550 units, and had a background of 300 to 400 units.

ARCTIC RED FORMATION 1434.0 m KB, -1273.0 m SS

The Arctic Red is a silty shale grading to an argillaceous siltstone with minor very fine grained sandstone lenses.

Gas readings were 150 to 220 units.

DEVONIAN, IMPERIAL FORMATION 1482.0 m KB, -1321.0 m SS

The Imperial Formation is a buff coloured quartz siltstone, grading locally to very fine grained quartz sandstone, with trace lithic content and scattered very fine carbonaceous flakes and inclusions. There is a clay matrix and 3 to 6% porosity. It is slightly calcareous and has some thin shale beds. Dark grey shale beds are present toward the base of the formation.

Gas readings were 60 to 140 units. The highest readings are in the dark shales at the base of the formation.

CANYON SANDSTONE 1700.0 m KB, -1539.0 m SS

At this location the Canyon Sandstone is a buff coloured siltstone. It is a moderately consolidated quartz silt with silica cementation, slightly calcareous with a clay matrix, trace black carbonaceous specks and 3 to 6% porosity. It is underlain by dark grey, platy, firm, micromicaceous shale. There is a high Gamma shale marker bed from 1761.0 to 1776.0 m KB, (-1600.0 to -1615.0 m subsea) with a dark grey to greyish brown colouration. This is underlain by medium to dark grey, fissile shale with a slightly waxy appearance. The shale becomes dark to very dark grey toward the top of the Canol. The last few metres were seen in core. They are dark grey, brittle, slightly carbonaceous, moderately siliceous, with traces of pyrite.

The gas readings were 50 to 80 units in the siltstone and 80 to 160 units in the shale. The gas trap was serviced and some information lost from 1800.0 to 1820.0 m.

CANOL FORMATION 1820.0 m KB, -1659.0 m SS

The Canol Formation was encountered at 1820.0 m and cored in three core runs to 1874.0 m with good recovery. The core was sleeved, and samples were taken where the sleeves were cut into 1.5 m lengths for transport. It is a dark grey to brownish grey, hard, siliceous shale. The core was dry, with only one instance of bleeding oil from a microfracture. Sample chips of core all gave a bright white cut, and most chips had a dull brown fluorescence. The bleeding oil had a yellow fluorescence. Finely disseminated pyrite was common, and may be associated with a sulphurous odour from the core. Hairline and slightly wider fractures filled with white calcite were common. There was no evidence of fracture porosity except for the trace of oil. The core appears carbonaceous, but may instead be bituminous. There were rare chips with some dry black bitumen. The 1.5 m lengths of sleeved core were stored in a temperature controlled van to keep them above freezing temperature. The rubber end caps bulged on some of the pieces indicating degassing of the core. Gas readings while coring were 100 to 150 units. The best gas was seen from 1839.0 to 1851.0 with shows of 210 and 290 units.

The Canol was drilled with a tricone bit from 1874.0 m to the top of the Hare Indian at 1918.0 m. This interval was very similar to the core, with sample chips producing a milky streaming cut and a yellow ring cut. Gas readings were in the 100 to 150 units range, with 150 to 200 units from 1884.0 to 1889.0 m.

HARE INDIAN 1918.0 m KB, -1757.0 m SS

The Hare Indian Formation is a dark grey, slightly carbonaceous shale with a slow streaming milky cut, pyrite nodules or pyrite fracture infill, and traces of calcite filled micro fractures.

The gas readings were 100 to 150 units.

BLUEFISH 1937.0 m KB, -1776.0 m SS

The Bluefish Formation was cored from 1938.0 m to the top of the Hume. Small samples were taken at 1.5 m intervals, where the core was cut for shipment. It is a dark grey, firm, slightly siliceous, slightly carbonaceous or bituminous shale with local calcite filled fractures and traces of pyrite. Small fossil fragments and fossil moulds are present on bedding surfaces and in thin beds. It has some weak brown fluorescence and a streaming milky cut. There are some interbedded chalky limestone beds with bitumen staining.

Gas readings were low, in the 40 to 80 unit range.

HUME 1957.0 m KB, -1796.0 m SS

The upper 3.0 m of the Hume Formation were recovered at the bottom of the fourth core. The upper 3.0 m is a slightly translucent, tan coloured microcrystalline limestone. It grades locally to very fine and finely crystalline. In the uppermost metre some pinpoint vugs are present with traces of soft black bitumen. There is trace local tan oil staining, no to local faint yellow fluorescence and a faint milky cut.

The limestone was drilled from 1960.0 m to Total Depth at 2001.0 m. It grades from microcrystalline to cryptocrystalline with depth and becomes chalky and less indurated. There is rare tan oil stain, no fluorescence and a very faint milky cut. There are traces of calcite filled microfractures.

LITHOLOGICAL DESCRIPTIONS

MGM SHELL EAST MACKAY I – 78
3001786450125300

CORE DESCRIPTIONS

CORE 1, February 8, 2013: cut 1820.0 to 1834.0 m, 14.0 m in 5.5 hours. Recovery 12.7 m

Note: sleeved core, cut and sampled at 1.5 m intervals.

1820 m — **SHALE**: dark grey, slightly carbonaceous, well consolidated, firm to hard, pyrite on subvertical to vertical fracture, conchoidal fracture, siliceous, no stain, no fluorescence, slow streaming milky cut.

1821.5 m — **SHALE**: dark grey, slightly carbonaceous, hard, brittle, siliceous, slightly micromicaceous, no stain, no fluorescence, slow streaming milky cut.

1823.2 m — **SHALE**: dark grey, slightly carbonaceous, hard, brittle, siliceous, no stain, no fluorescence, weak to moderate white cut.

1824.7 m — **SHALE**: dark grey, brittle, hard, siliceous, slightly carbonaceous, 2.0 to 3.0 mm disseminated pyrite lamina, minor pyrite on subvertical fracture surface, no stain, no fluorescence, weak to moderate white cut,

1826.2 m — **SHALE**: dark grey, hard, brittle, siliceous, slightly carbonaceous, trace pyrite along bedding plane, conchoidal fracture, no stain, no fluorescence, weak to moderate white cut.

1827.7 m — **SHALE**: dark grey, hard, brittle, siliceous, slightly carbonaceous, conchoidal fracture, very slightly micromicaceous, no stain, no fluorescence, weak to moderate white cut.

1829.2 m — **SHALE**: dark grey, hard, brittle, siliceous, slightly carbonaceous, conchoidal fracture, trace pyrite, no stain, no fluorescence, weak milky streaming cut.

1830.7 m — **SHALE**: dark grey, slightly brown grey, hard, brittle, siliceous, slightly carbonaceous, scattered pyrite on fracture plane, no fluorescence, no stain, weak to moderate milky cut.

1832.2 m — **SHALE**: dark grey, slightly brown, hard, brittle, siliceous, slightly carbonaceous, conchoidal fracture; no fluorescence, no stain, moderate milky cut.

1832.7 m — **SHALE**: dark grey, slightly brown, hard, brittle, siliceous, slightly carbonaceous, scattered disseminated, pyrite, no fluorescence, no stain, moderate milky cut.

No Core 1832.7 to 1834 m, core shoe jammed with rubble chips.

CORE 2, February 10, 2013: cut 1834.0 to 1851.6 m, 17.6 m in 5.75 hours. Recovery 17.3 m

1834 m — **SHALE**: dark grey, slightly micromicaceous, hard, brittle, siliceous, slightly carbonaceous, trace scattered pyrite, no stain, no fluorescence, slow moderate white cut.

1835.5 m **SHALE**: dark grey, slightly micromicaceous, hard, brittle, siliceous, common scattered pyrite needles, slightly carbonaceous, no stain, no fluorescence, strong white cut.

1837 m **SHALE**: dark grey, slightly micromicaceous, hard, brittle, siliceous, trace scattered pyrite needles, slightly carbonaceous, trace bitumen replacing microfossils, trace moldic porosity, no stain, strong fast white cut, sulphurous odour.

1838.5 m **SHALE**: dark grey, brittle, siliceous, slightly carbonaceous, trace disseminated pyrite, fissile, platy, slightly sulphurous odour, no stain, no fluorescence, strong milky cut.

1840 m **SHALE**: dark grey, hard, slightly micromicaceous, slightly carbonaceous, siliceous, pyrite in a 2.0 to 3.0 mm lamina, no stain, no fluorescence, strong milky cut, sulphurous odour.

1841.7 m **SHALE**: dark grey, hard, platy, fissile, siliceous, trace calcite on vertical fracture surface, slightly carbonaceous, trace scattered pyrite, no staining, dull brown fluorescence, slow white streaming cut, weak sulphurous odour.

1843.2 m **SHALE**: dark grey, platy, fissile, hard, siliceous, slightly carbonaceous, trace pyrite, no staining, dull brown fluorescence, slow milky cut.

1844.7 m **SHALE**: dark grey, micromicaceous, hard, siliceous, platy, slightly carbonaceous, no staining, dull brown fluorescence, slow milky cut.

1846.2 m **SHALE**: dark grey, hard, siliceous, platy, common scattered micro-pyrite, no stain, dull brown fluorescence, moderate milky cut, sulphurous odour.

1847.7 m **SHALE**: dark grey, hard, siliceous, slightly micromicaceous, no stain, dull brown fluorescence, slow milky cut, sulphurous odour.

Note: the milky cut dries to a pale yellow ring cut.

1849.2 m **SHALE**: dark grey, hard, siliceous, slightly micromicaceous, trace calcite on vertical fracture surfaces, no stain, dull brown fluorescence, moderate to strong white milky cut.

1850.7 m **SHALE**: dark grey, micromicaceous, hard, siliceous, slightly carbonaceous, trace pyrite, trace pyrite replacing a fossil, no stain, dull brown fluorescence, moderate milky cut, moderate sulphurous odour.

1851.3 m **SHALE**: dark grey, micromicaceous, hard, siliceous, slightly carbonaceous, possible slickensides, local rugose bedding surface or possible pressure solution, microscopic scattered pyrite, no staining, dull brown fluorescence, moderate to strong white cut, weak sulphurous odour.

CORE 3, February 11, 2013: cut 1851.6 to 1874.2 m, 22.6 m in 6.75 hours. Recovery 21.4 m

1853.1 m **SHALE**: dark grey, hard, brittle, siliceous, slightly carbonaceous, scattered micro-pyrite, no visible stain, weak dull brown fluorescence, weak sulphurous odour, bright white streaming cut.

1854.3 m **SHALE**: dark grey, slightly micromicaceous, hard, brittle, siliceous, slightly carbonaceous, no visible stain, dull dark brown fluorescence, no sulphurous odour, bright white streaming cut.

1855.8 m **SHALE**: dark grey, hard, siliceous, slightly carbonaceous, micromicaceous, no visible stain, medium brown fluorescence, no sulphurous odour, bright white streaming cut.

Note: white cut dries to a pale yellow ring cut.

1857.3 m **SHALE**: dark grey, hard, brittle, slightly micromicaceous, siliceous, slightly carbonaceous, no visible stain, dull brown fluorescence, no sulphur odour, bright white streaming cut.

1858.8 m **SHALE**: dark grey, hard, slightly micromicaceous, siliceous, slightly carbonaceous, calcite coating on subvertical fracture, calcite and/or dolomite on horizontal bedding surfaces, trace very fine granular pyrite in very thin horizontal beds, no visible stain, dull brown fluorescence, weak sulphurous odour, bright white streaming cut.

1860.3 m **SHALE**: dark grey, hard, siliceous, conchoidal fracture, slightly carbonaceous, minor thin bedding-parallel pyrite seams, no visible stain, even medium brown fluorescence, weak sulphurous odour, bright white streaming cut.

1861.8 m **SHALE**: dark grey, hard, siliceous, micromicaceous, abundant very fine disseminated pyrite. Slightly carbonaceous, no visible stain, dull brown fluorescence, weak sulphurous odour, bright white streaming cut.

1863.4 m **SHALE**: dark grey, hard, siliceous, slightly carbonaceous, slightly micromicaceous, finely crystalline calcite on subvertical fracture, trace bleeding oil on a tight fracture, oil has a dark yellow fluorescence, no visible stain on shale, even medium brown fluorescence, no sulphurous odour, bright white streaming cut.

1864.9 m **SHALE**: dark grey, hard, siliceous, siliceous, slightly carbonaceous, common very fine disseminated pyrite, one subvertical calcite lined hairline fracture, dull brown fluorescence, weak sulphurous odour, bright white streaming cut.

1866.4 m **SHALE**: dark grey, hard, siliceous, conchoidal fracture, one calcite lined hairline fracture, minor disseminated pyrite, dull brown fluorescence, weak sulphurous odour, bright white streaming cut.

1867.9 m **SHALE**: dark grey, hard, siliceous, conchoidal fracture, slightly carbonaceous, common very fine disseminated pyrite, no visible staining, weak dull brown fluorescence, slightly sulphurous odour, bright white milky streaming cut.

1869.4 m **SHALE**: dark grey, hard, siliceous, slightly carbonaceous, common micro disseminated pyrite, trace calcite along possible subvertical fracture, no visible stain, possible dull brown fluorescence, weak sulphurous odour, slow bright white streaming milky cut.

1870.9 m **SHALE**: dark grey, hard, siliceous, slightly carbonaceous, minor micro scattered pyrite, one vertical hairline fracture no calcite coating possibly mechanically

fractured, no visible stain, slow streaming milky cut.

1872.4 m **SHALE**: dark grey, hard, siliceous, slightly carbonaceous, slightly micromicaceous, minor scattered micro-pyrite, no visible stain, dull dark brown fluorescence, slow streaming milky cut.

1873 m **SHALE**: dark grey, hard, siliceous, slightly carbonaceous, no visible stain, possible weak dull brown fluorescence, no fluorescence, no sulphurous odour, slow streaming milky cut.

CORE 4, February 13, 2013: cut 1938.0 to 1960.5 m, 22.5 m in 7.75 hours. Recovery 21.5 m.

1938 m **SHALE**: dark grey, firm, slightly ductile, slightly micromicaceous, platy, fissile, possible dull fluorescence, faint milky cut.

1939.5 m **SHALE**: dark grey, slightly micromicaceous, firm to hard, slightly silicified, slightly carbonaceous, scattered pyrite cubes to 2.0 mm, numerous black glassy inclusions, trace calcite filled hairline fractures, no visible stain, possible dull fluorescence, moderate streaming cut.

1940.8 m **SHALE**: dark grey, fissile, firm, slightly silicified, carbonaceous, slightly carbonaceous, no visible stain, no fluorescence, moderate streaming milky cut.

1942.8 m **LIMESTONE**: medium grey, microcrystalline, slightly translucent, abundant interstitial bitumen, bitumen stain, no fluorescence, moderate streaming milky cut.

1943.8 m **SHALE**: dark grey, firm to hard, slightly silicified, platy, fissile, no visible stain, no fluorescence, moderate streaming milky cut.

1945.3 m **SHALE**: dark grey, firm to hard, slightly brittle, slightly silicified, slightly carbonaceous, trace pyrite, no visible stain, no fluorescence, moderate streaming milky cut.

1946.8 m **SHALE**: dark grey, fissile, firm to hard, slightly silicified, moderately carbonaceous, polished surfaces possible slickensides, trace calcite fracture coating, no visible stain, medium brown fluorescence, slow to moderate streaming milky cut.

1948.3 m **SHALE**: dark grey, firm to hard, slightly silicified, moderately carbonaceous, slightly micromicaceous, fissile, numerous fossil moulds, no stain, medium brown fluorescence, moderate streaming milky cut.

1950 m **SHALE**: dark grey, firm to hard, fissile, platy, trace calcite filled micro fracture, some limestone lenses in the shale, no visible stain, no fluorescence, slow to moderate streaming milky cut.

1951.5 m **SHALE**: dark grey, firm to hard, slightly silicified, fissile, slightly carbonaceous, trace pyrite cubes, common fossil moulds, no stain, no fluorescence, slow to moderate streaming milky cut.

1953 m **SHALE**: dark grey, firm to hard, slightly silicified, slightly carbonaceous, calcareous beds, common fossil moulds, no stain, no fluorescence, slow to

moderate streaming milky cut.

1954.5 m **SHALE**: dark grey, firm to hard, fissile, slightly silicified, slightly carbonaceous, no stain, possible weak fluorescence, slow to moderate streaming milky cut.

1956 m **SHALE**: dark grey, firm, fissile, slightly silicified, slightly carbonaceous, microcrystalline calcareous beds of fossil fragments, no stain, no fluorescence, slow to moderate streaming milky cut.

1957.5 m **LIMESTONE**: tan, light brown, very fine to finely crystalline, slightly translucent, dense, faint fossil fragments, rare specks of soft bitumen, trace soft bitumen in vugs, trace pinpoint to vuggy porosity, 2 to 3% porosity, spotty yellow fluorescence, faint milky cut.

1958.5 m **LIMESTONE**: medium grey, grey to brown, microcrystalline, slightly translucent, hard, one calcite filled hairline fracture, black fracture surface, bitumen stain, no fluorescence, faint milky cut.

1959.5 m **LIMESTONE**: tan, microcrystalline, slightly translucent, hard, trace calcite filled micro fracture, trace fracture surface with very fine white calcite crystals, trace fossil fragments, possible tan oil stain, no fluorescence, faint milky cut.

LITHOLOGICAL DESCRIPTIONS

MGM SHELL EAST MACKAY I – 78

3001786450125300

SAMPLE DESCRIPTIONS

2.5 m	**SAND**: salt and pepper, predominantly fine to medium grained, minor coarse grained, subrounded to subangular, poorly sorted, silt matrix, quartz, chert, minor lithic grains, loose, estimated 20% porosity.
5 m	**CLAY**: light grey, dense, slightly gritty to silty texture, soft, abundant firm black organic material. Note: Material is frozen with pieces of ice present, permafrost.
7.5 m	**SANDSTONE/SILTSTONE**: very light to light grey, finely banded, very fine to fine grained, common silt, subrounded, moderately sorted, quartz, minor chert, minor lithic grains, weakly consolidated, trace mica flakes, clay to silt matrix, 6 to 10% porosity. Bedrock.
10 m	**SILTSTONE/SANDSTONE**: light grey, quartz silt, grading to lower very fine grained, minor upper very fine grained, moderately sorted, quartz, trace lithic grains, clay matrix, 6 to 10% porosity.
12.5 m	**SANDSTONE**: salt and pepper, predominantly upper fine to upper medium grained, subrounded to subangular, moderately to well sorted, quartz, dark chert, minor lithic grains, trace pink chert, weakly consolidated, minor silica cement, silt matrix, clean, 15 to 18% porosity.
15 m	**SILTSTONE**: light grey, quartz silt, minor very fine grained, grading to very fine grained sandstone in part, trace lithic grains, moderately consolidated, clay matrix, 5 to 8% porosity.
17.5 m	**MUDSTONE**: dark grey, micromicaceous, firm, moderately to well consolidated, trace black, vitreous, coal microlaminae.
20-25 m	70% **SILTSTONE**/30% **MUDSTONE**: medium grey, quartz silt, trace very fine grained, non calcareous, moderately consolidated, grading from siltstone to silty shale, minor coal in micro seams, trace spotty carbonaceous inclusions, tight. Some cement in sample.
25-30 m	2% **COAL**: black, vitreous, brittle, trace silty, occurs as thin seams in mudstone. 70% **MUDSTONE**/30% **SILTSTONE**: medium grey, moderately consolidated, blocky, silty, grading to siltstone in part, common carbonaceous partings, common coal seams, trace pyrite nodules. Trace cement in sample.
30-35 m	95% **SANDSTONE**: salt and pepper, fine to lower medium grained, minor upper medium grained, moderately to well sorted, subrounded to subangular, quartz, 5% dark chert, minor lithic grains, predominantly loose in sample, silica cement, non calcareous, minor siltstone, possibly interbedded, possible clay matrix, estimated 6 to 10% porosity. **COAL**: several chips of coal, possible cavings. 5% **MUDSTONE** and **SILTSTONE**.
35-40 m	60% **MUDSTONE**/20% **SILTSTONE**: medium grey, blocky, moderately firm, consolidated, silty in part, interbedded medium grey, quartz siltstone, trace scattered carbonaceous inclusions and laminae, trace coal in micro seams. 20%

SANDSTONE: as above.

40-45 m — 100% **SILTSTONE**: light to medium grey, quartz silt, minor lithic grains, moderately consolidated, silica cement, clay matrix, minor interbedded silty mudstone, trace carbonaceous inclusions, trace coal micro seams, 3 to 6% porosity.

45-50 m — 90% **MUDSTONE**: medium grey, blocky, firm, minor microlaminae of coal, minor black carbonaceous partings, silty in part, minor siltstone lenses. 10% **SANDSTONE** salt and pepper as above, cavings.

50-55 m — 70% **SILTSTONE**/30% **MUDSTONE**: light grey, slightly salt and pepper, quartz silt, trace very fine grained, trace dark lithic grains, non calcareous, moderately consolidated, clay matrix, trace carbonaceous inclusions, trace porosity.

55-65 m — 70% **MUDSTONE**/30% **SILTSTONE**: medium grey, blocky, moderately consolidated, firm, trace carbonaceous inclusions, silty in part, common siltstone lenses, minor sandstone.

65-70 m — 80% **SANDSTONE**: salt and pepper, predominantly fine to lower medium, trace upper medium, subangular to subrounded, moderately to well sorted, quartz, minor chert, minor lithic grains, predominantly loose, silica cement, clay to silt matrix, trace mica flakes, 5 to 10% porosity. 20% Coarse **MUDSTONE** and **SILTSTONE** chips in sample, probable cavings.

70-75 m — 100% **SANDSTONE**: salt and pepper, as above, consolidated, moderately firm, 6 to 12% porosity.

75-80 m — 100% **SANDSTONE**: salt and pepper, fine to lower coarse grained, moderately sorted, subrounded, quartz, common dark chert and lithic grains, predominantly loose, silica cement, silt matrix, 8 to 12% porosity.

80-90 m — 90% **SANDSTONE**: salt and pepper, rarely pink, fine to lower medium grained, moderately to well sorted, subrounded to subangular, quartz, common lithic and dark chert, predominantly loose, silica cement, slightly calcareous, clay to silt matrix, 5 to 10% porosity. 10% coarse chips of **MUDSTONE** and **SILTSTONE**.

90-100 m — 90% **SANDSTONE**: salt and pepper, fine to lower medium grained, occasional upper medium grained, subangular to subrounded, moderately to well sorted, quartz, common lithic and dark chert, predominantly loose, silica cement, clay to silt matrix, trace carbonaceous inclusions, 5 to 10% porosity. Some mudstone and siltstone in sample.

100-110 m — 95% **SANDSTONE**: salt and pepper, lower fine to upper medium, moderately sorted, subrounded to subangular, quartz, common dark chert, minor lithic grains, predominantly loose, silica cement, silt matrix, trace white clay patches, trace interbedded mudstone, 8 to 12% porosity. 5% **SILTSTONE**: light grey, quartz silt, moderately consolidated, trace porosity.

110-120 m — 40% **MUDSTONE**/10% **SILTSTONE**: medium grey, blocky, firm, silty in part, interbedded with Siltstone: medium grey, quartz silt, minor lithic grains, moderately consolidated, non calcareous to slightly calcareous, trace carbonaceous inclusions, trace porosity. 50% **SANDSTONE** as above, cavings?

120-125 m	60% **SILTSTONE**/30% **MUDSTONE**: light grey, quartz silt, minor lithic grains, moderately consolidated, slightly calcareous, rare mica flakes, trace carbonaceous inclusions, clay matrix, 3 to 6% porosity, interbedded with medium grey mudstone. 10% **SANDSTONE** as above, cavings.
125-130 m	70% **SANDSTONE**: salt and pepper, trace pink, predominantly fine grained, well sorted, subangular, quartz, common dark chert and lithic grains, predominantly loose, silica cement, very slightly calcareous, silt matrix in part, 8 to 12% porosity. 30% **SILTSTONE** and **MUDSTONE** as above.
130-140 m	70% **MUDSTONE**/30% **SILTSTONE**: medium grey, blocky, firm, moderately calcareous, silty in part, trace carbonaceous inclusions, interbedded with light grey calcareous siltstone and very fine grained sandstone.
140-150 m	70% **MUDSTONE/SILTSTONE**: medium grey, blocky, firm, slightly calcareous, silty, interbedded with 30% **SILTSTONE**: light grey, slightly salt and pepper, quartz silt, trace lithic grains, moderately consolidated, moderately calcareous, clay matrix, rare mica flakes, trace to 3% porosity. Trace Sandstone, probable cavings.
150-155 m	70% **MUDSTONE**: medium grey, blocky, firm, silty, interbedded with siltstone, moderately calcareous. 30% **SILTSTONE**: light grey, moderately consolidated, calcareous cement, clay matrix, trace porosity. **SANDSTONE**: one chip, salt and pepper, trace pink, very fine to fine grained, moderately to well sorted, subangular to subrounded, quartz, common lithic and chert grains, calcareous, 5 to 8% porosity.
155-160 m	100% **SILTSTONE**: light to medium grey, quartz silt, minor lithic grains, rare mica flakes, clay matrix, moderately calcareous, grading to silty mudstone in part, local mudstone beds, trace porosity.
160-170 m	100% **SILTSTONE**: medium grey, quartz silt, minor lithic grains, moderately to well consolidated, firm to brittle, clay matrix, rare to trace carbonaceous inclusions, slightly to moderately calcareous, some interbedded mudstone, trace to 3% porosity,
170-180 m	100% **SILTSTONE**: as above, common interbedded mudstone, trace very fine to fine sandstone.
180-195 m	100% **SILTSTONE**: light to medium grey, slightly salt and pepper, quartz silt, minor lithic grains, grading from near clay size to near very fine grained, common microscopic white patches of clay?, slightly to moderately calcareous, minor interbedded silty mudstone, trace to 6% porosity.
195-200 m	5%, **MARLSTONE**: medium grey to green, cryptocrystalline, locally grading to microcrystalline, earthy, hard, brittle, minor clay residue after HCl, less reactive and more clay content in part, trace local rounded mudstone inclusions, tight. 95% **SILTSTONE** as above.
200-210 m	70% **MUDSTONE**: medium to dark grey, slightly micromicaceous, firm. 30% **SILTSTONE**: medium grey, slightly salt and pepper, as above.
210-220 m	50% **MUDSTONE**: medium grey, rounded chips, firm, slightly brittle. 50% **SILTSTONE**: medium grey, firm, brittle, clay matrix, trace porosity. Mixed

lithologies and sawdust, from a hole sweep.

220-230 m — 75% **MUDSTONE**: medium grey, firm, blocky, slightly micromicaceous. 25% **SILTSTONE**: medium grey, moderately consolidated, quartz, minor lithic grains, clay matrix, trace to 3% porosity. Higher viscosity mud producing some clay balls.

230-240 m — 75% **MUDSTONE**: medium grey, blocky, firm. 25% **SILTSTONE**: medium grey, quartz silt, firm, blocky, trace porosity. Trace sandstone.

240-250 m — 70% **SANDSTONE**: salt and pepper, fine to lower medium grained, moderately to well sorted, subrounded to subangular, quartz, common dark chert, trace pyrite, predominantly loose, silica cement, moderately calcareous, estimated 6 to 12% porosity. 30% mudstone.

250-260 m — 70% **MUDSTONE**: medium grey, dense, firm. Chips are rounded and covered in loose 30% sand as above.

260-270 m — 100% **MUDSTONE**: medium grey, dense, firm, minor siltstone.

270-285 m — 80% **MUDSTONE**: medium grey, firm, dense, blocky. 20% silt and sand loose in sample, cavings?

285-305 m — 90% **SANDSTONE**: salt and pepper, fine to lower medium grained, occasional coarse grained chert, moderately sorted, subrounded to subangular, quartz, common dark chert, minor lithic grains, loose, probable silica cement, rare pyrite, estimated 6 to 12% porosity. 10% Minor **MUDSTONE**. Trace white clay chips in 300.0 m sample.

305-310 m — 70%, **CHERT**: white, buff, pebble fragments. 10% **SANDSTONE**: salt and pepper, fine grained, moderately sorted, subangular to subrounded, quartz, minor chert, minor lithic grains, possible matrix for chert conglomerate. 20% **MUDSTONE**, medium grey, firm, blocky, some interbedded siltstone.

310-315 m — 80% **SANDSTONE**: salt and pepper, fine to medium grained, with coarse grained chert to small pebble fragments, poorly sorted, subangular to subrounded, quartz, minor dark chert, minor lithic grains, trace to minor interstitial pyrite, loose, possible silica cement, estimated 6 to 12% porosity. 20% **MUDSTONE**: medium grey, firm, blocky, moderately consolidated, some interbedded siltstone.

315-320 m — 80% **MUDSTONE**: medium grey in part, light green soft and waxy in part, grey to green very hard and brittle, appears silicified in part, non calcareous. 20% **SANDSTONE** as above.

320-335 m — No samples.

335-340 m — Sample of mixed lithologies, coarse chert and quartz grains, grey green silicified shale or altered chert, siltstone, minor sandstone, mudstone. Wet sample appears to be mudstone.

340-350 m — 70% **MUDSTONE**: medium grey, dense, firm, soft and slightly plastic in water. 30% **SILTSTONE** and **SANDSTONE** in sample, possible cavings or interbedded in mudstone.

350-360 m	80% **MUDSTONE**: medium grey, firm, blocky, dense, uniform, non silty, non calcareous. 20% **SILTSTONE** and **SANDSTONE**.
360-370 m	100% **SANDSTONE**: salt and pepper, fine to lower medium grained, moderately sorted, subrounded to subangular, quartz, common chert and lithic grains, loose, silica cement, 6 to 12% porosity.
370-385 m	100% **SANDSTONE**: as above, clay matrix, 6 to 12% porosity.
385-390 m	**SHALE**: 60%, medium grey, firm, blocky, one chip finely interbedded with fine grained quartz sandstone. 40% **SANDSTONE**: loose as above, cavings? Trace **SILTSTONE**: hard.
390-395 m	**SANDSTONE**: Fine fraction of sample is 95% loose fine to lower medium grained sandstone. Coarse fraction is 40% consolidated fine to lower medium grained sandstone. **SANDSTONE**: salt and pepper, fine to lower medium grained, subrounded, moderately to well sorted, quartz, common chert and lithic grains, moderately consolidated, silica cement, hard and very fine grained in part, clean, 8 to 12% porosity. 60% **MUDSTONE**: medium grey, firm, blocky, common fine interbedded sandstone lenses.
395-400 m	Interbedded **SANDSTONE**/**SILTSTONE**/ **MUDSTONE**
400-405 m	Interbedded **SANDSTONE**/**SILTSTONE**/**SHALE**: 50% **SANDSTONE**: salt and pepper, fine to medium grained, very fine grained in part, subangular to subrounded, moderately sorted, quartz, minor chert and lithic grains, rare mica flakes, moderately consolidated, clay to silt matrix, low relief, 5 to 10% porosity. 50% **MUDSTONE**: medium grey, firm, blocky, rare black carbonaceous inclusions.
405-410 m	80% **MUDSTONE**: medium grey, firm, moderately consolidated, slightly silty in part, rare carbonaceous inclusions, slightly micromicaceous, some siltstone lenses. 20% **SANDSTONE**: salt and pepper, fine to medium fair, occasional coarse grained, moderately sorted, subangular to subrounded, quartz, minor chert and lithic grains, loose, silica cement, clay to silt matrix, non calcareous to very slightly calcareous, 6 to 12% porosity. Cement in sample.
410-420 m	Grey mush at shaker, very little lithic material. 80% **MUDSTONE**: medium grey, blocky, moderately firm, slightly micromicaceous, slightly silty. 20% **SANDSTONE**: salt and pepper, fine to medium grained, subangular to subrounded, moderately sorted, quartz, minor chert and lithic grains, loose in sample, estimated 6 to 12% porosity.
420-430 m	Grey mush at shaker, very little lithic material. 90% **MUDSTONE**: medium grey, firm, blocky, slightly micromicaceous, rare carbonaceous inclusions. 10% **SANDSTONE**: salt and pepper, fine to medium, loose grains.
430-440 m	Grey mush at shaker, minor lithic material. 50% **SILTSTONE**: medium grey, firm, moderately consolidated, quartz silt, clay matrix, slightly to moderately calcareous, grading to silty mudstone in part, some interbedded very fine grained sandstone, tight to trace porosity. 50% **MUDSTONE**: medium grey, firm, blocky, silty in part, rare carbonaceous inclusions, slightly micromicaceous.

440-450 m	Grey mush at shaker, moderate lithic content: 50% **SANDSTONE**: salt and pepper, fine to medium grained, moderately sorted, subrounded to subangular, quartz, minor chert, minor lithic grains, predominantly loose, silica cement, slightly calcareous, clay to silt matrix, minor very fine grained lenses, 6 to 12% porosity. 50% **MUDSTONE**, medium grey, firm, silty in part, some interbedded argillaceous siltstone, slightly micromicaceous, trace pyrite.
450-460 m	Shaker material mix of thick grey mud and soft chips. 60% **SANDSTONE**: salt and pepper, fine to medium grained, subangular to subrounded, moderately sorted, quartz, minor to common grey to black chert, minor lithic grains, loose in part, silica cement, slightly calcareous, silt matrix, 6 to 12% porosity. 40% **MUDSTONE**: medium grey, firm, blocky, silty in part, trace carbonaceous inclusions, slightly micromicaceous.
460-470 m	80% **SANDSTONE**: salt and pepper, fine to medium grained, occasional coarse grained, moderately sorted, subangular to subrounded, quartz, common chert, minor lithic grains, rare glauconite, predominantly loose, silica cement, slightly calcareous, silica matrix, 6 to 12% porosity. 20% **MUDSTONE**: medium grey, blocky, firm, silty, some interbedded siltstone, trace carbonaceous inclusions.
470-490 m	90% **SANDSTONE**: salt and pepper, predominant medium grained, fine grained in part, trace coarse grained, moderately sorted, subrounded to subangular, quartz, minor to common chert, minor lithic grains, predominantly loose, friable, silica cement, very slightly calcareous, clay to silt matrix, 8 to 12% porosity. 10% **MUDSTONE**: medium grey, firm, silty in part.
490-510 m	70% **SANDSTONE**: salt and pepper, fine to medium grained, subrounded to subangular, quartz, minor chert, minor lithic grains, moderately consolidated, friable, silica cement, moderately calcareous, clay matrix, 5 to 8% porosity. 30% **MUDSTONE**: medium grey, blocky, firm, silty in part, some siltstone lenses.
510-520 m	80% **SANDSTONE**: salt and pepper, fine to m grained, minor rounded coarse grained, moderately sorted, subrounded to subangular, quartz, common grey to black chert, minor lithic grains, loose, friable, silt matrix, estimated 6 to 12% porosity. 20% **MUDSTONE**: medium grey, firm, blocky, silty in part.
520-530 m	70% **SANDSTONE**: salt and pepper, fine to coarse grained, moderately sorted, subrounded to subangular, quartz, common chert, minor lithic grains, rare glauconite, predominantly loose, silica cement, clay to silt matrix, very slightly calcareous, 5 to 10% porosity. 30% **MUDSTONE**, predominant medium grey, firm, silty in part, trace grey to green, minor light grey to brown with floating fine to coarse sand grains.
530-540 m	As above, occasional chert pebble fragments.
540-550 m	90% **SANDSTONE**: salt and pepper, predominant medium grained, coarse grained in part, minor very coarse grained to granule, minor fine grained, moderately sorted, subrounded, quartz, common grey to black chert, minor lithic grains, loose, silica cement, slightly calcareous in part, clay to silt matrix, estimated 6 to 12% porosity. 10% **MUDSTONE**: medium grey, blocky, firm, slightly micromicaceous; Some light brown silicified mudstone to argillaceous chert, hard, brittle, minor floating quartz and chert grains.

550-560 m — 80% **SANDSTONE**: salt and pepper, medium to coarse grained, some very coarse grains, moderately sorted, subrounded, quartz, common chert, minor lithic grains, predominantly loose, silica cement, moderately consolidated, slightly to moderately calcareous, clay to silt matrix, rare pyrite, 5 to 10% porosity. 20% **MUDSTONE**: medium grey, blocky, form, silty in part, slightly micromicaceous.

560-580 m — 70% **MUDSTONE**: medium grey, blocky, firm, slightly micromicaceous. 30% **SANDSTONE**: salt and pepper, fine to medium grained, moderately sorted, subrounded to subangular, quartz, minor chert, minor lithic grains, loose, estimated 6 to 12% porosity.

580-590 m — 90% **MUDSTONE**: medium grey, firm, slightly micromicaceous, minor silty lenses. 10% **SANDSTONE**: as above.

590-600 m — 100% **MUDSTONE**: medium grey, firm, silty in part, minor argillaceous siltstone beds, trace very fine to fine grained sandstone lenses.

600-610 m — 90% **SANDSTONE**: salt and pepper, medium to very coarse grained, occasional granule fragments, poorly to moderately sorted, subrounded to subangular, quartz, common to abundant grey to black chert, minor lithic grains, loose, trace light brown to tan silicified clay as matrix in sandstone, minor tan silt matrix, no fluorescence on tan silt, silt matrix, 5 to 8% porosity. 10% **MUDSTONE**.

610-620 m — 90% **SANDSTONE** (conglomerate): salt and pepper, medium to very coarse grained, some granules, trace chert pebble fragments, poorly sorted, subrounded to rounded, quartz, chert, predominantly loose, silicified tan clay to siltstone matrix, very fine grained matrix in part, 5 to 8% porosity. 10% **MUDSTONE**: medium grey, firm, silty in part.

620-630 m — 50% **SANDSTONE**: salt and pepper, medium to coarse grained, very fine to fine grained in part, occasional very coarse grained, moderately sorted, subrounded to subangular, quartz, common chert, minor lithic grains, silica cement, silica clay and silt matrix, non calcareous to very slightly calcareous, 5 to 8% porosity. 30% **SILTSTONE**: medium grey, quartz silt, grading to very fine grained in part, consolidated, clay matrix, common interbedded mudstone and very fine to fine grained sandstone, trace porosity. 20% **MUDSTONE**: medium grey, firm, silty in part, interbedded with siltstone.

630-640 m — 50% **SANDSTONE**: light grey, very fine to fine grained, grading to siltstone in part, trace very coarse grained, moderately sorted, subangular to subrounded, quartz, minor lithic grains, silica cement, friable, clay matrix, non calcareous to very slightly calcareous, 5 to 10% porosity. 50% **SILTSTONE**: light grey, quartz silt, grading to very fine grained, moderately consolidated, clay matrix, slightly calcareous, 3 to 6% porosity.

640-660 m — 70% **SILTSTONE**: light grey, quartz silt, trace lithic grains, moderately consolidated, friable, slightly calcareous, clay matrix, trace nodular pyrite, 3 to 6% porosity. 20% **SANDSTONE**: light grey, salt and pepper, very fine to fine grained, trace coarse grains, subangular to subrounded, moderately sorted, quartz, minor chert, minor lithic grains, silica cement, clay matrix, 5 to 10% porosity. 10% **MUDSTONE**: medium grey, firm, blocky.

660-670 m — 90% **SANDSTONE**: salt and pepper, very fine to fine grained, minor medium grains, trace chert pebble fragments, subangular to subrounded, moderately

sorted, quartz, minor chert, minor lithic grains, consolidated, moderately friable, trace silica cement, clay matrix, trace pyrite nodules, occasional finely interbedded with mudstone, occasional floating coarse grained chert to pebbles, 5 to 8% porosity. 10% **MUDSTONE**: light grey to green, buff, moderately firm, non calcareous, medium grey, firm blocky in part.

670-680 m — 90% **SANDSTONE**: salt and pepper, very light grey, silt fine grained, predominant very fine grained, trace coarse grained to very coarse grained, moderately sorted, subangular to subrounded, quartz, minor lithic grains, moderately consolidated, friable, trace silica cement, breaks apart in water, clay matrix, trace pyrite, 5 to 8% porosity. 10% **MUDSTONE**: medium grey, blocky, firm, silty in part.

680-690 m — 80% **SANDSTONE**: salt and pepper, very fine to lower medium grained, occasional coarse to very coarse grained, moderately sorted, subangular to subrounded, quartz, minor chert, minor lithic grains, very rare glauconite, loose in part, silica cement, friable, clay matrix, argillaceous to very argillaceous in part, trace pyrite nodules, 5 to 10% porosity. 20% **MUDSTONE**: medium grey, firm, slightly micromicaceous, silty in part.

690-700 m — 70% **MUDSTONE**: medium grey, blocky, firm trace carbonaceous inclusions, trace buff rounded inclusions, silty and sandy in part, interbedded with argillaceous sandstone. 30% **SANDSTONE**: light grey, as above.

700-710 m — 70% **SANDSTONE**: light to medium grey, salt and pepper, very fine to fine grained, subangular to subrounded, quartz, minor chert, minor lithic grains, moderately consolidated, friable, silica cement, moderately to very argillaceous, interbedded with silty and sandy mudstone, 3 to 6% porosity. 30% **MUDSTONE**: medium grey, blocky, firm, slightly micromicaceous, silty and sandy in part.

710-720 m — 80% **MUDSTONE**: medium grey, firm, slightly micromicaceous, trace carbonaceous inclusions, silty, grading to argillaceous siltstone. 30% **SANDSTONE**: as above.

720-730 m — 100% **MUDSTONE**: medium grey, blocky, firm, silty, grading to and interbedded with argillaceous siltstone, some interbedded argillaceous sandstone, trace pyrite nodules.

730-740 m — 50% **SANDSTONE**: light to medium grey, very fine grained, grading to silt, subangular to subrounded, quartz, minor lithic grains, moderately consolidated, silica cement, moderately to very argillaceous, 3 to 6% porosity. 50% **MUDSTONE**: medium grey, firm, blocky, trace carbonaceous inclusions, silty and sandy lenses and beds, trace nodular pyrite.

740-750 m — 70% **MUDSTONE**: medium grey, firm, silty, grading to and interbedded with argillaceous siltstone, trace carbonaceous inclusions. 50% **SANDSTONE**: light to medium grey, very fine grained, silty, quartz, minor lithic grains, subangular to subrounded, moderately sorted, moderately consolidated, silica cement, argillaceous to very argillaceous, 3 to 6% porosity.

750-765 m — 80% **MUDSTONE**: medium grey, firm, blocky, trace carbonaceous inclusions, silty in part, common interbedded argillaceous siltstone and argillaceous sandstone, trace pyrite nodules. 20% **SANDSTONE**: light to medium grey, predominant very fine grained, minor fine grained, subangular to subrounded,

moderately sorted, quartz, minor lithic grains, moderately consolidated, silica cement, argillaceous to very argillaceous, 3 to 8% porosity.

765-770 m — 95% **SANDSTONE**: salt and pepper, fine to medium grained, moderately sorted, subrounded to subangular, quartz, common chert, minor lithic grains, predominantly loose, silica cement, clay matrix, 8 to 12% porosity, trace interstitial pyrite. 5% **MUDSTONE**: medium grey, firm, silty.

770-775 m — **SANDSTONE**: as above, trace chert pebble fragments.

775-780 m — **SANDSTONE** (Conglomerate): fine to very coarse grained, some larger fragments from granules to small pebbles, subrounded to subangular, poorly sorted, quartz, abundant varicoloured chert, predominantly loose, friable, silica cement, moderately consolidated, trace interstitial pyrite, 6 to 12% porosity.

780-790 m — 95% **SANDSTONE**: salt and pepper, predominantly fine grained, minor medium grained, moderately to well sorted, subrounded to subangular, quartz, minor lithic grains, minor chert, predominantly loose, silica cement, minor clay matrix, trace interstitial pyrite, 8 to 14% porosity. 5% **MUDSTONE**: medium grey, firm.

790-800 m — **SANDSTONE** (Conglomerate): very light grey, salt and pepper, predominantly fine grained, minor medium grained, numerous very coarse grained to small pebble chert fragments floating, subrounded to subangular, poorly to moderately sorted, quartz, minor lithic grains, moderately consolidated, silica cement, minor clay matrix, 8 to 14% porosity.

800-810 m — 95% **SANDSTONE** (Conglomerate): salt and pepper, predominantly fine grained, trace medium to coarse grained, common varicoloured chert granule to pebble fragments, poorly to moderately sorted, subangular to subrounded, quartz, common chert, minor lithic grains, moderately consolidated, friable, minor clay matrix, coarse grains and pebbles appear to float in fine grained sandstone, minor interbedded argillaceous siltstone, 6 to 12% porosity, no staining. 5% **SILTSTONE**: medium, blocky, firm, very argillaceous, grading to mudstone.

810-820 m — 90% **SANDSTONE**: salt and pepper, predominantly fine grained, occasional medium to coarse grained, minor granule to pebble fragments, subangular to subrounded, moderately to well sorted, quartz, minor lithic grains, minor chert, moderately consolidated, friable, non calcareous, silica cement, minor clay matrix, no staining, 6 to 12% porosity. 5% **MUDSTONE**: medium grey, blocky, firm, silty in part. 5% **MUDSTONE**: buff, tan, firm, blocky, hard in part, possibly silicified.

820-830 m — 80% **SANDSTONE**: salt and pepper, predominantly fine grained, minor medium to coarse grained, trace pebble fragments, moderately sorted, subangular to subrounded, quartz, common chert, minor lithic grains, moderately consolidated, friable, silica cement, non calcareous, minor clay matrix, trace pyrite masses, no staining, 6 to 12% porosity. 20% **MUDSTONE**: light to medium grey, firm, blocky, silty grading to argillaceous siltstone in part.

830-840 m — 100% **MUDSTONE**: medium to dark grey, blocky, firm, silty in part, slightly micromicaceous, non calcareous.

840-850 m — 90% **SANDSTONE**: salt and pepper, very light grey, predominantly fine grained, occasional medium and coarse grained, minor chert pebble fragments,

subangular to subrounded, moderately sorted, moderately consolidated, quartz, common chert, minor lithic grains, friable, silica cement, minor clay matrix, no staining, 6 to 12% porosity. 10% **MUDSTONE**: medium grey, blocky, firm, silty in part.

850-865 m — 80% **SANDSTONE**: salt and pepper, predominantly fine grained, very fine in part, minor medium grained, occasional chert pebble fragments, subangular to subrounded, moderately sorted, quartz, minor chert, minor lithic grains, moderately consolidated, friable, silica cement, minor clay matrix, 6 to 12% porosity. 20% **MUDSTONE**: medium grey, firm, blocky, silty in part, buff hard and silicified in part.

865-885 m — 70% **MUDSTONE**: medium grey, blocky, firm, silty in part, buff and brittle in part. 20% **SILTSTONE**: medium grey, blocky, moderately consolidated, grading to very fine sandstone in part. 10% **SANDSTONE**: salt and pepper, light grey, very fine to fine grained, subangular to subrounded, moderately sorted, quartz, minor chert, minor lithic grains, moderately consolidated, silica cement, clay matrix, 6 to 10% porosity.

885-900 m — 90% **SANDSTONE**: salt and pepper, predominantly fine grained, minor medium grained, subrounded to subangular, moderately sorted quartz, minor chert, minor lithic grains, moderately consolidated, friable, silica cement, clay matrix, 5 to 10% porosity. 10% **MUDSTONE**: medium grey, light grey in part, trace carbonaceous inclusions, firm, blocky, silty in part.

900-915 m — 90% **SANDSTONE**: salt and pepper, very fine to fine grained, moderately sorted, subangular to subrounded, quartz, minor chert, minor lithic grains, moderately consolidated, friable, silica cement, clay to silt matrix, non calcareous, 6 to 12% porosity. 10% **MUDSTONE**: medium to dark grey, blocky, firm, slightly micromicaceous, silty in part.

915-925 m — 90% **SANDSTONE**: salt and pepper, fine to medium grained, moderately sorted, subangular to subrounded, quartz, minor to common chert, minor lithic grains, predominantly loose, silica cement, minor clay matrix, trace nodular and interstitial pyrite, no staining, 8 to 14% porosity. 10% **MUDSTONE**: medium to dark grey, slightly micromicaceous, firm, blocky.

925-940 m — 90% **SANDSTONE**: salt and pepper, predominantly fine grained, grading from very fine to medium grained, subrounded to subangular, moderately sorted, quartz, minor chert, minor lithic grains, moderately consolidated, silica cement, non calcareous, clay matrix, trace nodular pyrite, no staining, 5 to 10% porosity. 10% **MUDSTONE**: medium grey, blocky, firm, silty in part.

940-950 m — 90% **SANDSTONE**: salt and pepper, light grey, very fine to fine grained, moderately sorted, subangular to subrounded, quartz, minor lithic grains, trace chert, silica cement, clay matrix, trace nodular pyrite, 6 to 12% porosity. 10% **MUDSTONE**: medium grey, firm, blocky.

950-955 m — 70% **SANDSTONE**: very light grey, very fine to fine grained, subangular to subrounded, moderately sorted, quartz, minor lithic grains, trace chert, consolidated, friable, silica cement, non calcareous, moderately clay matrix, 6 to 12% porosity. 30% **MUDSTONE**: medium grey, blocky, firm, silty in part, interbedded with argillaceous siltstone.

955-960 m	90% **SANDSTONE**: salt and pepper, predominantly fine grained, lower medium grained in part, subangular to subrounded, moderately sorted, quartz, minor to common chert, minor lithic grains, moderately consolidated, friable, silica cement, non calcareous, clay matrix, trace local tan stain, 6 to 12% porosity, no fluorescence. 10% **MUDSTONE**: medium grey, blocky, firm, slightly micromicaceous.
960-970 m	20% **SANDSTONE**: As above. 40% **MUDSTONE**: medium grey, blocky, firm, silty in part, trace carbonaceous inclusions. 40% **SILTSTONE**: medium grey, blocky, moderately consolidated, quartz silt, moderately to very argillaceous, silica cement, friable, slightly calcareous to non calcareous, 2 to 3% porosity.
970-975 m	80% **SANDSTONE**/**SILTSTONE**: light to medium grey, silt to fine grained, moderately sorted, subrounded to subangular, quartz, minor lithic grains, trace carbonaceous, moderately consolidated, friable, slightly calcareous, silica cement, clay matrix, 3 to 10% porosity. 20% **MUDSTONE**: medium grey, blocky, firm, silty in part, interbedded with siltstone/sandstone.
975-980 m	50% **MUDSTONE**: medium grey, blocky, firm, slightly micromicaceous, tan to brown and brittle in part. 50% **SANDSTONE**: salt and pepper, very fine grained, grading to fine grained in part, subangular to subrounded, moderately sorted, quartz, minor lithic grains, moderately consolidated, friable, silica cement, non calcareous, trace interstitial pyrite, clay matrix, 6 to 12% porosity.
980-985 m	70% **SANDSTONE**: salt and pepper, very fine grained, minor fine grained, subangular to subrounded, moderately sorted, quartz, minor lithic grains, trace carbonaceous, rare glauconite, moderately consolidated, friable, silica cement, non calcareous to slightly calcareous, clay matrix, some interbedded siltstone, 5 to 10% porosity. 30% **MUDSTONE**: medium grey, blocky, firm, silty in part, slightly micromicaceous, rare carbonaceous inclusions.
985-995 m	90% **SANDSTONE**: light grey, very fine grained, grading to siltstone in part, moderately sorted, subangular to subrounded, quartz, minor lithic grains, trace carbonaceous inclusions, trace pyrite, moderately consolidated, friable, silica cement, clay matrix, very argillaceous in part, 5 to 8% porosity. 10% **MUDSTONE**: medium grey, firm, blocky.
995-1000 m	100% **MUDSTONE**: medium to dark grey, firm, blocky, silty, grading to very argillaceous siltstone in part, trace pyrite nodules.
1000-1010 m	70% **MUDSTONE**: medium to dark grey, slightly micromicaceous, blocky, firm, silty in part, 30% **SILTSTONE**: medium grey, blocky, firm, moderately consolidated, quartz silt, argillaceous to very argillaceous, grading to silty mudstone, trace porosity. Trace: light green, light buff mudstone, trace sandstone.
1010-1015 m	70% **SANDSTONE**: very light grey, very fine grained, subangular to subrounded, moderately sorted, quartz, minor lithic grains, moderately consolidated, friable, silica cement, trace carbonaceous inclusions, slightly to moderately calcareous, clay matrix, 5 to 10% porosity. 30% **SHALE**: medium grey, tan, trace green, firm, blocky, slightly micromicaceous and silty in part, trace pyrite.
1015-1020 m	90% **MUDSTONE**: In part tan, blocky, hard, brittle, appears silicified; in part medium grey, blocky, firm, slightly micromicaceous, silty in part, trace fine

carbonaceous inclusions. 10% **SILTSTONE**/**SANDSTONE**: light grey, quartz silt to very fine grained, moderately contaminated, friable.

1020-1030 m — 70% **SANDSTONE**: light to medium grey, very fine grained, grading to siltstone in part, subangular to subrounded, moderately sorted, quartz, minor lithic grains, trace carbonaceous inclusions, moderately consolidated, silica cement, non calcareous to slightly calcareous, clay matrix, moderately to very argillaceous, 5 to 8% porosity. 30% **MUDSTONE**: medium grey, firm, blocky, slightly micromicaceous, silty, grading to argillaceous siltstone in part; partly tan, light brown, hard, brittle.

1030-1040 m — 70% **MUDSTONE**: medium grey, blocky, fissile, firm, silty in part; minor tan, hard, brittle. 30% **SILTSTONE**: medium grey, blocky, moderately consolidated, silica cement, argillaceous to very argillaceous, trace carbonaceous inclusions, grading to and interbedded with very fine grained sandstone lenses.

1040-1055 m — 80% **SANDSTONE** (**SILTSTONE**): very light grey, slightly salt and pepper, very fine grained, grading to silt, subangular to subrounded, moderately sorted, quartz, minor lithic grains, trace carbonaceous inclusions, moderately consolidated, friable, silica cement, clay matrix, very slightly calcareous, moderately to very argillaceous in part, 5 to 8% porosity. 20% **MUDSTONE**: medium grey, blocky firm, slightly micromicaceous, silty in part.

1055-1060 m — 100% **MUDSTONE**: medium to dark grey, blocky, firm to hard, slightly carbonaceous, slightly silty, grading to argillaceous siltstone in part, trace nodular pyrite.

1060-1065 m — 30% **SANDSTONE** (**SILTSTONE**): salt and pepper, very light grey, silt to very fine grained, subangular to subrounded, moderately sorted, quartz, minor lithic grains, trace carbonaceous, moderately consolidated, friable, silica cement, clay matrix, 5 to 8% porosity. 50% **SHALE**: as above. 20% **SILTSTONE**: medium grey, blocky, firm, argillaceous; trace porosity.

1065-1070 m — 80% **SILTSTONE**: light grey, quartz silt, grading to very fine grained, quartz, minor lithic grains, blocky, moderately consolidated, friable, argillaceous, trace interstitial pyrite, 3 to 6% porosity. 20% **MUDSTONE**: tan, hard and brittle, in part medium grey, silty, blocky, firm.

1070-1080 m — 50% **SILTSTONE**: medium grey, silt, minor very fine grained, quartz, minor lithic grains, trace carbonaceous inclusions, blocky, moderately consolidated, friable, trace pyrite, silica cement, non calcareous, argillaceous to very argillaceous, 3 to 6% porosity. 50% **SHALE**: medium grey, firm, blocky, slightly micromicaceous, silty in part.

1080-1090 m — 90% **SANDSTONE**: very light grey, salt and pepper, very fine to fine grained, subangular to subrounded, moderately sorted, quartz, minor lithic grains, trace carbonaceous inclusions, silica cement, clay matrix, 5 to 8% porosity, 10% **MUDSTONE**: medium grey, firm, blocky, silty.

1090-1100 m — 90% **SANDSTONE** (**SILTSTONE**): light grey, very fine to fine grained, silt to very fine grained in part, subangular to subrounded, moderately sorted, quartz, minor lithic grains, trace carbonaceous inclusions, moderately consolidated, friable, silica cement, non calcareous, trace interstitial pyrite, 5 to 8% porosity, some 6 to

12%. 10% **MUDSTONE**: medium grey, blocky, firm, silty in part.

1100-1115 m — 80% **SILTSTONE** (**SANDSTONE**): light to medium grey, silt to very fine sandstone, subangular to subrounded, moderately sorted, quartz, minor lithic grains, trace carbonaceous inclusions, silica cement, friable, clay matrix, moderately argillaceous, 5 to 8% porosity. 20% **MUDSTONE**: medium grey, blocky, firm, slightly micromicaceous, silty in part.

1115-1130 m — 80% **SILTSTONE** (**SANDSTONE**): light to medium grey, silt, grading to very fine grained in part, quartz, minor lithic grains, trace carbonaceous, moderately consolidated, silica cement, friable, argillaceous to very argillaceous, trace to 5% porosity. 20% **MUDSTONE**: medium grey, blocky, firm. silty in part, minor tan brittle siderite?

1130-1140 m — 80% **SILTSTONE**: medium grey, blocky, moderately consolidated, quartz, minor lithic grains, trace carbonaceous, silica cement, non calcareous, argillaceous to very argillaceous, trace to 3% porosity. 20% **MUDSTONE**: medium grey, firm, blocky, silty in part.

1140-1150 m — 70% **MUDSTONE**: medium grey, firm, blocky, slightly micromicaceous, silty, grading to argillaceous siltstone in part. 30% **SILTSTONE**: medium grey, moderately consolidated, quartz, minor lithic grains, silica cement, argillaceous to very argillaceous, trace to 3% porosity.

1150-1160 m — 60% **SILTSTONE**: medium grey, blocky, moderately consolidated, quartz, minor lithic grains, silica cement, argillaceous to very argillaceous, trace to 3% porosity. 30% **MUDSTONE**: medium grey, blocky, firm, silty. 10% **SANDSTONE**: salt and pepper, very fine to fine grained, subangular to subrounded, moderately sorted, quartz, minor lithic grains, trace carbonaceous inclusions, moderately consolidated, friable, silica cement, clay to silt matrix, 5 to 8% porosity.

1160-1170 m — 80% **SANDSTONE**: salt and pepper, fine to coarse grained, poorly to moderately sorted, subangular to subrounded, quartz, common chert, minor lithic grains, moderately consolidated, silica cement, slightly calcareous, clay matrix, trace interstitial pyrite, trace spotty gold colour in fine grains and silica cement, 8 to 14% porosity, no fluorescence. 20% **MUDSTONE** as above.

1170-1175 m — 90% **SANDSTONE**: salt and pepper, predominantly fine to medium grained, coarse grained in part, occasional very coarse grained, trace chert pebble fragments, subangular to subrounded, poorly to moderately sorted, quartz, common chert, minor lithic grains, moderately consolidated, friable, silica cement, clay matrix, non calcareous to very slightly calcareous, trace interstitial pyrite, 6 to 12% porosity. 10% **MUDSTONE**: medium grey, blocky, firm, silty, minor tan siderite nodules?

1175-1180 m — 80% **SANDSTONE**: salt and pepper, predominantly fine grained, very fine matrix, minor medium grains, subangular to subrounded, moderately sorted, quartz, common chert, minor lithic grains, moderately contaminated, silica cement, non calcareous, clay to silt matrix, trace interstitial pyrite, some more argillaceous sandstone beds, 6 to 12% porosity. 20% **MUDSTONE**: medium grey, blocky, firm, silty, minor tan brittle siderite nodules?

1180-1185 m — 80% **SANDSTONE**: light grey, salt and pepper, very fine to fine grained, subangular to subrounded, moderately sorted, quartz, minor to common chert,

minor lithic grains, moderately consolidated, silica cement, clay to silt matrix, argillaceous to very argillaceous, 5 to 8% porosity. 20% **MUDSTONE**: medium grey, blocky, firm, silty in part.

1185-1190 m — 80% **MUDSTONE**: medium grey, blocky, firm, silty in part. 20% **SANDSTONE**: light grey, as above.

1190-1200 m — 100% **MUDSTONE**: medium grey, grading to dark grey, firm, blocky, slightly micromicaceous, slightly silty, minor interbedded siltstone lenses, occasional sandstone lenses.

1200-1215 m — 100% **MUDSTONE**: medium grey, blocky, firm, slightly micromicaceous, silty in part, minor interbedded siltstone and very fine grained sandstone.

1215-1230 m — 100% **MUDSTONE**: medium grey, blocky, firm, silty in part, slightly micromicaceous, minor interbedded argillaceous siltstone and very fine grained sandstone, trace nodular pyrite.

1230-1245 m — 100% **MUDSTONE**: medium grey, firm, blocky, silty in part, some interbedded siltstone and very fine grained sandstone.

1245-1255 m — 60% **SANDSTONE**: salt and pepper, very fine to fine grained, subangular to subrounded, moderately sorted, quartz, minor lithic grains, trace carbonaceous, moderately consolidated, friable, silica cement, clay matrix, interbedded with mudstone and siltstone, 5 to 10% porosity. 30% **SILTSTONE**: light to medium grey, silt, grading to very fine grained, quartz, minor lithic grains, moderately consolidated, silica cement, argillaceous, very argillaceous in part, trace to 3% porosity. 20% **MUDSTONE**: medium grey, firm, blocky, silty in part.

1255-1270 m — 80% **MUDSTONE**: medium grey, blocky, firm, silty in part, minor to common interbedded argillaceous siltstone. 20% **SANDSTONE**: light grey, very fine grained, silt in part, subangular to subrounded, moderately sorted, quartz, minor lithic grains, moderately consolidated, silica cement, clay matrix, 5 to 8% porosity.

1270-1285 m — 60% **MUDSTONE**: medium grey, blocky, firm, silty in part, common interbedded sandstone and siltstone. 20% **SILTSTONE**: medium grey, quartz silt, minor lithic grains, moderately consolidated, argillaceous, trace to 3% porosity. 20% **SANDSTONE**:, light grey, very fine grained, subangular to subrounded, moderately sorted, quartz, minor lithic grains, trace carbonaceous, silica cement, clay matrix, 5 to 8% porosity.

1285-1300 m — 60% **MUDSTONE**: medium grey, blocky, firm, common interbedded siltstone and sandstone. 20% **SILTSTONE**: medium grey, quartz silt, moderately consolidated, silica cement, argillaceous, trace to 3% porosity. 20% **SANDSTONE**: light grey, salt and pepper, very fine grained, silt in part, subangular to subrounded, moderately sorted, quartz, minor lithic grains, trace carbonaceous, silica cement, clay matrix, 5 to 8% porosity.

1300-1315 m — 70% **MUDSTONE**: medium grey, firm to hard, micromicaceous, blocky. 20% **SANDSTONE**: salt and pepper, very fine grained, grading to silt, subangular to subrounded, moderately sorted, quartz, minor lithic grains, silica cement, clay matrix, 5 to 10% porosity. 10% **SILTSTONE**: medium grey, quartz, minor lithic grains, moderately consolidated, silica cement, argillaceous, trace to 3% porosity.

1315-1330 m 60% **MUDSTONE**: medium grey, firm, blocky, micromicaceous, silty in part. 30% **SILTSTONE**: medium grey, quartz silt, minor lithic grains, moderately consolidated, firm, silica cement, moderately to very argillaceous, trace to 3% porosity. 10% **SANDSTONE**: salt and pepper, very light grey, very fine grained, subangular to subrounded, moderately sorted, quartz, minor lithic grains, silica cement, clay matrix, 5 to 10% porosity.

1330-1345 m 70% **MUDSTONE**: medium to dark grey, firm, blocky, micromicaceous, silty in part. 20% **SILTSTONE**: medium grey, quartz silt, minor lithic grains, moderately consolidated, friable, silica cement, argillaceous to very argillaceous, trace to 3% porosity. 10% **SANDSTONE**: salt and pepper, very fine grained, grading to lower fine grained in part, subangular to subrounded, moderately sorted, quartz, minor lithic grains, moderately consolidated, silica cement, clay matrix, 5 to 10% porosity.

1345-1360 m 80% **MUDSTONE** to **SHALE**: medium to dark grey, firm, slightly fissile, micromicaceous, blocky, silty in part, minor interbedded siltstone and very fine grained sandstone. 10% **SILTSTONE**: light to medium grey, quartz silt, moderately consolidated, silica cement, argillaceous to very argillaceous, trace to 3% porosity. 10% **SANDSTONE**: salt and pepper, very fine grained, subangular to subrounded, moderately sorted, quartz, minor lithic grains, moderately consolidated, silica cement, clay matrix, 5 to 10% porosity.

1360-1375 m 90% **MUDSTONE** to **SHALE**: dark grey, blocky, slightly fissile, firm, micromicaceous, silty in part, some interbedded siltstone, trace medium grey to brown silicified siderite? 10% **SANDSTONE**: very light grey, salt and pepper, very fine grained, silt in part, quartz, minor lithic grains, trace carbonaceous inclusions, silica cement, clay matrix, 5 to 10% porosity.

1375-1390 m 100% **MUDSTONE** to **SHALE**: dark grey, micromicaceous, firm, blocky, platy in part, slightly fissile, silty in part, minor to common thin interbedded siltstone and sandstone, trace pyrite.

1390-1400 m 100% **SHALE**: dark grey, micromicaceous, slightly fissile, platy, firm, minor interbedded siltstone and sandstone, minor grey to brown brittle siderite?

1400-1405 m 100% **SHALE**: dark to very dark grey, hard, slightly brittle, platy, slightly fissile, micromicaceous, trace pyrite moderately, rare sandstone, 3 to 5% tan to light grey to brown silicified siderite?, possible silicified shale.

1405-1410 m 100% **SHALE**: dark to very dark grey, micromicaceous, platy, slightly fissile, hard, slightly brittle, trace siltstone, trace scattered pyrite cubes, 5% grey to brown hard brittle, silicified, siderite?

1410-1415 m 100% **SHALE**: dark to very dark grey, hard, brittle, platy, subfissile, trace white phosphate specks, trace pyrite, trace to 2% hard brittle siderite? 5% Clay: buff, very light grey, silty in part, sandy in part, local very fine pyrite crystals, possibly phosphatic.

1415-1420 m 100% **SHALE**: dark to very dark grey, platy, firm to hard, slightly fissile, micromicaceous, minor scattered white phosphatic specks, trace nodular pyrite, trace to minor buff to grey to blue clay, possibly phosphatic, rare coarse calcite crystals.

1420-1430 m	100% **SHALE**: dark to very dark grey, platy, firm to hard, micromicaceous, minor scattered white phosphatic specks, trace pyrite seams, trace sandstone, rare fossil fragments.
1430-1440 m	100% **SHALE**: dark grey, platy, firm to hard, micromicaceous, rare white phosphatic specks, trace micro lenses of siltstone, rare blue to grey clay, rare siderite nodules, trace pyrite.
1440-1450 m	100% **SHALE**: dark to very dark grey, platy to blocky, slightly fissile, micromicaceous, slightly silty and sandy, rare fossil fragments, moderately firm, trace siltstone, trace pyrite.
1450-1465 m	80% **SILTSTONE**: medium grey, quartz silt, very fine grained sandstone in part, minor lithic grains, moderately consolidated, argillaceous to very argillaceous, interbedded with silty shale, trace porosity. 20% **SHALE**: dark grey, platy to blocky, firm, silty. 20% **SHALE**: dark grey as above.
1465-1480 m	80% **SILTSTONE**: medium grey, quartz silt, minor very fine grained, minor lithic grains, moderately consolidated, silica and calcareous cement, friable, moderately argillaceous, trace carbonaceous inclusions, grading to very fine grained sandstone in part, trace to 3% porosity. 20% **SHALE**: medium grey, blocky, firm, slightly micromicaceous, silty in part.
1480-1495 m	100% **SILTSTONE**: buff, silt, grading to lower very fine grained, quartz, trace lithic grains, moderately consolidated, silica cement, slightly calcareous, trace very fine carbonaceous inclusions, clean, clay matrix, 3 to 6% porosity.
1495-1510 m	100% **SILTSTONE**: buff, silt, quartz, trace lithic grains, moderately consolidated, silica cement, slightly calcareous, white clay matrix, minor light grey firm shale beds, rare pyrite, 3 to 6% porosity.
1510-1525 m	100% **SILTSTONE**: buff, very light grey, quartz silt, rare lithic grains, moderately consolidated, silica cement, slightly calcareous, white clay matrix, minor interbedded light grey shale, trace local pyrite cubes, rare black carbonaceous(?) specks, possible bitumen, 3 to 6% porosity.
1525-1540 m	100% **SILTSTONE**: very light grey to light grey, quartz silt, trace very fine carbonaceous/bitumen specks, silica cement, moderately consolidated, slightly calcareous, white clay matrix, minor interbedded light to medium grey shale, 2 to 5% porosity.
1540-1555 m	100% **SILTSTONE**: buff, very light grey, quartz silt, no lithic grains, silica cement, slightly calcareous, white clay matrix, minor interbedded light grey shale, rare pyrite cubes, trace scattered black specks, possible bitumen, 3 to 6% porosity, possible very faint tan oil stain, no fluorescence.
1555-1570 m	60% **SILTSTONE**: very light grey, buff, quartz silt, silica cement, slightly calcareous, white to light grey clay matrix, very fine grading to silty shale, rare calcite filled micro fractures, rare black specks, trace to 3% porosity. 40% **SHALE**: medium grey, micromicaceous, hard, platy, slightly blocky, locally silty.
1570-1585 m	90% **SILTSTONE**: light grey, quartz silt, grading to silty shale, moderately consolidated, silica cement, slightly calcareous, light grey clay matrix, trace to 3%

porosity. 10% **SHALE**: medium grey, hard, micromicaceous, platy.

1585-1600 m — 90% **SILTSTONE**: very light grey, quartz silt, moderately consolidated, silica cement, slightly calcareous, white to light grey clay matrix, trace pyrite, trace scattered black carbonaceous to bitumen specks, 3 to 6% porosity. 10% **SHALE**: medium grey, hard, micromicaceous, platy.

1600-1615 m — 90% **SILTSTONE**: very light to light grey, quartz silt, grading to silty shale, moderately consolidated, silica cement, slightly calcareous, light grey clay matrix, trace scattered black carbonaceous to bitumen specks, 2 to 5% porosity. 10% **SHALE**: medium grey, platy, hard, micromicaceous.

1615-1625 m — 90% **SILTSTONE**: very light grey, buff, quartz silt, grading to silty shale in part, moderately consolidated, silica cement, slightly calcareous, white clay matrix, trace scattered black carbonaceous to bitumen specks, 3 to 6% porosity. 10% **SHALE**: medium grey, hard, platy, silty in part, micromicaceous.

1625-1635 m — 60% **SILTSTONE**: buff, very light grey, quartz silt, grading to very fine grained in part, moderately consolidated, silica cement, slightly calcareous, white clay matrix, trace scattered black carbonaceous to bitumen specks, 2 to 6% porosity. 40% **SHALE**: medium grey, hard, micromicaceous, platy, slightly blocky, rare slickensides.

1635-1650 m — 70%**SILTSTONE**: buff, quartz silt, lower very fine grained in part, moderately consolidated, silica cement, slightly calcareous, clay matrix, rare pyrite, trace scattered black carbonaceous to bitumen specks, rare pyrite filled fractures, 3 to 6% porosity. 30% **SHALE**: medium grey, hard, platy, micromicaceous, silty in part.

1650-1660 m — 60% **SHALE**: medium grey, platy, hard, micromicaceous, silty in part. 40% **SILTSTONE**: light grey, quartz silt, lower very fine grained sandstone in part, grading to silty shale, moderately consolidated, silica cement, slightly calcareous, clay matrix, trace pyrite, trace to 3% porosity.

1660-1670 m — 90% **SHALE**: dark grey, platy, fissile, firm, micromicaceous, rare fossil fragment. 10% **SILTSTONE**: buff, quartz, silt, moderately consolidated, trace pyrite.

1670-1680 m — 100% **SHALE**: dark grey, platy, fissile, firm to hard, micromicaceous, slightly waxy lustre.

1680-1690 m — 50% **SHALE**: medium grey, platy, fissile, firm, micromicaceous, rare pyrite filled micro fracture. 50% **SILTSTONE**: buff quartz silt, moderately consolidated, silica cement, clay matrix, slightly calcareous, trace scattered carbonaceous to bitumen specks, 3 to 6% porosity.

1690-1700 m — 50% **SHALE**: medium grey, platy, firm to hard, slightly micromicaceous, slightly fissile. 50% **SILTSTONE**: buff, silt to very fine grained, moderately consolidated, silica cement, slightly calcareous, clay matrix, trace scattered black bitumen to carbonaceous inclusions, 3 to 6% porosity.

1700-1715 m — 90% **SILTSTONE**: buff, quartz silt, moderately consolidated, silica cement, clay matrix, trace very fine pyrite, trace spotty black carbonaceous to bitumen specks,

3 to 8% porosity. 10% **SHALE**: medium to dark grey, firm, micromicaceous, platy.

1715-1725 m 90% **SILTSTONE**: buff, quartz silt, moderately consolidated, silica cement, slightly calcareous, white clay matrix, trace scattered black carbonaceous to scattered, 3 to 6% porosity. 10% **SHALE**: medium grey, firm, micromicaceous, platy.

1725-1730 m 50% **SILTSTONE**: buff, quartz, moderately consolidated, silica cement, slightly calcareous, clay matrix, 3 to 6% porosity. 50% **SHALE**: medium grey, micromicaceous, platy, hard.

1730-1740 m 90% **SHALE**: dark grey, micromicaceous, firm to hard, platy, slightly fissile.

1740-1750 m 100% **SHALE**: dark grey, platy, firm, micromicaceous, disseminated pyrite, slightly fissile.

1750-1755 m 100% **SHALE**: dark grey, grey to brown in part, trace calcite filled micro-fractures.

1755-1760 m 100% **SHALE**: dark grey to brown, trace calcite filled micro-fractures.

1760-1765 m 100%**SHALE**: dark grey to brown, platy, fissile, rare cc filled micro fractures, firm, rare pyrite.

1765-1770 m 100% **SHALE**: dark grey to brown, platy, firm, fissile, micromicaceous, trace pyrite.

1770-1775 m 100% **SHALE**: dark grey, platy, firm, micromicaceous, trace pyrite.

1775-1780 m 100% **SHALE**: dark grey, platy, fissile, firm, trace pyrite, trace grey to brown shale.

1780-1790 m 100% **SHALE**: dark grey, platy, fissile, trace pyrite, slightly waxy lustre, firm.

1790-1800 m 100% **SHALE**: dark grey, platy, fissile, firm, slightly waxy, rare pyrite,

1800-1810 m 100% **SHALE**: medium to dark grey, platy, fissile, firm, slightly waxy lustre.

1810-1820 m 100% **SHALE**: medium to dark grey, fissile, platy, slightly waxy lustre, firm. trace coarse calcite.

1820-1825 m 100% **SHALE**: dark to very dark grey, platy, fissile, firm, trace pyrite in very fine crystalline masses, slightly carbonaceous, siliceous.

1825-1830 m 100% **SHALE**: very dark grey, slightly grey to brown, platy, fissile, firm, slightly carbonaceous, trace pyrite, siliceous, no fluorescence.

1830-1833 m 100% **SHALE**: very dark grey, slightly grey to brown, firm, fissile, platy, slightly brittle, trace to minor pyrite, slightly carbonaceous, siliceous, no stain or fluorescence.

1833-1835 m 100% **SHALE**: very dark grey, firm, platy, fissile, trace pyrite, slightly carbonaceous, siliceous, slightly micromicaceous, no stain or fluorescence.

1835-1840 m 100% **SHALE**: very dark grey, slightly grey brown, platy, firm, fissile, slightly micromicaceous, slightly brittle, slightly carbonaceous, siliceous, rare calcite, rare white specks possibly phosphatic, trace siltstone, no stain or fluorescence.

1840-1845 m 100% **SHALE**: very dark grey, grey brown in part, brittle, siliceous, slightly carbonaceous, platy, fissile, slightly micromicaceous, trace pyrite, no stain, minor very weak dull brown fluorescence.

1845-1851 m 100% **SHALE**: very dark grey, locally grey brown, firm, brittle, slightly micromicaceous, siliceous, slightly carbonaceous, locally moderately carbonaceous, rare white specks to possibly phosphatic, trace pyrite possibly infilling fractures, rare calcite, trace pyritic siltstone, no stain, minor very weak dull brown fluorescence.

1851-1855 m 100% **SHALE**: very dark grey, locally grey to brown, platy, hard, siliceous, carbonaceous, trace black bitumen along chip margins, crumbly in part, no visible stain, dull medium brown fluorescence, minor yellow fluorescence, bright white streaming milky cut, pale yellow ring cut. 50% Cavings of shale in sample.

1855-1860 m 100% **SHALE**: very dark grey to greyish brown, hard, brittle, siliceous, carbonaceous, trace pyrite fracture infill, subplaty, slightly crumbly, trace carbonaceous siltstone, rare calcite, no visible stain, dull brown to locally yellow fluorescence, fast streaming bright milky cut, dark yellow ring cut.

1860-1865 m 100% **SHALE**: very dark grey to greyish brown, platy, hard, siliceous, carbonaceous, crumbly in part, trace calcite fracture infill, no visible stain, dull brown to medium brown fluorescence, bright white streaming cut.

1865-1870 m 100% **SHALE**: dark brownish grey, very dark grey, subplaty, fissile, moderately siliceous, firm, trace pyrite, trace calcite fracture fill, rare black dry bitumen chips, no visible stain, spotty medium brown fluorescence, bright white streaming milky cut.

1870-1872 m 100% **SHALE**: very dark grey, minor grey brown, hard, brittle, platy, subplaty in part, siliceous, slightly carbonaceous, trace siltstone, trace calcite fracture infill, no visible stain, spotty dull brown fluorescence, bright white milky cut.

1872-1880 m 100% (After trip) **SHALE**: very dark grey, brownish grey in part, micromicaceous, hard, brittle, silicified, trace calcite lined fracture surfaces, carbonaceous, no visible stain, spotty dull brown fluorescence, weak streaming milky cut.

1880-1885 m 100% **SHALE**: very dark grey, micromicaceous, hard, silicified, carbonaceous, numerous calcite filled hairline fractures, no visible stain, spotty to even medium brown cut, moderately streaming milky cut, medium yellow ring cut.

1885-1890 m 100% **SHALE**: very dark grey, brownish grey in part, micromicaceous, hard, brittle, silicified, carbonaceous to bitumen, trace calcite lined fractures, trace pyrite, no visible stain, spotty to even medium brown fluorescence, slow milky streaming cut, medium yellow ring cut.

1890-1895 m 100% **SHALE**: very dark grey, brownish grey, micromicaceous, hard, brittle, silicified, carbonaceous to bitumen, trace calcite filled hairline to very narrow fractures, trace microcrystalline pyrite masses, slightly bitumen appearance in

part, no visible stain, moderately milky streaming cut, medium yellow ring cut.

1895-1900 m 100% **SHALE**: very dark grey, brownish grey, micromicaceous, hard, silicified, carbonaceous to bitumen, trace calcite lined fractures, trace pyritic siltstone, no visible stain, moderately streaming milky cut, medium yellow ring cut.

1900-1905 m 100% **SHALE**: very dark grey, brownish grey, micromicaceous, hard, brittle, silicified, carbonaceous to bitumen, some calcite filled micro fractures, trace fine to medium clear calcareous crystals on fracture surface, trace pyrite, bituminous appearance in part, no visible oil stain, very weak brown fluorescence, moderately milky streaming cut, yellow ring cut.

1905-1910 m 100% **SHALE**: very dark grey, brownish grey, hard, silicified, micromicaceous, carbonaceous to bitumen, trace pyrite, trace calcite filled micro fractures, slightly bitumen, no visible oil stain, even dull brown fluorescence, moderately milky streaming cut, yellow ring cut.

1910-1920 m No samples.

1920-1925 m 100% **SHALE**: very dark grey, minor brownish grey, micromicaceous, hard, silicified, carbonaceous, trace pyrite chips, trace calcite filled micro fractures, no visible stain, even to spotty medium brown fluorescence, slow milky streaming cut.

1925-1930 m 100% **SHALE**: very dark grey, hard, silicified, micromicaceous, trace pyrite chips, silicified, slightly carbonaceous, rare calcite fracture infill, no visible stain, even to spotty medium brown fluorescence, very slow streaming milky cut.

1930-1938 m 100% **SHALE**: very dark grey, micromicaceous, hard, siliceous, slightly carbonaceous, trace pyrite chips, trace siltstone, no stain, even to spotty medium brown fluorescence, slow milky streaming cut.

1938-1940 m 100% (After trip), **SHALE**: dark grey., micromicaceous, firm., platy, fissile, moderately silicified, slightly carbonaceous, rare calcite fracture infill, trace pyrite, trace siltstone.

1940-1945 m 100% **SHALE**: dark grey, micromicaceous, firm, platy, fissile, slightly silicified, slightly carbonaceous, trace white calcite fracture infill, trace light grey, cryptocrystalline calcareous chips, trace pyrite, no visible stain, even to spotty dull brown fluorescence, slow milky streaming cut, yellow ring cut.

1945-1950 m 100% **SHALE**: very dark grey, platy, fissile, hard, silicified, carbonaceous, several calcite filled micro fractures, common light grey cryptocrystalline calcite, no visible stain, dull brown fluorescence, slow streaming milky cut. Note: the light grey calcareous chips are bitumen stained and occasionally contain clean white calcite filled micro fractures.

1950-1955 m 100% **SHALE**: very dark grey, slightly grey to brown, firm to hard, silicified, carbonaceous, platy, fissile, trace pyrite, trace light grey calcareous chips, dull medium brown fluorescence, moderately streaming milky cut, yellow ring cut.

1955-1960 m 100% **SHALE**: very dark grey, grey brown, platy, fissile, hard, slightly micromicaceous, silicified, carbonaceous to bitumen, trace light grey calcareous chips, trace white slightly oil stained siltstone, no visible stain, dull brown

fluorescence, yellow fluorescence in siltstone, moderately streaming cut.

1960-1965 m — 50%, **LIMESTONE**: tan, buff, microcrystalline, cryptocrystalline in part, some fine to medium crystalline, dense, earthy to slightly translucent, minor spotty tan oil stain, no visible porosity, no fluorescence, faint milky to pale yellow cut. 50% **SHALE**: dark grey, cavings.

1965-1970 m — 90% **LIMESTONE**: buff, minor tan, minor very light grey, cryptocrystalline to microcrystalline, some fine crystalline, minor fine to medium grained fossil fragments, dense, earthy to crystalline texture, rare micro sucrosic texture, dense, trace calcite filled micro fractures, trace tan stain, tight, trace milky cut. 10% **SHALE**: dark grey, platy, fissile, firm to hard.

1970-1975 m — 95%, **LIMESTONE**: buff, minor tan, microcrystalline, cryptocrystalline in part, some fine to medium crystalline, slightly translucent, earthy in part, dense, rare brown oil stain, rare pinpoint vug porosity, rare trace intercrystalline porosity, no fluorescence, very faint milky cut: 5% **SHALE**: dark grey, platy, fissile, minor blocky and silty.

1975-1980 m — 95% **LIMESTONE**: buff, minor tan, microcrystalline, cryptocrystalline in part, minor fine to medium crystalline, dense, crystalline texture, earthy in part, trace calcite filled micro fractures, trace brown stain, trace pyrite, tight, no fluorescence, faint cut. 5% **SHALE**: dark grey, medium grey in part, platy, blocky and slightly silty in part, non calcareous.

1980-1985 m — 100% **LIMESTONE**: buff, minor tan, light grey, cryptocrystalline to microcrystalline, earthy to slightly translucent, dense, trace calcite filled fractures, trace pyrite, slightly argillaceous in part, rare tan stain, tight, rare fluorescence, very faint cut. Trace **SHALE**: dark grey, hard, fissile, platy.

1985-1990 m — 95% **LIMESTONE**: buff, trace tan, cryptocrystalline to micro crystalline, rare very fine crystalline, earthy, slightly translucent in part, trace tan stain, rare local intercrystalline porosity, rare weak fluorescence, very faint milky cut. 5% **SHALE**: dark grey, platy, fissile, firm.

1990-1995 m — 100% **LIMESTONE**: buff, minor tan, cryptocrystalline, minor microcrystalline, trace very fine crystalline, earthy, dense, rare tan oil stain, tight, rare intercrystalline porosity, no fluorescence, very faint milky cut.

1995-2001 m — 100% **LIMESTONE**: buff, very light grey, cryptocrystalline, microcrystalline in part, trace very fine crystalline, earthy, minor slightly translucent, trace calcite filled micro fractures, rare pyrite, rare coarse crystalline calcite, rare brown oil stain, tight, no fluorescence, very faint milky cut.

TOTAL DEPTH — **was reached at 2001.0 m TVD (-1840.0 m SS) on February 15, 2013 at 09:45 hours.**

RPS ENERGY CANADA LTD. (RPS)

TERMS

All interpretations and conclusions presented herein are opinions based on inferences from geological, geophysical, engineering and other available data. The report represents RPS`s best professional judgment and best efforts, and should not be considered a guarantee of results.

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Under no circumstances shall RPS's liability to the customer exceed the amount of fees it received for performing the services under this agreement.



Scale 1:240 (5"=100') Metric

Well Name:	MGM - Shell East MacKay I-78		
Location:	Unit I, Section 78, Grid 64 50 125 30		
Licence Number:	1202	Region:	NWT mainland
Spud Date:	Jan 17, 2013	Drilling Completed:	Feb 15, 2013
Surface Coordinates:	Lat 64°47'42.1" N; Long 125°43'19.1" W		
Bottom Hole Coordinates	Lat 64°47'42.1" N; Long 125°43'19.1" W		
Ground Elevation (m):	155.0	K.B. Elevation (m):	161.2
Logged Interval (m):	0 To: 2001	Total Depth (m):	2001
Formation:	Total Depth in Hume Formation		
Type of Drilling Fluid:	Gel chem		

Printed by STRIP.LOG from WellSight Systems 1-800-447-1534 www.WellSight.com

OPERATOR

Company: MGM Energy Corp.
Address: 4100, 350 - 7th Avenue SW
Calgary, Alberta
T2P 3N9

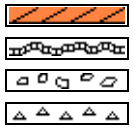
GEOLOGIST

Name: Dave Prior
Company: RPS Energy
Address: 1400, 800 - 5th Avenue SW
Calgary, AB Canada T2P 3T6

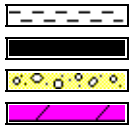
Cores

Cut core from 1820 to 1874 m in three runs, cut 1938 to 1960 m in one run.
Core logs appended below.

ROCK TYPES



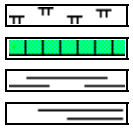
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Bent
Brec
Cht



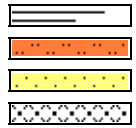
Clyst
Coal
Congl
Dol



Gyp
Igne
Lmst
Meta



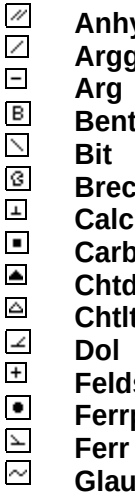
Mrlst
Salt
Shale
Shcol



Shgy
Sltst
Ss
Till

ACCESSORIES

MINERAL

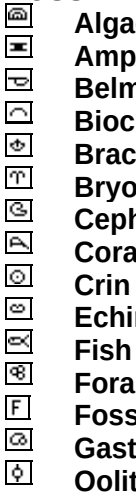


Anhy
Arggrn
Arg
Bent
Bit
Brecfrag
Calc
Carb
Chtdk
Chtlt
Dol
Feldspar
Ferrpel
Ferr
Glau

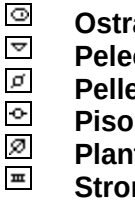


Gyp
Hvymin
Kaol
Marl
Minxl
Nodule
Phos
Pyr
Salt
Sandy
Silt
Sil
Sulphur
Tuff

FOSSIL



Algae
Amph
Belm
Bioclst
Brach
Bryozoa
Cephal
Coral
Crin
Echin
Fish
Foram
Fossil
Gastro
Oolite



Ostra
Pelec
Pellet
Pisolite
Plant
Strom

STRINGER



Anhy
Arg
Bent
Coal
Dol
Gyp
Ls
Mrst



Sltstrg
Ssstrg

TEXTURE



Boundst
Chalky
Cryxln
Earthy
Finexln
Grainst
Lithogr
Microxln
Mudst
Packst
Wackest

OTHER SYMBOLS

POROSITY

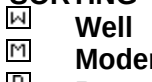


Earthy
Fenest
Fracture
Inter
Moldic
Organic
Pinpoint



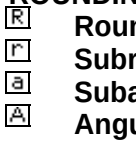
Vuggy

SORTING



Well
Moderate
Poor

ROUNDING



Rounded
Subrnd
Subang
Angular

OIL SHOW



Even



Spotted
Ques
Dead

INTERVAL

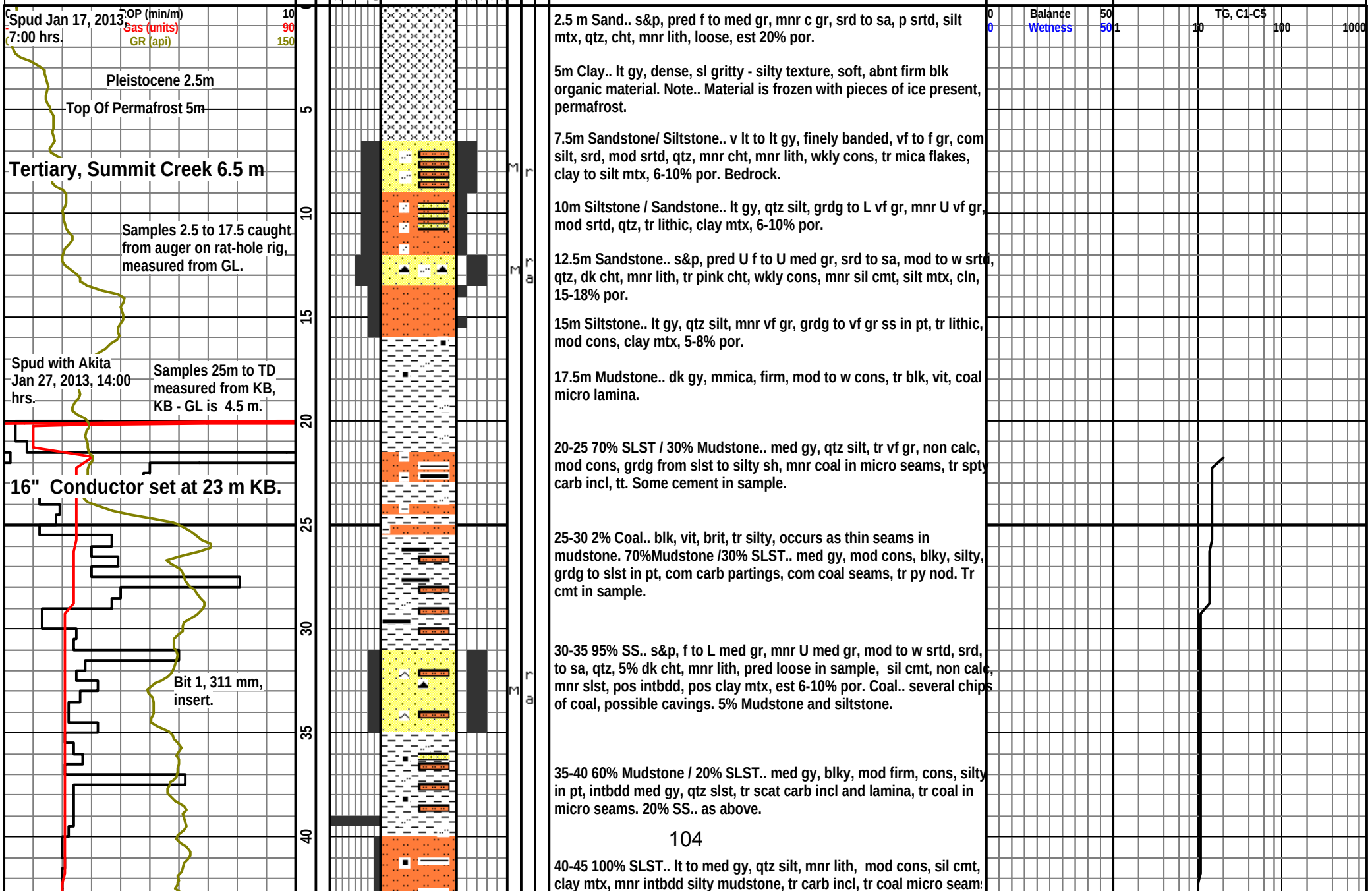


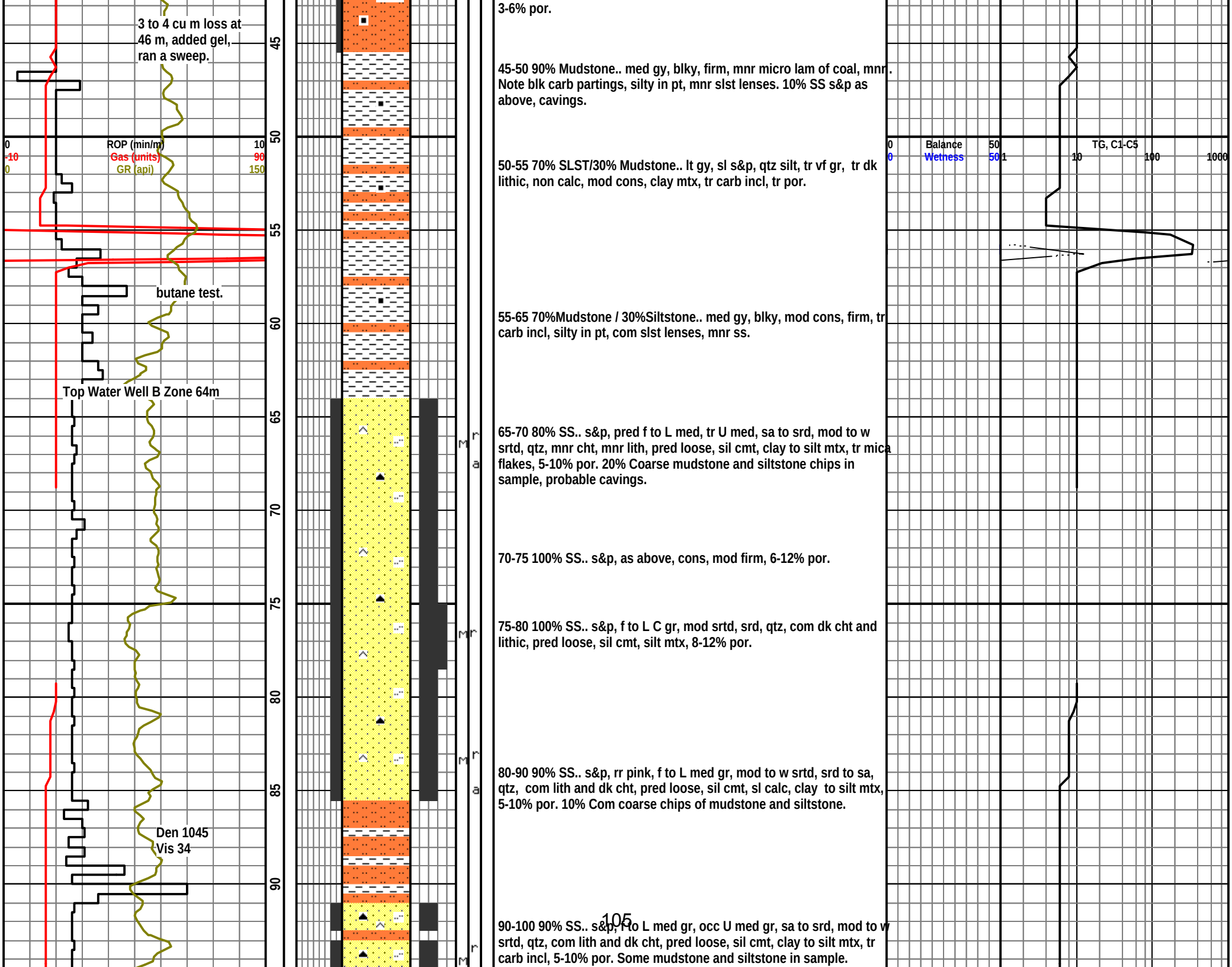
Core
Dst

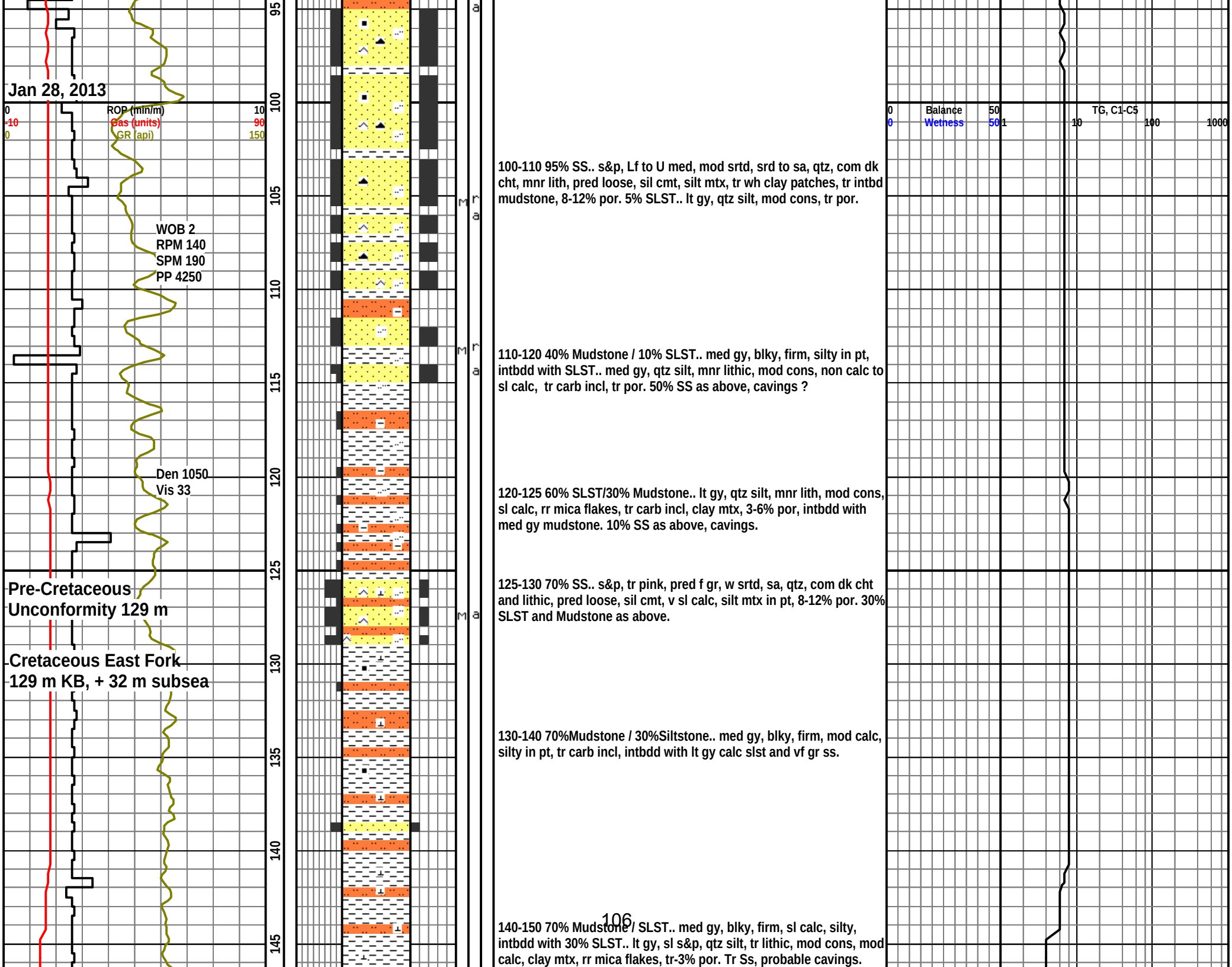
EVENT



Isotube
Rft
Sidewall


Curve Track 1
ROP (min/m)
Gas (units)
GR (api)
Depth
Porosity Type
Porosity
24%
18%
12%
6%
Lithology
Grain Size
1/16 mm
1/8 mm
1/4 mm
1/2 mm
1 mm
Sorting
Rounding
Oil Shows
Geological Descriptions
Balance/Wetness
Balance
Wetness
Chromatograph
TG (Units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
C5 (units)
ROP (min/m) 10
Gas (units) 90
GR (api) 150
Balance 0 50
Wetness 0 50
TG, C1-C5 0.1 10 100 1000
Spud Jan 17, 2013, 7:00 hrs.
Pleistocene 2.5m
Top Of Permafrost 5m
Tertiary, Summit Creek 6.5 m
Samples 2.5 to 17.5 caught from auger on rat-hole rig, measured from GL.
Spud with Akita Jan 27, 2013, 14:00 hrs.
Samples 25m to TD measured from KB, KB - GL is 4.5 m.
16" Conductor set at 23 m KB.
Bit 1, 311 mm, insert.
0
5
10
15
20
25
30
35
40
2.5 m Sand.. s&p, pred f to med gr, mnr c gr, srd to sa, p srtd, silt mtx, qtz, cht, mnr lith, loose, est 20% por.
5m Clay.. lt gy, dense, sl gritty - silty texture, soft, abnt firm blk organic material. Note.. Material is frozen with pieces of ice present, permafrost.
7.5m Sandstone/ Siltstone.. v lt to lt gy, finely banded, vf to f gr, com silt, srd, mod srtd, qtz, mnr cht, mnr lith, wkly cons, tr mica flakes, clay to silt mtx, 6-10% por. Bedrock.
10m Siltstone / Sandstone.. lt gy, qtz silt, grdg to L vf gr, mnr U vf gr, mod srtd, qtz, tr lithic, clay mtx, 6-10% por.
12.5m Sandstone.. s&p, pred U f to U med gr, srd to sa, mod to w srtd, qtz, dk cht, mnr lith, tr pink cht, wkly cons, mnr sil cmt, silt mtx, cln, 15-18% por.
15m Siltstone.. lt gy, qtz silt, mnr vf gr, grdg to vf gr ss in pt, tr lithic, mod cons, clay mtx, 5-8% por.
17.5m Mudstone.. dk gy, mmica, firm, mod to w cons, tr blk, vit, coal micro lamina.
20-25 70% SLST / 30% Mudstone.. med gy, qtz silt, tr vf gr, non calc, mod cons, grdg from slst to silty sh, mnr coal in micro seams, tr spty carb incl, tt. Some cement in sample.
25-30 2% Coal.. blk, vit, brit, tr silty, occurs as thin seams in mudstone. 70%Mudstone /30% SLST.. med gy, mod cons, blky, silty, grdg to slst in pt, com carb partings, com coal seams, tr py nod. Tr cmt in sample.
30-35 95% SS.. s&p, f to L med gr, mnr U med gr, mod to w srtd, srd, to sa, qtz, 5% dk cht, mnr lith, pred loose in sample, sil cmt, non calc, mnr slst, pos intbdd, pos clay mtx, est 6-10% por. Coal.. several chips of coal, possible cavings. 5% Mudstone and siltstone.
35-40 60% Mudstone / 20% SLST.. med gy, blky, mod firm, cons, silty in pt, intbdd med gy, qtz slst, tr scat carb incl and lamina, tr coal in micro seams. 20% SS.. as above.
104
40-45 100% SLST.. lt to med gy, qtz silt, mnr lith, mod cons, sil cmt, clay mtx, mnr intbdd silty mudstone, tr carb incl, tr coal micro seam


3 to 4 cu m loss at 46 m, added gel, ran a sweep.
0
ROP (min/m)
10
-10
Gas (units)
90
0
GR (api)
150
butane test.
Top Water Well B Zone 64m
Den 1045
Vis 34
45
50
55
60
65
70
75
80
85
90
3-6% por.
45-50 90% Mudstone.. med gy, blky, firm, mnr micro lam of coal, mnr. Note blk carb partings, silty in pt, mnr slst lenses. 10% SS s&p as above, cavings.
50-55 70% SLST/30% Mudstone.. lt gy, sl s&p, qtz silt, tr vf gr, tr dk lithic, non calc, mod cons, clay mtx, tr carb incl, tr por.
55-65 70%Mudstone / 30%Siltstone.. med gy, blky, mod cons, firm, tr carb incl, silty in pt, com slst lenses, mnr ss.
65-70 80% SS.. s&p, pred f to L med, tr U med, sa to srd, mod to w srtd, qtz, mnr cht, mnr lith, pred loose, sil cmt, clay to silt mtx, tr mica flakes, 5-10% por. 20% Coarse mudstone and siltstone chips in sample, probable cavings.
70-75 100% SS.. s&p, as above, cons, mod firm, 6-12% por.
75-80 100% SS.. s&p, f to L C gr, mod srtd, srd, qtz, com dk cht and lithic, pred loose, sil cmt, silt mtx, 8-12% por.
80-90 90% SS.. s&p, rr pink, f to L med gr, mod to w srtd, srd to sa, qtz, com lith and dk cht, pred loose, sil cmt, sl calc, clay to silt mtx, 5-10% por. 10% Com coarse chips of mudstone and siltstone.
90-100 90% SS.. s&p, f to L med gr, occ U med gr, sa to srd, mod to w srtd, qtz, com lith and dk cht, pred loose, sil cmt, clay to silt mtx, tr carb incl, 5-10% por. Some mudstone and siltstone in sample.
0
Balance
50
0
Wetness
50
1
TG, C1-C5
10
100
1000



100-110 95% SS.. s&p, Lf to U med, mod srtd, srd to sa, qtz, com dk cht, mnr lith, pred loose, sil cmt, silt mtx, tr wh clay patches, tr intbd mudstone, 8-12% por. 5% SLST.. lt gy, qtz silt, mod cons, tr por.

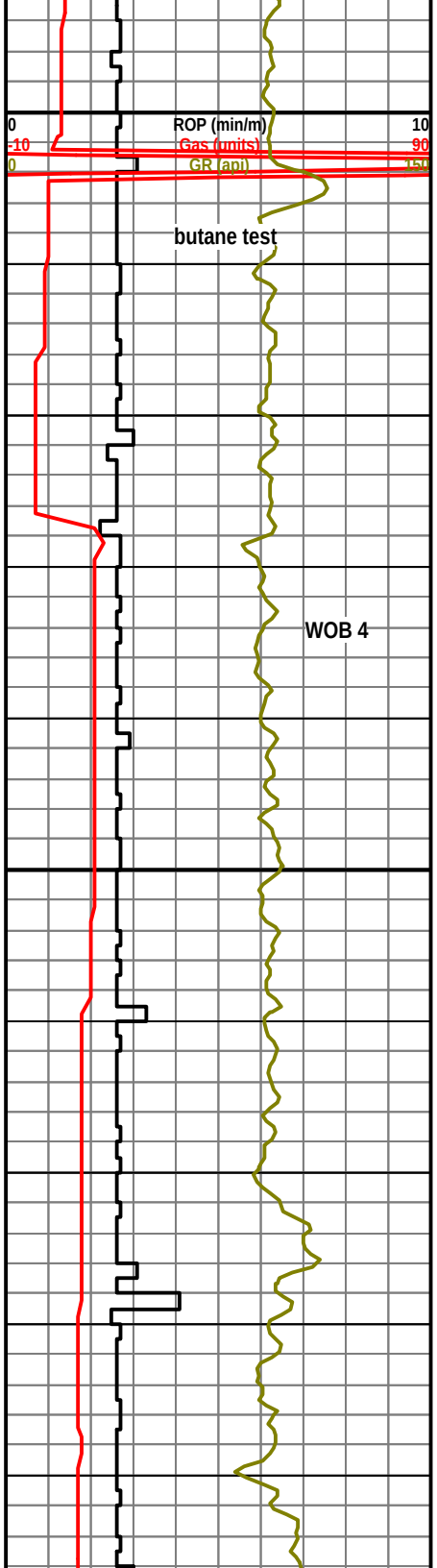
110-120 40% Mudstone / 10% SLST.. med gy, blky, firm, silty in pt, intbdd with SLST.. med gy, qtz silt, mnr lithic, mod cons, non calc to sl calc, tr carb incl, tr por. 50% SS as above, cavings ?

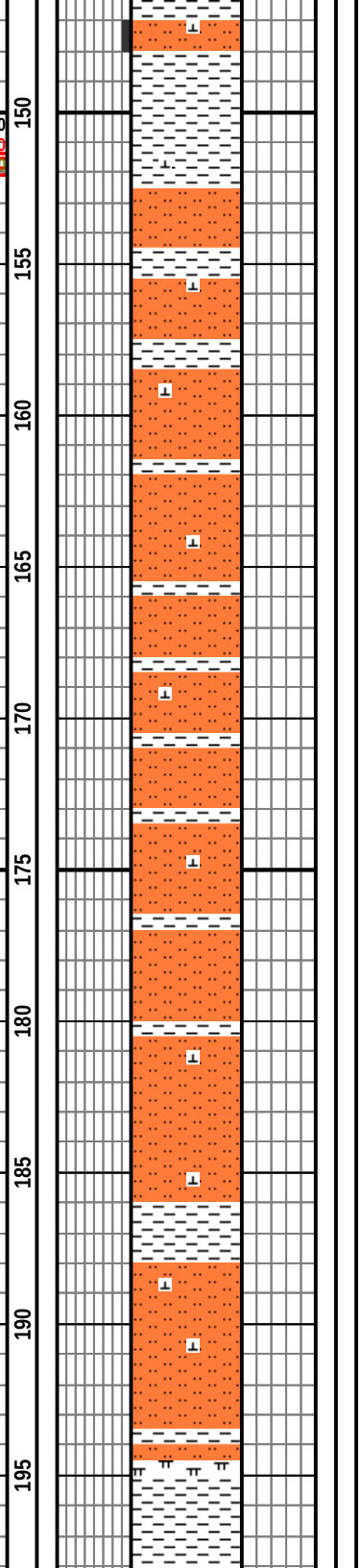
120-125 60% SLST/30% Mudstone.. lt gy, qtz silt, mnr lith, mod cons, sl calc, rr mica flakes, tr carb incl, clay mtx, 3-6% por, intbdd with med gy mudstone. 10% SS as above, cavings.

125-130 70% SS.. s&p, tr pink, pred f gr, w srtd, sa, qtz, com dk cht and lithic, pred loose, sil cmt, v sl calc, silt mtx in pt, 8-12% por. 30% SLST and Mudstone as above.

130-140 70%Mudstone / 30%Siltstone.. med gy, blky, firm, mod calc, silty in pt, tr carb incl, intbdd with lt gy calc slst and vf gr ss.

140-150 70% Mudstone / SLST.. med gy, blky, firm, sl calc, silty, intbdd with 30% SLST.. lt gy, sl s&p, qtz silt, tr lithic, mod cons, mod calc, clay mtx, rr mica flakes, tr-3% por. Tr Ss, probable cavings.





150-155 70% Mudstone.. med gy, blky, firm, silty, intbdd with slst, mod calc. 30% SLST.. lt gy, mod cons, calc cmt, clay mtx, tr por. SS.. one chip, s&p, tr pink, vf to f gr, mod to w srtd, sa to srd, qtz, com lith and cht, calc, 5-8% por.

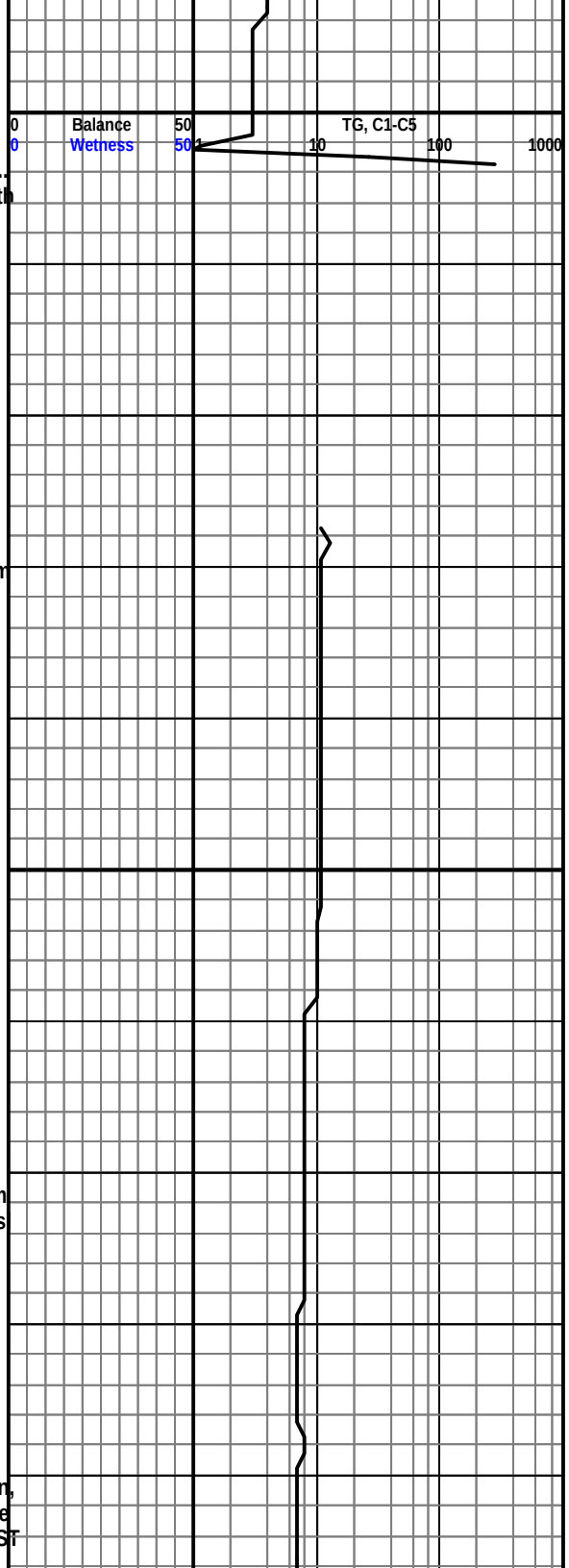
155-160 100% SLST.. lt to med gy, qtz silt, mnr lithic, rr mica flakes, clay mtx, mod calc, grdg to silty mudstone in part, local mudstone beds, tr por.

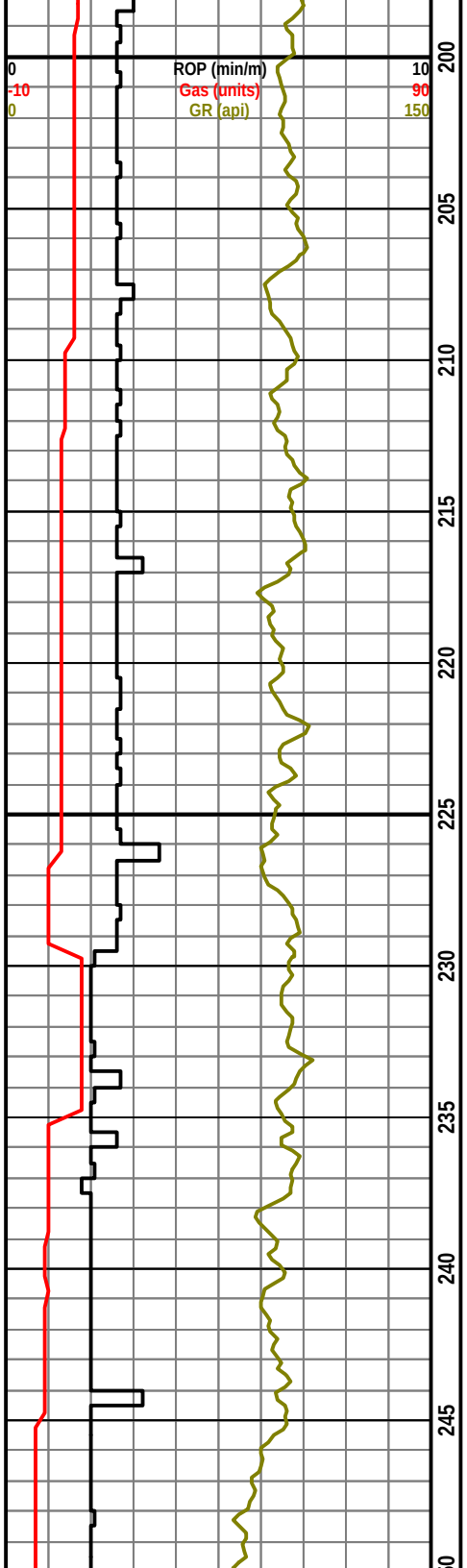
160-170 100% SLST.. med gy, qtz silt, mnr lithic, mod to w cons, firm to brittle, clay mtx, rr to tr carb incl, sl to mod calc, some intbdd mudstone, tr to 3% por,

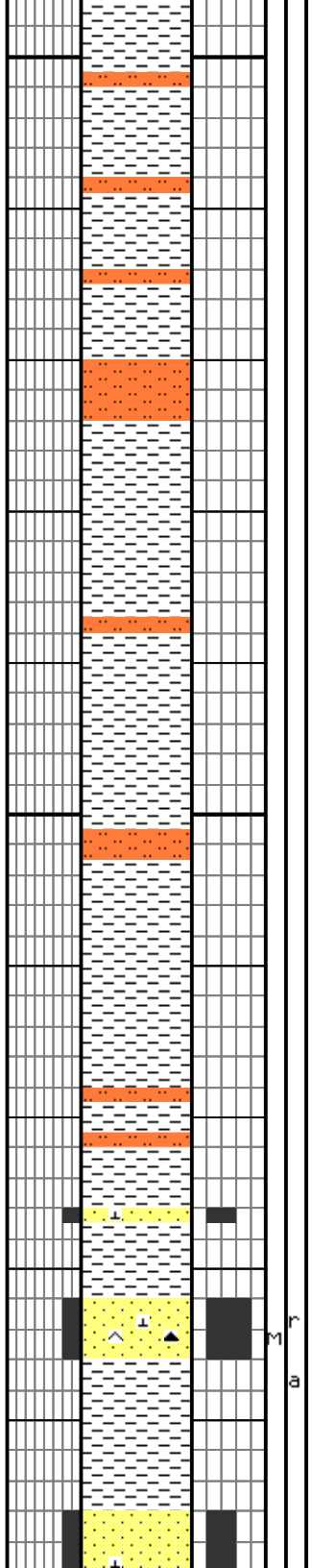
170-180 100% SLST.. as above, com intbdd mudstone, tr vf to f ss.

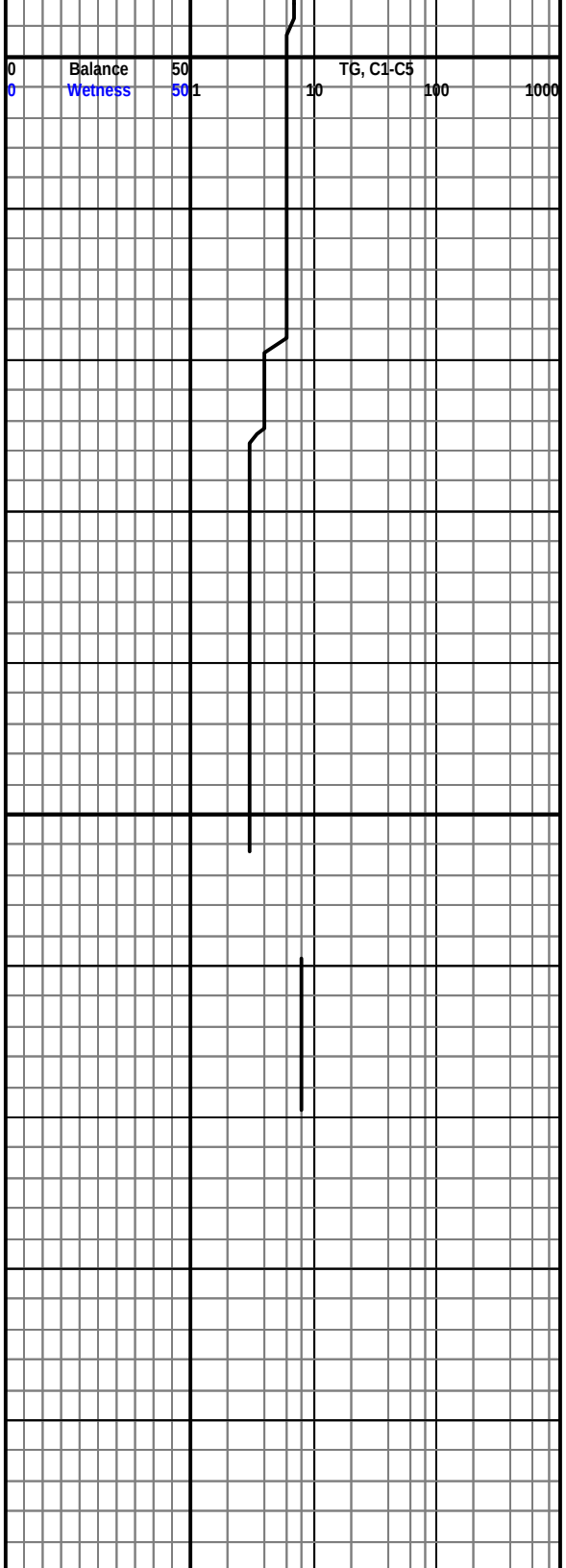
180-195 100% SLST.. lt to med gy, sl s&p, qtz silt, mnr lith, grdg from near clay size to near vf gr, com microscopic wh patches of clay ?, s to mod calc, mnr intbdd silty mudstone, tr to 6% por.

195-200 5%, Marlstone.. med gy-gn, crpxln, locally grading to micxln, earthy, hd, brittle, mnr clay residue after HCl, less reactive and more clay content in pt, tr local rounded mudstone inclusions, tt. 95% SLST as above









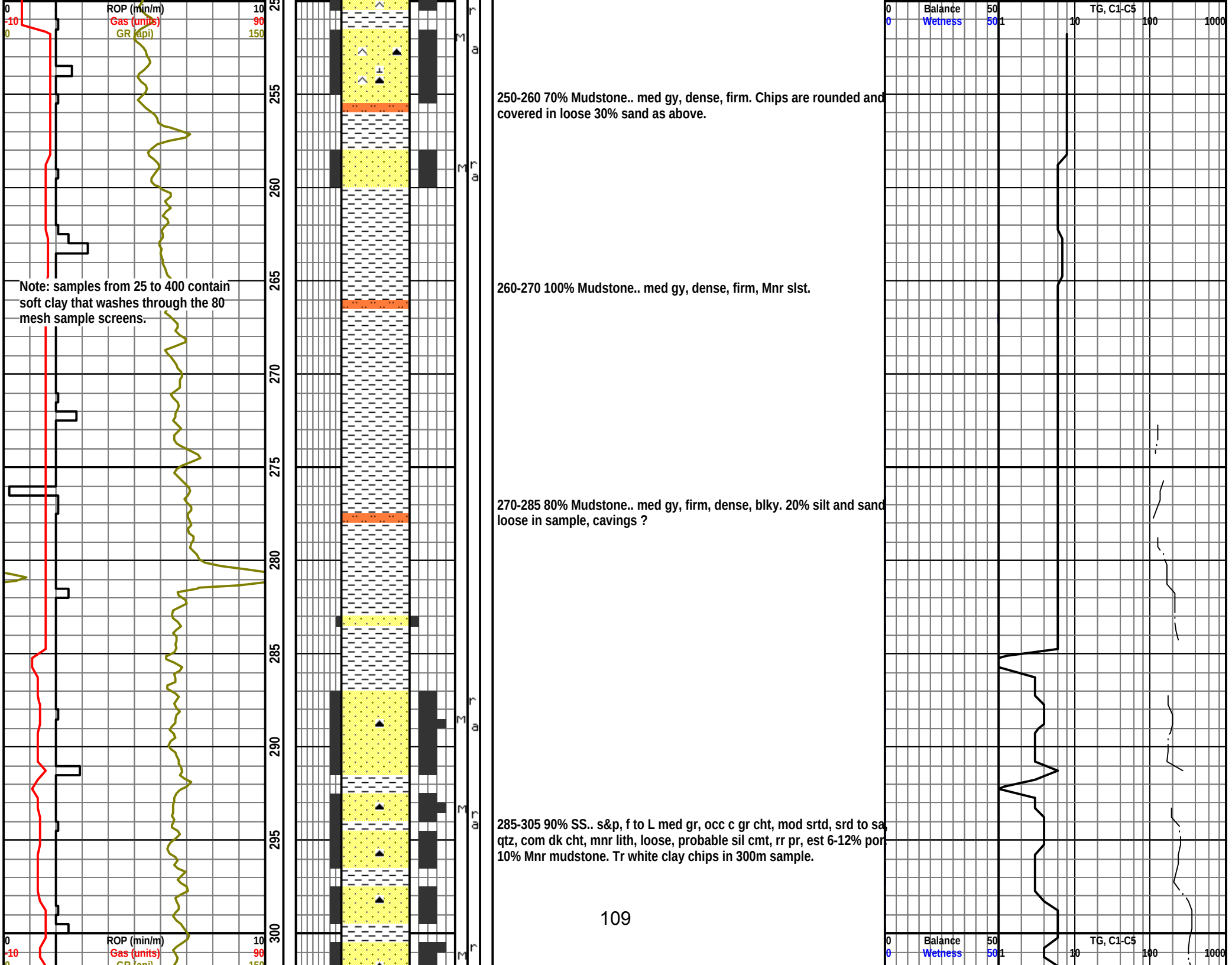
200-210 70% Mudstone.. med to dk gy, sl mmica, firm. 30% SLST.. med gy, sl s&p, as above.

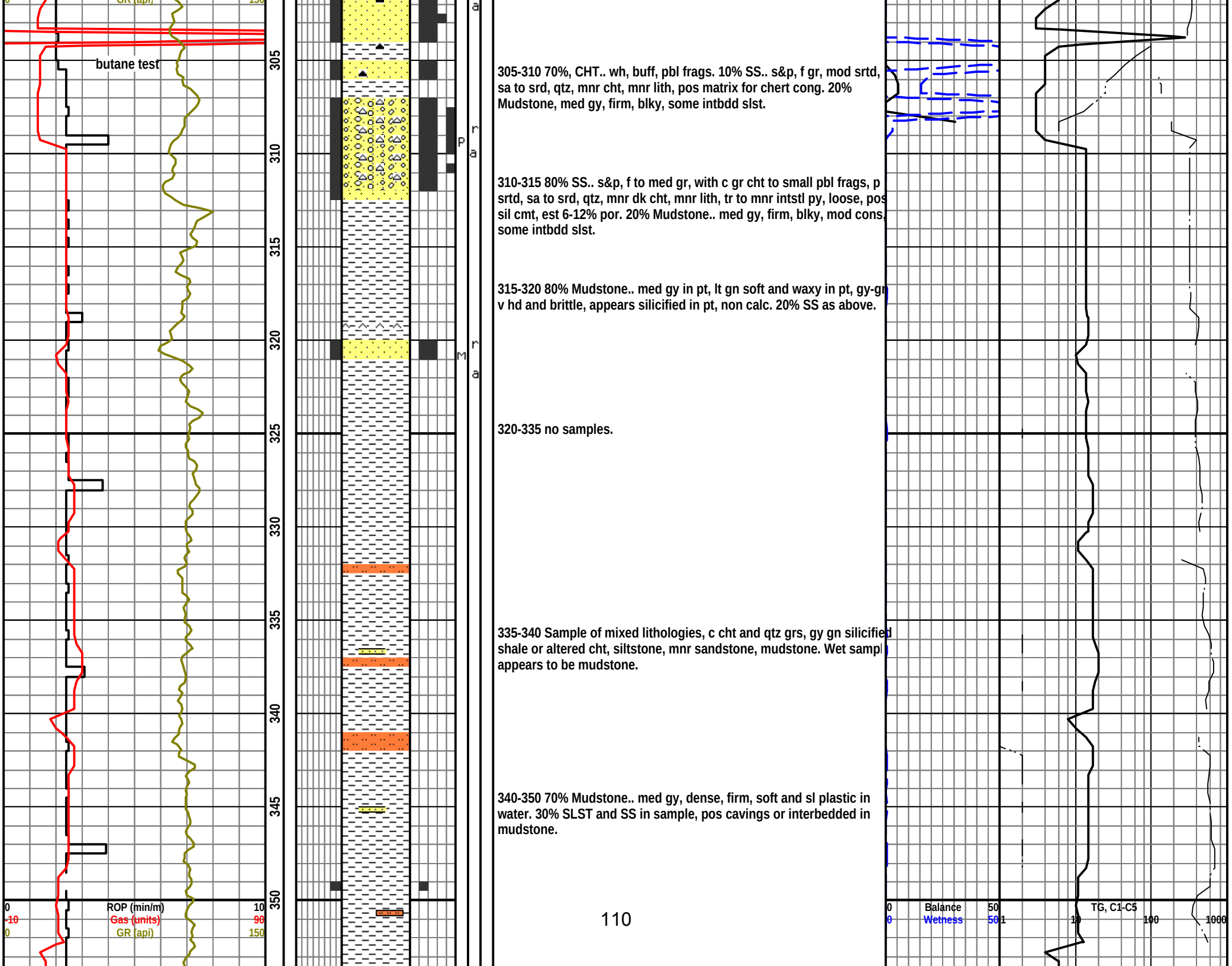
210-220 50% Mudstone.. med gy, rounded chips, firm, sl brit. 50% SLST.. med gy, firm, brit, clay mtx, tr por. Mixed lithologies and sawdust, from a hole sweep.

220-230 75% Mudstone.. med gy, firm, blky, sl mmica. 25% SLST.. med gy, mod cons, qtz, mnr lith, clay mtx, tr to 3% por. Higher vis mud producing some clay balls.

230-240 75%Mudstone.. med gy, blky, firm. 25% SLST.. med gy, qtz silt, firm, blky, tr por. Tr ss.

240-250 70% SS.. s&p, f to L med gr, mod to w srtd, srd to sa, qtz, com dk cht, tr py, pred loose, sil cmt, mod calc, est 6-12% por. 30% mudstone.


0
ROP (min/m)
10
-10
Gas (units)
90
0
GR (api)
150
Balance
Wetness
TG, C1-C5
1
10
100
1000
250
255
260
265
270
275
280
285
290
295
300
Note: samples from 25 to 400 contain soft clay that washes through the 80 mesh sample screens.
250-260 70% Mudstone.. med gy, dense, firm. Chips are rounded and covered in loose 30% sand as above.
260-270 100% Mudstone.. med gy, dense, firm, Mnr slst.
270-285 80% Mudstone.. med gy, firm, dense, blky. 20% silt and sand loose in sample, cavings ?
285-305 90% SS.. s&p, f to L med gr, occ c gr cht, mod srtd, srd to sa, qtz, com dk cht, mnr lith, loose, probable sil cmt, rr pr, est 6-12% por, 10% Mnr mudstone. Tr white clay chips in 300m sample.



305-310 70%, CHT.. wh, buff, pbl frags. 10% SS.. s&p, f gr, mod srtd, sa to srd, qtz, mnr cht, mnr lith, pos matrix for chert cong. 20% Mudstone, med gy, firm, blky, some intbdd slst.

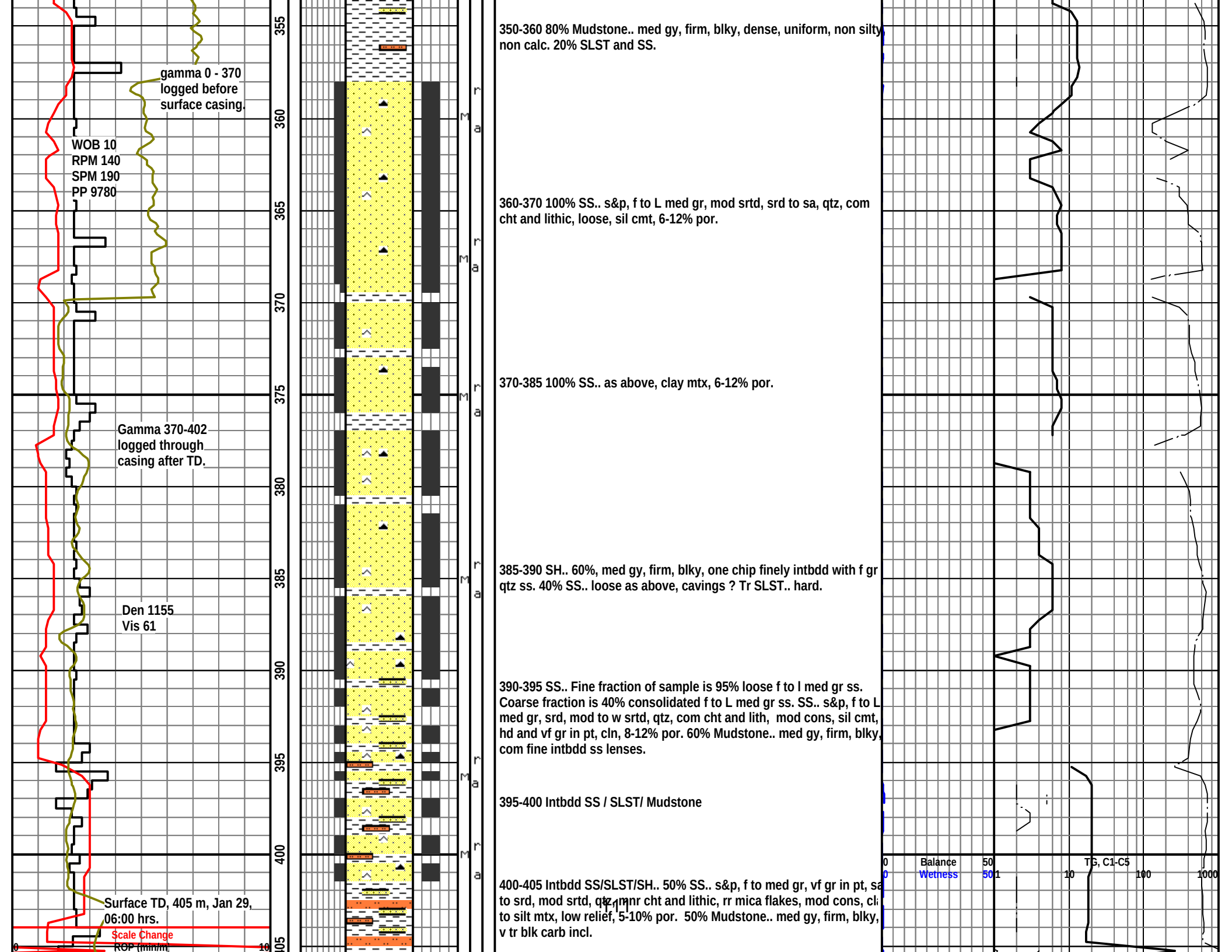
310-315 80% SS.. s&p, f to med gr, with c gr cht to small pbl frags, p srtd, sa to srd, qtz, mnr dk cht, mnr lith, tr to mnr intstl py, loose, pos sil cmt, est 6-12% por. 20% Mudstone.. med gy, firm, blky, mod cons, some intbdd slst.

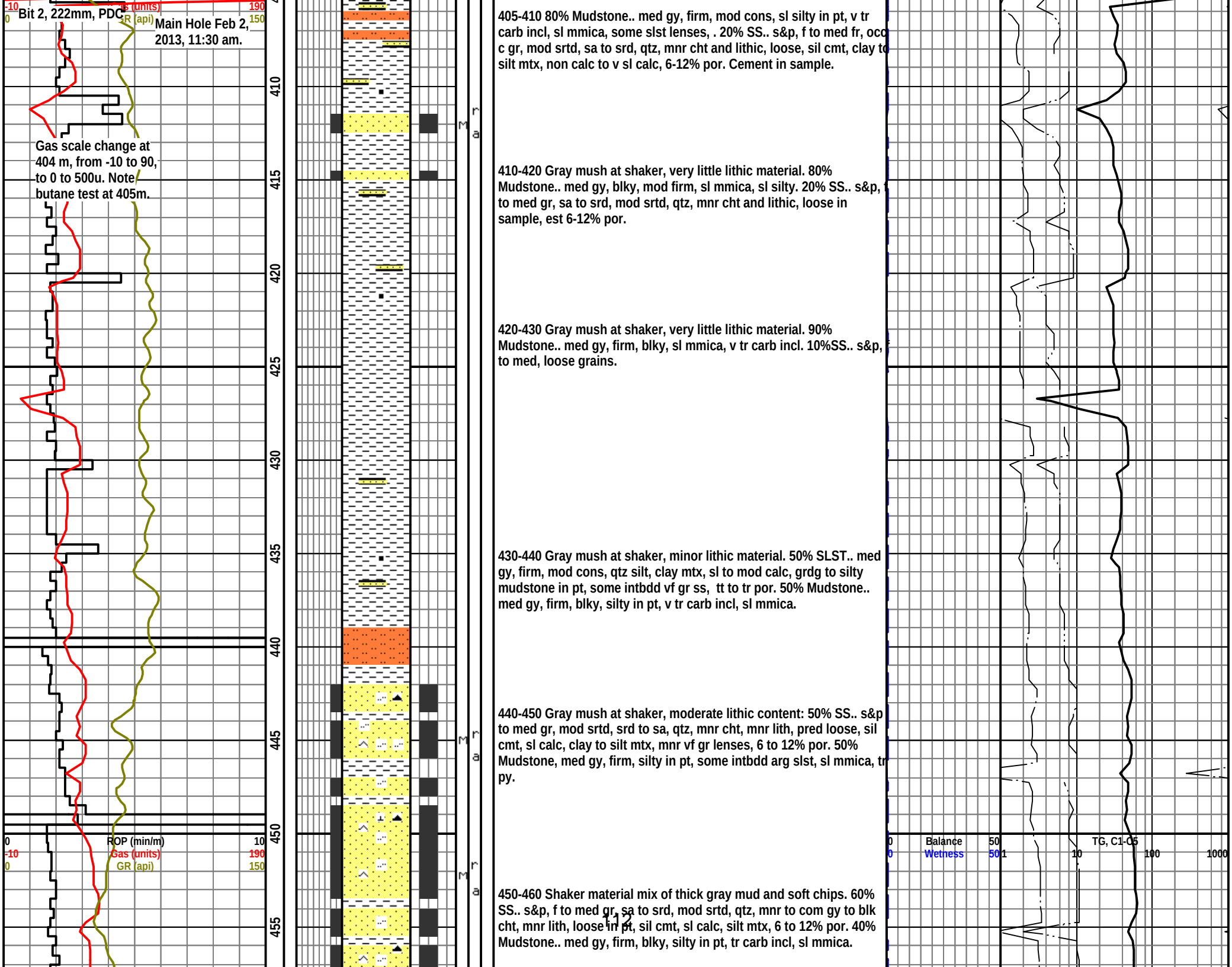
315-320 80% Mudstone.. med gy in pt, lt gn soft and waxy in pt, gy-gn v hd and brittle, appears silicified in pt, non calc. 20% SS as above.

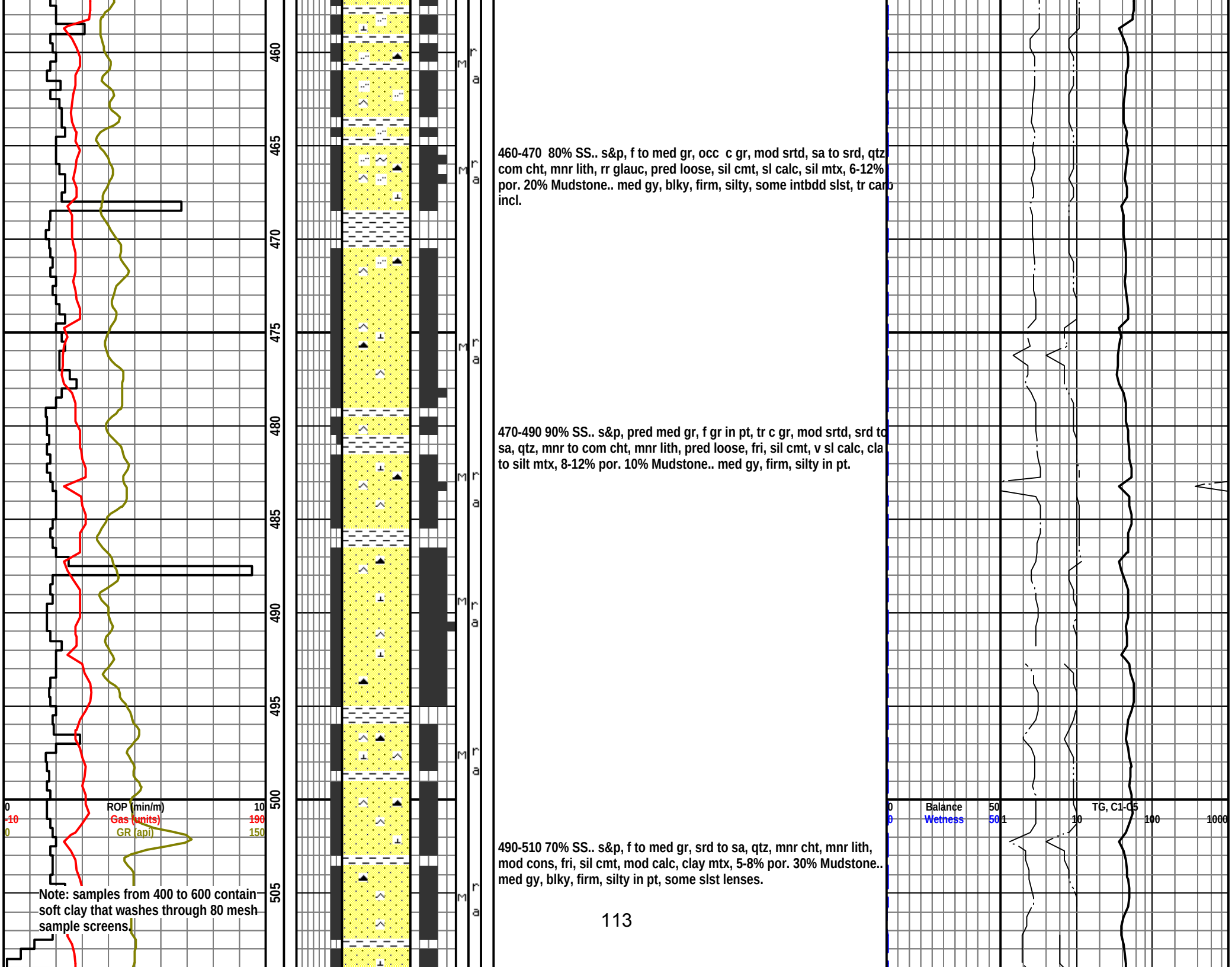
320-335 no samples.

335-340 Sample of mixed lithologies, c cht and qtz grs, gy gn silicified shale or altered cht, siltstone, mnr sandstone, mudstone. Wet sampl appears to be mudstone.

340-350 70% Mudstone.. med gy, dense, firm, soft and sl plastic in water. 30% SLST and SS in sample, pos cavings or interbedded in mudstone.


gamma 0 - 370
logged before
surface casing.
WOB 10
RPM 140
SPM 190
PP 9780
Gamma 370-402
logged through
casing after TD.
Den 1155
Vis 61
Surface TD, 405 m, Jan 29,
06:00 hrs.
Scale Change
ROP (min/m)
0
10
355
360
365
370
375
380
385
390
395
400
405
350-360 80% Mudstone.. med gy, firm, blky, dense, uniform, non silty
non calc. 20% SLST and SS.
360-370 100% SS.. s&p, f to L med gr, mod srtd, srd to sa, qtz, com
cht and lithic, loose, sil cmt, 6-12% por.
370-385 100% SS.. as above, clay mtx, 6-12% por.
385-390 SH.. 60%, med gy, firm, blky, one chip finely intbdd with f gr
qtz ss. 40% SS.. loose as above, cavings ? Tr SLST.. hard.
390-395 SS.. Fine fraction of sample is 95% loose f to l med gr ss.
Coarse fraction is 40% consolidated f to L med gr ss. SS.. s&p, f to L
med gr, srd, mod to w srtd, qtz, com cht and lith, mod cons, sil cmt,
hd and vf gr in pt, cln, 8-12% por. 60% Mudstone.. med gy, firm, blky,
com fine intbdd ss lenses.
395-400 Intbdd SS / SLST/ Mudstone
400-405 Intbdd SS/SLST/SH.. 50% SS.. s&p, f to med gr, vf gr in pt, sa
to srd, mod srtd, qtz, mnr cht and lithic, rr mica flakes, mod cons, cl
to silt mtx, low relief, 5-10% por. 50% Mudstone.. med gy, firm, blky,
v tr blk carb incl.
Balance
Wetness
50
50
1
TG, C1-C5
10
100
1000


Bit 2, 222mm, PDC
Main Hole Feb 2, 2013, 11:30 am.
Gas scale change at 404 m, from -10 to 90, to 0 to 500u. Note butane test at 405m.
ROP (min/m)
Gas (units)
GR (api)
Balance
Wetness
TG, C1-C5
405-410 80% Mudstone.. med gy, firm, mod cons, sl silty in pt, v tr carb incl, sl mmica, some slst lenses, . 20% SS.. s&p, f to med fr, occ c gr, mod srtd, sa to srd, qtz, mnr cht and lithic, loose, sil cmt, clay to silt mtx, non calc to v sl calc, 6-12% por. Cement in sample.
410-420 Gray mush at shaker, very little lithic material. 80% Mudstone.. med gy, blky, mod firm, sl mmica, sl silty. 20% SS.. s&p, f to med gr, sa to srd, mod srtd, qtz, mnr cht and lithic, loose in sample, est 6-12% por.
420-430 Gray mush at shaker, very little lithic material. 90% Mudstone.. med gy, firm, blky, sl mmica, v tr carb incl. 10%SS.. s&p, f to med, loose grains.
430-440 Gray mush at shaker, minor lithic material. 50% SLST.. med gy, firm, mod cons, qtz silt, clay mtx, sl to mod calc, grdg to silty mudstone in pt, some intbdd vf gr ss, tt to tr por. 50% Mudstone.. med gy, firm, blky, silty in pt, v tr carb incl, sl mmica.
440-450 Gray mush at shaker, moderate lithic content: 50% SS.. s&p to med gr, mod srtd, srd to sa, qtz, mnr cht, mnr lith, pred loose, sil cmt, sl calc, clay to silt mtx, mnr vf gr lenses, 6 to 12% por. 50% Mudstone, med gy, firm, silty in pt, some intbdd arg slst, sl mmica, tr py.
450-460 Shaker material mix of thick gray mud and soft chips. 60% SS.. s&p, f to med gr, sa to srd, mod srtd, qtz, mnr to com gy to blk cht, mnr lith, loose in pt, sil cmt, sl calc, silt mtx, 6 to 12% por. 40% Mudstone.. med gy, firm, blky, silty in pt, tr carb incl, sl mmica.

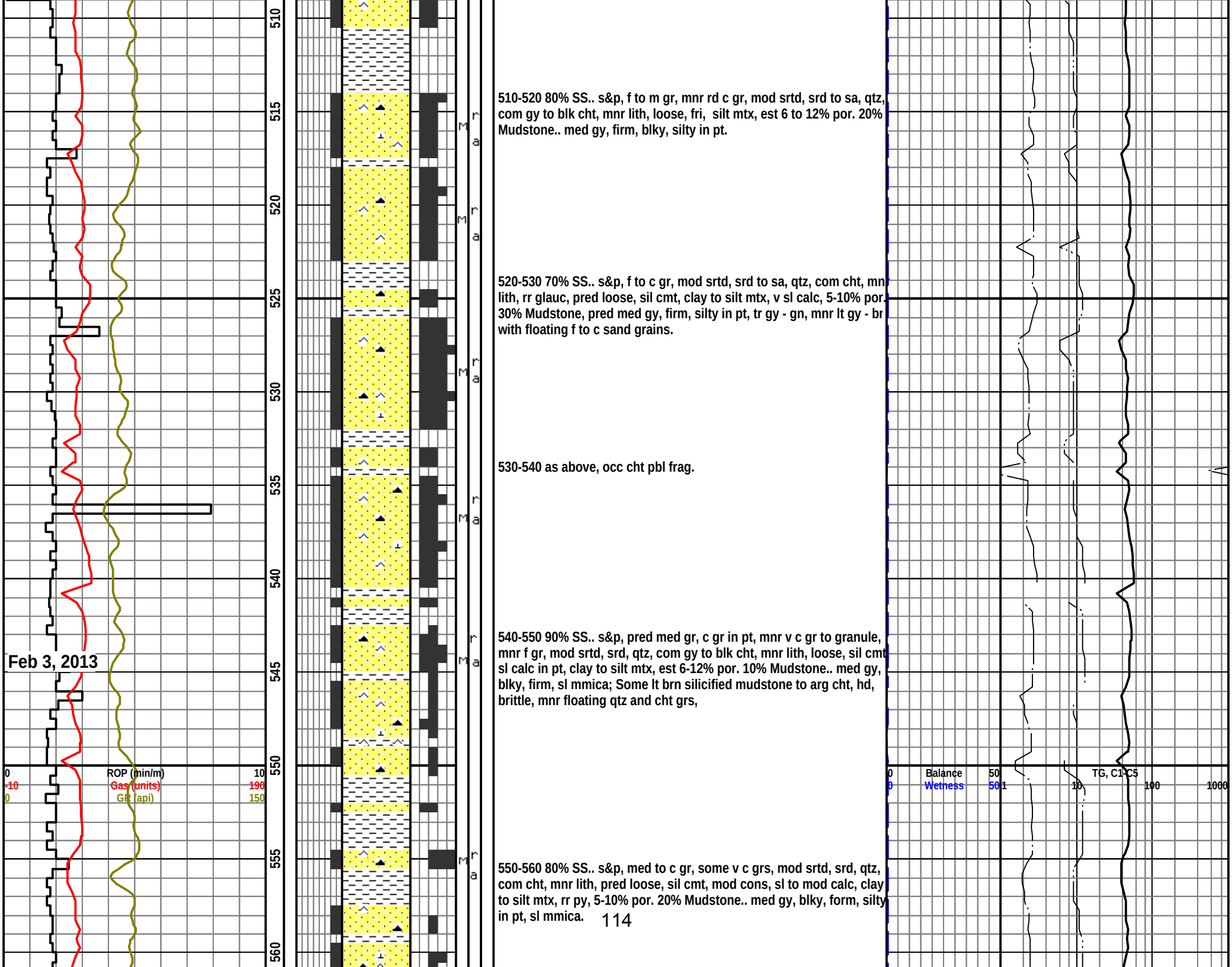


460-470 80% SS.. s&p, f to med gr, occ c gr, mod srtd, sa to srd, qtz com cht, mnr lith, rr glauc, pred loose, sil cmt, sl calc, sil mtx, 6-12% por. 20% Mudstone.. med gy, blky, firm, silty, some intbdd slst, tr carb incl.

470-490 90% SS.. s&p, pred med gr, f gr in pt, tr c gr, mod srtd, srd to sa, qtz, mnr to com cht, mnr lith, pred loose, fri, sil cmt, v sl calc, cla to silt mtx, 8-12% por. 10% Mudstone.. med gy, firm, silty in pt.

490-510 70% SS.. s&p, f to med gr, srd to sa, qtz, mnr cht, mnr lith, mod cons, fri, sil cmt, mod calc, clay mtx, 5-8% por. 30% Mudstone.. med gy, blky, firm, silty in pt, some slst lenses.

Note: samples from 400 to 600 contain soft clay that washes through 80 mesh sample screens.



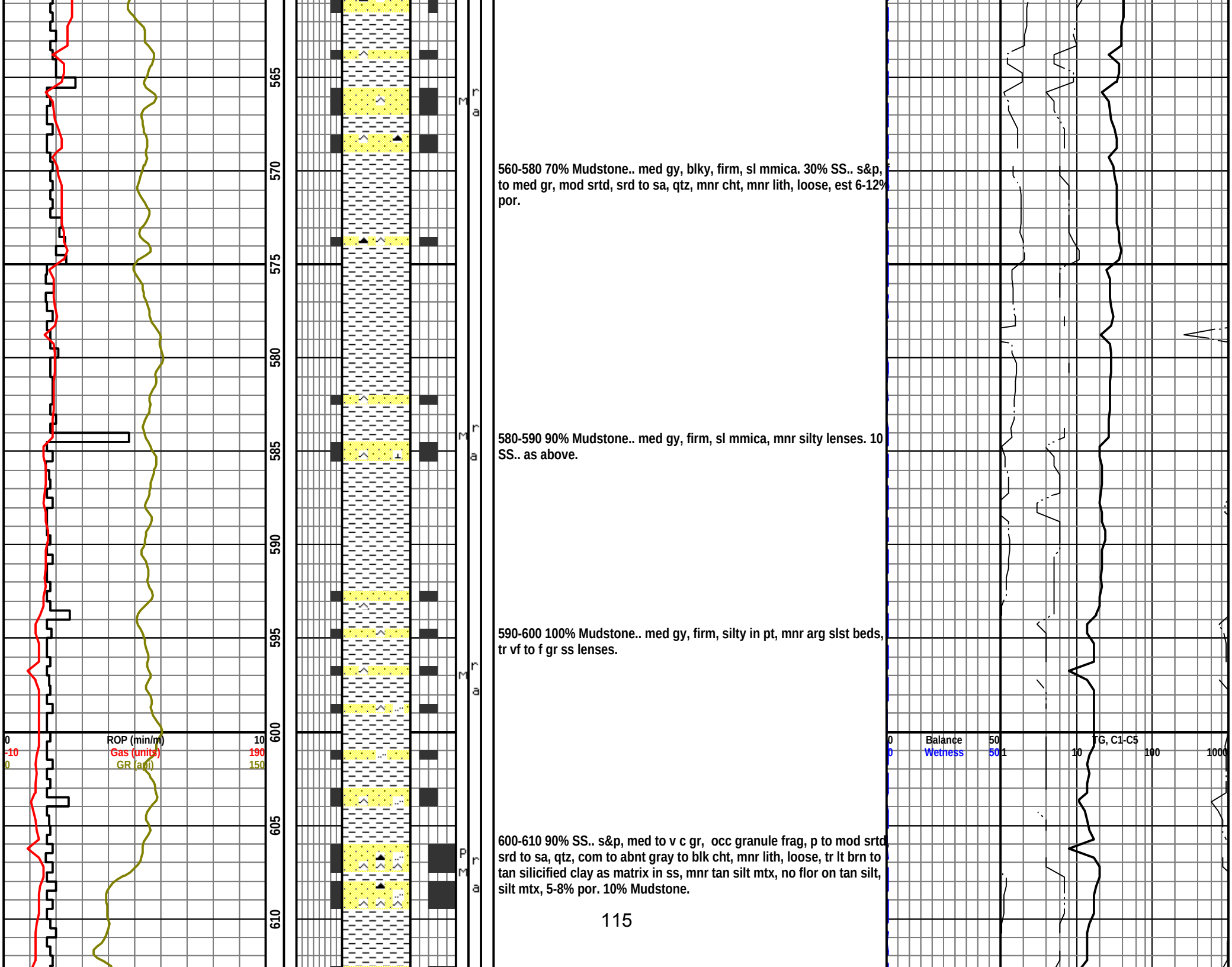
510-520 80% SS.. s&p, f to m gr, mnr rd c gr, mod srtd, srd to sa, qtz, com gy to blk cht, mnr lith, loose, fri, silt mtx, est 6 to 12% por. 20% Mudstone.. med gy, firm, blky, silty in pt.

520-530 70% SS.. s&p, f to c gr, mod srtd, srd to sa, qtz, com cht, mnr lith, rr glauc, pred loose, sil cmt, clay to silt mtx, v sl calc, 5-10% por. 30% Mudstone, pred med gy, firm, silty in pt, tr gy - gn, mnr lt gy - br with floating f to c sand grains.

530-540 as above, occ cht pbl frag.

540-550 90% SS.. s&p, pred med gr, c gr in pt, mnr v c gr to granule, mnr f gr, mod srtd, srd, qtz, com gy to blk cht, mnr lith, loose, sil cmt sl calc in pt, clay to silt mtx, est 6-12% por. 10% Mudstone.. med gy, blky, firm, sl mmica; Some lt brn silicified mudstone to arg cht, hd, brittle, mnr floating qtz and cht grs,

550-560 80% SS.. s&p, med to c gr, some v c grs, mod srtd, srd, qtz, com cht, mnr lith, pred loose, sil cmt, mod cons, sl to mod calc, clay to silt mtx, rr py, 5-10% por. 20% Mudstone.. med gy, blky, form, silty in pt, sl mmica.

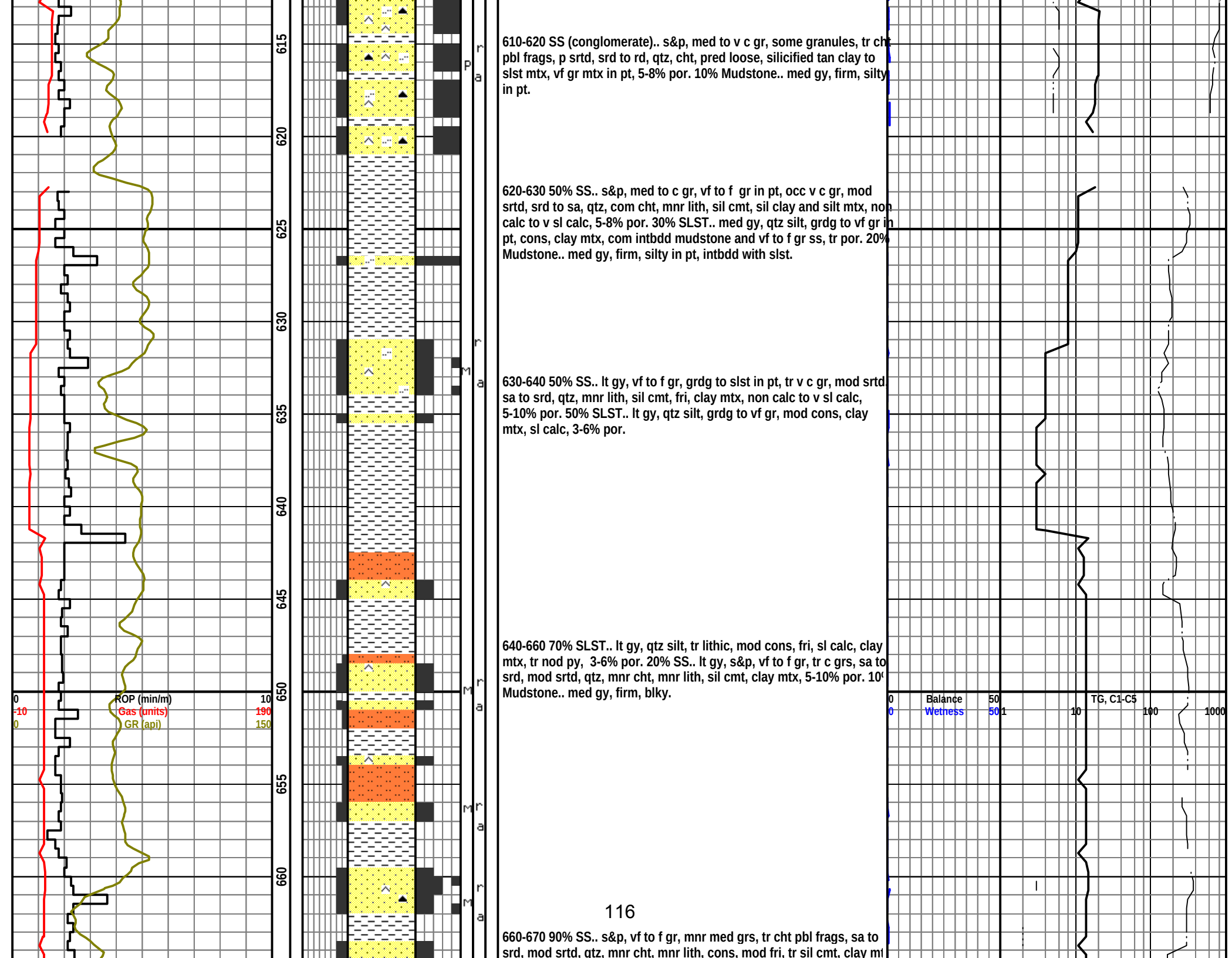


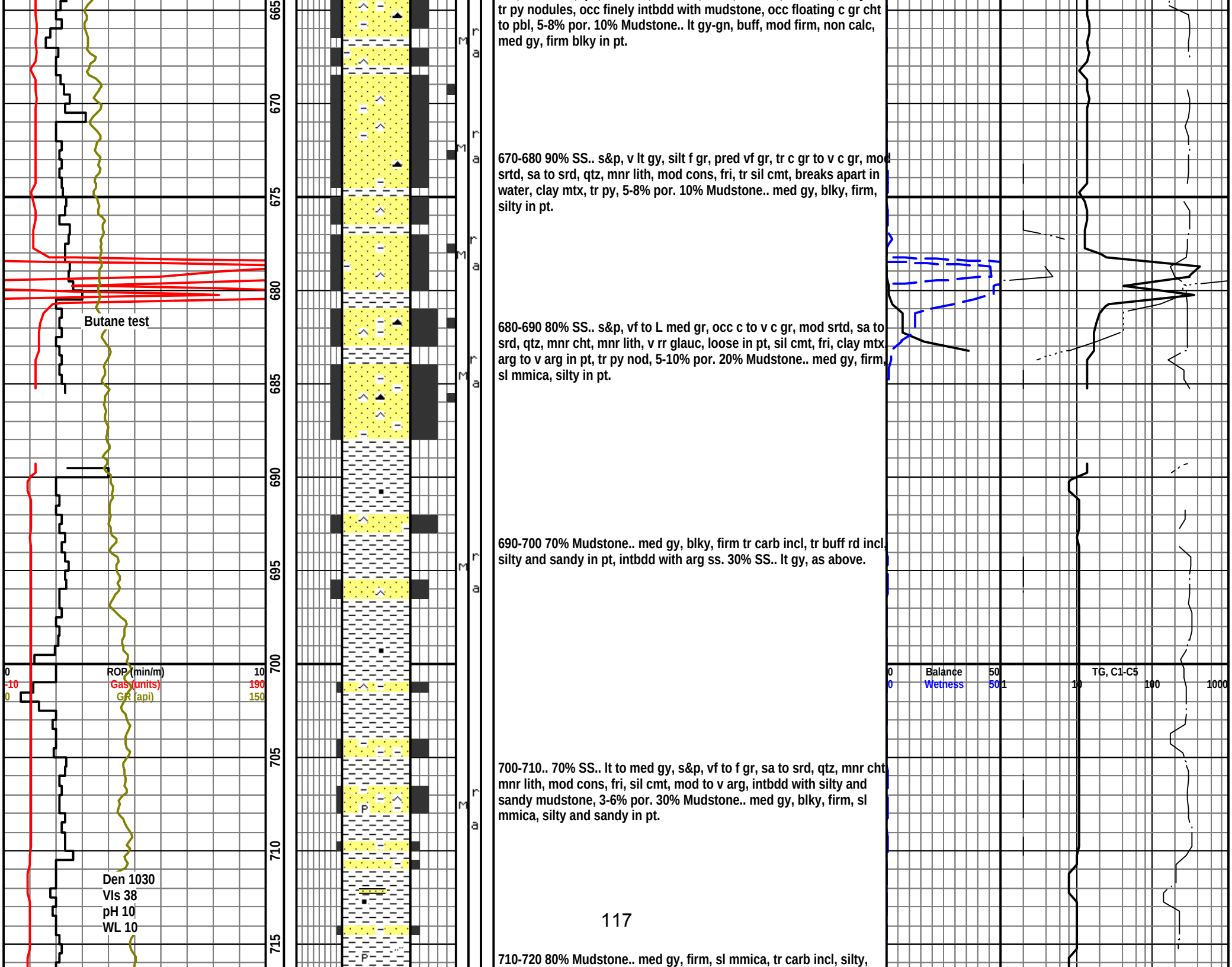
560-580 70% Mudstone.. med gy, blky, firm, sl mmica. 30% SS.. s&p, f to med gr, mod srtd, srd to sa, qtz, mnr cht, mnr lith, loose, est 6-12% por.

580-590 90% Mudstone.. med gy, firm, sl mmica, mnr silty lenses. 10 SS.. as above.

590-600 100% Mudstone.. med gy, firm, silty in pt, mnr arg slst beds, tr vf to f gr ss lenses.

600-610 90% SS.. s&p, med to v c gr, occ granule frag, p to mod srtd, srd to sa, qtz, com to abnt gray to blk cht, mnr lith, loose, tr lt brn to tan silicified clay as matrix in ss, mnr tan silt mtx, no flor on tan silt, silt mtx, 5-8% por. 10% Mudstone.


0
-10
0
ROP (min/m)
Gas (units)
GR (api)
10
190
150
615
620
625
630
635
640
645
650
655
660
610-620 SS (conglomerate).. s&p, med to v c gr, some granules, tr cht pbl frags, p srtd, srd to rd, qtz, cht, pred loose, silicified tan clay to slst mtx, vf gr mtx in pt, 5-8% por. 10% Mudstone.. med gy, firm, silty in pt.
620-630 50% SS.. s&p, med to c gr, vf to f gr in pt, occ v c gr, mod srtd, srd to sa, qtz, com cht, mnr lith, sil cmt, sil clay and silt mtx, non calc to v sl calc, 5-8% por. 30% SLST.. med gy, qtz silt, grdg to vf gr in pt, cons, clay mtx, com intbdd mudstone and vf to f gr ss, tr por. 20% Mudstone.. med gy, firm, silty in pt, intbdd with slst.
630-640 50% SS.. lt gy, vf to f gr, grdg to slst in pt, tr v c gr, mod srtd, sa to srd, qtz, mnr lith, sil cmt, fri, clay mtx, non calc to v sl calc, 5-10% por. 50% SLST.. lt gy, qtz silt, grdg to vf gr, mod cons, clay mtx, sl calc, 3-6% por.
640-660 70% SLST.. lt gy, qtz silt, tr lithic, mod cons, fri, sl calc, clay mtx, tr nod py, 3-6% por. 20% SS.. lt gy, s&p, vf to f gr, tr c grs, sa to srd, mod srtd, qtz, mnr cht, mnr lith, sil cmt, clay mtx, 5-10% por. 10% Mudstone.. med gy, firm, blky.
660-670 90% SS.. s&p, vf to f gr, mnr med grs, tr cht pbl frags, sa to srd, mod srtd, qtz, mnr cht, mnr lith, cons, mod fri, tr sil cmt, clay mt
0
Balance
50
0
Wetness
50
1
10
100
1000
TG, C1-C5



tr py nodules, occ finely intbdd with mudstone, occ floating c gr cht to pbl, 5-8% por. 10% Mudstone.. lt gy-gn, buff, mod firm, non calc, med gy, firm blky in pt.

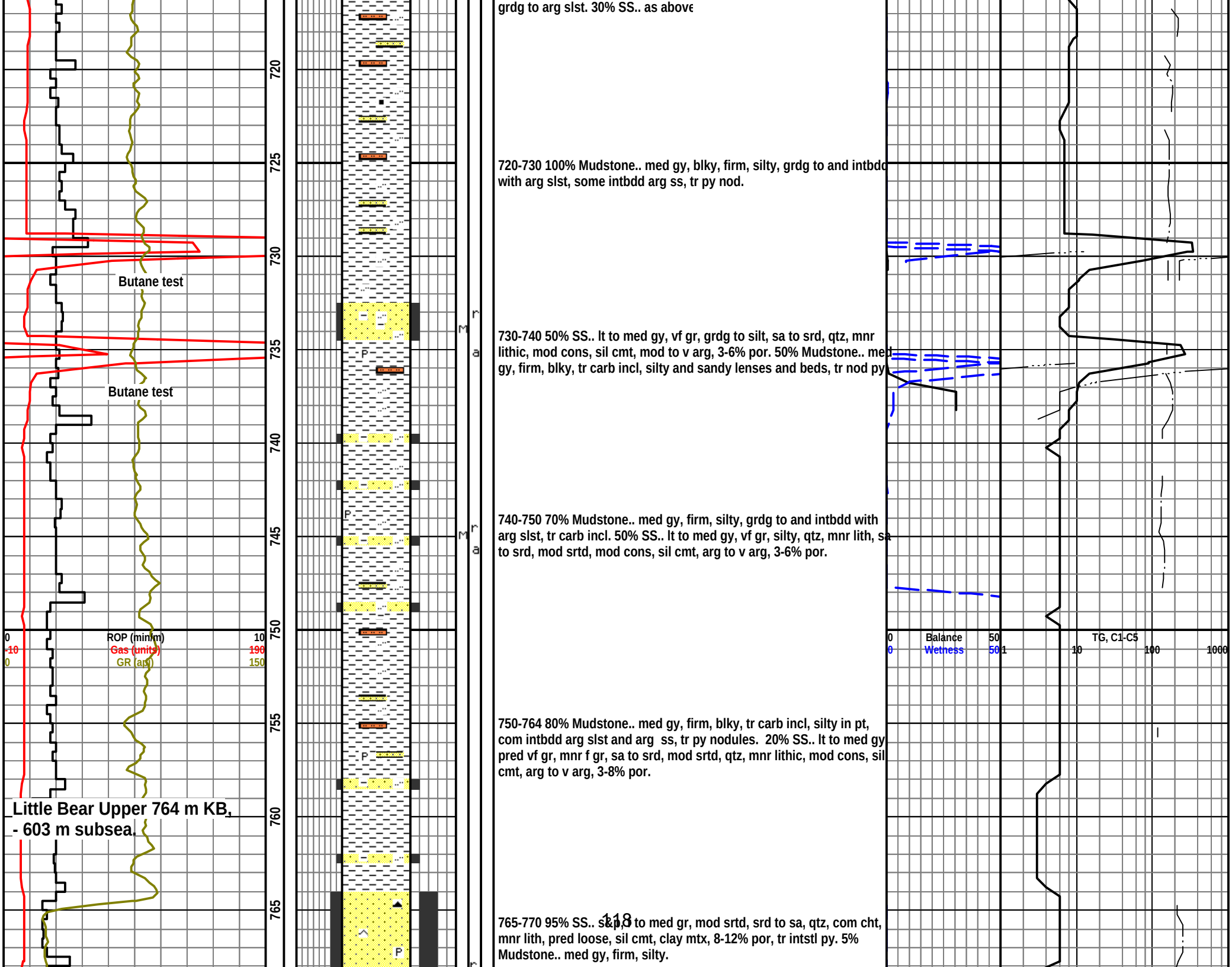
670-680 90% SS.. s&p, v lt gy, silt f gr, pred vf gr, tr c gr to v c gr, mod srtd, sa to srd, qtz, mnr lith, mod cons, fri, tr sil cmt, breaks apart in water, clay mtx, tr py, 5-8% por. 10% Mudstone.. med gy, blky, firm, silty in pt.

680-690 80% SS.. s&p, vf to L med gr, occ c to v c gr, mod srtd, sa to srd, qtz, mnr cht, mnr lith, v rr glauc, loose in pt, sil cmt, fri, clay mtx, arg to v arg in pt, tr py nod, 5-10% por. 20% Mudstone.. med gy, firm, sl mmica, silty in pt.

690-700 70% Mudstone.. med gy, blky, firm tr carb incl, tr buff rd incl, silty and sandy in pt, intbdd with arg ss. 30% SS.. lt gy, as above.

700-710.. 70% SS.. lt to med gy, s&p, vf to f gr, sa to srd, qtz, mnr cht, mnr lith, mod cons, fri, sil cmt, mod to v arg, intbdd with silty and sandy mudstone, 3-6% por. 30% Mudstone.. med gy, blky, firm, sl mmica, silty and sandy in pt.

710-720 80% Mudstone.. med gy, firm, sl mmica, tr carb incl, silty,



grdg to arg slst. 30% SS.. as above

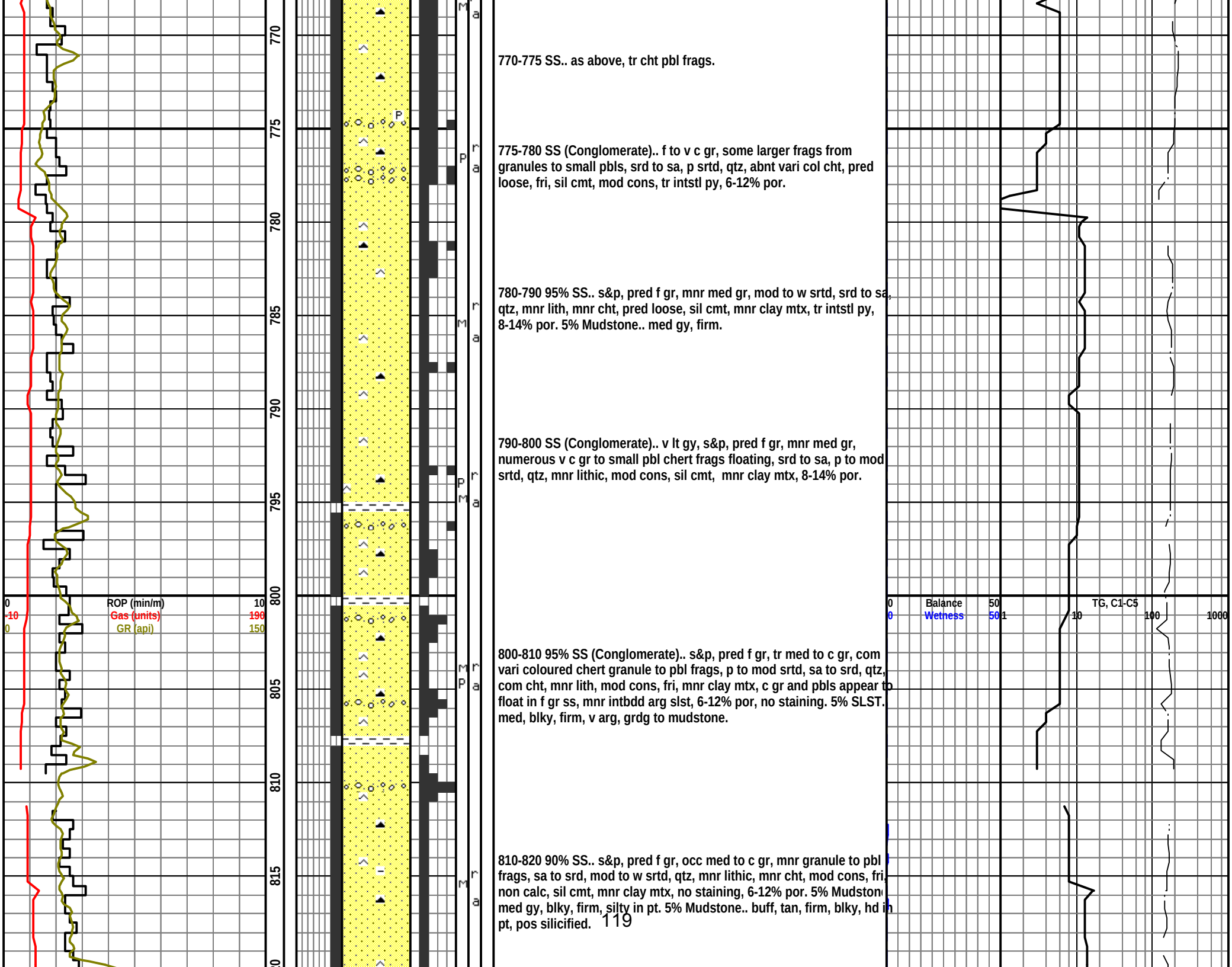
720-730 100% Mudstone.. med gy, blky, firm, silty, grdg to and intbdd with arg slst, some intbdd arg ss, tr py nod.

730-740 50% SS.. lt to med gy, vf gr, grdg to silt, sa to srd, qtz, mnr lithic, mod cons, sil cmt, mod to v arg, 3-6% por. 50% Mudstone.. med gy, firm, blky, tr carb incl, silty and sandy lenses and beds, tr nod py

740-750 70% Mudstone.. med gy, firm, silty, grdg to and intbdd with arg slst, tr carb incl. 50% SS.. lt to med gy, vf gr, silty, qtz, mnr lith, sa to srd, mod srtd, mod cons, sil cmt, arg to v arg, 3-6% por.

750-764 80% Mudstone.. med gy, firm, blky, tr carb incl, silty in pt, com intbdd arg slst and arg ss, tr py nodules. 20% SS.. lt to med gy pred vf gr, mnr f gr, sa to srd, mod srtd, qtz, mnr lithic, mod cons, sil cmt, arg to v arg, 3-8% por.

765-770 95% SS.. s&p, lt to med gr, mod srtd, srd to sa, qtz, com cht, mnr lith, pred loose, sil cmt, clay mtx, 8-12% por, tr intstl py. 5% Mudstone.. med gy, firm, silty.



770-775 SS.. as above, tr cht pbl frags.

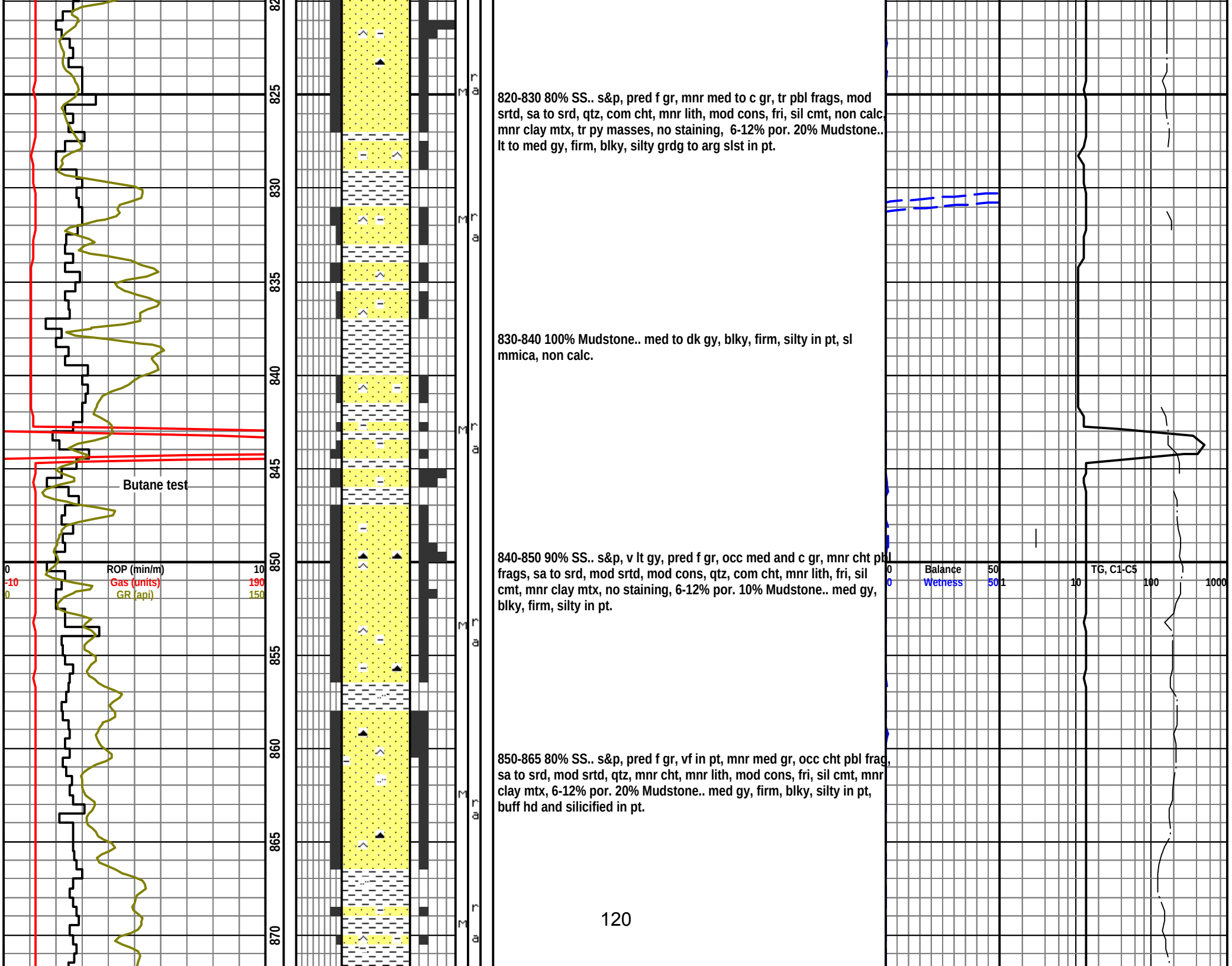
775-780 SS (Conglomerate).. f to v c gr, some larger frags from granules to small pbls, srd to sa, p srtd, qtz, abnt vari col cht, pred loose, fri, sil cmt, mod cons, tr intstl py, 6-12% por.

780-790 95% SS.. s&p, pred f gr, mnr med gr, mod to w srtd, srd to sa, qtz, mnr lith, mnr cht, pred loose, sil cmt, mnr clay mtx, tr intstl py, 8-14% por. 5% Mudstone.. med gy, firm.

790-800 SS (Conglomerate).. v lt gy, s&p, pred f gr, mnr med gr, numerous v c gr to small pbl chert frags floating, srd to sa, p to mod srtd, qtz, mnr lithic, mod cons, sil cmt, mnr clay mtx, 8-14% por.

800-810 95% SS (Conglomerate).. s&p, pred f gr, tr med to c gr, com vari coloured chert granule to pbl frags, p to mod srtd, sa to srd, qtz, com cht, mnr lith, mod cons, fri, mnr clay mtx, c gr and pbls appear to float in f gr ss, mnr intbdd arg slst, 6-12% por, no staining. 5% SLST. med, blky, firm, v arg, grdg to mudstone.

810-820 90% SS.. s&p, pred f gr, occ med to c gr, mnr granule to pbl frags, sa to srd, mod to w srtd, qtz, mnr lithic, mnr cht, mod cons, fri, non calc, sil cmt, mnr clay mtx, no staining, 6-12% por. 5% Mudstone med gy, blky, firm, silty in pt. 5% Mudstone.. buff, tan, firm, blky, hd in pt, pos silicified.

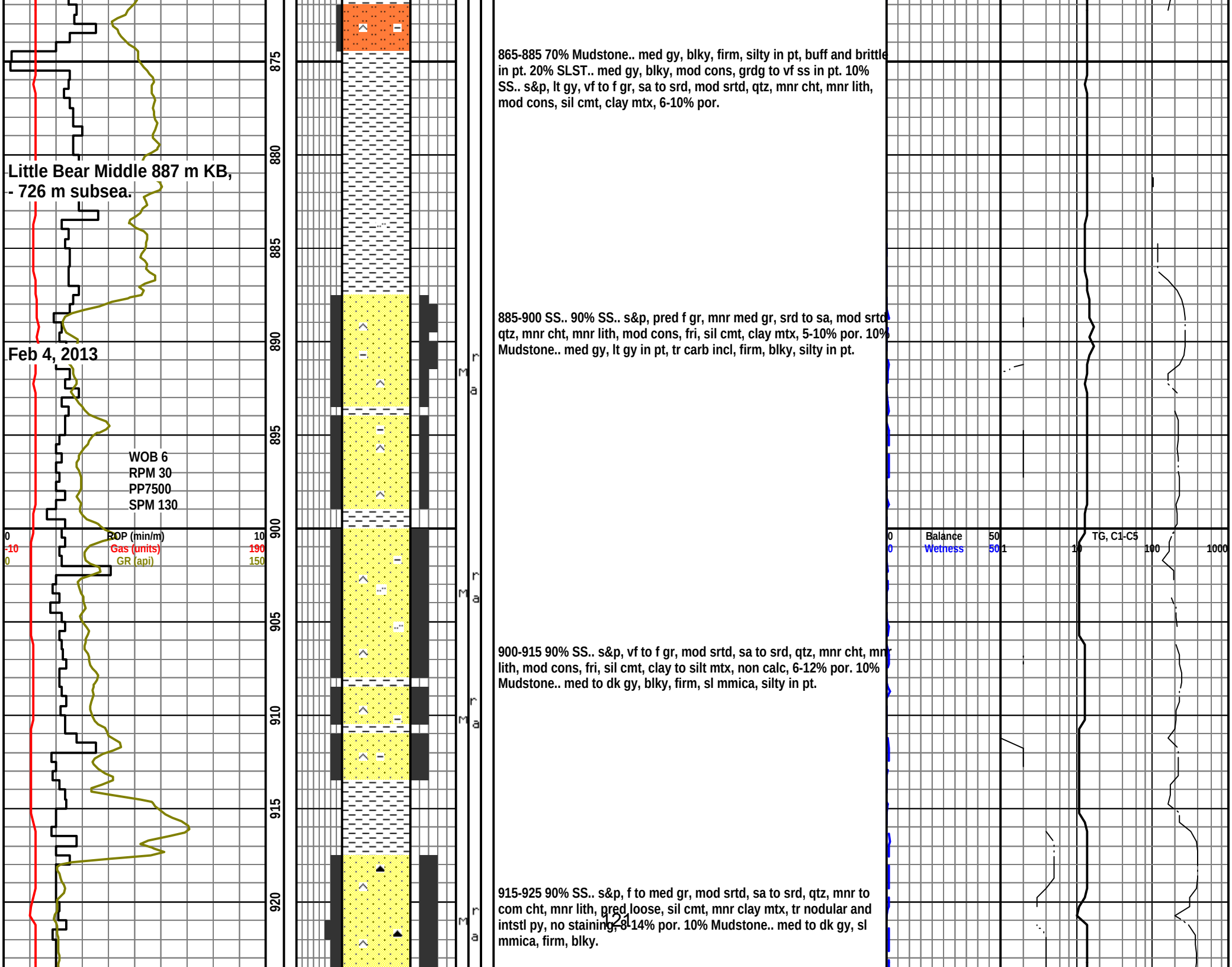


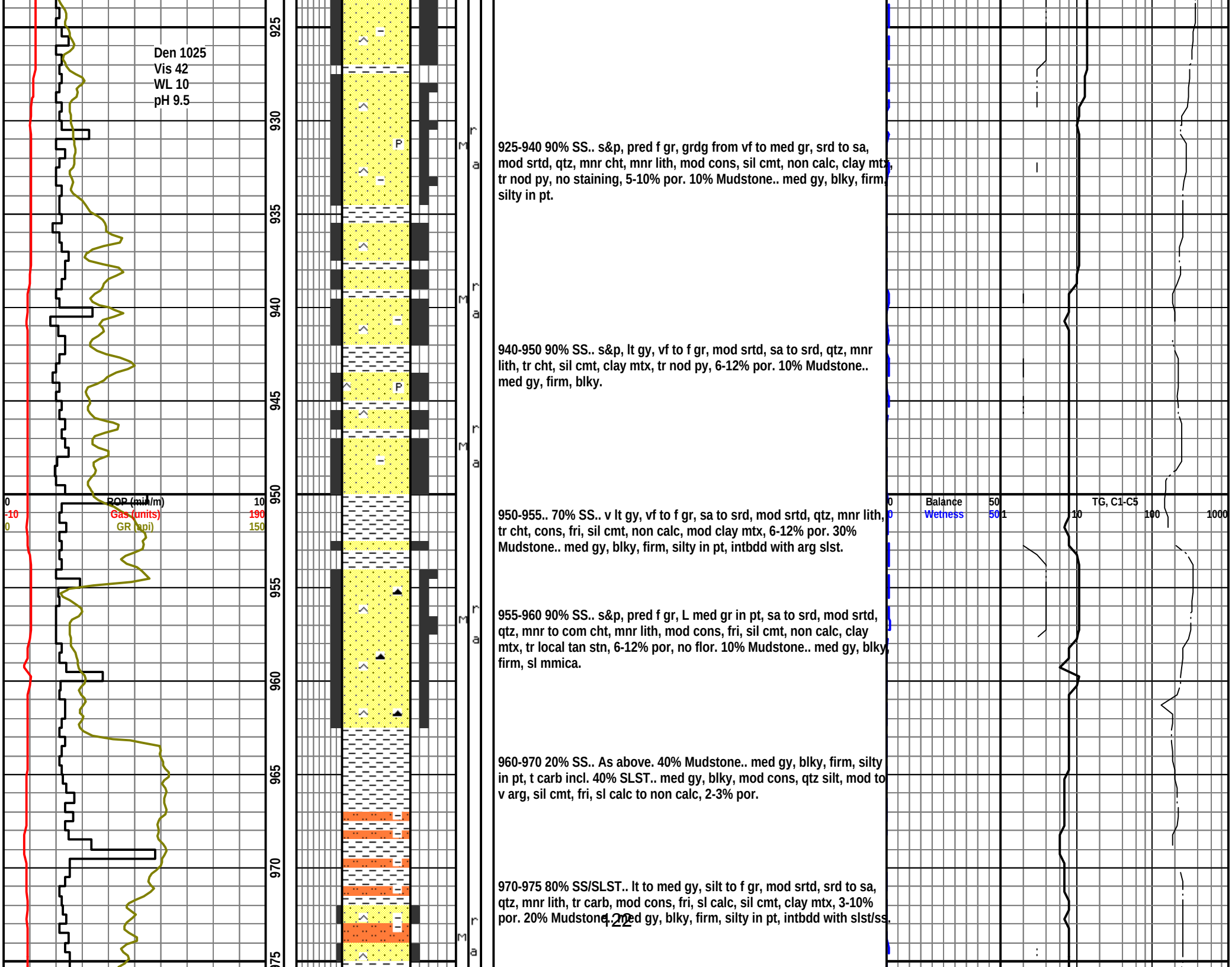
820-830 80% SS.. s&p, pred f gr, mnr med to c gr, tr pbl frags, mod srtd, sa to srd, qtz, com cht, mnr lith, mod cons, fri, sil cmt, non calc, mnr clay mtx, tr py masses, no staining, 6-12% por. 20% Mudstone.. lt to med gy, firm, blky, silty grdg to arg slst in pt.

830-840 100% Mudstone.. med to dk gy, blky, firm, silty in pt, sl mmica, non calc.

840-850 90% SS.. s&p, v lt gy, pred f gr, occ med and c gr, mnr cht pbl frags, sa to srd, mod srtd, mod cons, qtz, com cht, mnr lith, fri, sil cmt, mnr clay mtx, no staining, 6-12% por. 10% Mudstone.. med gy, blky, firm, silty in pt.

850-865 80% SS.. s&p, pred f gr, vf in pt, mnr med gr, occ cht pbl frag, sa to srd, mod srtd, qtz, mnr cht, mnr lith, mod cons, fri, sil cmt, mnr clay mtx, 6-12% por. 20% Mudstone.. med gy, firm, blky, silty in pt, buff hd and silicified in pt.


Little Bear Middle 887 m KB,
- 726 m subsea.
Feb 4, 2013
WOB 6
RPM 30
PP7500
SPM 130
0
ROP (min/m)
10
-10
Gas (units)
190
0
GR (api)
150
875
880
885
890
895
900
905
910
915
920
Marr
Marr
Marr
865-885 70% Mudstone.. med gy, blky, firm, silty in pt, buff and brittle in pt. 20% SLST.. med gy, blky, mod cons, grdg to vf ss in pt. 10% SS.. s&p, lt gy, vf to f gr, sa to srd, mod srtd, qtz, mnr cht, mnr lith, mod cons, sil cmt, clay mtx, 6-10% por.
885-900 SS.. 90% SS.. s&p, pred f gr, mnr med gr, srd to sa, mod srtd qtz, mnr cht, mnr lith, mod cons, fri, sil cmt, clay mtx, 5-10% por. 10% Mudstone.. med gy, lt gy in pt, tr carb incl, firm, blky, silty in pt.
900-915 90% SS.. s&p, vf to f gr, mod srtd, sa to srd, qtz, mnr cht, mnr lith, mod cons, fri, sil cmt, clay to silt mtx, non calc, 6-12% por. 10% Mudstone.. med to dk gy, blky, firm, sl mmica, silty in pt.
915-925 90% SS.. s&p, f to med gr, mod srtd, sa to srd, qtz, mnr to com cht, mnr lith, pred loose, sil cmt, mnr clay mtx, tr nodular and intstl py, no staining, 8-14% por. 10% Mudstone.. med to dk gy, sl mmica, firm, blky.
0
Balance
50
0
Wetness
50
1
TG, C1-C5
10
100
1000



925-940 90% SS.. s&p, pred f gr, grdg from vf to med gr, srd to sa, mod srtd, qtz, mnr cht, mnr lith, mod cons, sil cmt, non calc, clay mtx, tr nod py, no staining, 5-10% por. 10% Mudstone.. med gy, blky, firm, silty in pt.

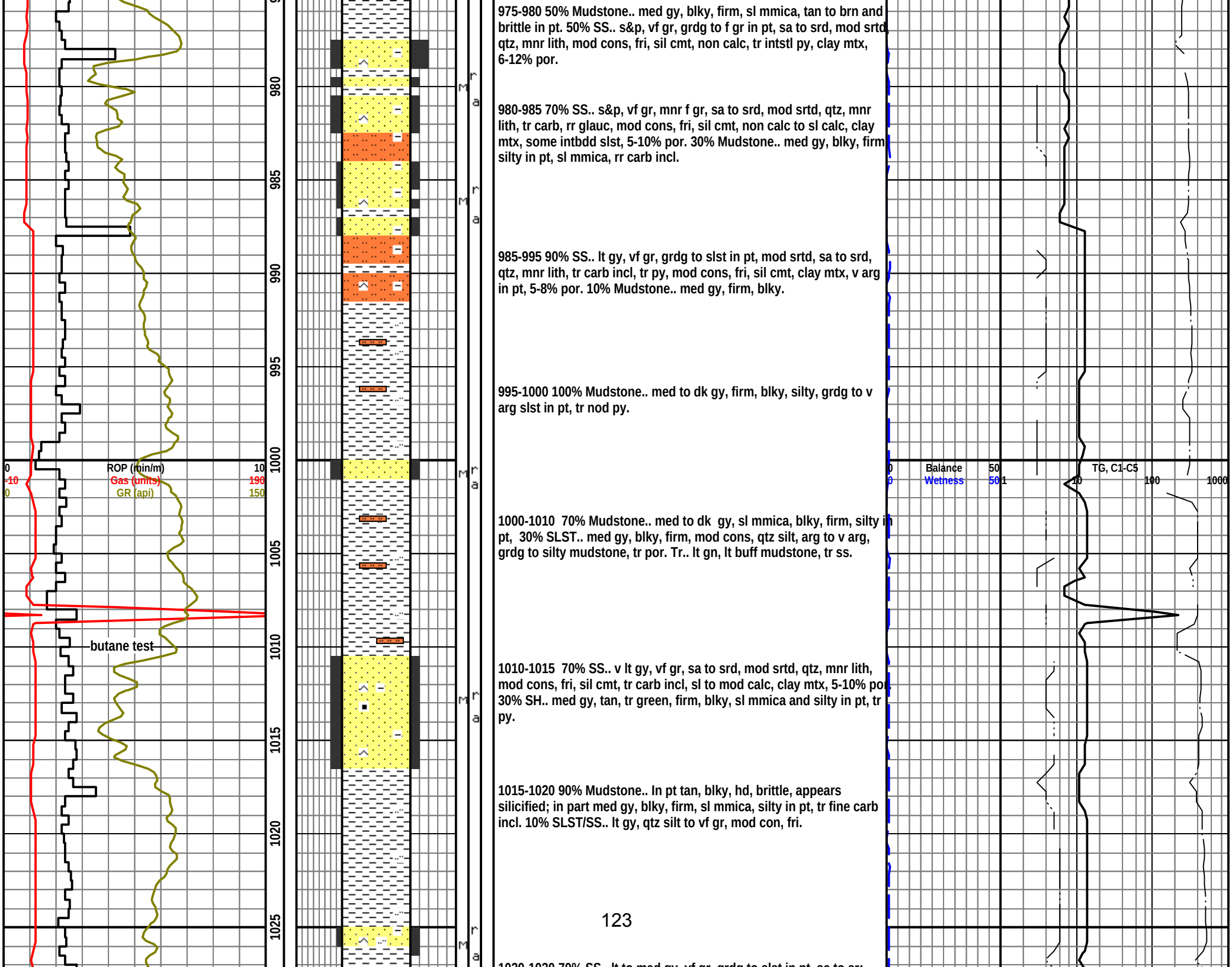
940-950 90% SS.. s&p, lt gy, vf to f gr, mod srtd, sa to srd, qtz, mnr lith, tr cht, sil cmt, clay mtx, tr nod py, 6-12% por. 10% Mudstone.. med gy, firm, blky.

950-955.. 70% SS.. v lt gy, vf to f gr, sa to srd, mod srtd, qtz, mnr lith, tr cht, cons, fri, sil cmt, non calc, mod clay mtx, 6-12% por. 30% Mudstone.. med gy, blky, firm, silty in pt, intbdd with arg slst.

955-960 90% SS.. s&p, pred f gr, L med gr in pt, sa to srd, mod srtd, qtz, mnr to com cht, mnr lith, mod cons, fri, sil cmt, non calc, clay mtx, tr local tan stn, 6-12% por, no flor. 10% Mudstone.. med gy, blky, firm, sl mmica.

960-970 20% SS.. As above. 40% Mudstone.. med gy, blky, firm, silty in pt, t carb incl. 40% SLST.. med gy, blky, mod cons, qtz silt, mod to v arg, sil cmt, fri, sl calc to non calc, 2-3% por.

970-975 80% SS/SLST.. lt to med gy, silt to f gr, mod srtd, srd to sa, qtz, mnr lith, tr carb, mod cons, fri, sl calc, sil cmt, clay mtx, 3-10% por. 20% Mudstone.. med gy, blky, firm, silty in pt, intbdd with slst/ss.



975-980 50% Mudstone.. med gy, blky, firm, sl mmica, tan to brn and brittle in pt. 50% SS.. s&p, vf gr, grdg to f gr in pt, sa to srd, mod srtd, qtz, mnr lith, mod cons, fri, sil cmt, non calc, tr intstl py, clay mtx, 6-12% por.

980-985 70% SS.. s&p, vf gr, mnr f gr, sa to srd, mod srtd, qtz, mnr lith, tr carb, rr glauc, mod cons, fri, sil cmt, non calc to sl calc, clay mtx, some intbdd slst, 5-10% por. 30% Mudstone.. med gy, blky, firm, silty in pt, sl mmica, rr carb incl.

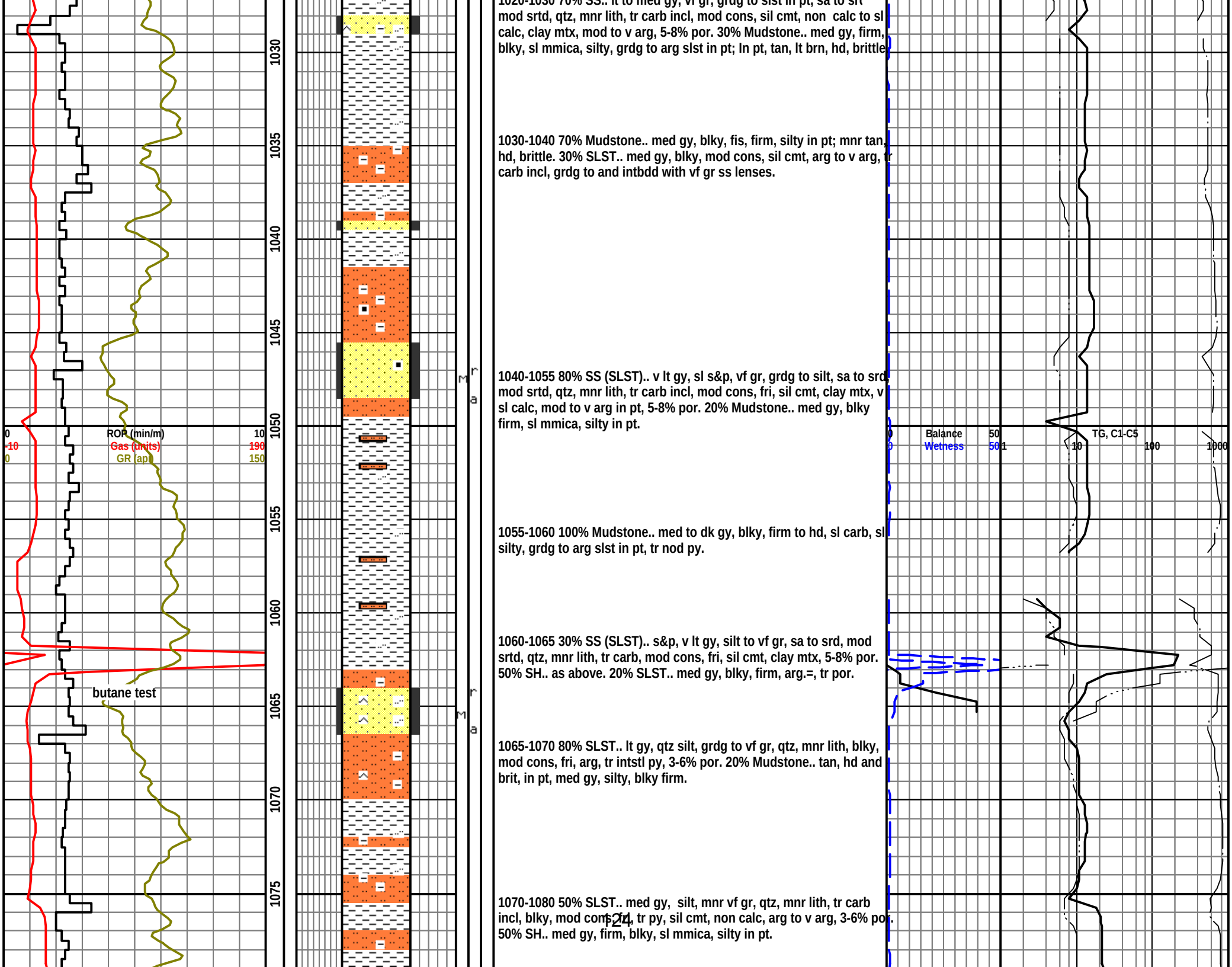
985-995 90% SS.. lt gy, vf gr, grdg to slst in pt, mod srtd, sa to srd, qtz, mnr lith, tr carb incl, tr py, mod cons, fri, sil cmt, clay mtx, v arg in pt, 5-8% por. 10% Mudstone.. med gy, firm, blky.

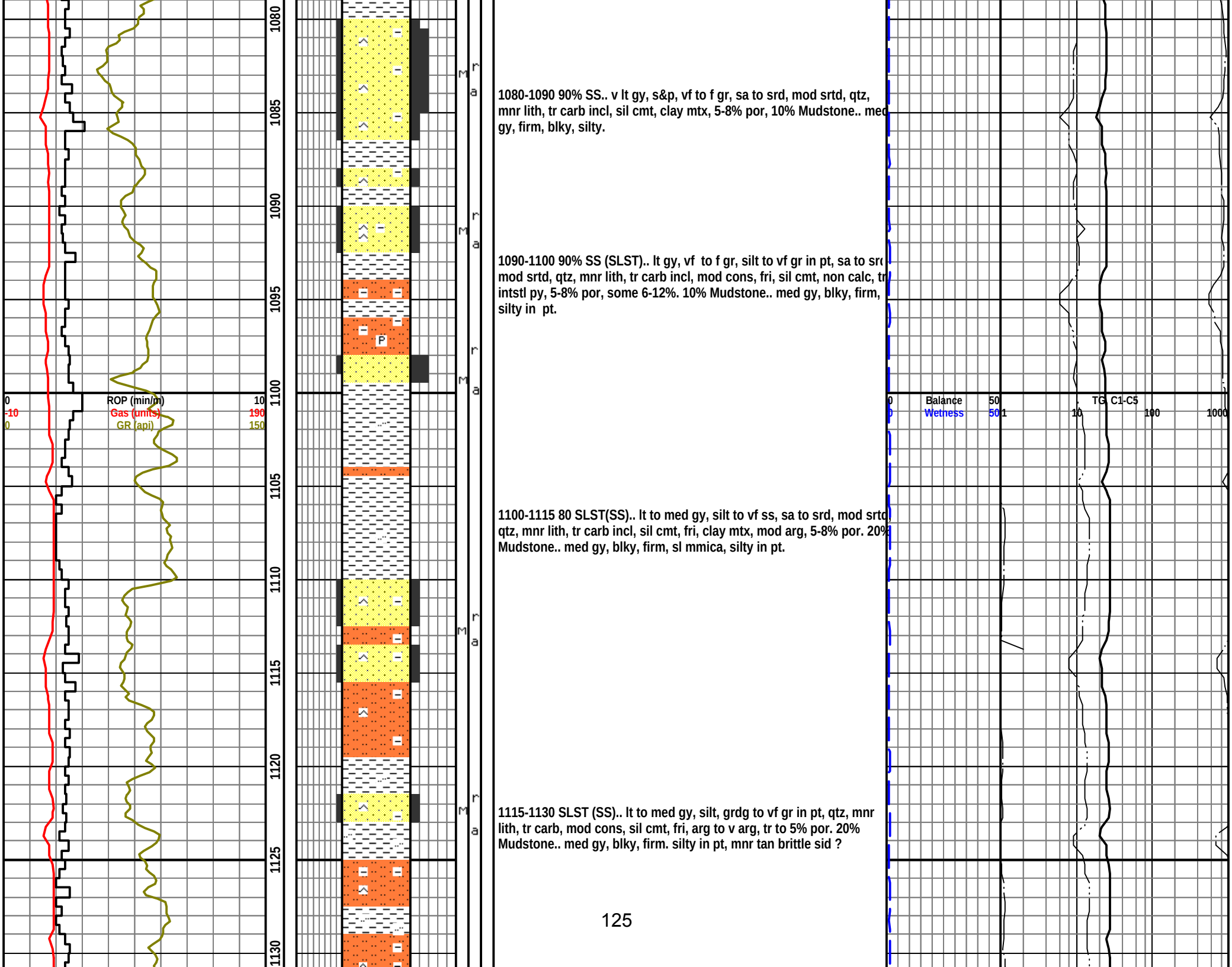
995-1000 100% Mudstone.. med to dk gy, firm, blky, silty, grdg to v arg slst in pt, tr nod py.

1000-1010 70% Mudstone.. med to dk gy, sl mmica, blky, firm, silty in pt, 30% SLST.. med gy, blky, firm, mod cons, qtz silt, arg to v arg, grdg to silty mudstone, tr por. Tr.. lt gn, lt buff mudstone, tr ss.

1010-1015 70% SS.. v lt gy, vf gr, sa to srd, mod srtd, qtz, mnr lith, mod cons, fri, sil cmt, tr carb incl, sl to mod calc, clay mtx, 5-10% por. 30% SH.. med gy, tan, tr green, firm, blky, sl mmica and silty in pt, tr py.

1015-1020 90% Mudstone.. ln pt tan, blky, hd, brittle, appears silicified; in part med gy, blky, firm, sl mmica, silty in pt, tr fine carb incl. 10% SLST/SS.. lt gy, qtz silt to vf gr, mod con, fri.


1020-1030 70% SS.. lt to med gy, vf gr, grdg to slst in pt, sa to srd mod srtd, qtz, mnr lith, tr carb incl, mod cons, sil cmt, non calc to sl calc, clay mtx, mod to v arg, 5-8% por. 30% Mudstone.. med gy, firm, blky, sl mmica, silty, grdg to arg slst in pt; ln pt, tan, lt brn, hd, brittle
1030-1040 70% Mudstone.. med gy, blky, fis, firm, silty in pt; mnr tan, hd, brittle. 30% SLST.. med gy, blky, mod cons, sil cmt, arg to v arg, tr carb incl, grdg to and intbdd with vf gr ss lenses.
1040-1055 80% SS (SLST).. v lt gy, sl s&p, vf gr, grdg to silt, sa to srd, mod srtd, qtz, mnr lith, tr carb incl, mod cons, fri, sil cmt, clay mtx, v sl calc, mod to v arg in pt, 5-8% por. 20% Mudstone.. med gy, blky firm, sl mmica, silty in pt.
1055-1060 100% Mudstone.. med to dk gy, blky, firm to hd, sl carb, sl silty, grdg to arg slst in pt, tr nod py.
1060-1065 30% SS (SLST).. s&p, v lt gy, silt to vf gr, sa to srd, mod srtd, qtz, mnr lith, tr carb, mod cons, fri, sil cmt, clay mtx, 5-8% por. 50% SH.. as above. 20% SLST.. med gy, blky, firm, arg.=, tr por.
1065-1070 80% SLST.. lt gy, qtz silt, grdg to vf gr, qtz, mnr lith, blky, mod cons, fri, arg, tr intstl py, 3-6% por. 20% Mudstone.. tan, hd and brit, in pt, med gy, silty, blky firm.
1070-1080 50% SLST.. med gy, silt, mnr vf gr, qtz, mnr lith, tr carb incl, blky, mod cons, tr py, sil cmt, non calc, arg to v arg, 3-6% por. 50% SH.. med gy, firm, blky, sl mmica, silty in pt.
1030
1035
1040
1045
1050
1055
1060
1065
1070
1075
0
-10
0
ROP (min/m)
Gas (units)
GR (api)
10
190
150
butane test
0
Balance
Wetness
50
50
1
TG, C1-C5
10
100
1000

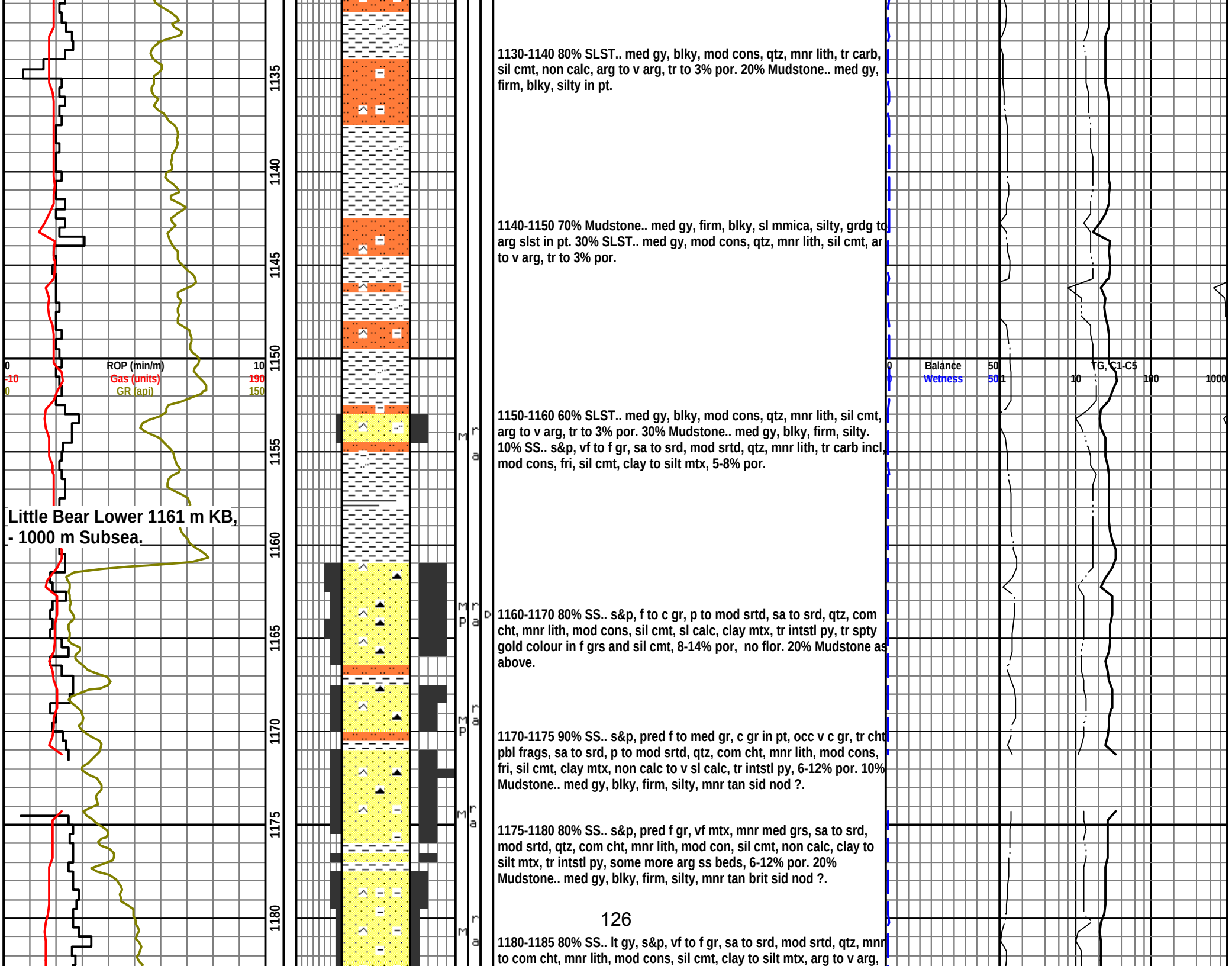


1080-1090 90% SS.. v lt gy, s&p, vf to f gr, sa to srd, mod srtd, qtz, mnr lith, tr carb incl, sil cmt, clay mtx, 5-8% por, 10% Mudstone.. med gy, firm, blky, silty.

1090-1100 90% SS (SLST).. lt gy, vf to f gr, silt to vf gr in pt, sa to srd, mod srtd, qtz, mnr lith, tr carb incl, mod cons, fri, sil cmt, non calc, tr intstl py, 5-8% por, some 6-12%. 10% Mudstone.. med gy, blky, firm, silty in pt.

1100-1115 80 SLST(SS).. lt to med gy, silt to vf ss, sa to srd, mod srtd, qtz, mnr lith, tr carb incl, sil cmt, fri, clay mtx, mod arg, 5-8% por. 20% Mudstone.. med gy, blky, firm, sl mmica, silty in pt.

1115-1130 SLST (SS).. lt to med gy, silt, grdg to vf gr in pt, qtz, mnr lith, tr carb, mod cons, sil cmt, fri, arg to v arg, tr to 5% por. 20% Mudstone.. med gy, blky, firm. silty in pt, mnr tan brittle sid ?



1130-1140 80% SLST.. med gy, blky, mod cons, qtz, mnr lith, tr carb, sil cmt, non calc, arg to v arg, tr to 3% por. 20% Mudstone.. med gy, firm, blky, silty in pt.

1140-1150 70% Mudstone.. med gy, firm, blky, sl mmica, silty, grdg to arg slst in pt. 30% SLST.. med gy, mod cons, qtz, mnr lith, sil cmt, ar to v arg, tr to 3% por.

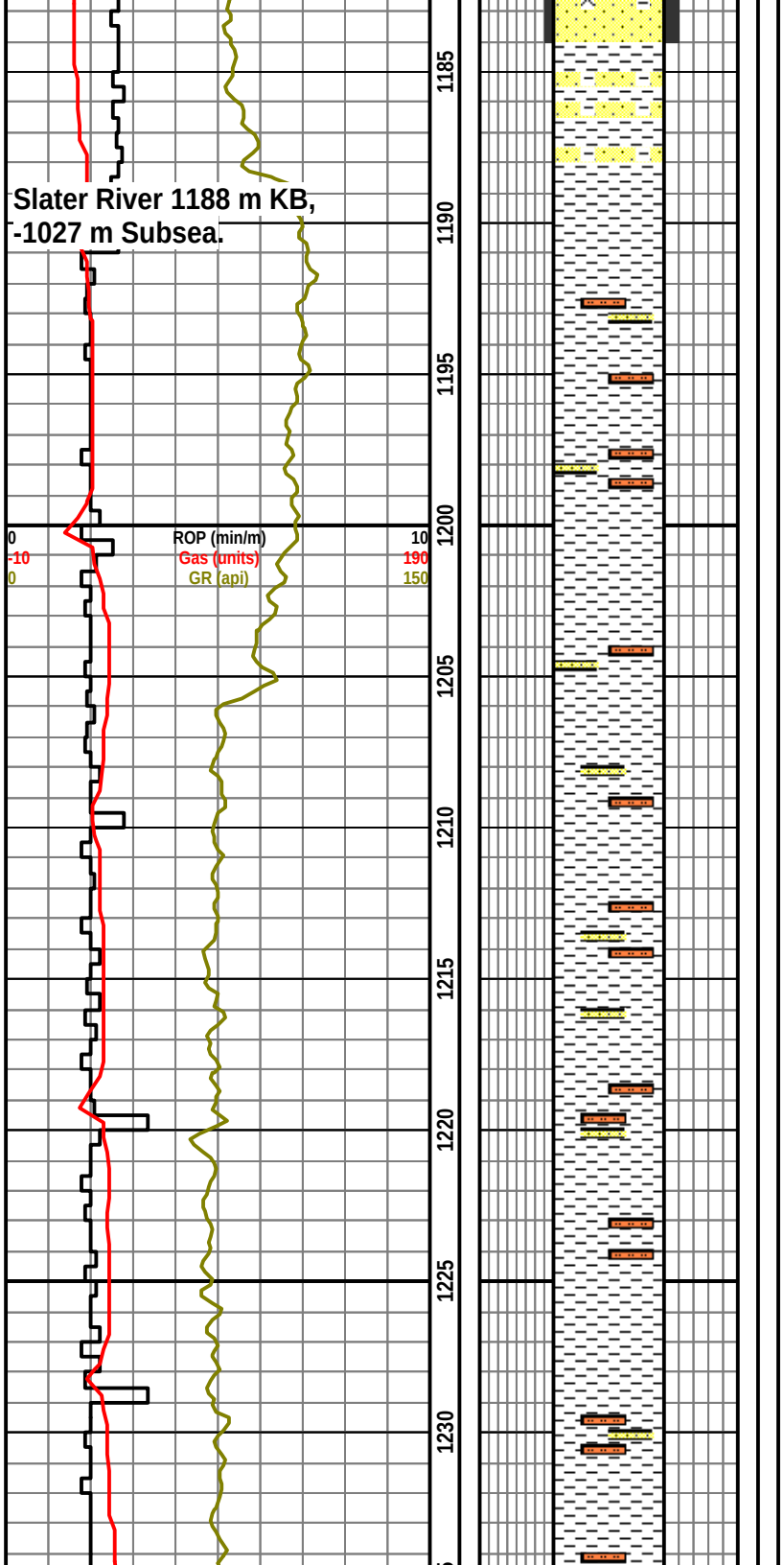
1150-1160 60% SLST.. med gy, blky, mod cons, qtz, mnr lith, sil cmt, arg to v arg, tr to 3% por. 30% Mudstone.. med gy, blky, firm, silty. 10% SS.. s&p, vf to f gr, sa to srd, mod srtd, qtz, mnr lith, tr carb incl, mod cons, fri, sil cmt, clay to silt mtx, 5-8% por.

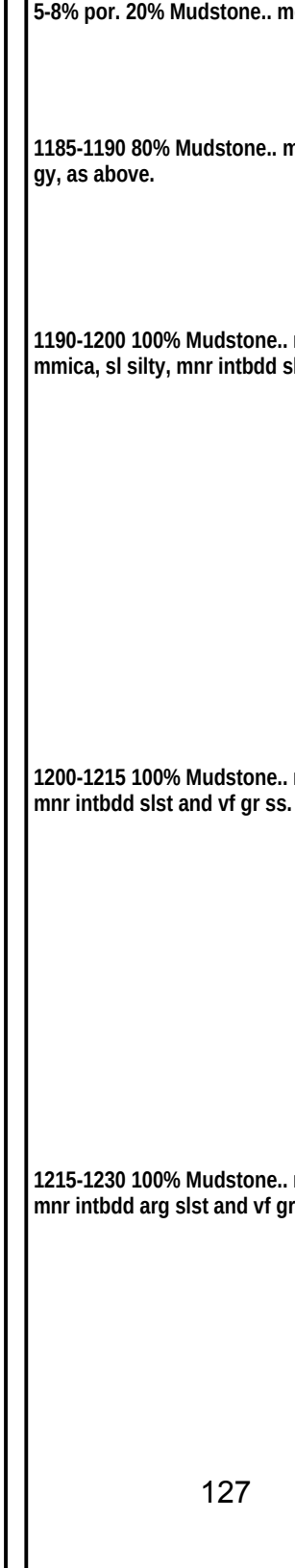
1160-1170 80% SS.. s&p, f to c gr, p to mod srtd, sa to srd, qtz, com cht, mnr lith, mod cons, sil cmt, sl calc, clay mtx, tr intstl py, tr spty gold colour in f grs and sil cmt, 8-14% por, no flor. 20% Mudstone as above.

1170-1175 90% SS.. s&p, pred f to med gr, c gr in pt, occ v c gr, tr cht pbl frags, sa to srd, p to mod srtd, qtz, com cht, mnr lith, mod cons, fri, sil cmt, clay mtx, non calc to v sl calc, tr intstl py, 6-12% por. 10% Mudstone.. med gy, blky, firm, silty, mnr tan sid nod ?.

1175-1180 80% SS.. s&p, pred f gr, vf mtx, mnr med grs, sa to srd, mod srtd, qtz, com cht, mnr lith, mod con, sil cmt, non calc, clay to silt mtx, tr intstl py, some more arg ss beds, 6-12% por. 20% Mudstone.. med gy, blky, firm, silty, mnr tan brit sid nod ?.

1180-1185 80% SS.. lt gy, s&p, vf to f gr, sa to srd, mod srtd, qtz, mnr to com cht, mnr lith, mod cons, sil cmt, clay to silt mtx, arg to v arg,





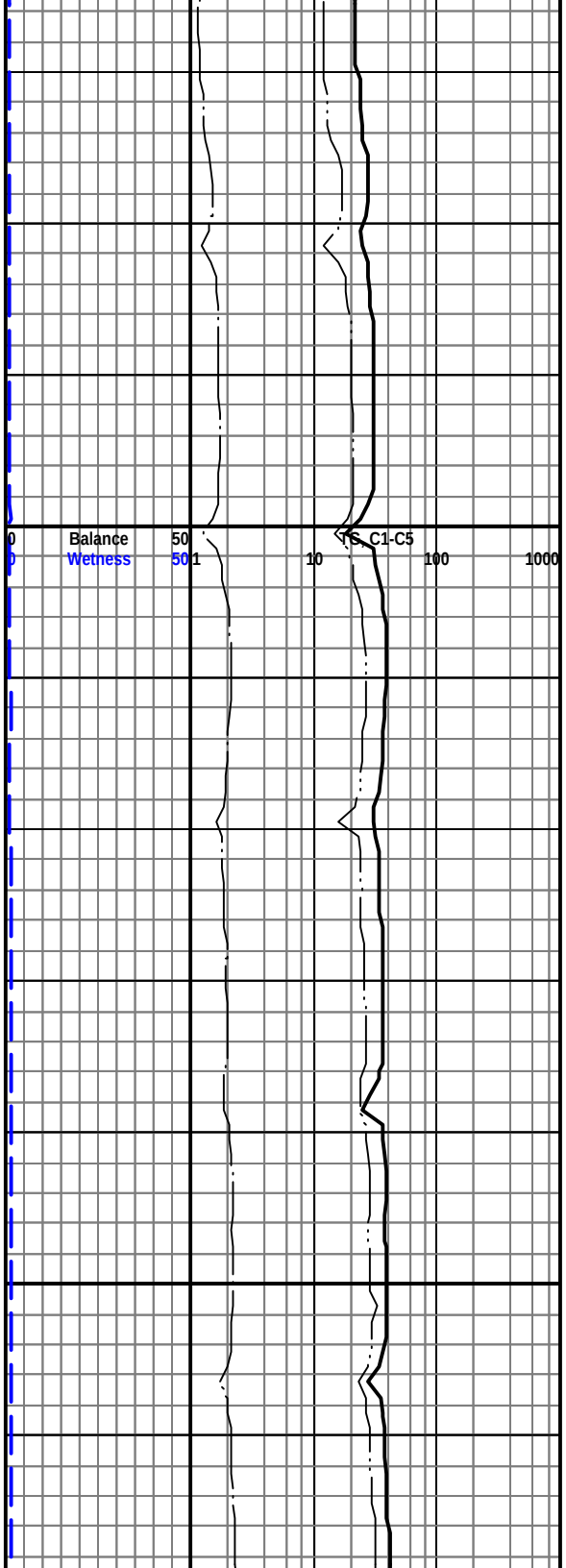
5-8% por. 20% Mudstone.. med gy, blky, firm, silty in p

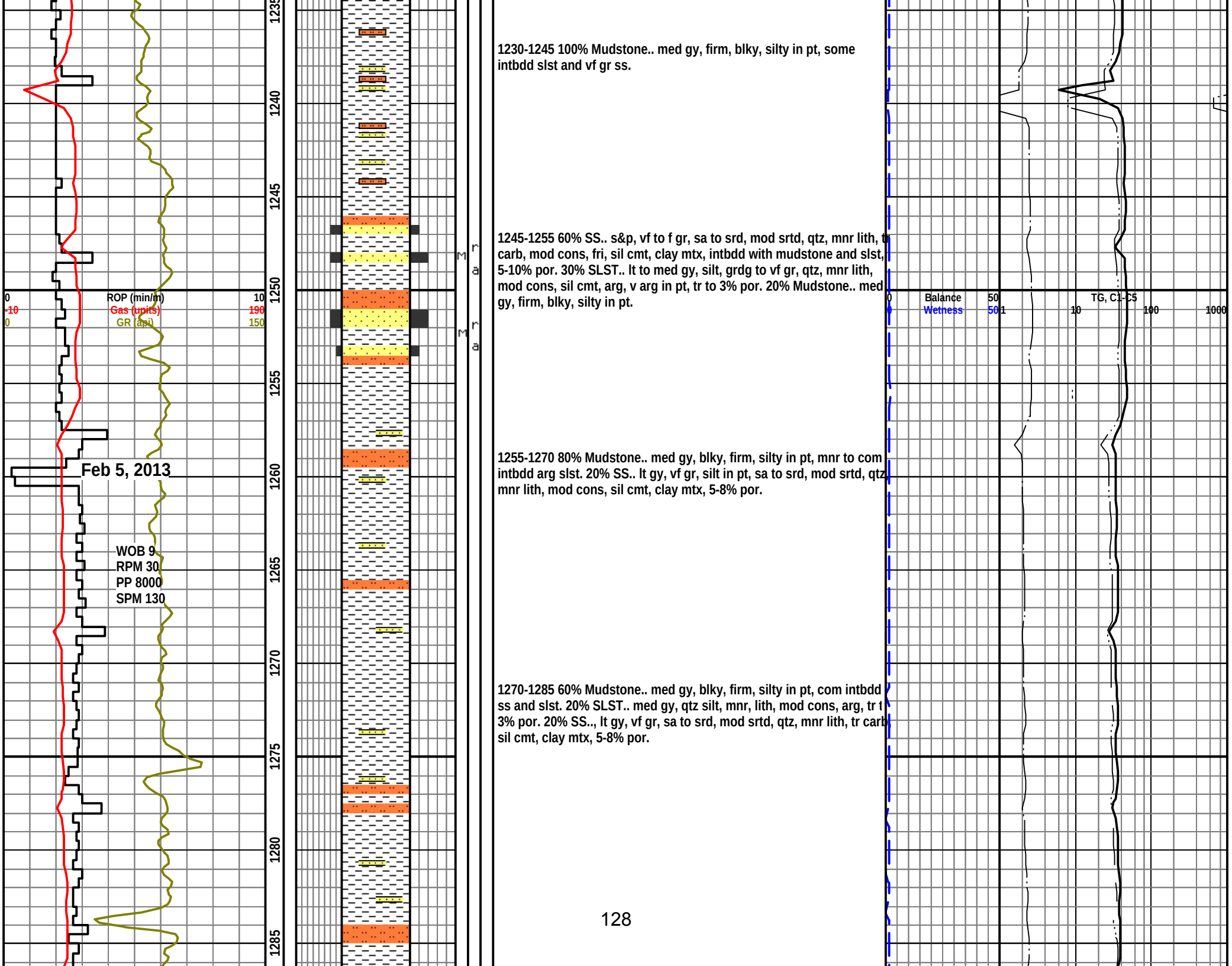
1185-1190 80% Mudstone.. med gy, blky, firm, silty in pt. 20% SS.. lt gy, as above.

1190-1200 100% Mudstone.. med gy, grdg to dk gy, firm, blky, sl mmica, sl silty, mnr intbdd slst lenses, occ ss lens.

1200-1215 100% Mudstone.. med gy, blky, firm, sl mmica, silty in pt, mnr intbdd slst and vf gr ss.

1215-1230 100% Mudstone.. med gy, blky, firm, silty in pt, sl mmica, mnr intbdd arg slst and vf gr ss, tr nod py.



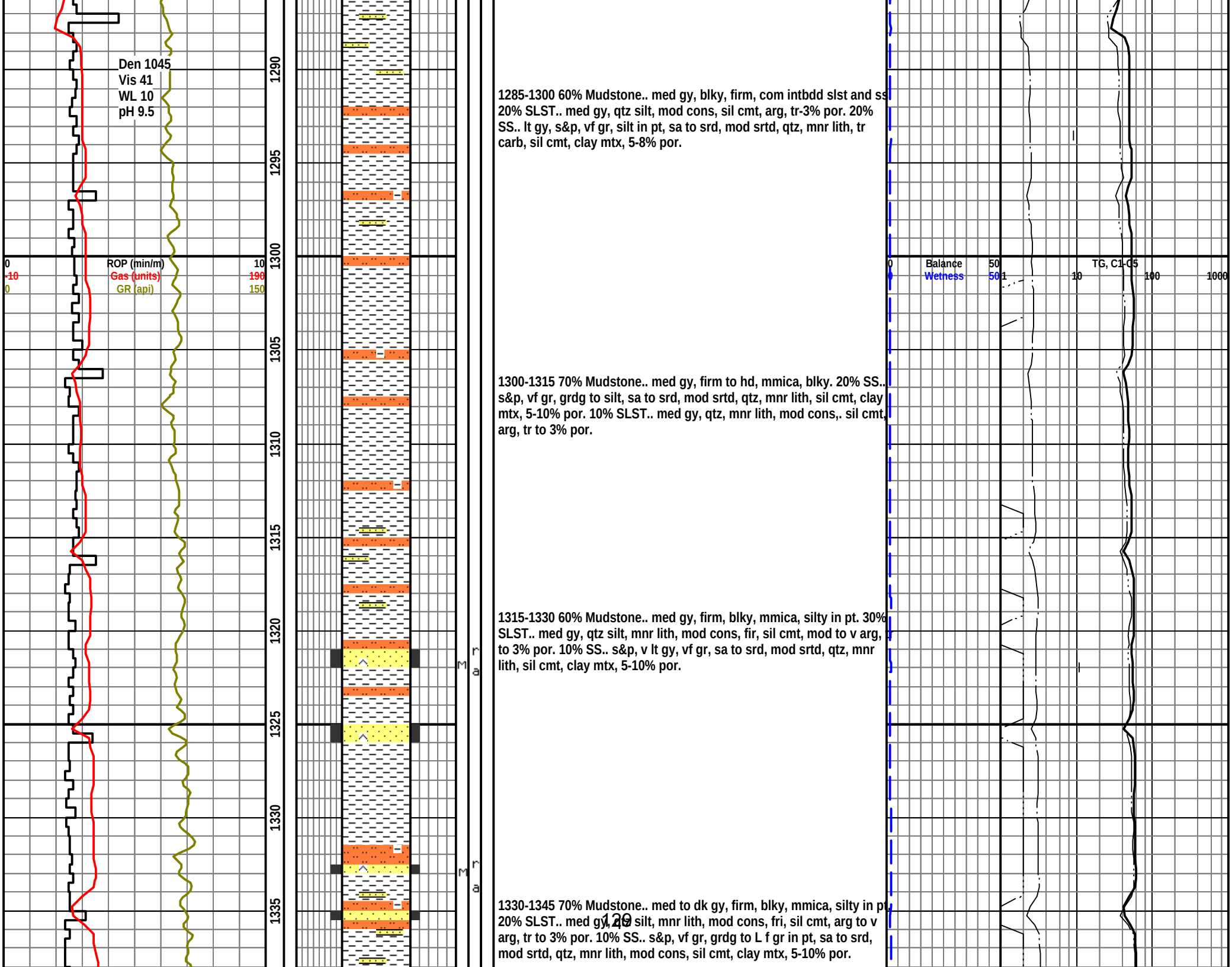


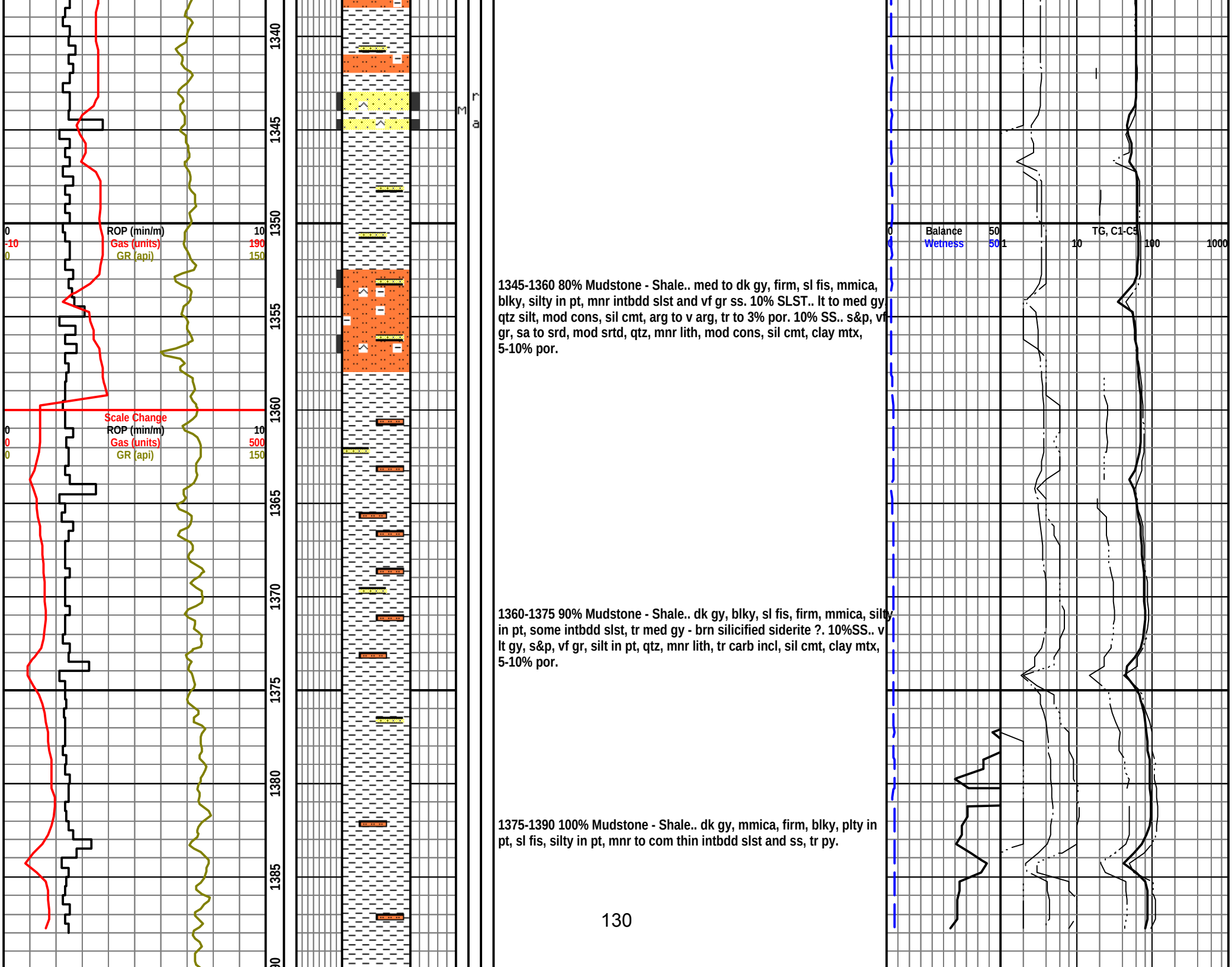
1230-1245 100% Mudstone.. med gy, firm, blky, silty in pt, some intbdd slst and vf gr ss.

1245-1255 60% SS.. s&p, vf to f gr, sa to srd, mod srtd, qtz, mnr lith, tr carb, mod cons, fri, sil cmt, clay mtx, intbdd with mudstone and slst, 5-10% por. 30% SLST.. lt to med gy, silt, grdg to vf gr, qtz, mnr lith, mod cons, sil cmt, arg, v arg in pt, tr to 3% por. 20% Mudstone.. med gy, firm, blky, silty in pt.

1255-1270 80% Mudstone.. med gy, blky, firm, silty in pt, mnr to com intbdd arg slst. 20% SS.. lt gy, vf gr, silt in pt, sa to srd, mod srtd, qtz, mnr lith, mod cons, sil cmt, clay mtx, 5-8% por.

1270-1285 60% Mudstone.. med gy, blky, firm, silty in pt, com intbdd ss and slst. 20% SLST.. med gy, qtz silt, mnr, lith, mod cons, arg, tr t 3% por. 20% SS.., lt gy, vf gr, sa to srd, mod srtd, qtz, mnr lith, tr carb, sil cmt, clay mtx, 5-8% por.

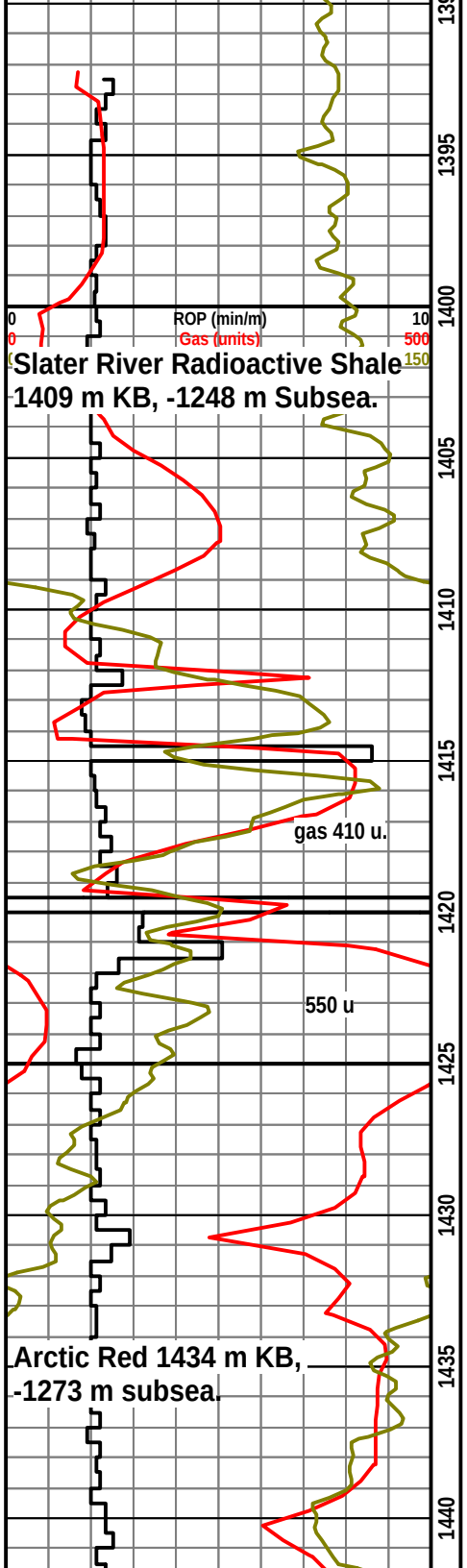

Den 1045
Vis 41
WL 10
pH 9.5
1290
1295
1300
1305
1310
1315
1320
1325
1330
1335
0
ROP (min/m)
10
-10
Gas (units)
190
0
GR (api)
150
Mar
Mar
0
Balance
50
0
Wetness
50
1
10
100
1000
TG, C1-C5
1285-1300 60% Mudstone.. med gy, blky, firm, com intbdd slst and ss 20% SLST.. med gy, qtz silt, mod cons, sil cmt, arg, tr-3% por. 20% SS.. lt gy, s&p, vf gr, silt in pt, sa to srd, mod srtd, qtz, mnr lith, tr carb, sil cmt, clay mtx, 5-8% por.
1300-1315 70% Mudstone.. med gy, firm to hd, mmica, blky. 20% SS.. s&p, vf gr, grdg to silt, sa to srd, mod srtd, qtz, mnr lith, sil cmt, clay mtx, 5-10% por. 10% SLST.. med gy, qtz, mnr lith, mod cons,. sil cmt, arg, tr to 3% por.
1315-1330 60% Mudstone.. med gy, firm, blky, mmica, silty in pt. 30% SLST.. med gy, qtz silt, mnr lith, mod cons, fir, sil cmt, mod to v arg, tr to 3% por. 10% SS.. s&p, v lt gy, vf gr, sa to srd, mod srtd, qtz, mnr lith, sil cmt, clay mtx, 5-10% por.
1330-1345 70% Mudstone.. med to dk gy, firm, blky, mmica, silty in pt. 20% SLST.. med gy, qtz silt, mnr lith, mod cons, fri, sil cmt, arg to v arg, tr to 3% por. 10% SS.. s&p, vf gr, grdg to L f gr in pt, sa to srd, mod srtd, qtz, mnr lith, mod cons, sil cmt, clay mtx, 5-10% por.

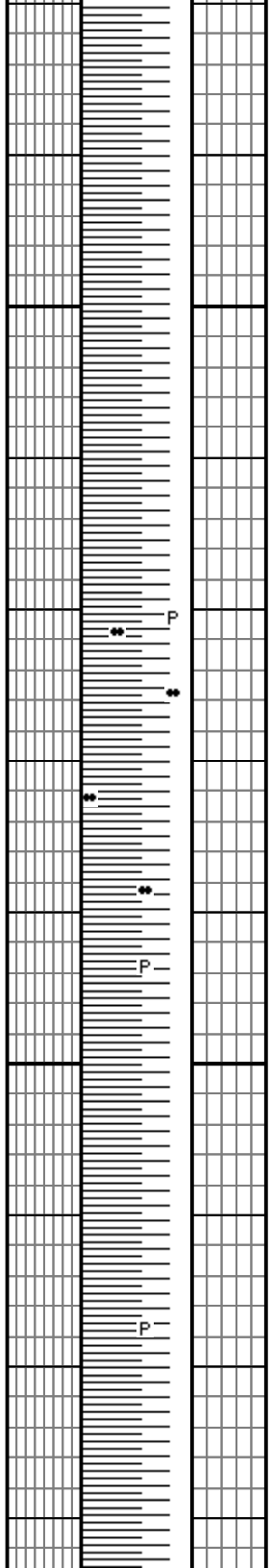


1345-1360 80% Mudstone - Shale.. med to dk gy, firm, sl fis, mmica, blky, silty in pt, mnr intbdd slst and vf gr ss. 10% SLST.. lt to med gy qtz silt, mod cons, sil cmt, arg to v arg, tr to 3% por. 10% SS.. s&p, vf gr, sa to srd, mod srtd, qtz, mnr lith, mod cons, sil cmt, clay mtx, 5-10% por.

1360-1375 90% Mudstone - Shale.. dk gy, blky, sl fis, firm, mmica, silty in pt, some intbdd slst, tr med gy - brn silicified siderite ?. 10%SS.. v lt gy, s&p, vf gr, silt in pt, qtz, mnr lith, tr carb incl, sil cmt, clay mtx, 5-10% por.

1375-1390 100% Mudstone - Shale.. dk gy, mmica, firm, blky, plty in pt, sl fis, silty in pt, mnr to com thin intbdd slst and ss, tr py.





1390-1400 100% SH.. dk gy, mmica, sl fis, plty, firm, mnr intbdd slst and ss, mnr gy-brn brittle sid ?.

1400-1405 100% SH.. dk to v dk gy, hd, sl brittle, plty, sl fis, mmica, tr py mod, rr ss, 3-5% tan to lt gy-brn silicified siderite ?, pos silicified sh.

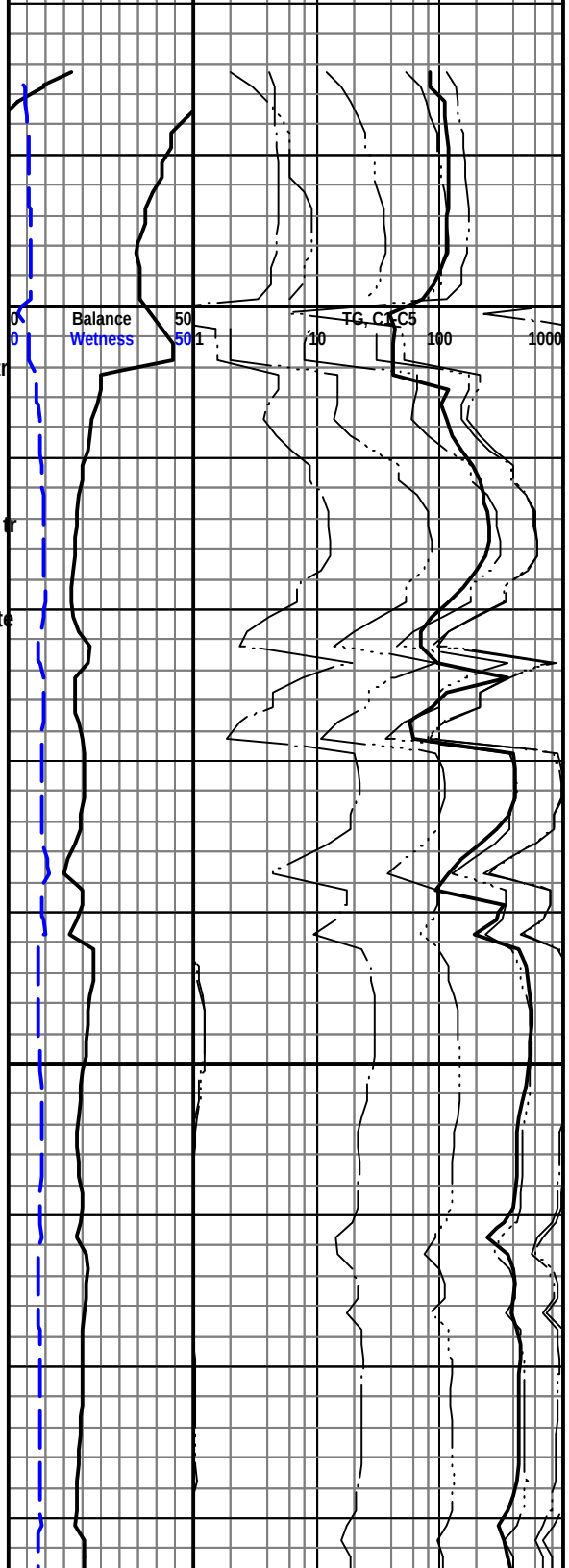
1405-1410 SH.. dk to v dk gy, mmica, plty, sl fis, hd, sl brittle, tr slst, tr scat py cubes, 5% gy-brn hd brittle, silicified, sid ?

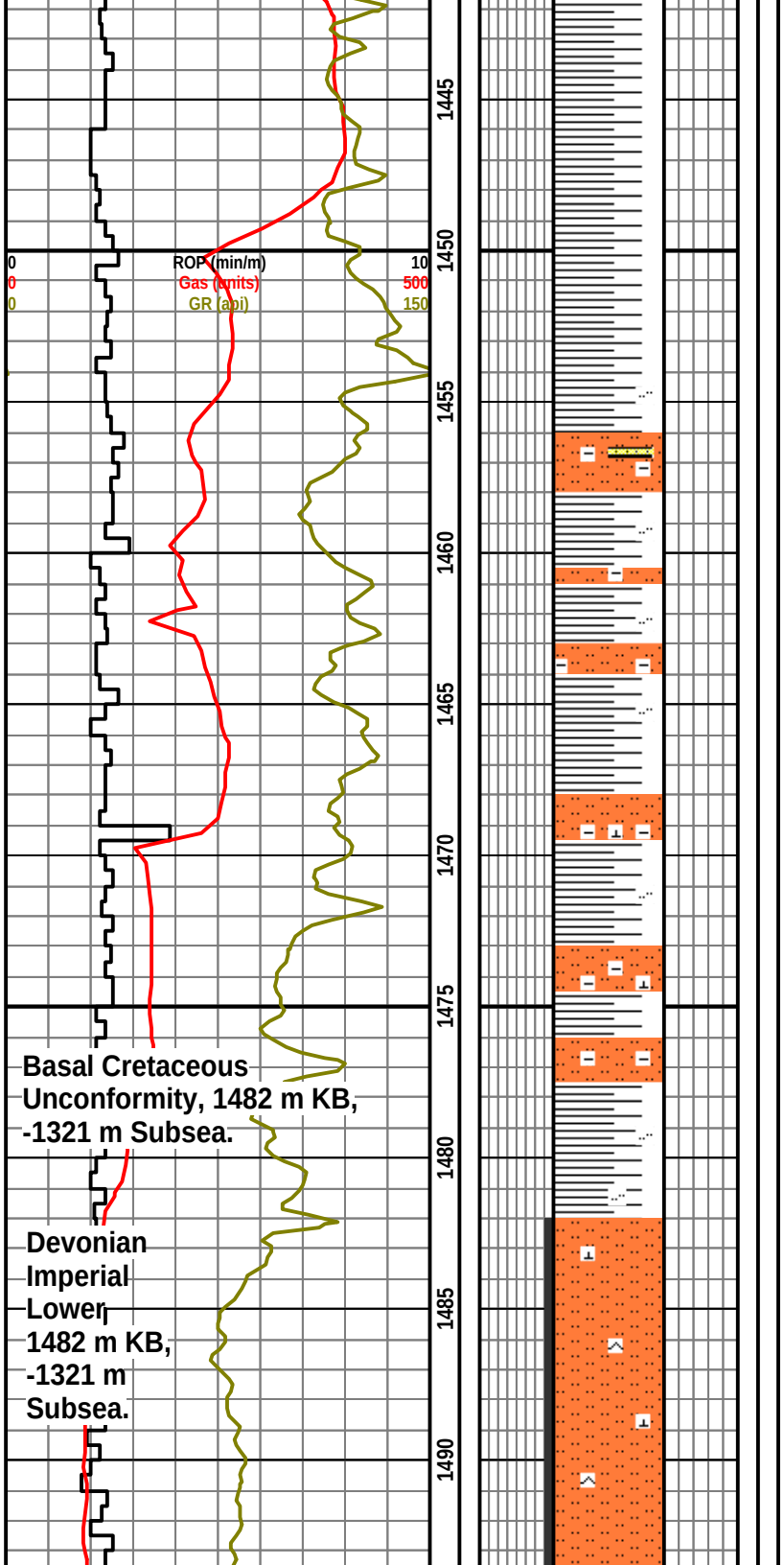
1410-1415 SH.. dk to v dk gy, hd, brittle, plty, sub fis, tr wh phosphate specs, tr py, tr to 2% hd brittles sid ?. 5% Clay.. buff, v lt gy, silty in pt, sandy in pt, local vf py xls, pos phosphatic.

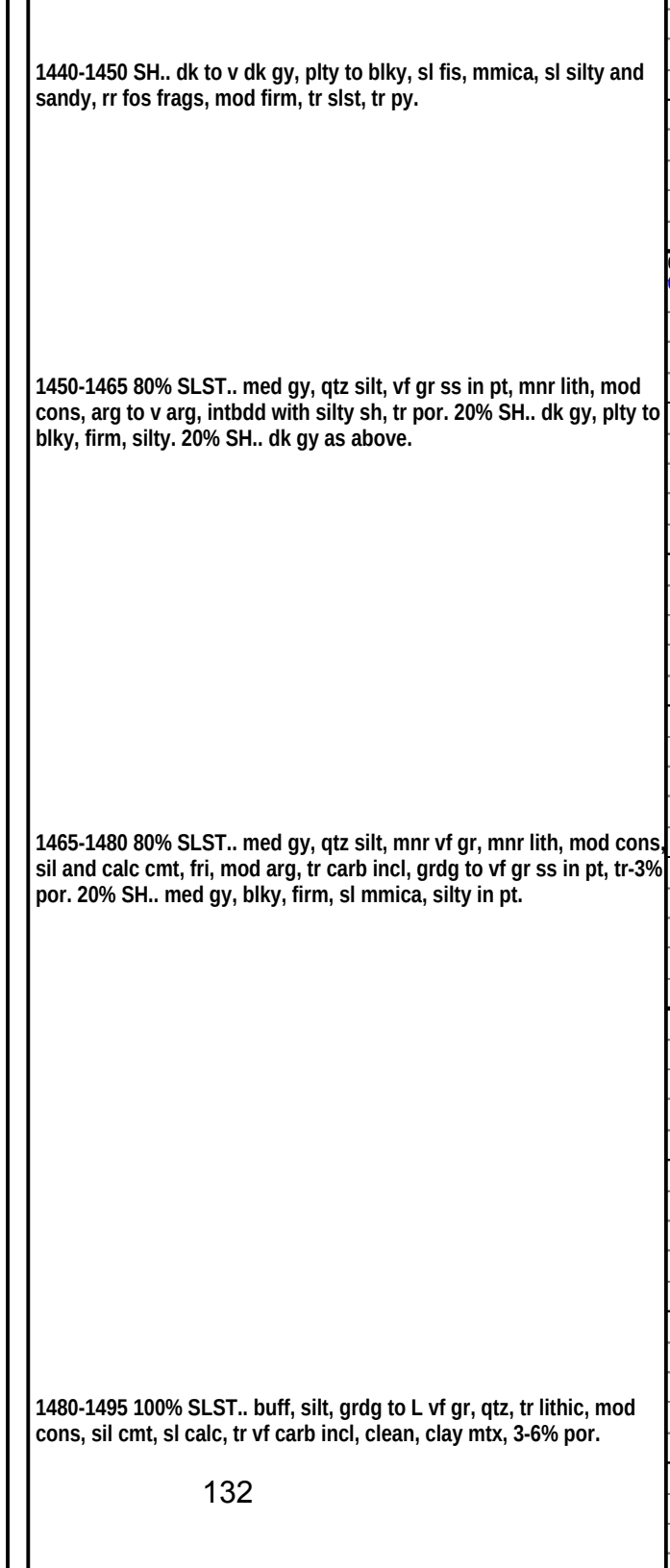
1415-1420 SH.. dk to v dk gy, plty, firm to hd, sl fis, mmica, mnr scat wh phosphatic specs, tr nod py, tr to mnr buff to gy-blue clay, pos phosphatic, rr c calcite xls.

1420-1430 SH.. dk to v dk gy, plty, firm to hd, mmica, mnr scat wh phosphatic specs, tr py seams, tr ss, rr fos frags.

1430-1440 SH.. dk gy, plty, firm to hd, mmica, v tr wh phosphatic specs, tr micro lenses of slst, rr blue-gy clay, rr sid nodule, tr py.





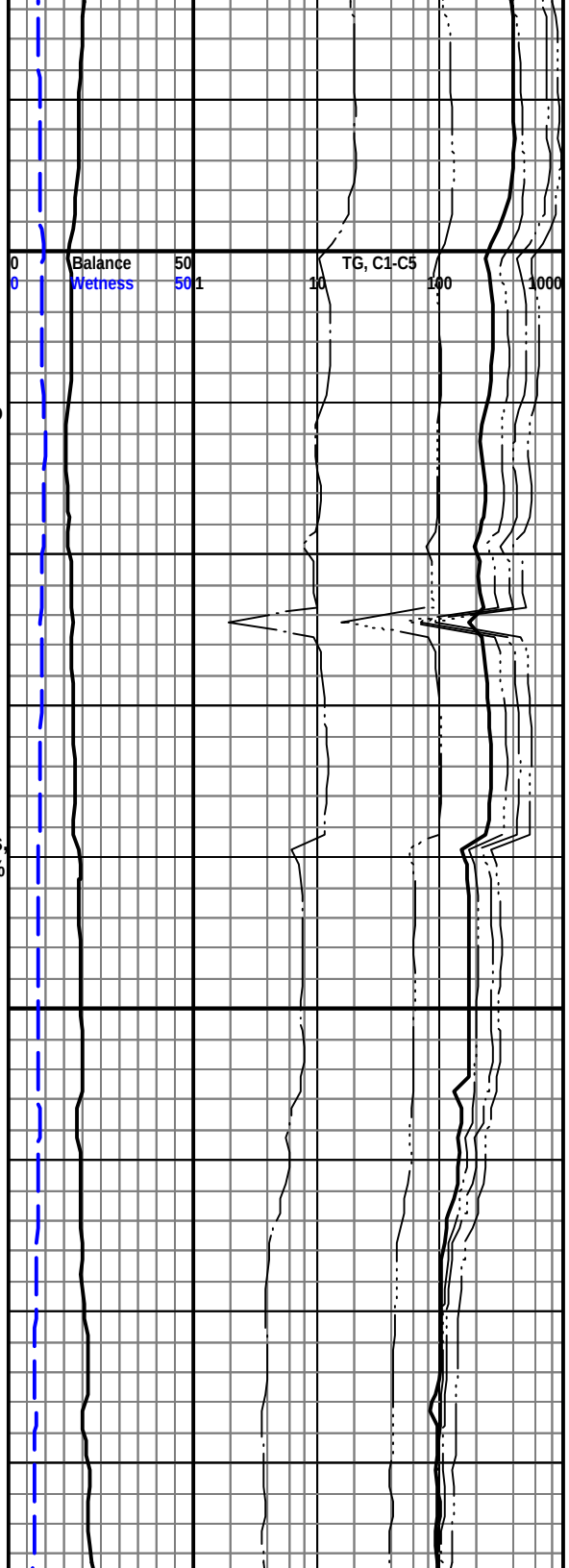


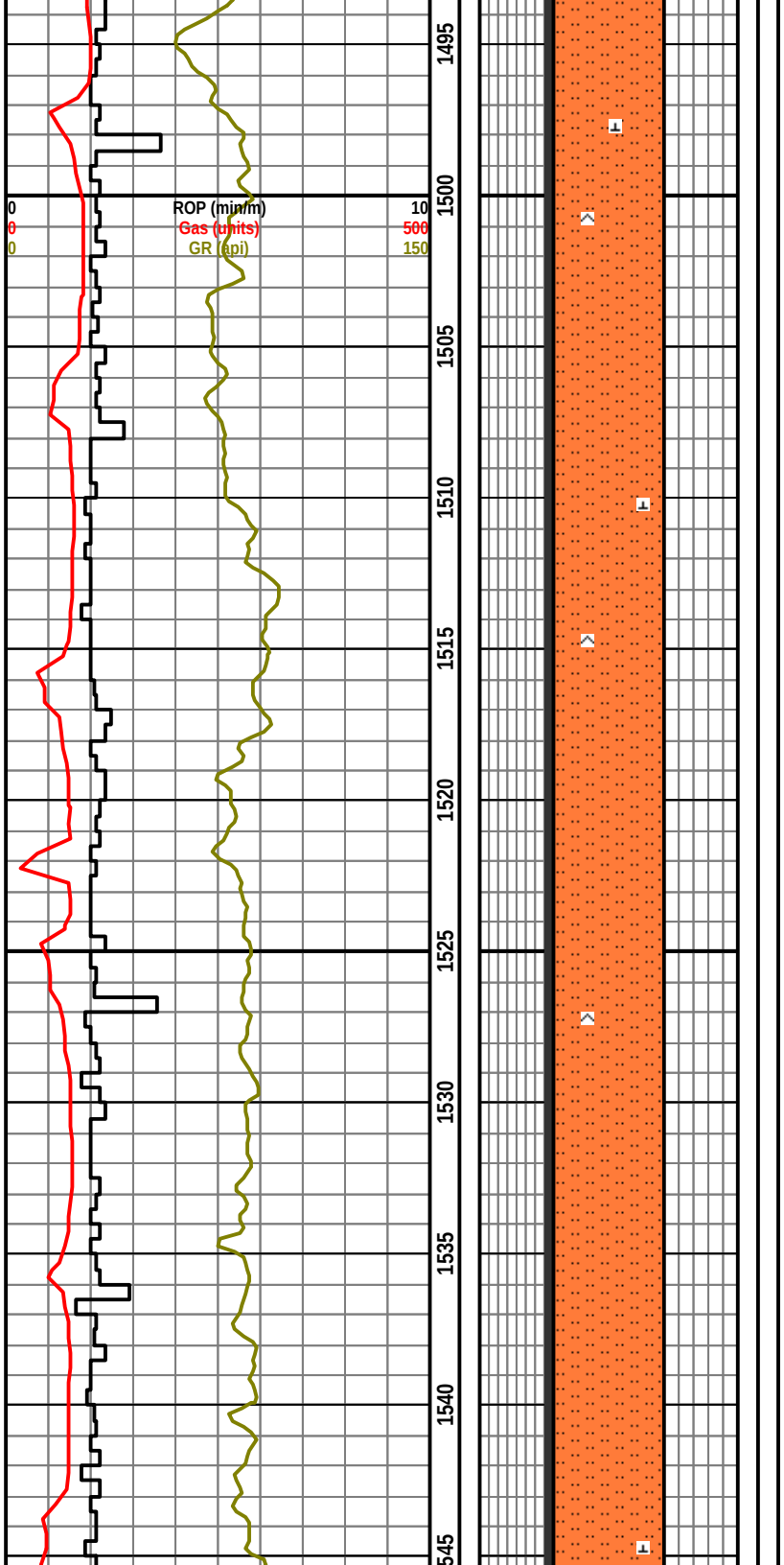
1440-1450 SH.. dk to v dk gy, plty to blky, sl fis, mmica, sl silty and sandy, rr fos frags, mod firm, tr slst, tr py.

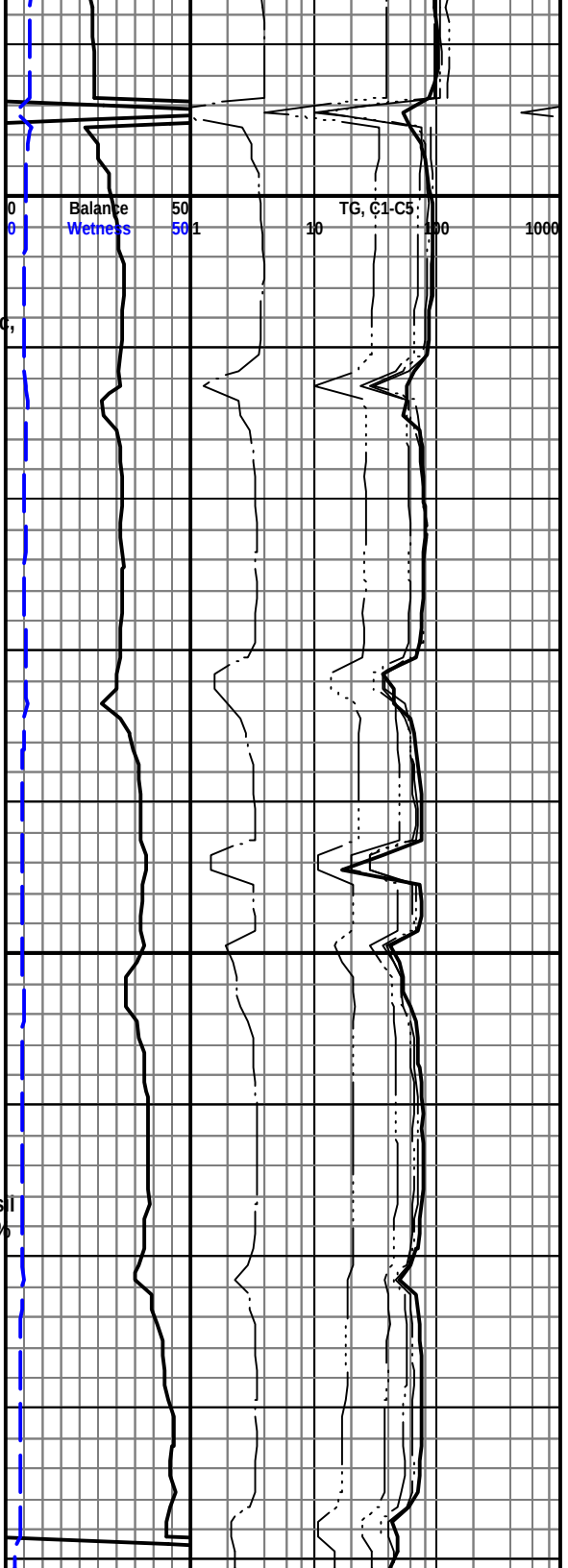
1450-1465 80% SLST.. med gy, qtz silt, vf gr ss in pt, mnr lith, mod cons, arg to v arg, intbdd with silty sh, tr por. 20% SH.. dk gy, plty to blky, firm, silty. 20% SH.. dk gy as above.

1465-1480 80% SLST.. med gy, qtz silt, mnr vf gr, mnr lith, mod cons, sil and calc cmt, fri, mod arg, tr carb incl, grdg to vf gr ss in pt, tr-3% por. 20% SH.. med gy, blky, firm, sl mmica, silty in pt.

1480-1495 100% SLST.. buff, silt, grdg to L vf gr, qtz, tr lithic, mod cons, sil cmt, sl calc, tr vf carb incl, clean, clay mtx, 3-6% por.



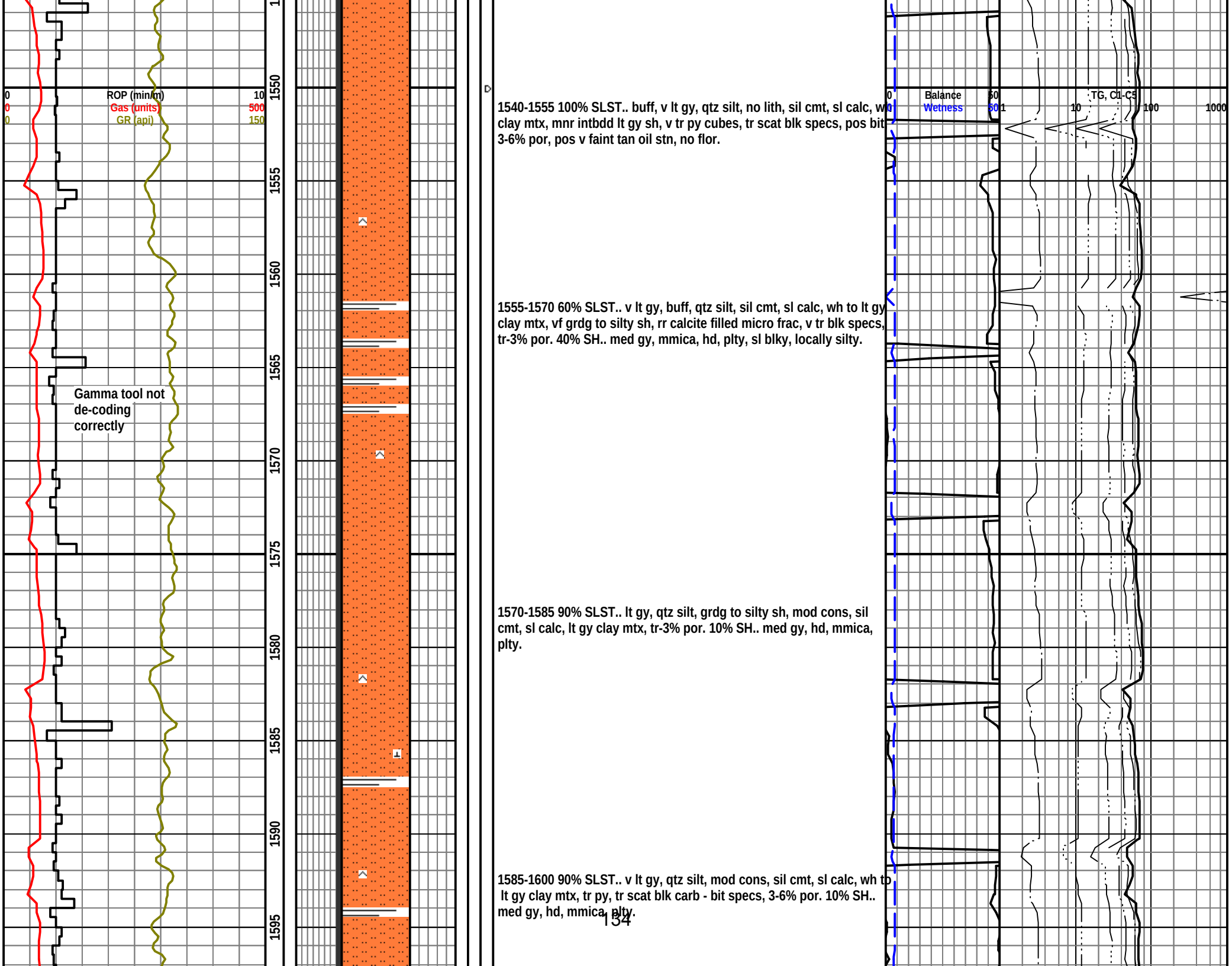




1495-1510 100% SLST.. buff, silt, qtz, tr lith, mod cons, sil cmt, sl calc, wh clay mtx, mnr lt gy firm shale beds, v tr py, 3-6% por.

1510-1525 100% SLST.. buff, v lt gy, qtz silt, v tr lithic, mod cons, sil cmt, sl calc, wh clay mtx, mnr intbdd lt gy sh, tr local py cubes, v tr blk carb ? specs, pos bit, 3-6% por.

1525-1540 100% SLST.. v lt gy to lt gy, qtz silt, tr vf carb / bit specs, sil cmt, mod cons, sl calc, wh clay mtx, mnr intbdd lt to med gy sh, 2-5% por.

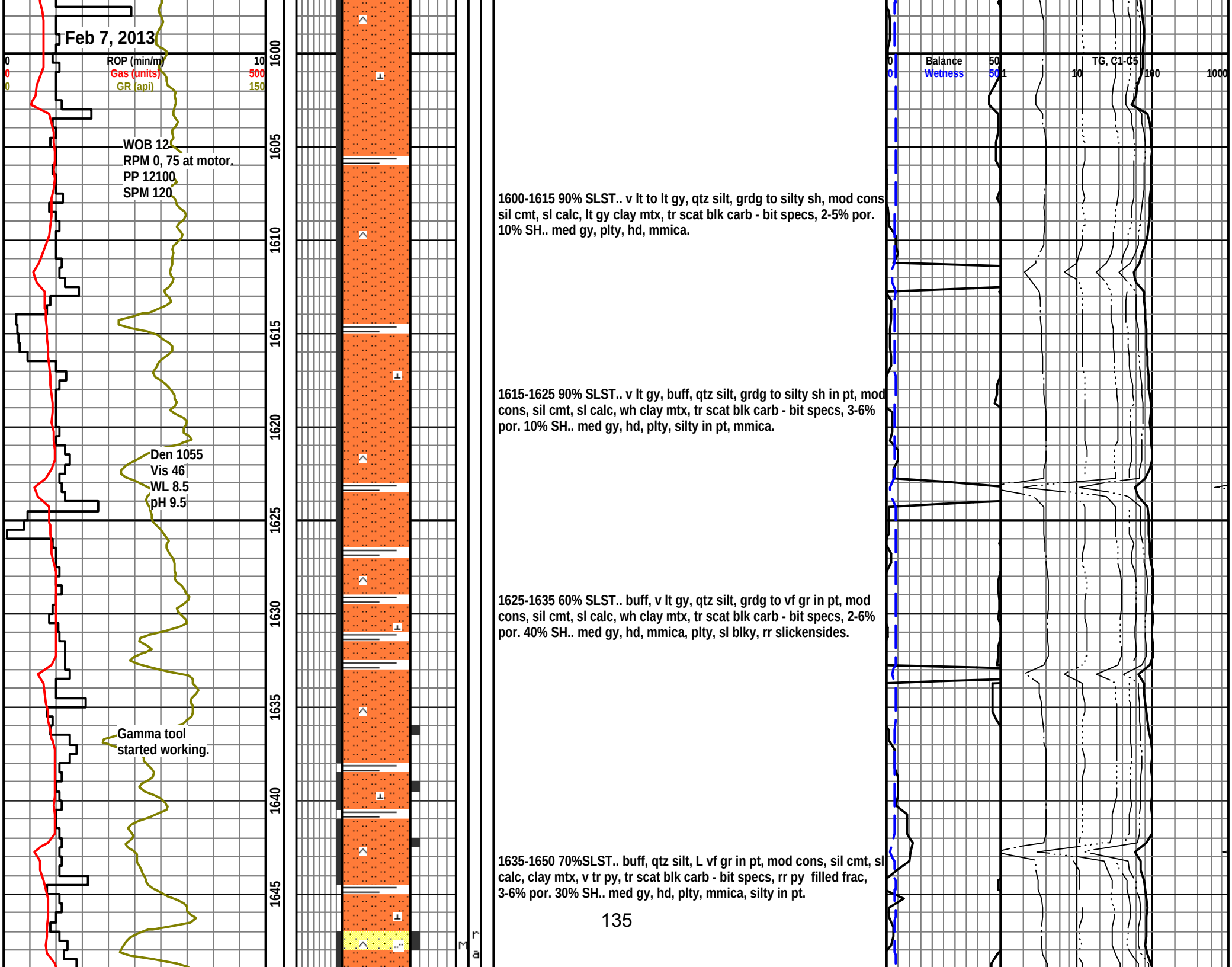


1540-1555 100% SLST.. buff, v lt gy, qtz silt, no lith, sil cmt, sl calc, wh clay mtx, mnr intbdd lt gy sh, v tr py cubes, tr scat blk specs, pos bit 3-6% por, pos v faint tan oil stn, no flor.

1555-1570 60% SLST.. v lt gy, buff, qtz silt, sil cmt, sl calc, wh to lt gy clay mtx, vf grdg to silty sh, rr calcite filled micro frac, v tr blk specs, tr-3% por. 40% SH.. med gy, mmica, hd, plty, sl blky, locally silty.

1570-1585 90% SLST.. lt gy, qtz silt, grdg to silty sh, mod cons, sil cmt, sl calc, lt gy clay mtx, tr-3% por. 10% SH.. med gy, hd, mmica, plty.

1585-1600 90% SLST.. v lt gy, qtz silt, mod cons, sil cmt, sl calc, wh to lt gy clay mtx, tr py, tr scat blk carb - bit specs, 3-6% por. 10% SH.. med gy, hd, mmica, plty.

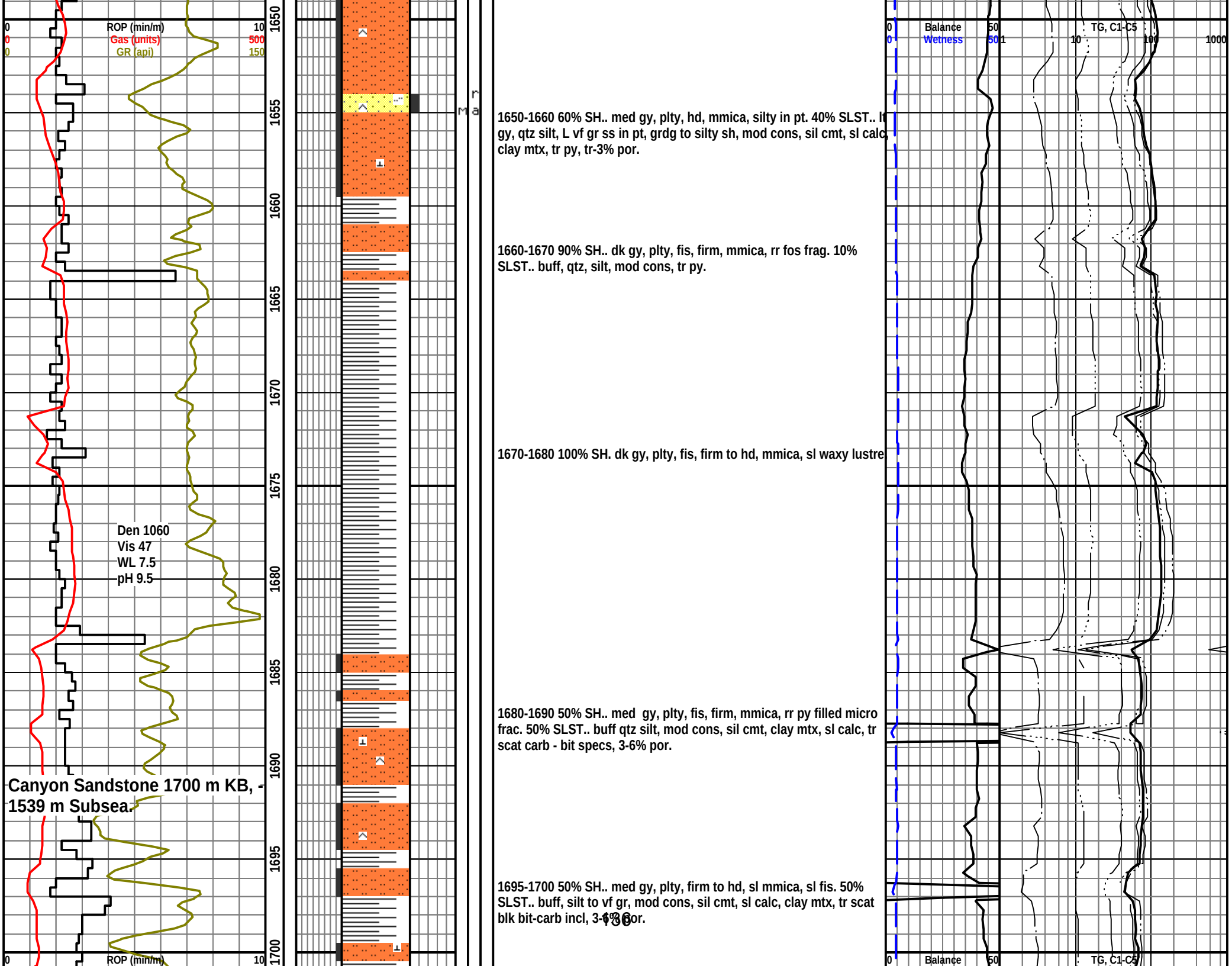


1600-1615 90% SLST.. v lt to lt gy, qtz silt, grdg to silty sh, mod cons sil cmt, sl calc, lt gy clay mtx, tr scat blk carb - bit specs, 2-5% por. 10% SH.. med gy, plty, hd, mmica.

1615-1625 90% SLST.. v lt gy, buff, qtz silt, grdg to silty sh in pt, mod cons, sil cmt, sl calc, wh clay mtx, tr scat blk carb - bit specs, 3-6% por. 10% SH.. med gy, hd, plty, silty in pt, mmica.

1625-1635 60% SLST.. buff, v lt gy, qtz silt, grdg to vf gr in pt, mod cons, sil cmt, sl calc, wh clay mtx, tr scat blk carb - bit specs, 2-6% por. 40% SH.. med gy, hd, mmica, plty, sl blky, rr slickensides.

1635-1650 70%SLST.. buff, qtz silt, L vf gr in pt, mod cons, sil cmt, sl calc, clay mtx, v tr py, tr scat blk carb - bit specs, rr py filled frac, 3-6% por. 30% SH.. med gy, hd, plty, mmica, silty in pt.



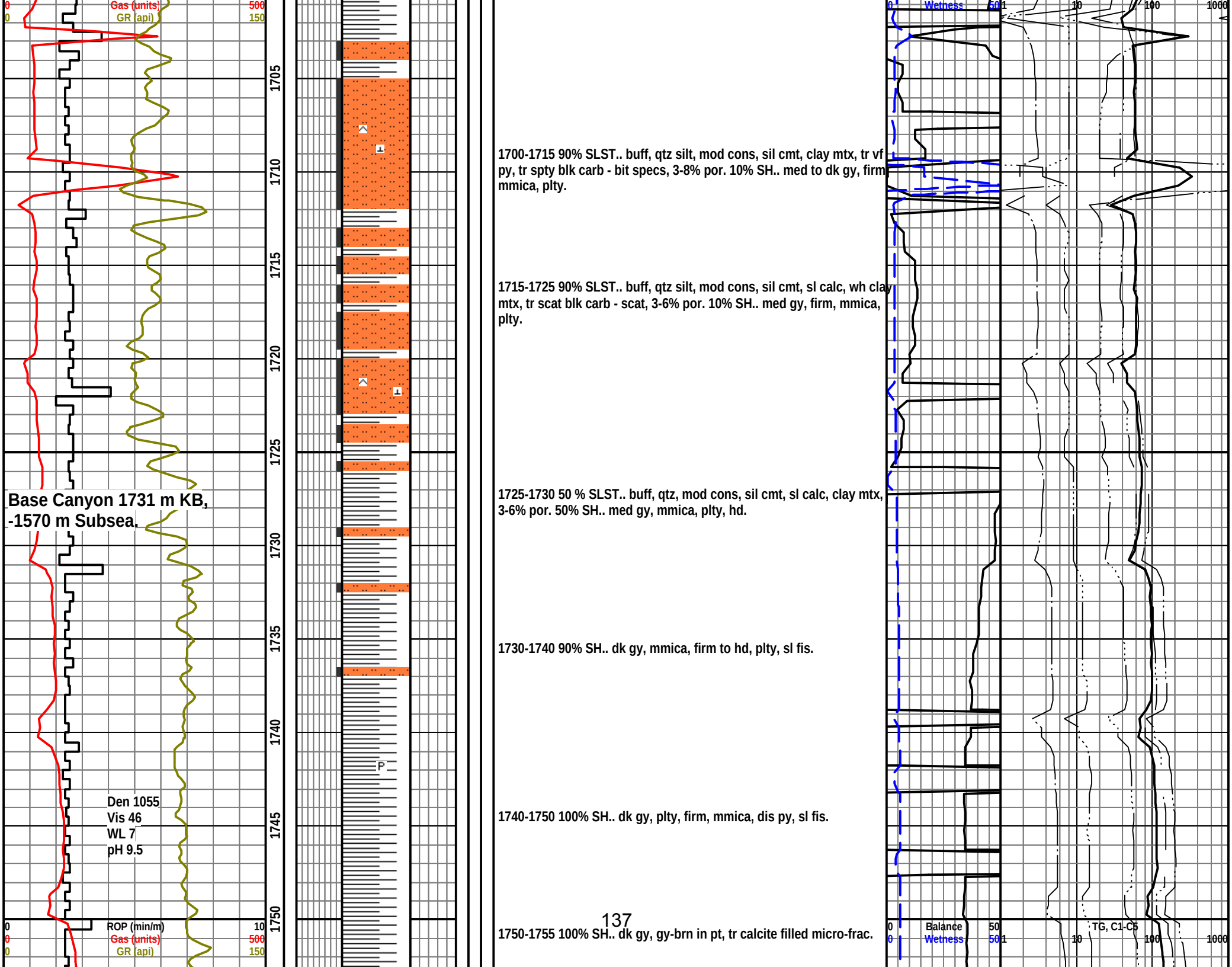
1650-1660 60% SH.. med gy, plty, hd, mmica, silty in pt. 40% SLST.. lt gy, qtz silt, L vf gr ss in pt, grdg to silty sh, mod cons, sil cmt, sl calc, clay mtx, tr py, tr-3% por.

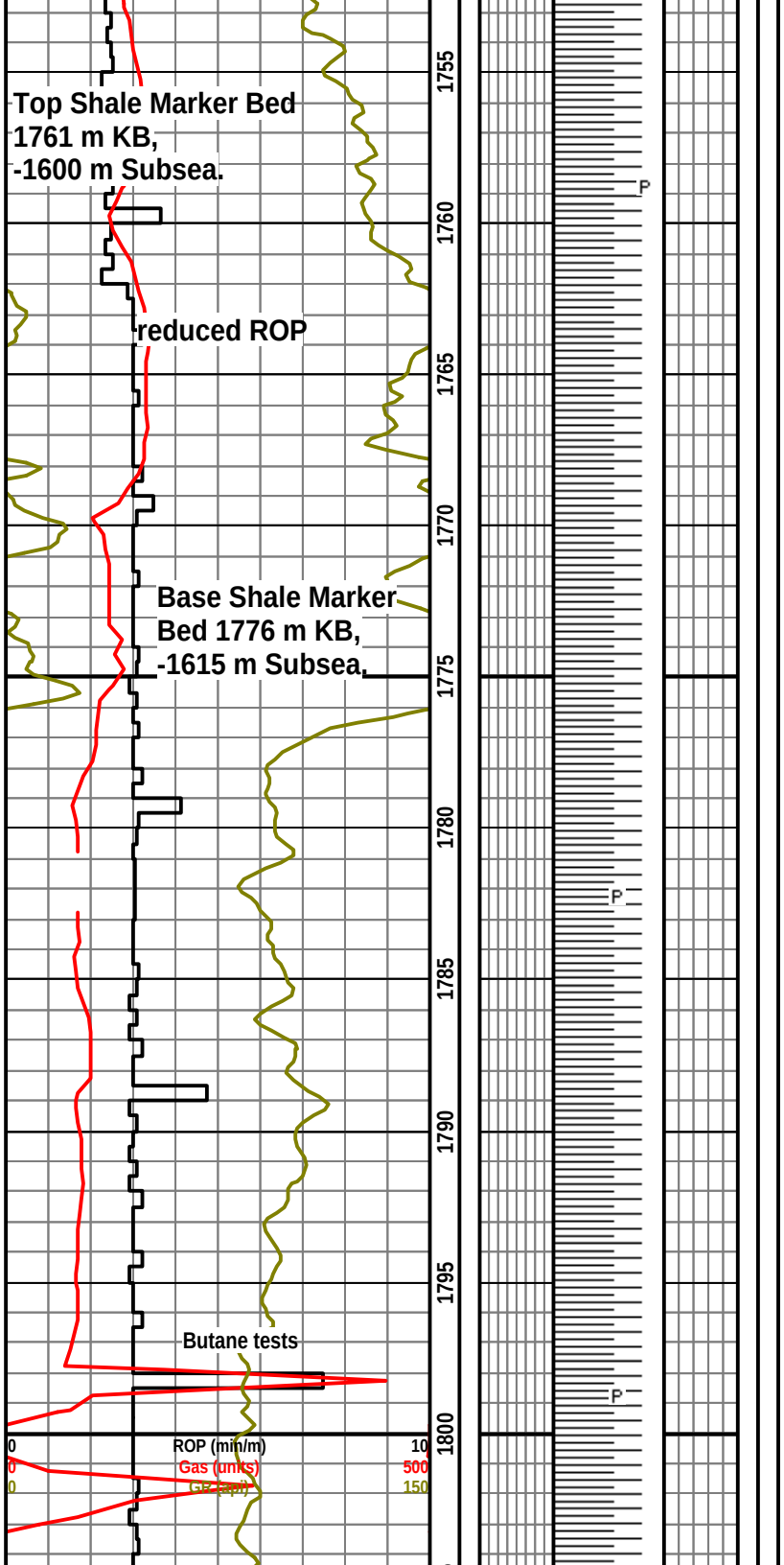
1660-1670 90% SH.. dk gy, plty, fis, firm, mmica, rr fos frag. 10% SLST.. buff, qtz, silt, mod cons, tr py.

1670-1680 100% SH. dk gy, plty, fis, firm to hd, mmica, sl waxy lustre

1680-1690 50% SH.. med gy, plty, fis, firm, mmica, rr py filled micro frac. 50% SLST.. buff qtz silt, mod cons, sil cmt, clay mtx, sl calc, tr scat carb - bit specs, 3-6% por.

1695-1700 50% SH.. med gy, plty, firm to hd, sl mmica, sl fis. 50% SLST.. buff, silt to vf gr, mod cons, sil cmt, sl calc, clay mtx, tr scat blk bit-carb incl, 3-6% por.


0
Gas (units)
500
0
GR (api)
150
1705
1710
1715
1720
1725
1730
1735
1740
1745
1750
Base Canyon 1731 m KB,
-1570 m Subsea.
Den 1055
Vis 46
WL 7
pH 9.5
0
ROP (min/m)
10
0
Gas (units)
500
0
GR (api)
150
0
Wetness
50
1
10
100
1000
1700-1715 90% SLST.. buff, qtz silt, mod cons, sil cmt, clay mtx, tr vf py, tr spty blk carb - bit specs, 3-8% por. 10% SH.. med to dk gy, firm, mmica, plty.
1715-1725 90% SLST.. buff, qtz silt, mod cons, sil cmt, sl calc, wh clay mtx, tr scat blk carb - scat, 3-6% por. 10% SH.. med gy, firm, mmica, plty.
1725-1730 50 % SLST.. buff, qtz, mod cons, sil cmt, sl calc, clay mtx, 3-6% por. 50% SH.. med gy, mmica, plty, hd.
1730-1740 90% SH.. dk gy, mmica, firm to hd, plty, sl fis.
1740-1750 100% SH.. dk gy, plty, firm, mmica, dis py, sl fis.
1750-1755 100% SH.. dk gy, gy-brn in pt, tr calcite filled micro-frac.
0
Balance
50
0
Wetness
50
1
10
100
1000
TG, C1-C5



1755-1760 100% SH.. dk gy-brn, tr calcite filled micro-frac.

1760-1765 100%SH.. dk gy-brn, plty, fis, rr cc filled micro frac, firm, v tr py.

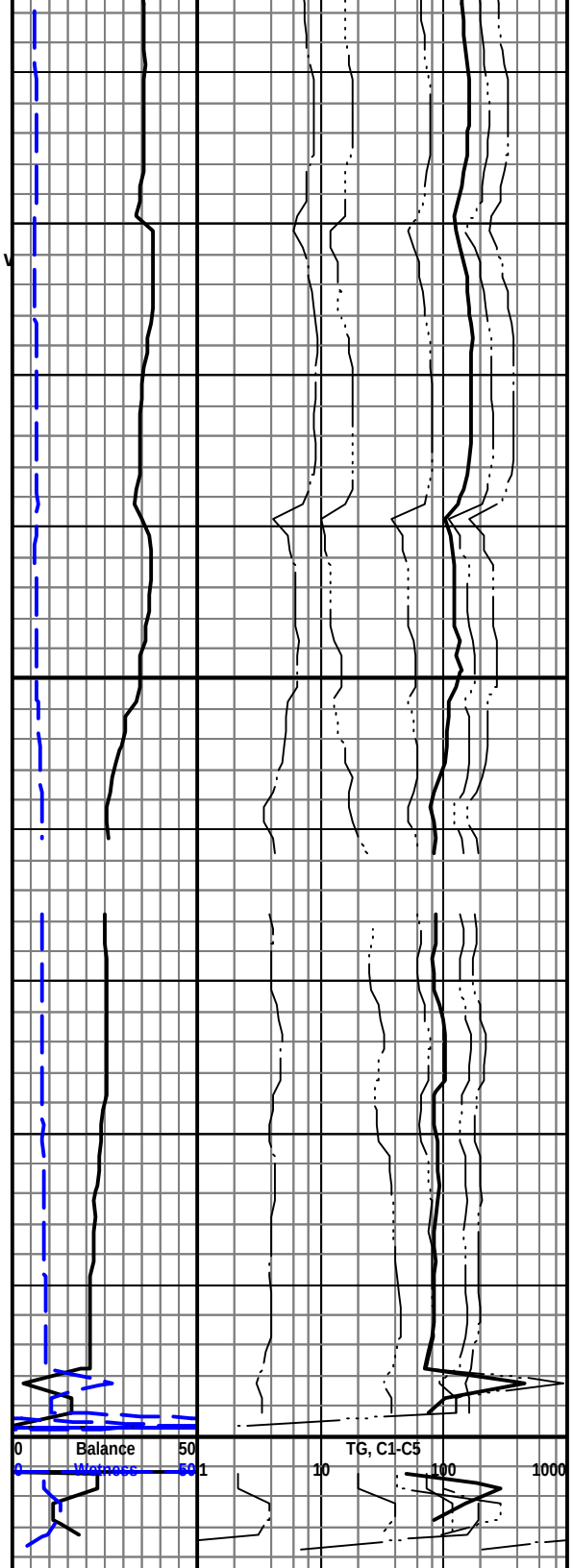
1765-1770 100% SH.. dk gy-brn, plty, firm, fis, mmica, tr py.

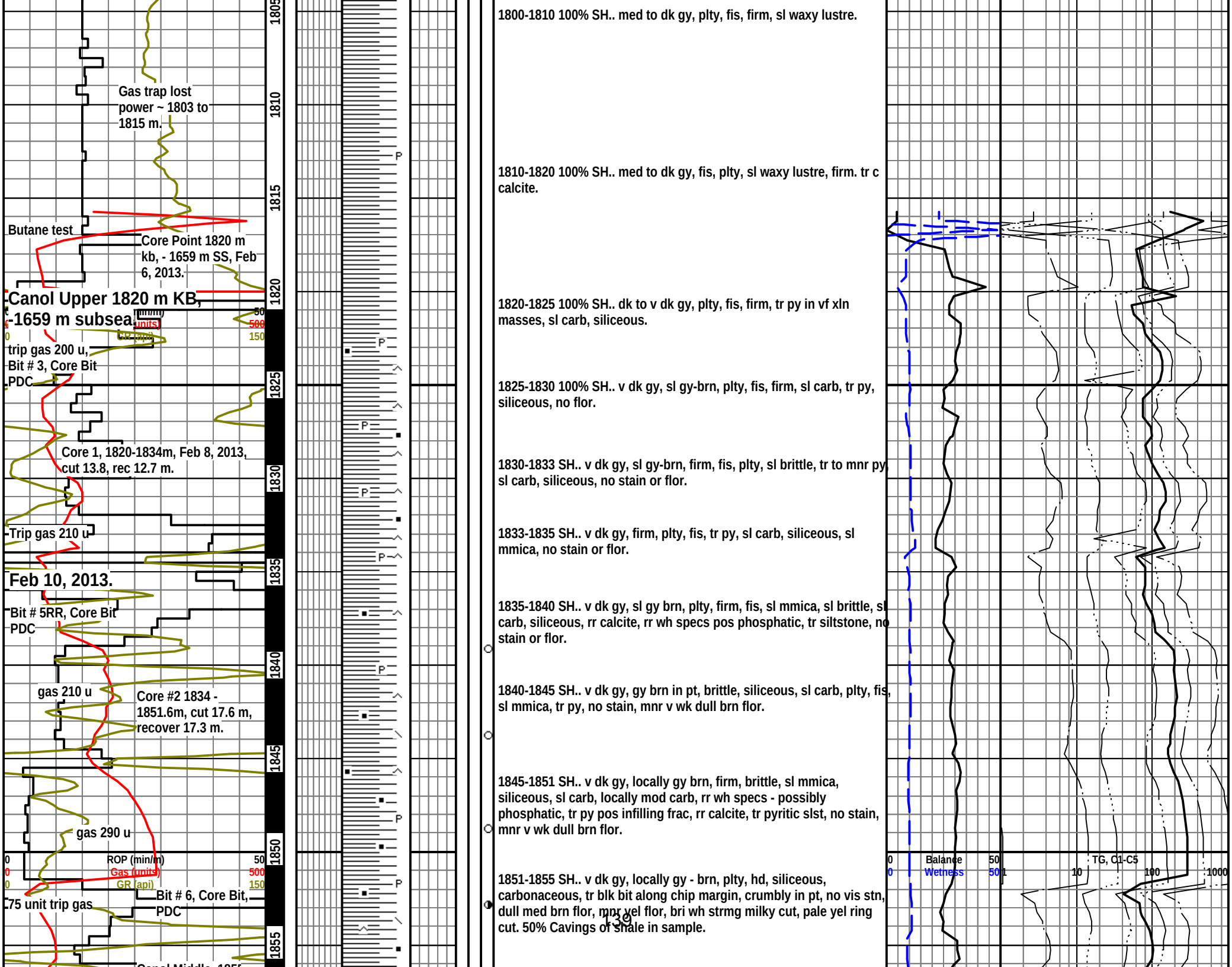
1770-1775 100% SH.. dk gy, plty, firm, mmica, tr py.

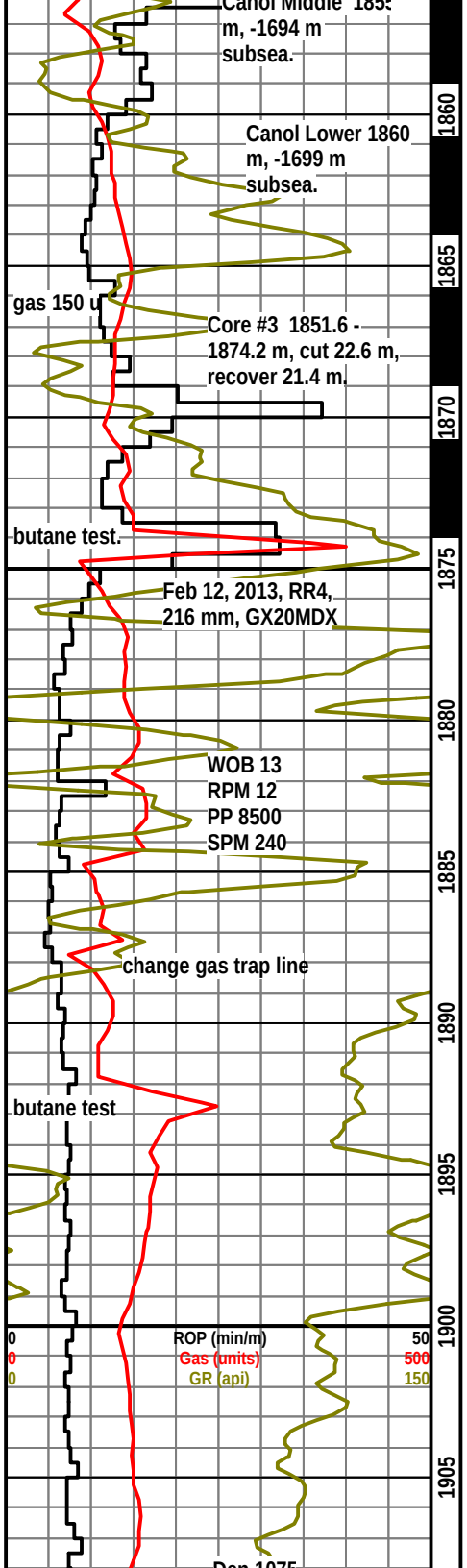
1775-1780 100% SH.. dk gy, plty, fis, firm, tr py, tr gy - brn sh.

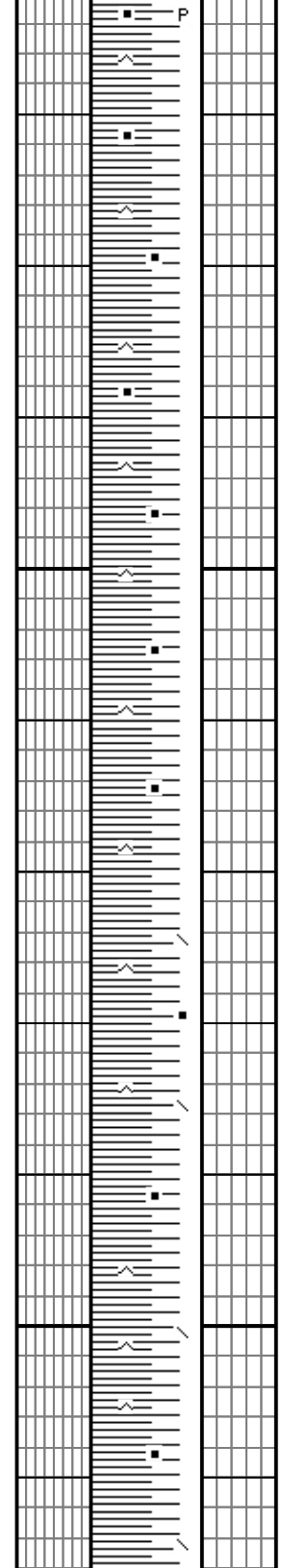
1780-1790 100% SH.. dk gy, plty, fis, tr py, sl waxy lustre, firm.

1790-1800 100% SH.. dk gy, plty, fis, firm, sl waxy, v tr py,




Gas trap lost power ~ 1803 to 1815 m.
Butane test
Core Point 1820 m kb, - 1659 m SS, Feb 6, 2013.
Canol Upper 1820 m KB, -1659 m subsea
trip gas 200 u,
Bit # 3, Core Bit PDC
Core 1, 1820-1834m, Feb 8, 2013, cut 13.8, rec 12.7 m.
Trip gas 210 u
Feb 10, 2013.
Bit # 5RR, Core Bit PDC
gas 210 u
Core #2 1834 - 1851.6m, cut 17.6 m, recover 17.3 m.
gas 290 u
75 unit trip gas
Bit # 6, Core Bit, PDC
ROP (min/m)
Gas (units)
GR (api)
1800-1810 100% SH.. med to dk gy, plty, fis, firm, sl waxy lustre.
1810-1820 100% SH.. med to dk gy, fis, plty, sl waxy lustre, firm. tr c calcite.
1820-1825 100% SH.. dk to v dk gy, plty, fis, firm, tr py in vf xln masses, sl carb, siliceous.
1825-1830 100% SH.. v dk gy, sl gy-brn, plty, fis, firm, sl carb, tr py, siliceous, no flor.
1830-1833 SH.. v dk gy, sl gy-brn, firm, fis, plty, sl brittle, tr to mnr py, sl carb, siliceous, no stain or flor.
1833-1835 SH.. v dk gy, firm, plty, fis, tr py, sl carb, siliceous, sl mmica, no stain or flor.
1835-1840 SH.. v dk gy, sl gy brn, plty, firm, fis, sl mmica, sl brittle, sl carb, siliceous, rr calcite, rr wh specs pos phosphatic, tr siltstone, no stain or flor.
1840-1845 SH.. v dk gy, gy brn in pt, brittle, siliceous, sl carb, plty, fis, sl mmica, tr py, no stain, mnr v wk dull brn flor.
1845-1851 SH.. v dk gy, locally gy brn, firm, brittle, sl mmica, siliceous, sl carb, locally mod carb, rr wh specs - possibly phosphatic, tr py pos infilling frac, rr calcite, tr pyritic slst, no stain, mnr v wk dull brn flor.
1851-1855 SH.. v dk gy, locally gy - brn, plty, hd, siliceous, carbonaceous, tr blk bit along chip margin, crumbly in pt, no vis stn, dull med brn flor, mnr yel flor, bri wh strmg milky cut, pale yel ring cut. 50% Cavings of shale in sample.
Balance
Wetness
TG, C1-C5





1855-1860 SH.. v dk gy to gyish brn, hd, brittle, siliceous, carbonaceous, tr py frac infil, sub plty, sl crumbly, tr carb slst, rr calcite, no vis stn, dull brn to locally yellow flor, fast strmg bri milky cut, dk yel ring cut.

1860-1865 SH.. v dk gy to gyish brn, plty, hd, siliceous, carbonaceous, crumbly in pt, tr calcite frac infil, no vis stn, dull brn to medium brn flor, bri wh strmg cut.

1865-1870 SH.. dk brnish gy, v dk gy, sub plty, fis, mod siliceous, firm, tr py, tr calcite fracture fill, rr blk dry bit chip, no vis stn, spty med brn flor, bri wh strmg milky cut.

1870-1872 SH.. v dk gy, mnr gy brn, hd, brittle, plty, sub plty in pt, siliceous, sl carb, tr slst , tr calcite frac infil, no vis stn, spty dull brn flor, bri wh milky cut.

1872-1880 after trip, SH.. v dk gy, brnish gy in pt, mmica, hd, brit, sili tr calcite lined frac surfaces, carb, no vis stn, spty dull brn flor, wk strmg milky cut.

1880-1885 SH.. v dk gy, mmica, hd, silic, carb, num calcite filled hairline frac, no vis stn, spty to even med brn cut, mod strmg milky cut, med yel ring cut.

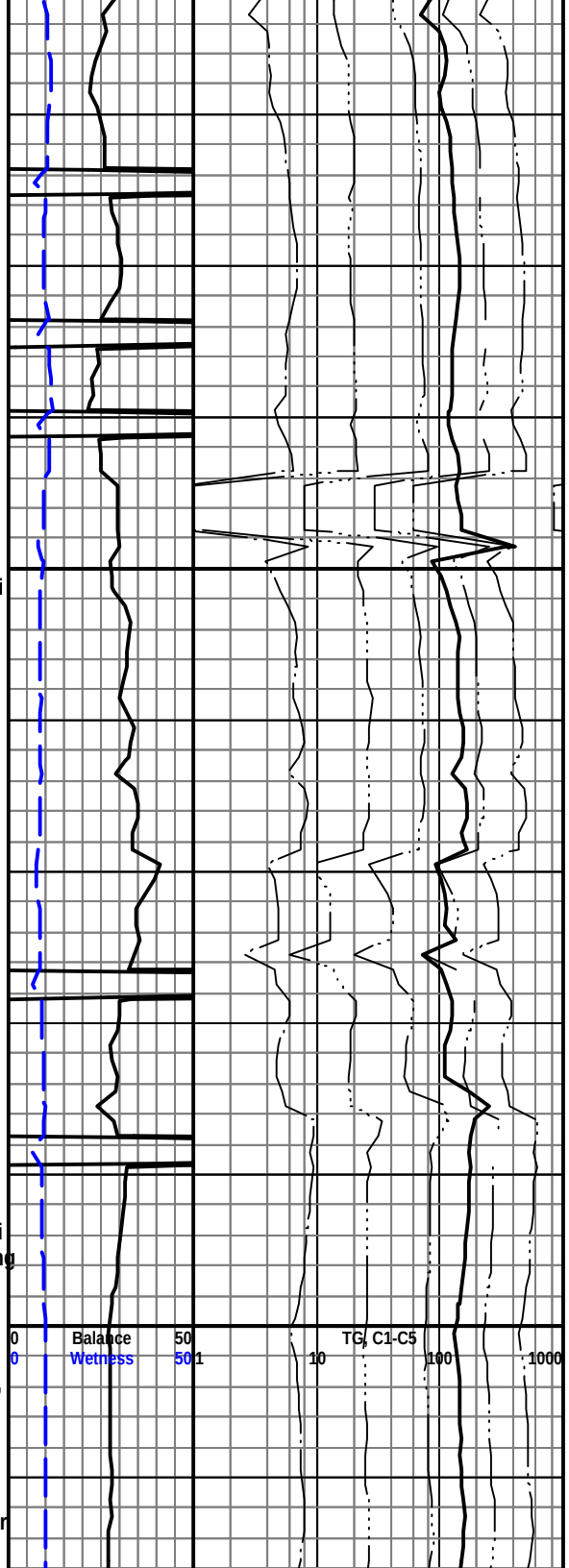
1885-1890 SH.. v dk gy, brnish gy in pt, mmica, hd, brit, silic, carb - bit, tr calcite lined frac, tr py, no vis stn, spty to even med brn flor, slow milky strmg cut, med yel ring cut.

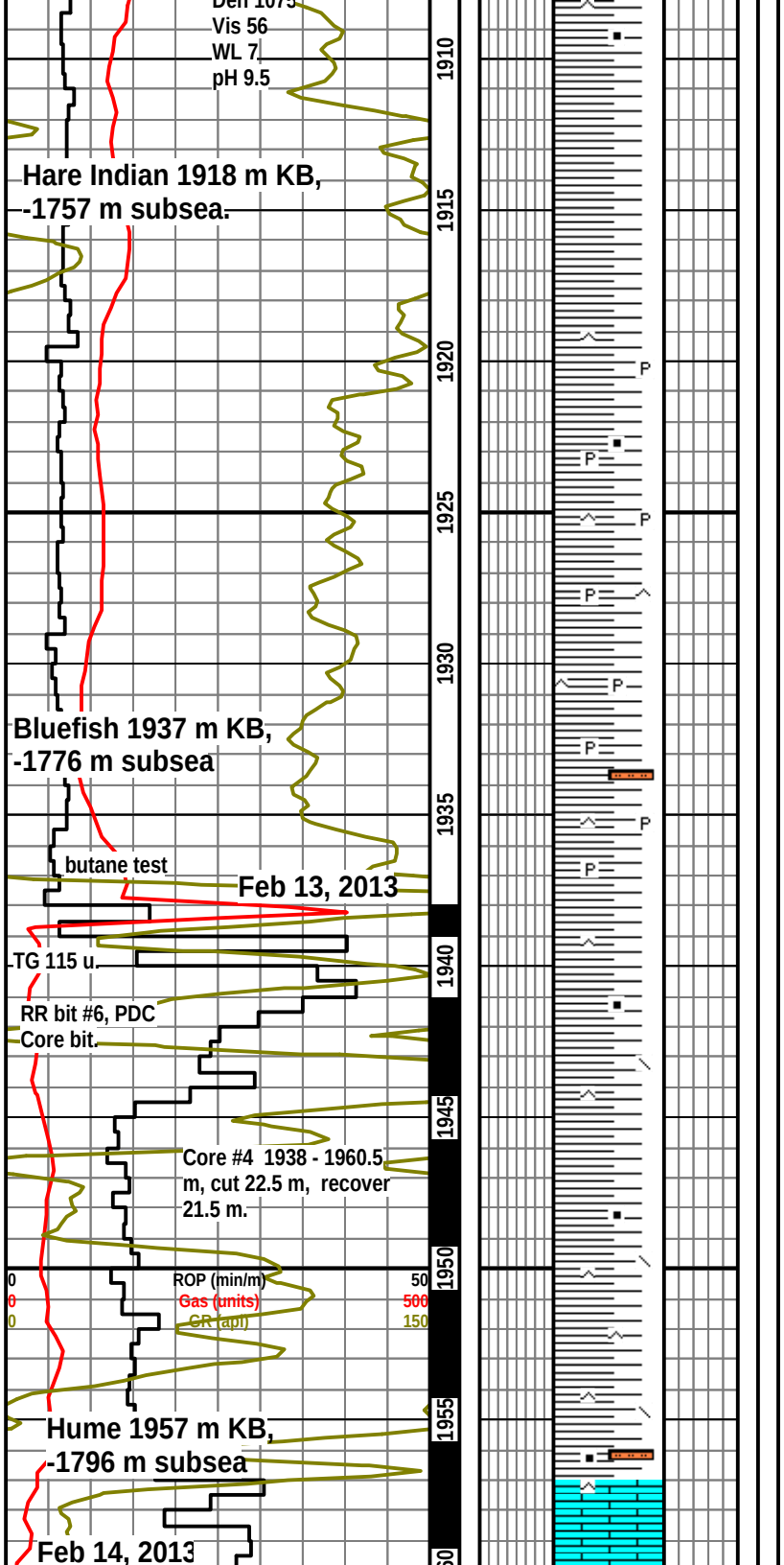
1890-1895 SH.. v dk gy, brnish gy, mmica, hd, brit, silic, carb - bit, tr calcite filled hairline to v narrow frac, tr micxln py masses, sl bit appearance in pt, no vis stn, mod milky strmg cut, med yel ring cut.

1895-1900 SH.. v dk gy, brnish gy, mmica, hd, silic, carb - bit, tr calci lined frac, tr pyritic slst, no vis stn, mod strmg milky cut, med yel ring cut.

1900-1905 SH.. v dk gy, brnish gy, mmica, hd, brit, silic, carb - bit, some calcite filled micro frac, tr f to med clr calc xls on frac surface, tr py, bituminous appearance in pt, no vis oil stn, v wk brn flor, mod milky strmg cut, yel ring cut.

1905-1910 SH.. v dk gy, brnish gy, hd, silic, mmica, carb - bit, tr py, tr calcite filled micro frac, sl bit, no vis oil stn, even dull brn flor, mod





milky strmg cut, yel ring cut

1910-1920 no samples.

1920-1925 SH.. v dk gy, mnr brnish gy, mmica, hd, silic, carb, tr py chips , tr calcite filled micro frac, no vis stn, even to spty med brn flor, slow milky strmg cut.

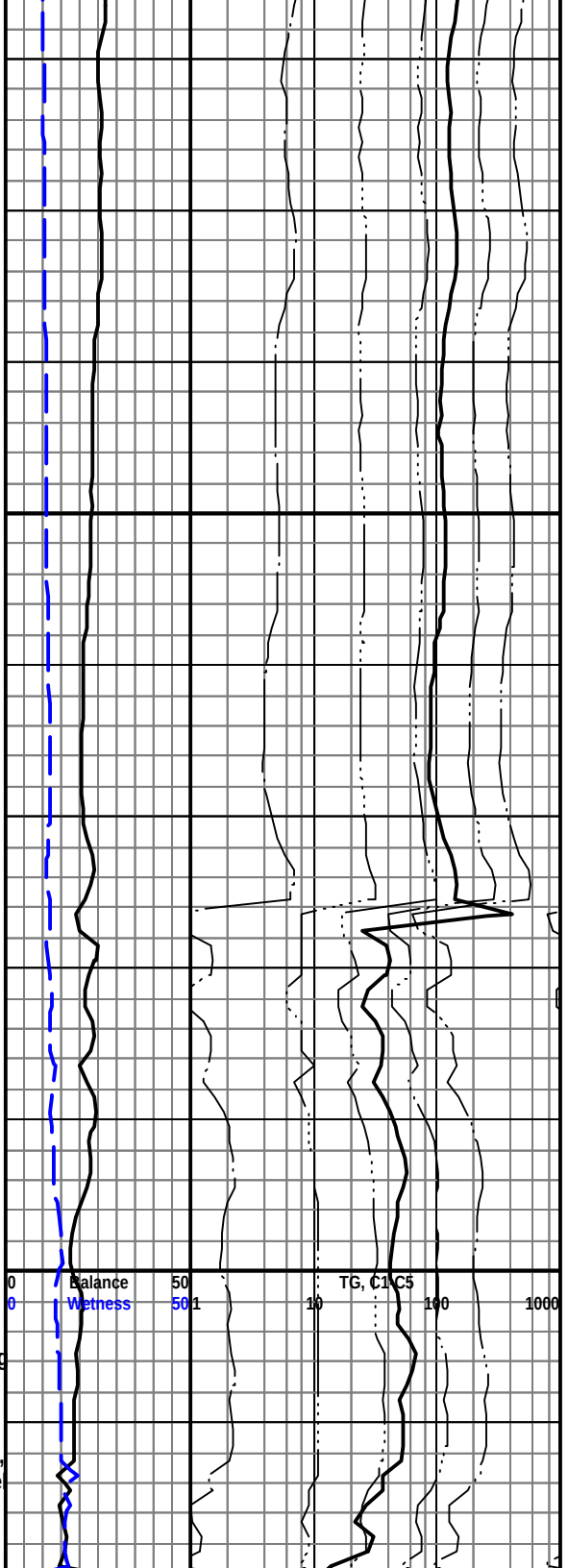
1925-1930 SH.. v dk gy, hd, silic, mmica, tr py chips. silic, sl carb, rr calcite frac infil, no vis stn, even to spty med brn flor, v slow strmg milky cut.

1930-1938 SH.. v dk gy, mmica, hd, siliceous, sl carb, tr py chips, tr slst, no stn, even to spty med brn flor, slow milky strmg cut.

1938-1940 after trip, SH.. dk gy., mmica, firm., plty, fis, mod silic, sl carb, rr calcite fracture infil tr py, tr slst.

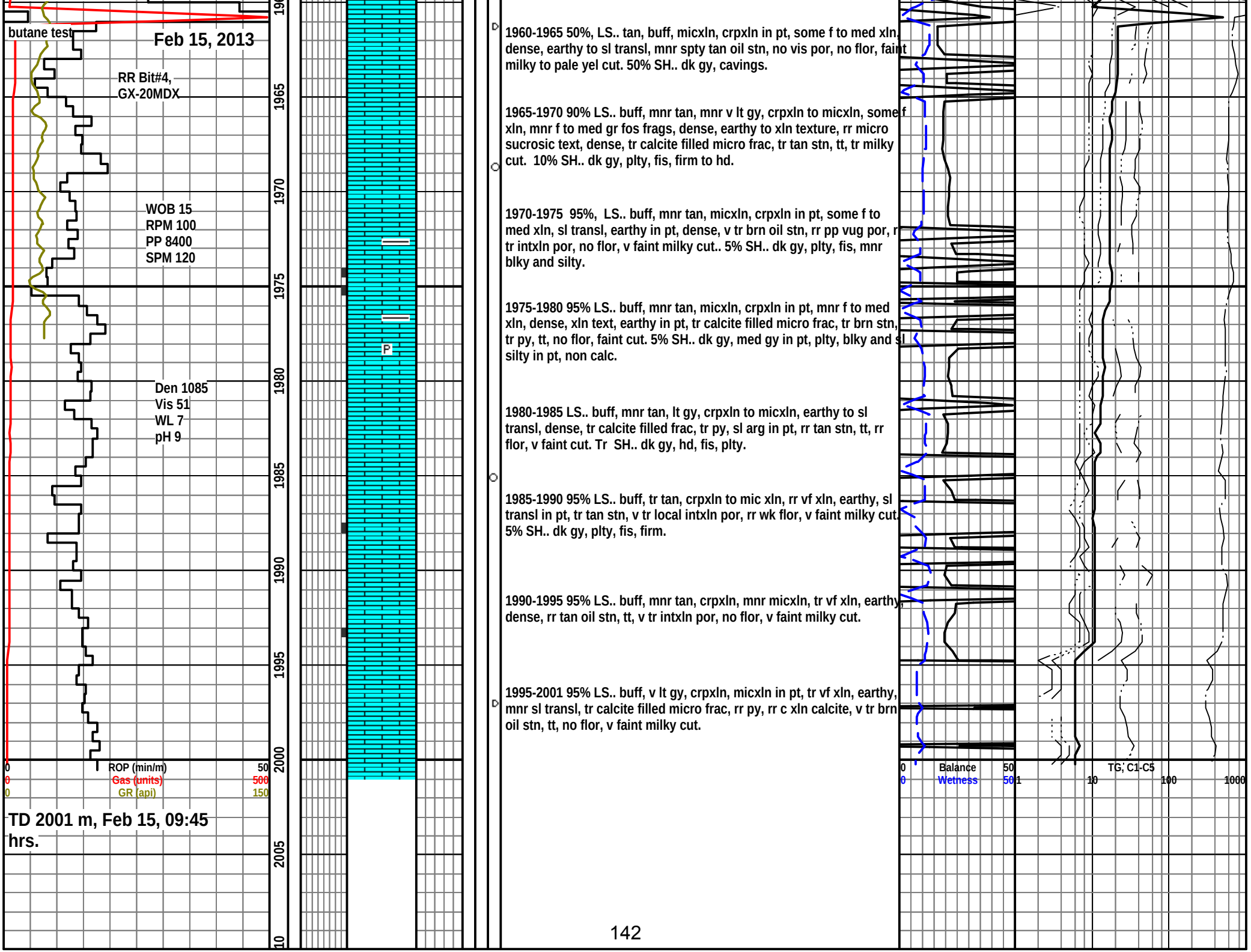
1940-1945 SH.. dk gy, mmica, firm, plty, fis, sl silic, sl carb, tr wh calcite frac infil, tr lt gy, crpxln calcareous chips, tr py, no vis stn, even to spty dull brn flor, slow milky strmg cut, yel ring cut.

1945-1950 SH.. v dk gy, plty, fis, hd, silic, carb, several calcite filled micro frac, com lt gy crpxln calcite, no vis stn, dull brn flor, slow strmg milky cut. Note.. the lt gy calcareous chips are bitumen staine and are occasionally contain clean wh calcite filled micro fracs.



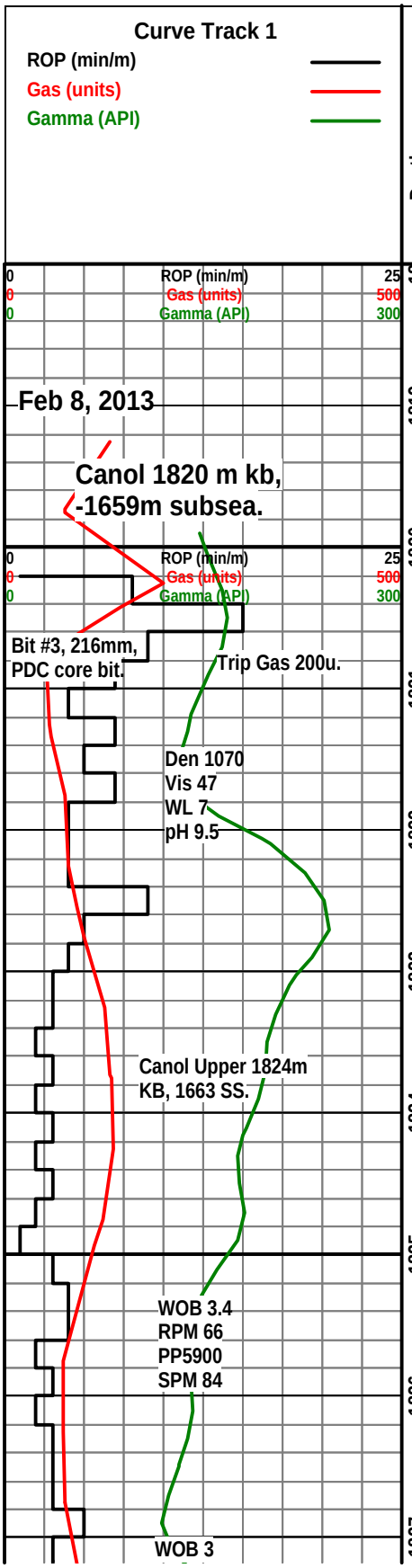
1950-1955 SH.. v dk gy, sl gy - brn, firm to hd, silic, carb, plty, fis, tr py, tr lt gy calc chips, dull med brn flor, mod strmg milky cut, yel ring cut.

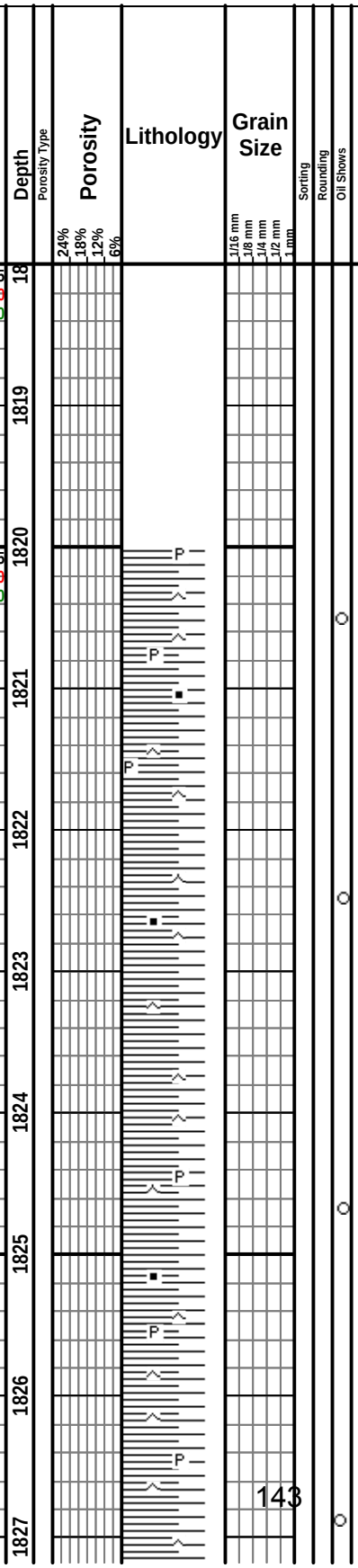
1955-1960 SH.. v dk gy, gy brn, plty, fis, hd, sl mmica, silic, carb - bit, tr lt gy calc chips, tr wh sl oil stained slst, no vis stn, dull brn flor, ye flor in slst, mod strmg cut.


butane test
Feb 15, 2013
RR Bit#4,
GX-20MDX
WOB 15
RPM 100
PP 8400
SPM 120
Den 1085
Vis 51
WL 7
pH 9
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
P
0
ROP (min/m)
50
0
Gas (units)
500
0
GR (api)
150
TD 2001 m, Feb 15, 09:45 hrs.
1960-1965 50%, LS.. tan, buff, micxln, crpxln in pt, some f to med xln, dense, earthy to sl transl, mnr spty tan oil stn, no vis por, no flor, faint milky to pale yel cut. 50% SH.. dk gy, cavings.
1965-1970 90% LS.. buff, mnr tan, mnr v lt gy, crpxln to micxln, some f xln, mnr f to med gr fos frags, dense, earthy to xln texture, rr micro sucrosic text, dense, tr calcite filled micro frac, tr tan stn, tt, tr milky cut. 10% SH.. dk gy, plty, fis, firm to hd.
1970-1975 95%, LS.. buff, mnr tan, micxln, crpxln in pt, some f to med xln, sl transl, earthy in pt, dense, v tr brn oil stn, rr pp vug por, r tr intxln por, no flor, v faint milky cut.. 5% SH.. dk gy, plty, fis, mnr blky and silty.
1975-1980 95% LS.. buff, mnr tan, micxln, crpxln in pt, mnr f to med xln, dense, xln text, earthy in pt, tr calcite filled micro frac, tr brn stn, tr py, tt, no flor, faint cut. 5% SH.. dk gy, med gy in pt, plty, blky and sl silty in pt, non calc.
1980-1985 LS.. buff, mnr tan, lt gy, crpxln to micxln, earthy to sl transl, dense, tr calcite filled frac, tr py, sl arg in pt, rr tan stn, tt, rr flor, v faint cut. Tr SH.. dk gy, hd, fis, plty.
1985-1990 95% LS.. buff, tr tan, crpxln to mic xln, rr vf xln, earthy, sl transl in pt, tr tan stn, v tr local intxln por, rr wk flor, v faint milky cut. 5% SH.. dk gy, plty, fis, firm.
1990-1995 95% LS.. buff, mnr tan, crpxln, mnr micxln, tr vf xln, earthy, dense, rr tan oil stn, tt, v tr intxln por, no flor, v faint milky cut.
1995-2001 95% LS.. buff, v lt gy, crpxln, micxln in pt, tr vf xln, earthy, mnr sl transl, tr calcite filled micro frac, rr py, rr c xln calcite, v tr brn oil stn, tt, no flor, v faint milky cut.
0
Balance
50
0
Wetness
50
1
10
100
1000
TG, C1-C5

CORE LOG 1:48 SCALE

Contractor: Baker Hughes
Core #: 1,2,3
Formation: Canol
Core Interval: From: 1820 m To: 1874.2 m
Cut: 54.2 m **Recovered:** 51.4 m
Bit type: PDC
Size: 216 mm
Coring Time: 17.5 hrs





Geological Descriptions

CORE 1, Feb 8 2013: cut 1820 to 1834 m, 14 m in 5.5 hrs. Recovery 12.7 m.

Note.. sleeved core, cut and sampled at 1.5 m intervals.

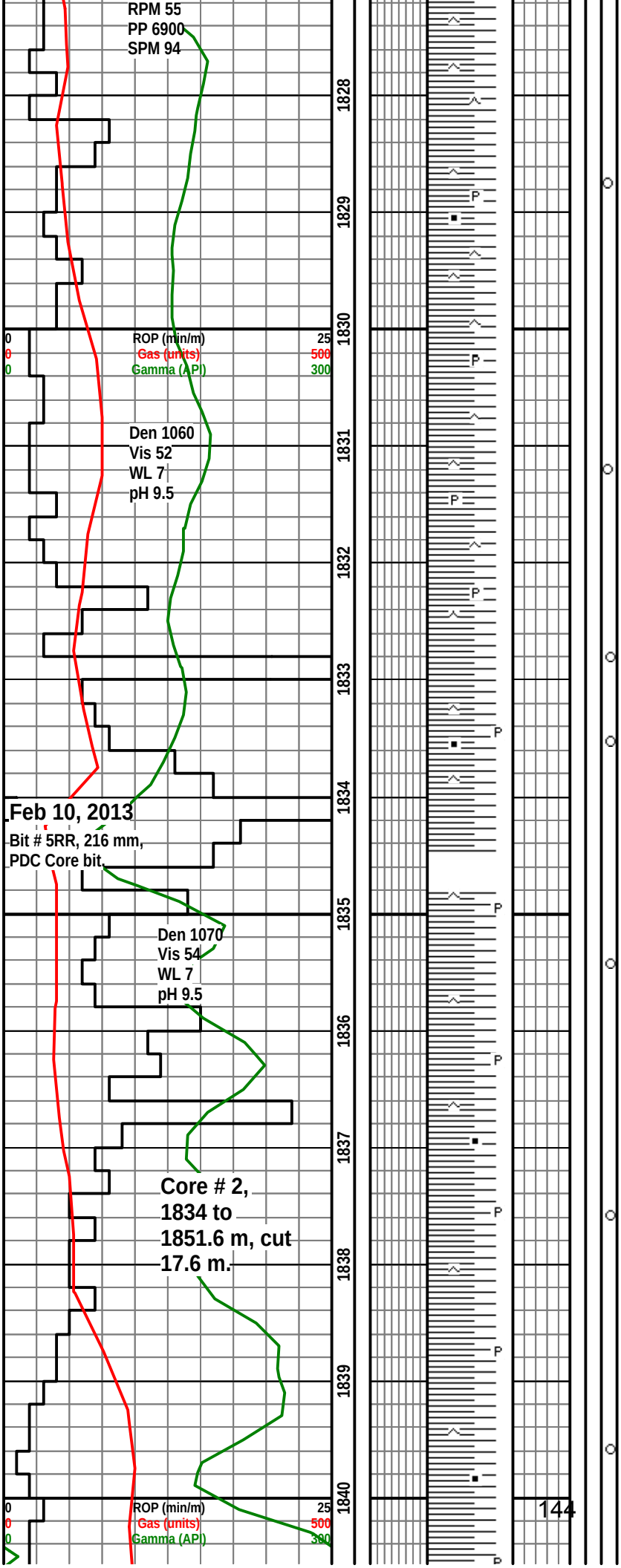
1820m SH.. dk gy, sl carb, w cons, firm to hd, py on sub-vertical frac, concoidal nature, siliceous, no stn, no flor, slow strmg milky cut.

1821.5 SH.. dk gy, sl carb, hd, brittle, siliceous, sl mmica, no stn, no flor, slow strmg milky cut.

1823.2 SH.. dk gy, sl carb, hd, brittle, siliceous, no stn, no flor, wk to mod wh cut.

1824.7 SH.. dk gy, brittle, hd, siliceous, sl carb, 2-3 mm disseminated py bed, mnr py on sub vertical fracture surface, no stn, no flor, wk to mod wh cut.

1826.2 SH.. dk gy, hd, brittle, siliceous, sl carb, tr py along bedding plane, concoidal nature, no stn, no flor, wk to mod wh cut.



1827.7 SH.. dk gy, hd, brittle, siliceous, sl carb, concoidal nature, v sl mmica, no stn, no flor, wk to mod wh cut.

1829.2 SH.. dk gy, hd, brittle, siliceous, sl carb, concoidal nature, tr py, no stn, no flor, wk milky strmg cut.

1830.7 SH.. dk gy, sl brn gy, hd, brittle, siliceous, sl carb, scat py on fracture plane, no flor, no stn, wk to mod milky cut.

1832.2 SH.. dk gy, sl brn, hd, brittle, siliceous, sl carb, concoidal frac no flor, no stn, mod milky cut.

1832.7 SH.. dk gy, sl brn, hd, brittle, siliceous, sl carb, scat dis, py, no flor, no stn, mod milky cut.

No Core 1832.7 to 1834 m, core shoe jammed with rubble chips.

CORE 2, Feb 10 2013: cut 1834 to 1851.6 m, 17.6 m in 5.75 hrs. Recovery 17.3 m

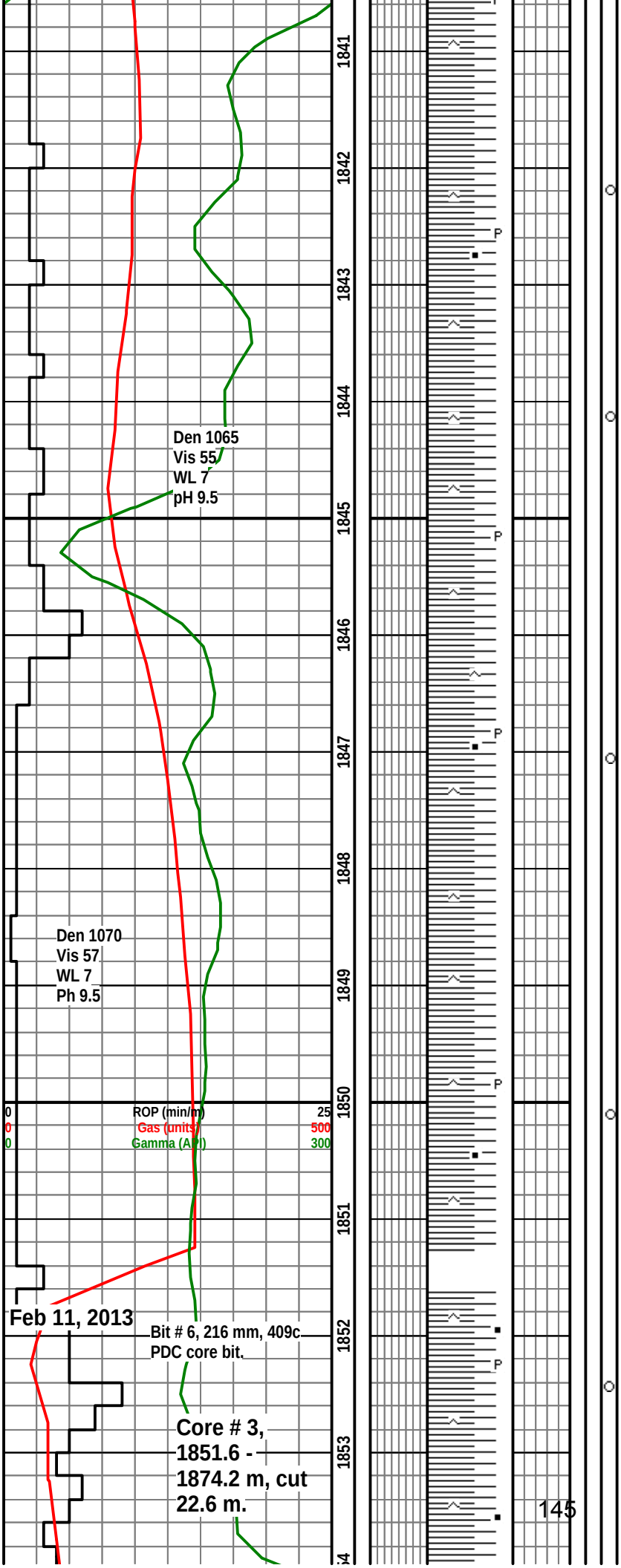
1834 SH.. dk gy, sl mmica, hd, brittle, siliceous, sl carb, tr scat py, no stain, no flor, slow mod wh cut.

1835.5 SH.. dk gy, sl mmica, hd, brittle, siliceous, com scat py needles, sl carb, no stn, no flor, strong wh cu

1837 SH.. dk gy, sl mmica, hd, brittle, siliceous, tr scat py needles, , sl carb, tr bit replacing micro fossils, tr moldic por, no stain, strong fast wh cut, sulfur odour.

1838.5 SH.. dk gy, brittle, siliceous, sl carb, tr dis py, fis, plty, sl sulfur odour, no stain, no flor, strong milky cut.

1840 SH.. dk gy, hd, sl mmica, sl carb, siliceous, py in a 2-3mm bed, no stain, no flor, strong milky cut, sulfur odou



1841.7 SH.. dk gy, hd, platy, fis, siliceous, tr calcite on vertical fracture surface, sl carb, tr scat py, no staining, dull brn flor, slow wh strmg cut, wk sulfur odour.

1843.2 SH.. dk gy, plty, fis, hd, siliceous, sl carb, tr py, no staining, dull brn flor, slow milky cut

1844.7 H.. dk gy, mmica, hd, siliceous, plty, sl carb, no staining, dull brn flor, slow milky cut.

1846.2 SH.. dk gy, hd, siliceous, platy, com scat micro py, no stain, dull brn flor, mod milky cut, sulfur odour.

1847.7 SH.. dk gy, hd, siliceous, sl mmica, no stain, dull brn flor, slow milky cut, sulfur odour

Note.. the milky cut dries to a pale yellow ring cut.

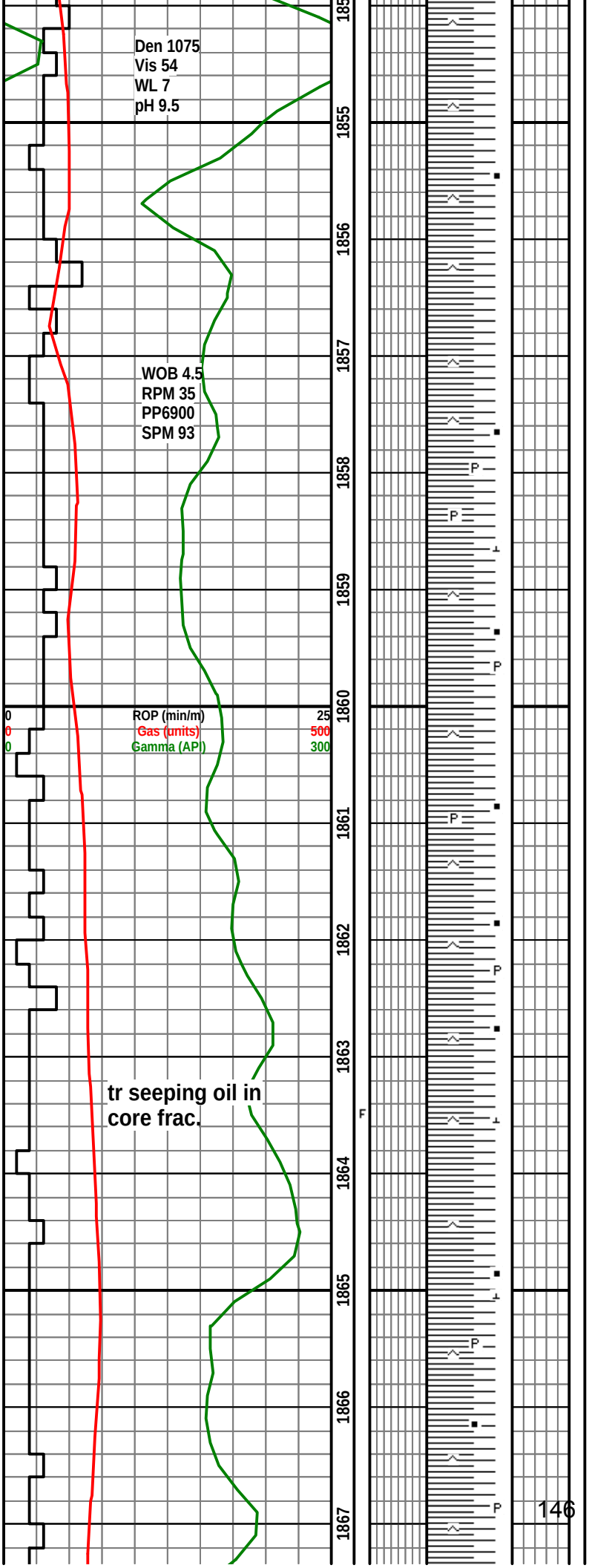
1849.2 SH.. dk gy, hd, siliceous, sl mmica, tr calcite on vertical frac surfaces, no stain, dull brn flor, mod to strong wh milky cut,

1850.7 SH.. dk gy, mmica, hd, siliceous, sl carb, tr py, tr py replacing a fossil, no stain, dull brn flor, mod milky cut, mod sulfur odour.

1851.3 SH.. dk gy, mmica, hd, siliceous, sl carb, pos slickensides, local rugose bedding surface - pos pressure solution, microscopic scat py, no staining, dull brn flor, mod to strong wh cut, wk sulfur odour.

CORE 3, Feb 11 2013: cut 1851.6 - 1874.2 m, 22.6 m in 6.75 hrs. Recovery 21.4 m

1853.1 SH.. dk gy, hd, brittle, siliceous, sl carb, micro scat py, no vis stn, wk dull brn flor, wk sulfur odour, bri wh strmg cut.



1854.3 SH.. dk gy, sl mmica, hd, brittle, siliceous, sl carb, no vis stn, dull dk brn flor, no sulfur odor, bri wh strmg cut.

1855.8 SH.. dk gy, hd, siliceous, sl carb, mmica, no vis stn, med brn flor, no sulfur odour, bri wh strmg cut.

Note.. white cut dries to a pale yellow ring cut.

1857.3 SH.. dk gy, hd, brittle, sl mmica, siliceous, sl carb, no vis stn, dull brn flor, no sulfur odor, bri wh strmg cut.

1858.8 SH.. dk gy, hd, sl mmica, siliceous, sl carb, calcite coating on sub vertical frac, calcite +/- dol on horiz bedding surfaces, tr vf gran py in v thin horiz beds, no vis stn, dull brn flor, wk sulfur odour, bri wh strmg cut.

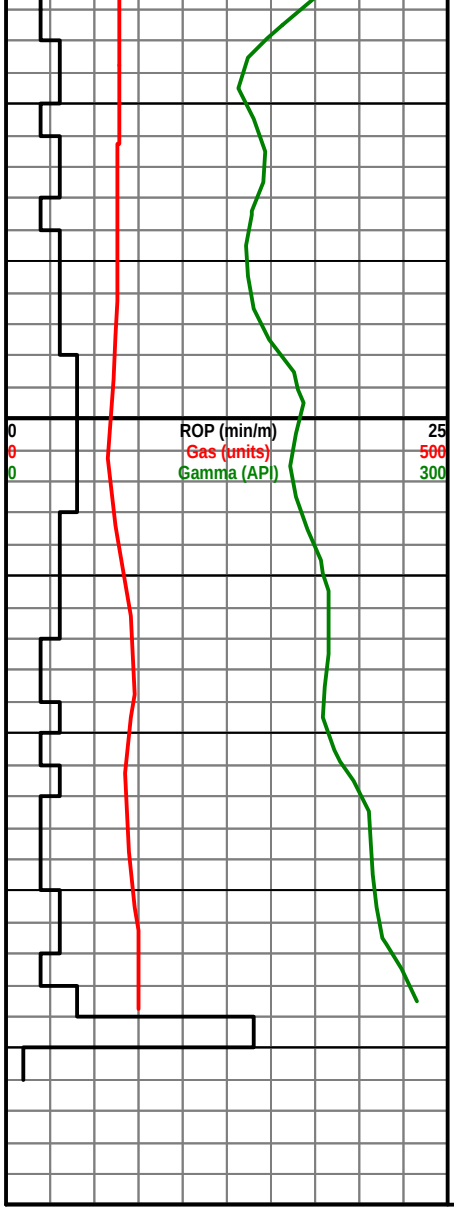
1860.3 SH.. dk gy, hd, siliceous, concoidal frac, sl carb, mnr thin bedding parallel py seams, no vis stn, even med brn flor, wk sulfur odour, bri wh strmg cut.

1861.8 SH.. dk gy, hd, siliceous, mmica, abnt vf dis py. sl carb, no vis stn, dull brn flor, wk sulfur odour, bri wh strmg cut.

1863.4 SH.. dk gy, hd, siliceous, sl carb, sl mmica, f xln calcite on sub vertical frac, tr bleeding oil on a tight frac, oil has a dk yel flor, no vis stn on sh, even med brn flor, no sulfur odour, bri wh strmg cut.

1864.9 SH.. dk gy, hd, siliceous, siliceous, sl carb, com vf dis py, one sub vertical calcite lined hairline frac, dull brn flor, wk sulfur odour, bri wh strmg cut.

1866.4 SH.. dk gy, hd, siliceous, concoidal frac, one calcite lined hairline frac, mnr dis py, dull brn flor, wk sulfur odour, bri wh strmg cut.



1867.9 SH.. dk gy, hd, siliceous, concoidal frac, sl carb, com vf dis py, no vis staining, wk dull brn flor, sl sulfur odour, bri wh milky strmg cut.

1869.4 SH.. dk gy, hd, siliceous, sl carb, com micro dis py, tr calcite along pos sub vertical frac, no vis stn, possible dull brn flor, wk sulfur odour, slow bri wh strmg milky cut.

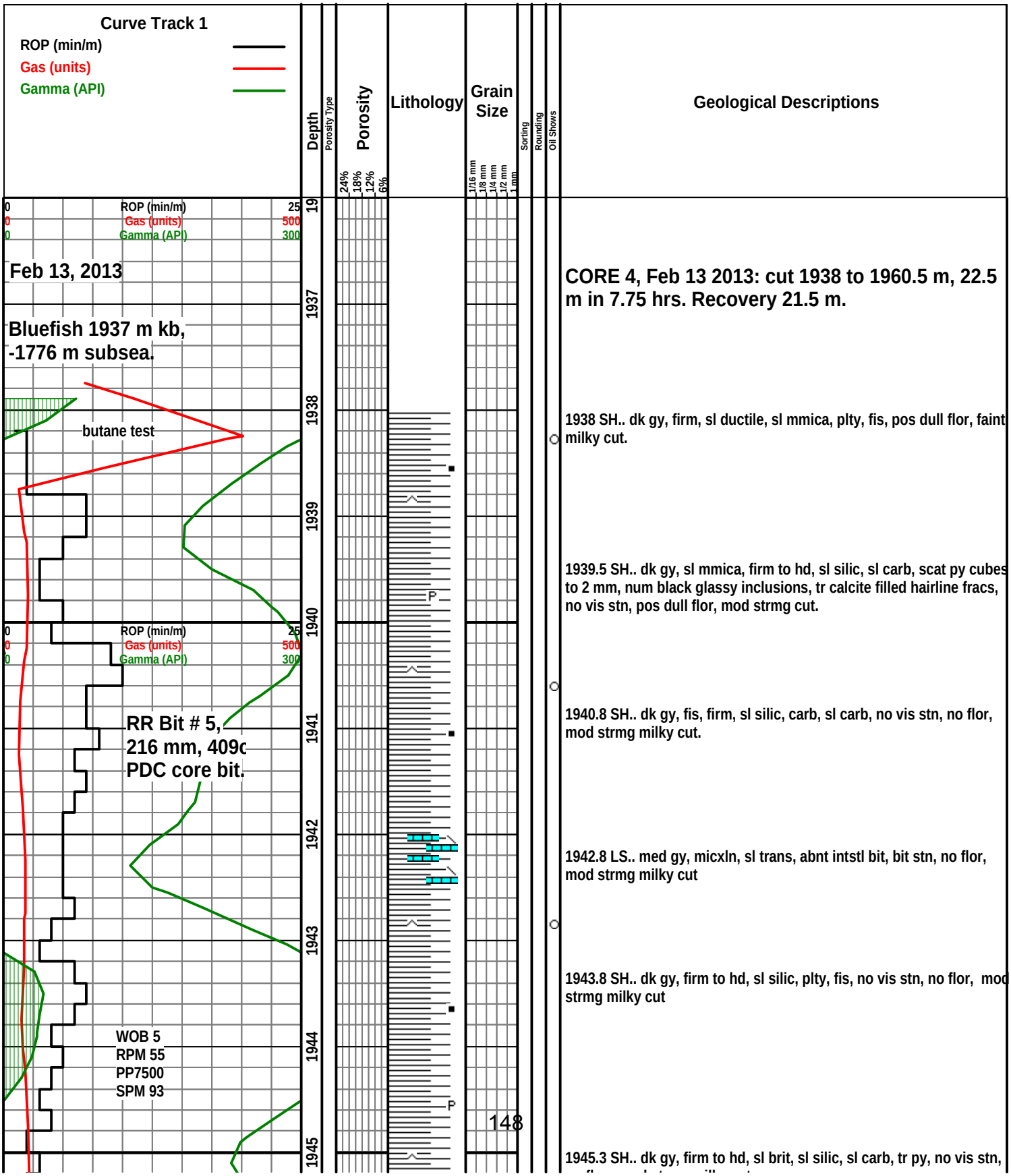
1870.9 SH.. dk gy, hd, siliceous, sl carb, mnr micro scat py, one vertical hairline frac no calcite coating possibly mechanically fractured, no vis stn, slow strmg milky cut.

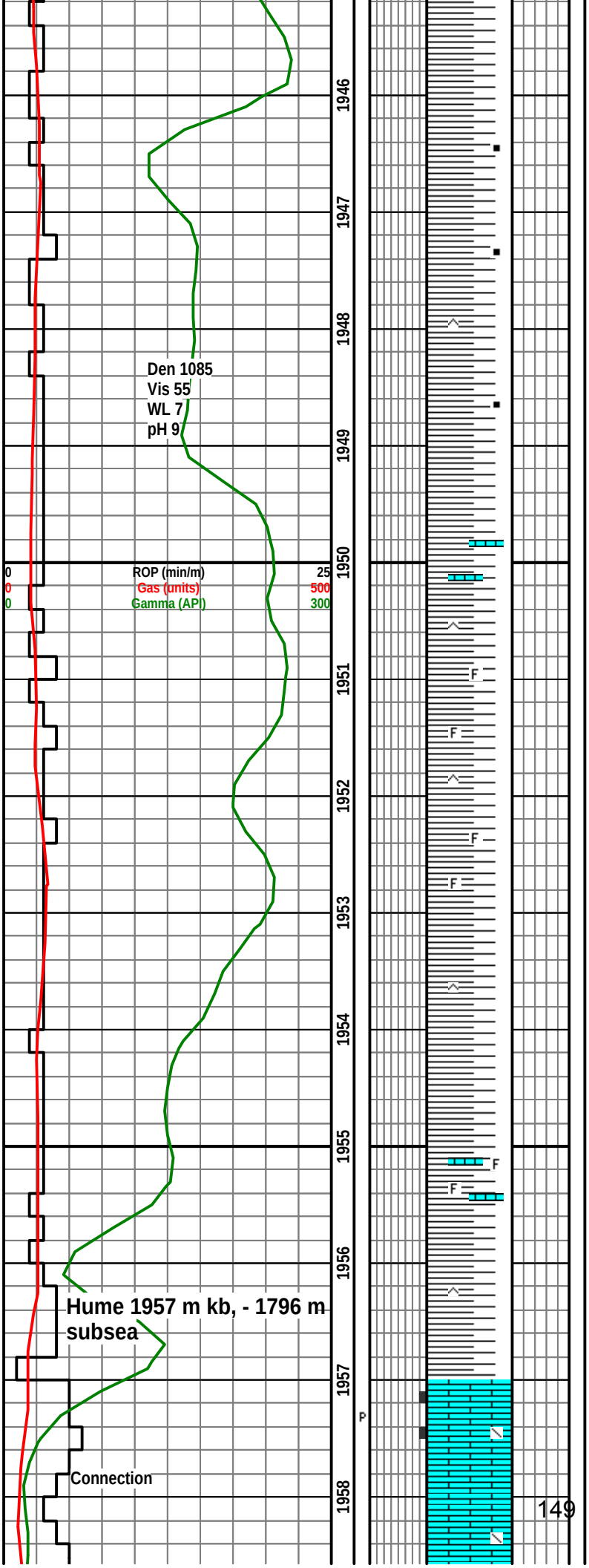
1872.4 SH.. dk gy, hd, siliceous, sl carb, sl mmica, mnr scat micro py, no vis stn, dull dk brn flor, slow strmg milky cut.

1873 SH.. dk gy, hd, siliceous, sl carb, no vis stn, pos wk dull brn flor, no flor, no sulfur odour, slow strmg milky cut.

CORE LOG 1:48 SCALE

Contractor: Baker Hughes
Core #: 4
Formation: Blue Fish
Core Interval: From: 1938 m To: 1960.5 m
Cut: 22.5 m **Recovered:** 21.5 m
Bit type: BHC 409C
Size: 216 mm
Coring Time: 7.75 hrs





no flor, mod strmg milky cut

1946.8 SH.. dk gy, fis, firm to hd, sl silic, mod carb, polished surfaces pos slickensides, tr calcite frac coating, no vis stn, med brn flor, slow to mod strmg milky cut

1948.3 SH.. dk gy, firm to hd, sl silic, mod carb, sl mmica, fis, num fos molds, no stn, med brn flor, mod strmg milky cut.

1950 SH.. dk gy, firm to hd, fis, plty, tr calcite filled micro frac, some ls lenses in the sh, no vis stn, no flor, slow to mod strmg milky cut.

1951.5 SH.. dk gy, firm to hd, sl silic, fis, sl carb, tr py cubes, com fos molds, no stn, no flor, slow to mod strmg milky cut.

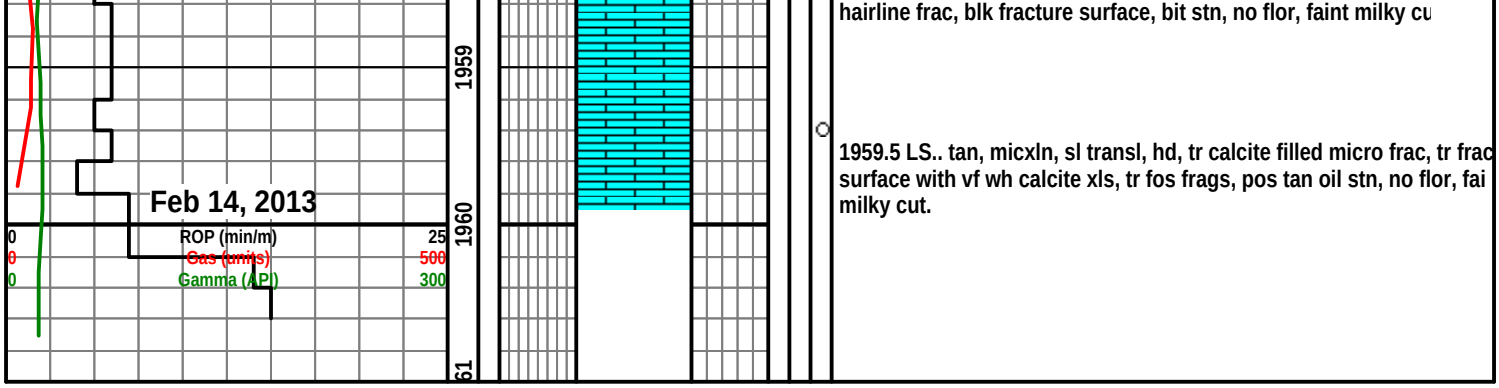
1953 SH.. dk gy, firm to hd, sl silic, sl carb, calc beds, com fos molds no stn, no flor, slow to mod strmg milky cut.

1954.5 SH.. dk gy, firm to hd, fis, sl silic, sl carb, no stn, pos wk flor, slow to mod strmg milky cut.

1956 SH.. dk gy, firm, fis, sl silic, sl carb, micxln calc beds of fos frags, no stn, no flor, slow to mod strmg milky cut.

1957.5 LS.. tan, lt brn, vf to f xln, sl transl, dense, faint fos frags, rr spec soft bit, tr soft bit in vugs, tr pp vug por, 2-3% por, spty yel flor, faint milky cut.

1958.5 LS.. med gy, gy-brn, micxln, sl transl, hd, one calcite filled



hairline frac, blk fracture surface, bit stn, no flor, faint milky cu

1959.5 LS.. tan, micxln, sl transl, hd, tr calcite filled micro frac, tr frac surface with vf wh calcite xls, tr fos frags, pos tan oil stn, no flor, fai milky cut.

Depth	API counts	ppm Th	ppm U	% K	
1820	131.256	1.294376	7.646404246	0.917018	Core 1
1820.117	137.1278	1.16151	7.488417123	0.996755	
1820.233	142.6413	1.014727	7.116326043	1.098946	
1820.35	141.6558	1.503422	7.256500971	1.075538	
1820.466	137.9893	1.247935	7.319573595	0.953521	
1820.583	135.4014	1.264353	7.093041823	0.819437	
1820.699	131.5903	1.086041	7.258190315	0.709335	
1820.816	123.6337	1.425478	6.773649299	0.700097	
1820.933	115.0431	1.562747	5.963405416	0.7359	
1821.049	112.5138	0.973096	5.004223579	0.853079	
1821.166	122.879	0.590552	5.427227803	0.933283	
1821.282	151.4559	0.305018	7.466486545	0.999421	
1821.399	187.3518	1.45292	9.559215166	0.99049	
1821.515	212.5793	2.870789	10.72587843	0.945417	
1821.632	220.9149	4.058157	10.80612911	0.904986	
1821.749	223.8473	3.444068	11.84309812	0.903721	
1821.865	236.1458	3.11715	13.67501691	0.869464	
1821.982	251.8143	3.350071	15.71457176	0.809337	
1822.098	251.8901	3.834283	16.11768642	0.758645	
1822.215	228.8232	3.244898	14.93150826	0.760591	
1822.332	209.6537	1.828488	14.00207542	0.803231	
1822.448	205.5324	0.822757	13.47849337	0.787117	
1822.565	207.276	0.727445	13.18502997	0.736979	
1822.681	190.9769	0.852602	11.55484875	0.59539	
1822.798	159.2126	0.840307	9.620737536	0.439064	
1822.914	142.4449	0.434055	8.91464712	0.322046	
1823.031	148.1823	0	10.14189345	0.301084	
1823.148	166.1837	0.32175	10.8755903	0.407962	
1823.264	177.4552	0.76896	10.98581	0.478737	
1823.381	175.0362	0.85989	10.05074935	0.509989	
1823.497	166.1147	1.191218	9.321621197	0.492806	
1823.614	157.1899	1.597801	8.992355653	0.465204	
1823.73	155.4325	1.588697	9.903449063	0.388108	
1823.847	162.1761	1.457772	11.11598198	0.346392	
1823.964	170.3739	1.222488	11.350606	0.461005	
1824.08	170.8839	2.167734	9.494785138	0.641447	
1824.197	161.6661	1.962092	7.873626593	0.75155	
1824.313	147.2174	1.941449	6.68437656	0.763909	
1824.43	133.1995	1.993782	6.385402195	0.731464	
1824.546	124.0403	2.898573	5.827979162	0.72745	
1824.663	119.6778	2.899962	5.617774483	0.743308	
1824.78	120.1947	1.820557	5.612793743	0.876283	
1824.896	122.8032	0.599255	5.834705646	1.025723	
1825.013	122.6309	0.407728	5.946022677	1.074516	
1825.129	120.622	0.742938	6.291936552	1.010528	
1825.246	120.3567	1.290659	6.566000982	0.921136	
1825.363	123.4993	1.307016	6.669961303	0.959551	
1825.479	123.9921	0.971805	6.229186086	1.016497	
1825.596	118.8405	0.424085	5.66022569	1.022187	
1825.712	111.0941	0.083204	4.956419518	0.904171	
1825.829	103.4373	1.637365	4.216849199	0.773326	

1825.945	96.31116	2.555779	3.723556904	0.684781
1826.062	91.90386	2.851399	3.677494402	0.723074
1826.179	89.40558	1.90124	3.727997511	0.824772
1826.295	90.19469	0.982825	3.761541668	0.905142
1826.412	94.06788	0.604002	4.268475179	0.921155
1826.528	104.7812	0.386699	4.819250994	0.874726
1826.645	121.132	0.624721	5.299648645	0.834885
1826.761	139.602	0.874871	6.320264724	0.765151
1826.878	160.0465	0.756602	7.84711749	0.739708
1826.995	177.0762	1.009849	10.0604041	0.724756
1827.111	185.9287	1.232954	11.05005822	0.69836
1827.228	184.5193	1.777951	10.96103021	0.649266
1827.344	174.6606	1.617116	10.09195941	0.646065
1827.461	162.438	1.953285	8.9072652	0.668215
1827.577	152.6585	1.873032	8.455209516	0.668067
1827.694	148.8784	1.542598	8.770407087	0.659996
1827.811	149.2161	0.774032	8.937879458	0.672811
1827.927	150.3498	0.286303	8.447453727	0.718983
1828.044	150.7667	0.286303	8.093486317	0.800872
1828.16	149.4607	0.245445	7.905932662	0.915987
1828.277	146.5524	1.371837	7.480308656	0.930823
1828.394	145.6461	2.547509	6.735834311	0.896016
1828.51	146.7764	2.971221	6.768615965	0.870532
1828.627	146.5799	1.599384	7.015888766	1.00926
1828.743	144.0541	0.423712	6.975170427	1.081726
1828.86	140.6978	0	6.811544891	1.060874
1828.976	138.2374	0	7.267265593	0.923565
1829.093	135.4807	0	7.255752852	0.875897
1829.21	133.4752	0.35241	6.844158108	0.927977
1829.326	131.7453	1.353861	6.275403647	1.06361
1829.443	131.3456	1.451536	6.242247744	1.184707
1829.559	134.1299	1.598965	6.691993136	1.175635
1829.676	141.7074	1.987821	7.361945033	1.042467
1829.792	149.8398	3.145976	7.724301011	0.906532
1829.909	155.1671	3.991375	8.096659943	0.879534
1830.026	158.2891	3.98699	9.182530342	0.805195
1830.142	163.5096	2.913092	10.4647831	0.691905
1830.259	173.6371	2.104005	11.59798085	0.539219
1830.375	188.644	1.750397	11.96090576	0.516993
1830.492	193.5579	2.167509	11.64844432	0.517002
1830.608	184.2505	1.631358	10.52173853	0.543034
1830.725	169.9948	1.48419	9.05643614	0.611209
1830.842	163.0996	1.609432	8.667221015	0.590161
1830.958	161.611	2.239419	8.408784806	0.515111
1831.075	155.9045	1.866064	8.597939259	0.449282
1831.191	149.4607	1.263076	8.355985705	0.551686
1831.308	147.879	0.950945	8.453493291	0.657289
1831.425	148.4304	0.439154	8.333659097	0.770734
1831.541	147.7584	0.323175	8.319539953	0.840112
1831.658	145.3222	0.756564	7.533237273	0.911541
1831.774	142.2795	1.431385	6.80608367	0.905928
1831.891	139.1747	1.823967	5.812402322	0.878532

1832.007	136.0183	1.627845	5.76644329	0.923901	
1832.124	127.4449	0.953024	5.927243109	0.90985	
1832.241	114.7433	0.555123	5.855419499	0.802972	
1832.357	104.3367	0.504554	5.981371395	0.658485	
1832.474	103.134	0.752578	6.396321164	0.631104	
1832.59	110.3222	1.854968	7.545935593	0.671326	
1832.707	103.5544	1.688809	7.307556254	0.617409	
1832.823	90.4552	1.440785	4.825314849	0.376487	
1832.94	80.70951	0.338394	3.814225218	0.214524	
1834	83.37112	0.029819	2.963645009	0.106488	Core 2
1834.116	79.74604	0.029819	3.003108219	0.111481	
1834.233	90.95141	0.029819	4.508574288	0.245633	
1834.349	105.828	0.66577	5.710115804	0.394195	
1834.465	125.642	1.692192	6.066357875	0.506295	
1834.581	169.9397	1.676013	10.38786169	0.59723	
1834.698	210.2188	1.040062	13.59659867	0.674682	
1834.814	217.2209	0.01364	14.01180748	0.681887	
1834.93	194.602	0.633567	11.99611527	0.563605	
1835.046	158.9714	1.099565	9.232115766	0.382662	
1835.163	133.0548	1.557207	7.666556078	0.239599	
1835.279	123.6475	1.394329	7.725615063	0.177487	
1835.395	130.4841	0.940886	9.281481496	0.199045	
1835.511	148.265	1.635094	9.744946659	0.331477	
1835.628	173.2236	1.783399	10.33251911	0.508526	
1835.744	205.1671	1.785965	11.03053065	0.667022	
1835.86	230.6461	0.955791	12.3183471	0.831546	
1835.977	233.52	0.62571	12.57464053	0.879303	
1836.093	215.6496	0.61059	11.84149854	0.830334	
1836.209	191.4731	0.288914	10.73687441	0.658533	
1836.325	173.6475	0	10.26015444	0.549128	
1836.442	161.8694	1.252081	9.323672959	0.409543	
1836.558	151.6868	1.590306	8.50554285	0.353484	
1836.674	143.4132	1.590306	7.478189461	0.387705	
1836.79	143.5682	0.714961	7.543379943	0.499939	
1836.907	155.9114	0.376736	8.506861124	0.642732	
1837.023	176.7936	0.376736	10.01396764	0.709075	
1837.139	193.358	0	11.54022705	0.718986	
1837.255	199.1471	0	12.48045027	0.684178	
1837.372	189.9363	0	11.85450798	0.645139	
1837.488	175.2119	0	10.83313011	0.642814	
1837.604	159.316	0.147167	9.268332213	0.57181	
1837.721	156.5214	0.673769	9.183705181	0.538793	
1837.837	158.4683	0.77918	8.968389325	0.544846	
1837.953	171.3594	0.632013	9.985805646	0.627511	
1838.069	202.1623	0.105411	13.00891101	0.627831	
1838.186	243.5338	0	16.82204854	0.577499	
1838.302	256.4111	0	18.39617656	0.453273	
1838.418	231.48	0	15.83556792	0.349587	
1838.534	201.9521	0.28268	12.91009853	0.254987	
1838.651	204.6433	0.944217	12.19043044	0.243249	
1838.767	230.8563	0.944217	13.41131434	0.366234	

1838.883	249.7915	1.063921	14.77121158	0.421251
1838.999	247.3174	0.478479	15.10807857	0.346325
1839.116	224.9431	0.482755	14.1622405	0.208369
1839.232	198.489	0.080371	13.24635878	0.193408
1839.348	177.848	0.004276	11.69543622	0.291417
1839.465	165.5875	0.273553	11.03831237	0.293354
1839.581	164.8019	0.273553	10.53664488	0.280861
1839.697	190.1189	0.273553	12.28518902	0.277011
1839.813	247.7481	0	15.67631752	0.426284
1839.93	313.837	0	20.41826941	0.483933
1840.046	356.9659	0	24.36065073	0.464446
1840.162	356.9452	0	25.14421728	0.401078
1840.278	321.6695	0	22.6224317	0.461185
1840.395	274.4159	0.002735	18.60552977	0.563668
1840.511	237.7757	0.002735	15.08847563	0.660791
1840.627	213.8267	0.179543	12.78860011	0.619367
1840.743	196.8418	1.029887	11.81460026	0.49154
1840.86	188.458	1.886106	11.8883457	0.314479
1840.976	193.4614	2.139485	12.40540984	0.205752
1841.092	207.8997	2.552229	13.4239479	0.134102
1841.209	217.0486	3.680142	14.1013081	0.089642
1841.325	212.1726	3.644105	14.81941431	0.142213
1841.441	196.6626	2.649074	13.78515722	0.35944
1841.557	179.0059	0.909534	12.7088384	0.491883
1841.674	174.1609	1.466119	11.8136064	0.520597
1841.79	173.1099	1.802825	11.83701809	0.474738
1841.906	165.3084	1.558233	11.79113627	0.425274
1842.022	153.01	0.607498	11.43234163	0.324986
1842.139	150.2602	0	11.65759527	0.235841
1842.255	155.2016	0	11.96724316	0.247036
1842.371	166.9831	0	12.10412753	0.357163
1842.487	179.664	0	12.01211866	0.429037
1842.604	201.0837	0	12.94859943	0.534827
1842.72	220.7012	0	14.41457372	0.645334
1842.836	231.0906	0.015874	15.3868306	0.718371
1842.953	228.327	0.142928	14.92546899	0.672698
1843.069	224.4642	0.91148	14.61503327	0.579227
1843.185	221.3663	1.030644	14.10366007	0.548708
1843.301	215.236	1.026109	12.9833685	0.600816
1843.418	200.1085	0.739479	11.05027782	0.700722
1843.534	188.9128	0.964169	9.833653845	0.805485
1843.65	192.9652	1.202208	10.64721475	0.829746
1843.766	202.2657	0.720285	12.03682228	0.811794
1843.883	208.5544	0.519062	13.4619863	0.758727
1843.999	214.4469	1.309518	14.01092925	0.764128
1844.115	221.387	2.733123	13.58473723	0.79074
1844.231	213.458	2.574619	12.31915935	0.76476
1844.348	181.356	1.423605	10.57239648	0.638448
1844.464	130.4945	0	8.109257013	0.492348
1844.58	81.74879	0	5.22535906	0.358309
1844.697	46.43866	0	2.947837116	0.233541
1844.813	27.64128	0	1.931646927	0.112392

1844.929	25.94245	0	2.027295185	0.076226
1845.045	44.05755	0	3.17128322	0.17265
1845.162	77.85493	0	4.7888553	0.414038
1845.278	111.7833	0.324228	6.334319614	0.62923
1845.394	133.4304	0.929548	6.92461481	0.776212
1845.51	148.0307	2.255288	7.407503144	0.80742
1845.627	167.1623	2.49108	8.553891353	0.806442
1845.743	183.4028	2.100124	9.775084744	0.825168
1845.859	183.2684	0.813074	10.73237017	0.727072
1845.975	174.3194	0.34594	11.32833056	0.575002
1846.092	174.6709	0.131577	12.17059502	0.47545
1846.208	190.7391	0.092886	13.41903376	0.509964
1846.324	200.9183	0	13.73441243	0.597518
1846.441	187.1864	0	12.72768322	0.6073
1846.557	161.9245	0	10.77303814	0.552173
1846.673	146.3697	0.139716	9.388644336	0.461518
1846.789	150.5186	0.229993	9.926926219	0.38469
1846.906	165.1292	1.248323	10.58065512	0.383727
1847.022	177.3553	2.836061	11.25786067	0.437242
1847.138	180.205	3.967967	10.55171858	0.483171
1847.254	177.4655	3.680328	10.17702331	0.490732
1847.371	171.001	2.417128	9.696948741	0.540011
1847.487	168.1754	1.628581	9.900777901	0.496507
1847.603	168.8025	1.94901	10.39803083	0.379227
1847.719	180.7736	3.551165	10.56868978	0.309328
1847.836	196.9073	4.386424	10.58935309	0.4667
1847.952	205.4394	3.887028	10.34265036	0.658858
1848.068	203.1685	2.972208	10.953273	0.632593
1848.185	195.8356	3.002251	11.33865425	0.500303
1848.301	191.0389	2.991677	11.88215078	0.440354
1848.417	185.9218	1.840088	11.71168538	0.502398
1848.533	180.3532	0.541151	11.69484328	0.510153
1848.65	177.8136	0.173559	11.6384815	0.474083
1848.766	175.4152	0.481986	12.15431951	0.403839
1848.882	171.3904	0.481986	11.78660649	0.425699
1848.998	162.1451	0.600833	10.25971502	0.452712
1849.115	155.7047	0.781387	8.4507307	0.471751
1849.231	154.4331	0.781387	7.873122495	0.40521
1849.347	155.1292	0.488981	8.162559167	0.34366
1849.463	158.5786	0	8.473239627	0.324226
1849.58	162.7998	0.303658	8.99866742	0.368411
1849.696	171.5765	1.039041	10.47864401	0.380458
1849.812	181.101	1.855658	11.60804743	0.439626
1849.929	181.8143	2.075148	11.03961584	0.493007
1850.045	176.0493	2.184043	9.495881546	0.49398
1850.161	169.44	1.526315	9.362649948	0.441567
1850.277	170.8184	1.003167	10.45045689	0.414163
1850.394	173.1272	0.158889	11.78140594	0.46462
1850.51	165.7633	0	11.11577738	0.525316
1850.626	152.0417	0.568498	9.641917278	0.506328
1850.742	137.4345	1.253989	7.809455596	0.437095
1850.859	128.6613	2.220243	6.923967106	0.356777

1850.975	124.1023	2.183857	6.76882023	0.266949	
1851.091	121.287	1.498366	6.88240863	0.234841	
1851.207	110.8666	0.532112	6.549620544	0.200613	
1851.324	99.24294	0	5.949873598	0.185172	
1851.44	106.8163	0	6.631155031	0.112819	
1851.6	139.835	0.323068	7.937161584	0.348544	Core 3
1851.718	147.7851	0.364032	8.565573682	0.351713	
1851.836	158.1203	1.079581	9.414455694	0.376153	
1851.955	159.7261	1.297468	10.15932912	0.349667	
1852.073	156.6041	1.567715	9.799798441	0.337125	
1852.191	155.7839	1.343156	8.687676548	0.366618	
1852.309	157.7963	0.983883	8.302062813	0.416644	
1852.427	164.7364	0.564982	9.285367669	0.46451	
1852.546	177.4621	0	11.47424923	0.466578	
1852.664	192.6585	0	13.25743394	0.395631	
1852.782	203.0341	0	13.91058266	0.360337	
1852.9	203.5924	0	13.80272483	0.377113	
1853.018	199.981	0	12.75198509	0.433617	
1853.137	195.8873	0.21208	11.59556809	0.407131	
1853.255	192.7033	0.788659	10.65187229	0.354364	
1853.373	188.2271	1.017861	10.0992634	0.360934	
1853.491	199.6192	1.22022	10.79046022	0.487059	
1853.609	237.3863	3.149528	12.59164902	0.6363	
1853.728	291.9935	5.007465	15.8311919	0.700799	
1853.846	325.0569	5.04278	17.85990571	0.679995	
1853.964	312.4173	2.536893	18.04152398	0.667444	
1854.082	287.1416	0.472037	17.46849836	0.654707	
1854.2	261.0286	0.183846	15.64056809	0.744328	
1854.319	245.9976	0.704902	13.20186033	0.866498	
1854.437	230.1568	1.507656	10.61581471	1.085535	
1854.555	224.9259	1.615343	11.34618186	1.144136	
1854.673	228.1926	1.243496	13.05635596	1.186606	
1854.791	224.2023	1.061311	13.34214028	1.250724	
1854.91	198.9094	0.852038	10.55029032	1.226622	
1855.028	148.4373	0.702829	6.926602942	0.901479	
1855.146	98.62681	0.059978	4.265466308	0.447965	
1855.264	88.10992	0.851459	3.485822384	0.340873	
1855.382	124.9604	2.825943	4.857696626	0.574293	
1855.5	174.4779	4.535649	7.09719664	0.880829	
1855.619	203.1099	5.11009	9.525347428	0.958577	
1855.737	210.9941	3.935181	11.10764604	0.937224	
1855.855	207.6826	2.225475	12.15646333	0.889585	
1855.973	199.8329	1.019985	12.12995423	0.877743	
1856.091	190.5634	0.645092	10.97099537	0.88526	
1856.21	185.1809	1.746871	9.297539358	0.852234	
1856.328	182.5861	1.526461	8.658213465	0.852724	
1856.446	180.205	1.101779	8.694209175	0.822333	
1856.564	181.611	0.986381	9.327895295	0.856039	
1856.682	183.2857	2.748217	9.019163335	0.876825	
1856.801	186.9831	4.77938	9.030971686	0.856124	
1856.919	189.7467	5.124696	9.368974211	0.815541	

1857.037	192.5448	3.362859	10.49664924	0.817823
1857.155	185.9287	1.331696	10.67555743	0.823551
1857.273	163.5372	0	10.0098257	0.727584
1857.392	140.3773	0	9.222489822	0.55457
1857.51	131.3801	0.085633	9.114785927	0.439576
1857.628	135.6289	0.947424	9.098484585	0.449438
1857.746	145.5806	1.600908	8.536905729	0.499824
1857.864	156.2905	2.455207	8.050712743	0.54635
1857.983	169.7123	1.988322	8.049151577	0.620979
1858.101	173.2064	2.444598	7.471427652	0.742532
1858.219	164.4986	1.669201	6.763892416	0.787121
1858.337	155.3911	1.274296	5.957753185	0.873575
1858.455	155.398	0.616334	6.034648841	0.808446
1858.574	158.358	0.946698	6.303615472	0.731256
1858.692	154.0024	1.522866	6.613920554	0.590258
1858.81	150.6427	1.678449	6.747952447	0.621469
1858.928	158.0617	2.368188	7.071642473	0.74981
1859.046	174.8777	3.404271	7.067912696	0.87862
1859.165	189.5951	3.581305	7.533184679	0.949003
1859.283	196.4835	2.774542	7.630989298	1.053826
1859.401	198.4786	1.358342	7.960023488	1.216339
1859.519	199.0024	0.754093	8.593619516	1.264975
1859.637	197.4518	0.47368	10.03940772	1.187469
1859.756	190.3601	0.27763	11.14697358	1.056492
1859.874	181.3766	0.107016	10.36610423	1.021678
1859.992	174.2505	0.009551	8.724798517	1.033888
1860.11	170.5496	0.707869	6.970768742	1.031855
1860.228	167.7171	2.521871	5.908154468	1.032824
1860.347	167.3312	4.062619	5.992960973	1.002185
1860.465	172.6034	4.639474	6.882320208	0.983298
1860.583	181.1044	3.172349	8.177776598	0.952032
1860.701	190.5117	2.221036	8.876201108	1.013345
1860.819	199.4228	1.483564	10.31977003	1.037174
1860.938	204.2677	1.127136	12.05900896	1.021594
1861.056	203.3305	0.5377	12.63552013	0.96053
1861.174	198.1375	0.43604	11.29192373	0.953548
1861.292	193.4269	0.939728	10.5452299	0.928385
1861.41	195.7667	1.233128	11.17042306	0.883576
1861.529	202.6447	0.82094	12.25296397	0.852652
1861.647	211.7488	0.627211	12.78465165	0.8713
1861.765	219.9397	0.985865	12.56146316	0.899188
1861.883	227.9859	2.301301	11.9196327	0.86452
1862.001	234.9707	3.412181	11.67014062	0.827127
1862.12	243.4373	3.497045	12.52460147	0.81665
1862.238	249.6813	3.306429	13.89652718	0.795432
1862.356	248.6509	2.893408	13.648417	0.838758
1862.474	236.3939	2.290852	12.48063015	0.803904
1862.592	224.2781	1.48888	11.37216082	0.79942
1862.71	221.8349	2.817908	10.85198518	0.794645
1862.829	220.2016	4.316874	10.28978692	0.870168
1862.947	212.7447	4.062156	10.71831478	0.920889
1863.065	212.8618	1.72531	12.90878427	0.892341

1863.183	227.662	0.130837	15.18891312	0.842167
1863.301	249.826	0.647189	16.44783111	0.829492
1863.42	261.7626	2.292243	15.9276808	0.80114
1863.538	263.7853	3.758826	15.77036531	0.765492
1863.656	262.0658	4.098706	16.3188435	0.698055
1863.774	259.409	3.198256	16.35069677	0.74407
1863.892	262.0382	2.327723	16.11790695	0.886493
1864.011	269.5744	1.959101	16.09444409	1.037403
1864.129	272.6999	1.409669	16.53395518	1.054307
1864.247	259.5951	1.373595	16.09863863	0.981432
1864.365	229.7708	1.482706	14.08432741	0.818382
1864.483	194.4228	1.862751	11.48281861	0.657744
1864.602	171.7453	2.071065	9.901784635	0.547352
1864.72	167.9549	2.213634	9.914123005	0.55024
1864.838	178.3098	2.922482	10.72679373	0.702325
1864.956	188.899	2.70326	11.59067685	0.824349
1865.074	190.8666	1.871989	11.2208992	0.84957
1865.193	185.6909	0.587924	10.55391529	0.781869
1865.311	177.7963	0.413716	9.755777292	0.738296
1865.429	174.7054	2.294047	9.090095932	0.744762
1865.547	179.1058	3.63107	9.54561011	0.776685
1865.665	186.0837	3.656414	10.66450803	0.781133
1865.784	191.2939	1.788207	12.41142674	0.785369
1865.902	189.9363	0.575297	12.56050759	0.743293
1866.02	189.5882	0.314508	11.15315399	0.691435
1866.138	201.9211	1.22611	10.57776548	0.70694
1866.256	225.6668	2.06245	11.31623776	0.825972
1866.375	243.6027	3.398924	12.82445377	0.91644
1866.493	239.347	3.804979	13.23061425	0.845118
1866.611	220.1465	3.518184	13.12069066	0.648079
1866.729	203.3959	2.674552	13.22315324	0.460902
1866.847	190.7943	1.729057	12.04988147	0.45396
1866.966	176.6316	1.055398	10.11210616	0.560576
1867.084	160.1292	0.536197	7.645237124	0.634977
1867.202	150.4669	1.274998	6.306635046	0.608718
1867.32	153.203	1.996938	6.650019023	0.533147
1867.438	162.879	2.427165	7.930025745	0.477182
1867.557	166.5145	1.329849	9.106602374	0.49808
1867.675	164.1782	0.607908	10.08981693	0.469186
1867.793	162.5551	0.172347	10.49106052	0.413999
1867.911	166.0734	0.547328	10.52941811	0.471159
1868.029	169.2574	0.669034	10.33711435	0.550542
1868.148	164.4125	0.522457	9.911374922	0.603885
1868.266	157.4931	0.121707	9.731422501	0.524781
1868.384	155.7012	0.452396	9.31750459	0.487739
1868.502	161.2009	0.500772	9.465294756	0.567191
1868.62	166.2491	0.500772	10.15779513	0.65169
1868.739	166.8866	0.048376	10.44225056	0.78101
1868.857	168.3856	0.75125	10.24197049	0.783461
1868.975	177.338	1.003246	9.822554274	0.752325
1869.093	189.7984	2.089846	10.4258059	0.568191
1869.211	198.8611	1.338595	11.86714175	0.487968

1869.33	203.7819	1.0866	13.49408317	0.47466	
1869.448	205.3808	0.716606	13.9259541	0.595662	
1869.566	203.0858	1.443489	12.97432203	0.77326	
1869.684	197.6999	2.207378	11.41596462	0.830239	
1869.802	192.4276	2.24207	10.34776246	0.794147	
1869.92	192.2932	1.672093	10.42095417	0.776355	
1870.039	197.1657	1.349029	11.25458462	0.809959	
1870.157	207.5138	1.608767	11.78654349	0.909301	
1870.275	220.1912	2.682813	12.06260872	0.933388	
1870.393	224.1127	3.59576	11.83731617	0.932413	
1870.511	211.6144	3.76246	10.92223403	0.862454	
1870.63	187.1141	3.25884	9.892272902	0.704853	
1870.748	165.8804	1.905068	9.687720957	0.52514	
1870.866	169.1609	0.727332	11.65771111	0.380715	
1870.984	190.2912	0.277704	14.07127779	0.363312	
1871.102	212.6378	0.417616	15.02029049	0.464136	
1871.221	214.509	0.417616	14.02157631	0.549279	
1871.339	208.2994	0.139912	12.97028172	0.547874	
1871.457	208.4511	0	13.85881512	0.482076	
1871.575	222.6723	0	16.54911852	0.484058	
1871.693	242.8205	0.313372	18.14081264	0.551194	
1871.812	259.509	0.41792	18.14543343	0.661323	
1871.93	268.4338	0.41792	17.28719121	0.722279	
1872.048	265.1258	0.104548	16.96707674	0.746485	
1872.166	249.4986	0.768972	15.99896252	0.688733	
1872.284	224.0196	1.562796	14.17340545	0.545249	
1872.403	196.5455	2.23603	11.99622998	0.491302	
1872.521	180.2223	1.789402	11.17256357	0.476515	
1872.639	177.1899	0.995578	11.68456955	0.503904	
1872.757	179.6296	0.322344	12.77121491	0.431939	
1872.875	174.7123	0	13.4505762	0.351371	
1872.994	148.8818	0	12.33548041	0.32995	
1873.112	136.4318	0	11.85633925	0.213476	
1873.23	115.296	0	10.41984015	0.114404	
1938	155.3963	4.022947	8.593341722	0.41916	Core 4
1938.114	180.8129	3.029089	9.535587382	0.485151	
1938.228	207.0038	1.284576	12.1951687	0.657533	
1938.341	219.5227	0.347125	12.66872721	0.734384	
1938.455	199.2988	0	11.14499749	0.644364	
1938.569	177.3656	0.014241	10.1224184	0.473563	
1938.683	178.2167	0.41732	9.929778693	0.463606	
1938.797	179.154	0.63821	9.988992737	0.486901	
1938.91	165.9149	0.83586	9.439533146	0.479917	
1939.024	160.7426	0.832567	10.19265367	0.427675	
1939.138	183.3201	1.740098	11.08613043	0.539341	
1939.252	222.9101	2.843505	12.65372892	0.760517	
1939.365	252.2484	3.570494	14.30563115	0.913581	
1939.479	264.7019	2.652633	15.71969673	1.024529	
1939.593	268.2167	1.512257	15.74135461	1.186639	
1939.707	276.7385	0.570469	15.02088786	1.355384	
1939.821	293.5613	0.359909	15.95238676	1.376972	

1939.934	303.8267	0.184986	17.51953253	1.238448
1940.048	295.1844	0.092252	17.50604525	1.179211
1940.162	274.2195	0.188455	16.14009527	1.255573
1940.276	255.3084	0.689663	14.3519289	1.334009
1940.39	232.7274	0.955968	13.10187648	1.170307
1940.503	190.9976	1.013118	10.77587786	0.884156
1940.617	149.6365	0.51191	8.7035013	0.662469
1940.731	137.2416	1.91692	7.147376755	0.73181
1940.845	158.0307	3.752424	7.166710462	0.92059
1940.959	182.1416	4.196482	8.525033161	1.028229
1941.072	186.4938	2.432915	10.11426244	0.942843
1941.186	179.285	0.444058	10.93976222	0.847903
1941.3	176.3112	0.560706	10.48108536	0.807529
1941.414	177.8515	1.182933	9.896288174	0.804229
1941.527	175.1844	1.211264	9.633257428	0.720958
1941.641	165.9597	0.899879	9.172606027	0.669014
1941.755	148.1651	0.566699	8.170625995	0.589043
1941.869	124.3091	0.538368	7.059058535	0.493063
1941.983	100.6461	0.289046	6.044236661	0.338936
1942.096	102.3828	0	5.811897807	0.34881
1942.21	137.8618	0.76103	6.931299402	0.516217
1942.324	183.2753	2.186785	8.129971408	0.785948
1942.438	211.1182	4.12765	8.457417171	1.036974
1942.552	221.9969	5.3288	9.02481661	1.197604
1942.665	238.3374	4.445173	11.74978703	1.326088
1942.779	272.3518	2.626846	16.59251153	1.28769
1942.893	312.1313	1.886556	20.31247839	1.17298
1943.007	339.1299	2.282743	21.9274416	1.00537
1943.121	345.1154	2.589797	21.84778336	0.884961
1943.234	336.3904	1.786813	21.64986546	0.825376
1943.348	322.4104	0.85471	21.29863397	0.807513
1943.462	310.1844	0.997949	20.83817634	0.839404
1943.576	302.8411	1.283617	20.77527102	0.851658
1943.689	300.0603	1.912819	20.96294102	0.82352
1943.803	299.1368	2.450206	20.69932959	0.763815
1943.917	298.5028	2.007669	19.31509156	0.792362
1944.031	298.0548	1.372254	17.89376099	0.815386
1944.145	297.5827	0.262037	18.16582646	0.863487
1944.258	290.8632	0	18.4915042	0.933713
1944.372	276.9693	0	18.30924191	1.028771
1944.486	255.7391	0.325755	16.38474603	1.054988
1944.6	228.4028	0.325755	14.67577181	0.872126
1944.714	208.551	0.325755	13.79665914	0.669868
1944.827	206.3801	0.151162	13.99657721	0.567859
1944.941	220.3808	0.385948	14.15604763	0.676906
1945.055	232.9928	0.774487	14.02232586	0.816509
1945.169	237.4552	1.353291	13.80846862	0.866343
1945.283	238.0927	2.327243	13.93146498	0.819246
1945.396	239.9431	2.300812	14.4410049	0.718214
1945.51	237.755	1.580786	14.99261972	0.649011
1945.624	228.3511	0.751604	15.09411448	0.501109
1945.738	207.245	0.534167	13.66853687	0.376288

1945.851	172.7963	0.524229	11.08473616	0.320824
1945.965	135.877	0.144671	8.912246946	0.419448
1946.079	111.3077	0	7.437820455	0.571518
1946.193	104.5193	0	6.948737202	0.666184
1946.307	103.93	0.353362	6.426548297	0.65141
1946.42	104.7433	1.964906	5.922672569	0.569184
1946.534	114.4194	3.892255	5.864296319	0.547217
1946.648	132.5517	4.653236	7.078378151	0.626043
1946.762	153.4786	4.890952	8.590144169	0.800944
1946.876	164.3608	5.286292	9.292491724	0.875178
1946.989	167.0589	5.224866	9.452000653	0.890963
1947.103	165.2774	4.842479	9.186518145	0.826763
1947.217	164.6502	3.990283	8.42940982	0.857436
1947.331	166.0665	3.711312	7.406289888	0.925806
1947.445	168.0238	3.300136	7.578279369	0.949984
1947.558	169.8742	2.030541	9.602463195	0.837914
1947.672	172.0107	1.256595	10.40547988	0.809027
1947.786	172.4139	0.200899	10.2815155	0.803708
1947.9	167.3759	0	9.457268397	0.812486
1948.013	157.0451	0	9.022300261	0.725472
1948.127	152.3415	0.270192	8.561971435	0.740862
1948.241	153.5648	0.270192	8.728643511	0.77488
1948.355	160.3567	0.447622	9.170954769	0.758573
1948.469	164.8398	0.784925	10.08730083	0.662992
1948.582	163.5682	0.784925	9.888014614	0.636385
1948.696	155.7874	0.607495	9.68534754	0.666554
1948.81	157.8032	0.0712	9.616209096	0.748357
1948.924	180.2877	0.408438	11.16650001	0.870654
1949.038	213.6888	0.408438	13.83734081	0.941635
1949.151	235.3498	0.337238	15.73416571	1.008602
1949.265	240.3532	0	15.34697723	1.019559
1949.379	241.3663	0.052632	14.3163584	1.072047
1949.493	243.9197	0.187265	13.85104792	1.094926
1949.607	248.0789	0.434237	14.08450943	1.039492
1949.72	246.735	0.769195	14.51075212	0.965726
1949.834	239.0196	0.634561	14.62045548	0.88533
1949.948	221.8177	0.38759	13.81955602	0.873396
1950.062	214.95	0	13.12235857	0.899086
1950.175	222.2381	0	13.23483718	0.99244
1950.289	245.3084	1.028617	14.33795081	1.191715
1950.403	264.2264	2.811319	14.86073278	1.320722
1950.517	260.3739	3.701051	14.36692455	1.264389
1950.631	236.0355	3.026039	13.25651826	1.029588
1950.744	221.959	2.400819	12.72058425	0.896889
1950.858	229.1196	2.215886	13.26919216	0.938435
1950.972	242.8653	2.540846	13.60636927	1.034323
1951.086	236.6041	3.086309	13.09708675	1.010661
1951.2	216.673	3.444662	12.08818852	0.891243
1951.313	205.8735	3.341916	12.37302994	0.787677
1951.427	199.9845	2.194106	12.95767207	0.70557
1951.541	190.2533	1.295542	12.18615982	0.61123
1951.655	182.4724	0.719723	11.64767078	0.582216

1951.769	187.1313	0.164588	11.22622957	0.678355
1951.882	205.6633	0	11.90032596	0.811442
1951.996	222.6826	0.487956	11.81217588	0.829695
1952.11	237.1933	1.556861	12.564715	0.767224
1952.224	249.4504	3.363761	13.64974589	0.773555
1952.337	256.5214	3.260255	14.89546117	0.804342
1952.451	249.316	2.275036	14.24794028	0.851023
1952.565	229.6675	1.593183	13.32840579	0.778348
1952.679	211.5765	2.573397	12.62804566	0.795586
1952.793	209.7261	3.178278	13.39296278	0.859918
1952.906	217.8205	2.109694	15.11040349	0.927695
1953.02	213.489	1.081031	14.93854332	0.829119
1953.134	201.866	0.392464	13.82298805	0.711571
1953.248	193.8853	0.336	12.02733597	0.70444
1953.362	195.4049	0.093951	12.36746881	0.794629
1953.475	189.8294	0.234016	12.41886159	0.826399
1953.589	174.764	0.632579	11.57833899	0.763565
1953.703	159.2298	1.362395	9.872643292	0.734029
1953.817	148.8784	2.113992	9.110991098	0.709327
1953.931	145.9321	1.71543	9.331121098	0.713857
1954.044	145.5255	0.891663	9.107352419	0.707414
1954.158	140.1499	0.29028	8.184617255	0.661652
1954.272	134.1437	0.528352	7.305504996	0.642776
1954.386	133.3339	1.048202	6.980575667	0.622603
1954.499	143.7819	0.757922	8.163566527	0.669577
1954.613	154.9983	0.51985	9.820889428	0.728187
1954.727	159.5882	0.292001	10.1250526	0.858984
1954.841	155.174	0.565283	8.520788252	0.981768
1954.955	146.6764	0.599532	6.483156773	1.158514
1955.068	137.7516	0.435949	5.892230136	1.32353
1955.182	122.4655	0.162667	6.154266607	1.252476
1955.296	96.01482	0.128419	5.737844008	0.847306
1955.41	64.40903	0	4.625190843	0.326877
1955.524	39.52619	0.027036	3.099278506	0.045069
1955.637	28.60269	0.902687	1.583665862	0
1955.751	29.22984	1.380675	1.237144542	0.019729
1955.865	44.32633	1.353639	2.171367322	0.177318
1955.979	81.26637	1.109302	4.08311321	0.524159
1956.093	128.4545	2.221445	5.998124032	0.940734
1956.206	156.9418	2.477764	7.029285249	1.049633
1956.32	150.2085	1.84645	6.506683468	0.890765
1956.434	115.5289	0.256319	4.803155966	0.623666
1956.548	76.24225	0.559067	2.729914354	0.414536
1956.661	45.75637	0.942682	1.866172497	0.226563
1956.775	30.47726	0.967859	1.58433685	0.057358
1956.889	28.09614	0.408792	2.020620793	0
1957.003	29.1816	0.02917	1.737443796	0
1957.117	27.0417	0.003993	1.945751355	0
1957.23	21.9969	0.003993	1.672783542	0
1957.344	17.06926	0	1.373500398	0
1957.458	14.14714	0	0.684278903	0
1957.572	13.54755	0	0.474422636	0

1957.686	14.21261	0	0.682523254	0
1957.799	16.24225	0	1.343751193	0
1957.913	20.01895	0	1.768445388	0
1958.027	22.64128	0.445196	1.843211146	0
1958.141	22.61371	0.445196	1.718007246	0
1958.255	19.96726	0.445196	1.420401405	0
1958.368	18.35114	0	1.216224335	0
1958.482	18.77498	0	1.116226483	0
1958.596	19.7674	0	1.368325175	0
1958.71	20.06375	0	1.482584563	0
1958.823	20.40489	0	1.425551294	0
1958.937	21.93832	0	1.888873857	0
1959.051	23.30979	0	2.496489378	0
1959.165	22.88939	0	2.608606704	0
1959.279	20.9459	0	1.789496325	0.00053
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1959.506	19.2264	0.045892	1.1715559	0.013061
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Weatherford
LABORATORIES

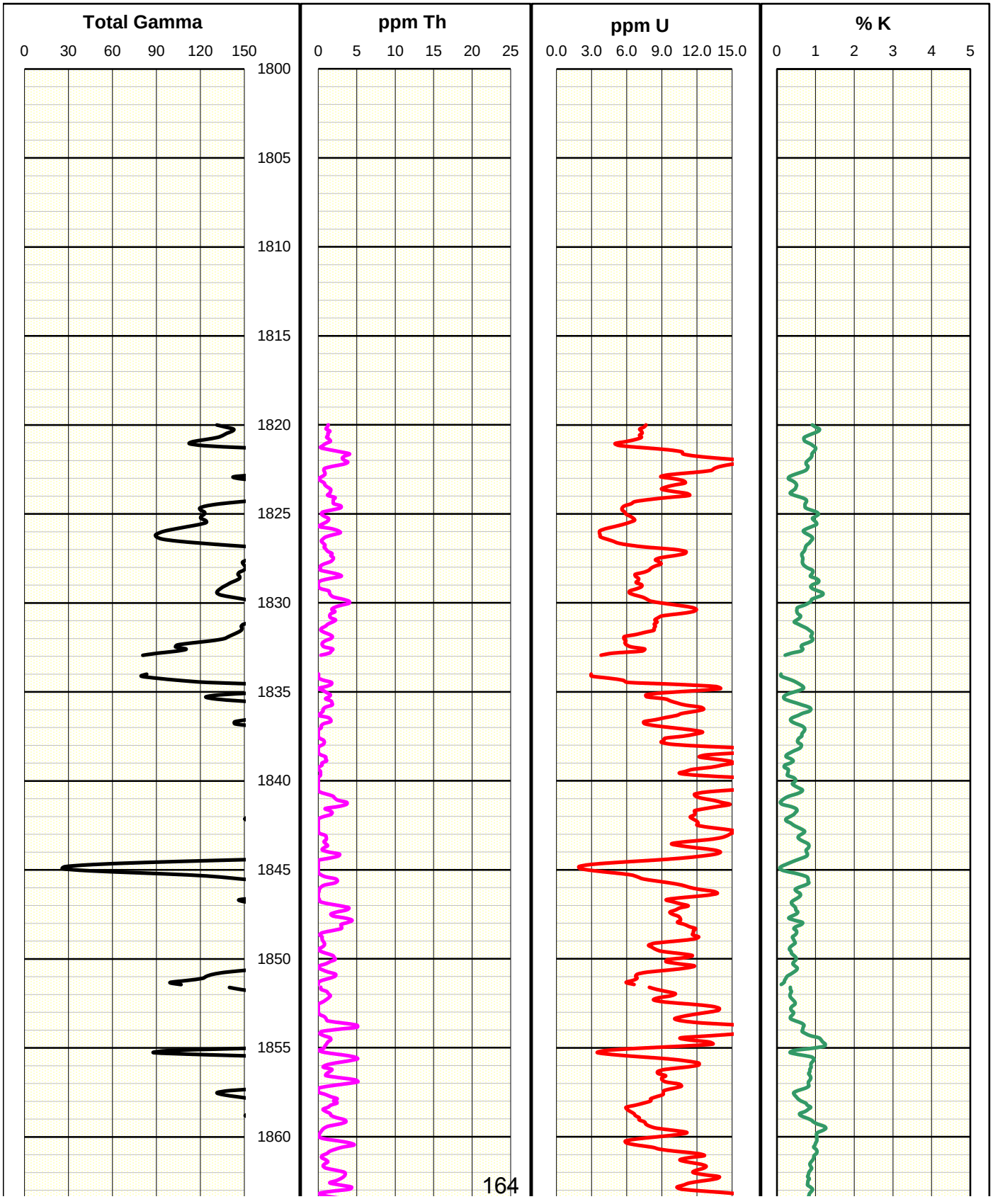
SPECTRAL GAMMA RAY LOG PLOT

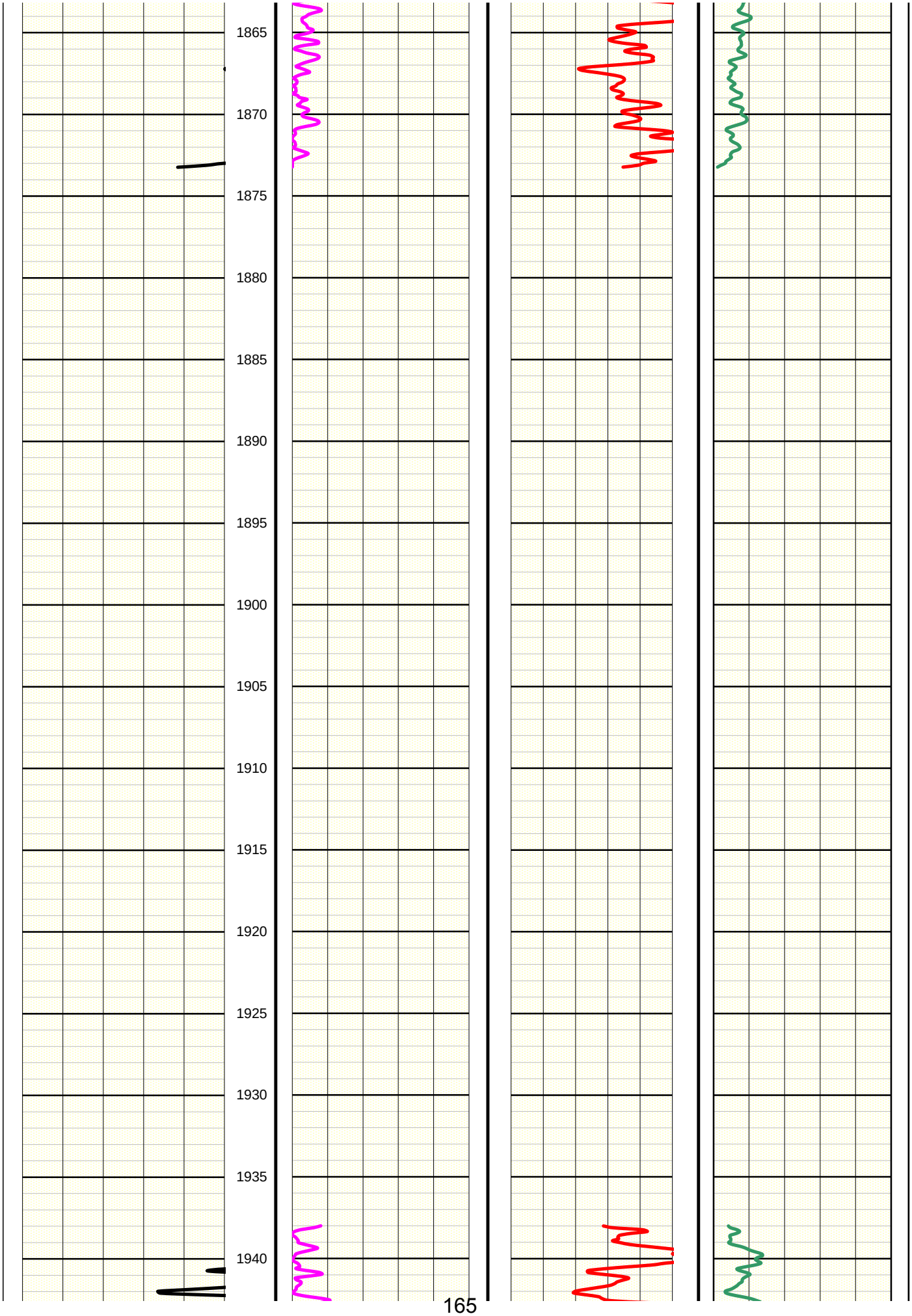
VERTICAL SCALE 10 cm:24 m

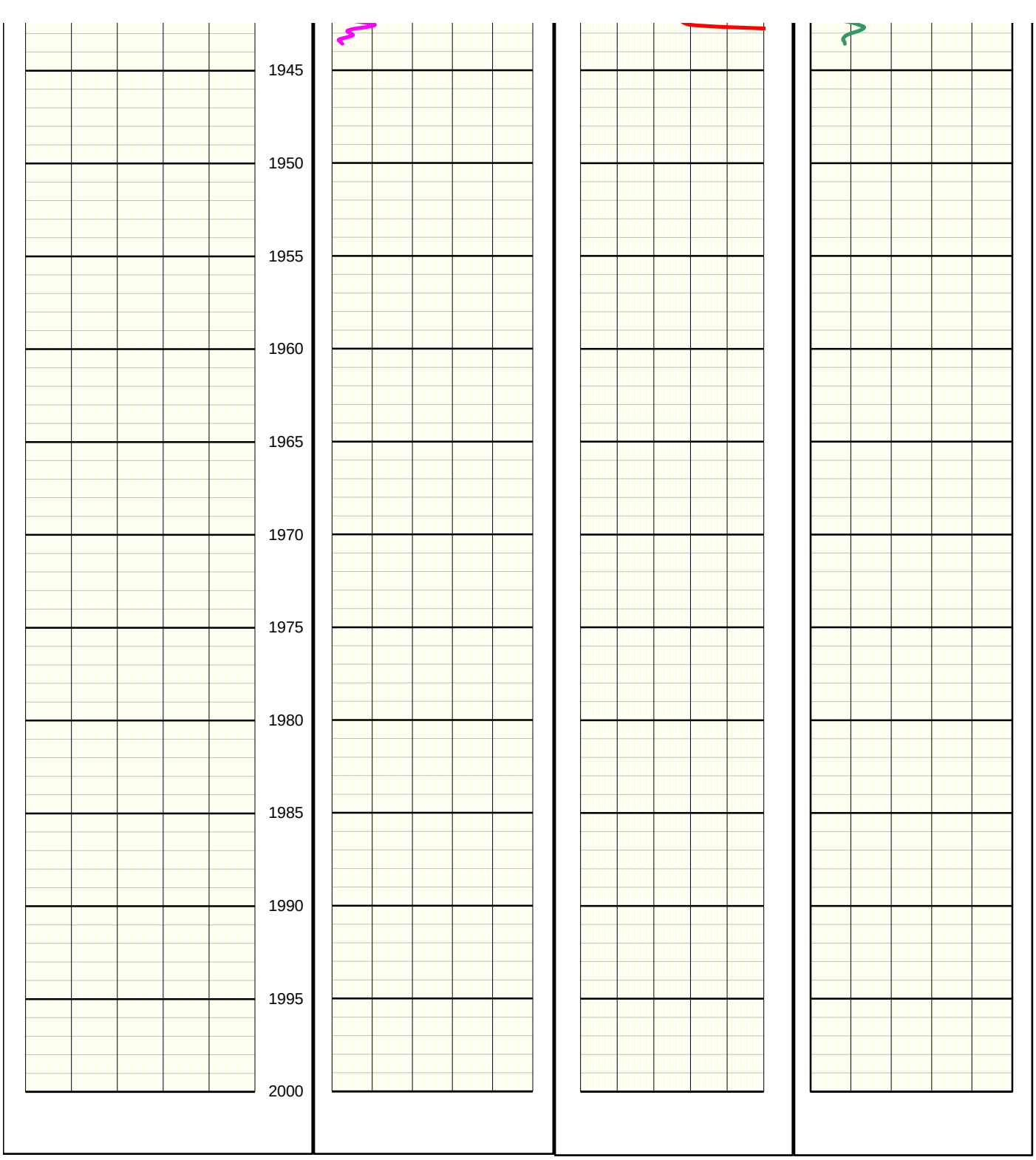
MGM Energy Corporation
MGM Shell East MacKay I-78
East Mackay

Northwest Territories
File: CL-61558
Date: 2-22-13

Core 1 - 4




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Weatherford
LABORATORIES

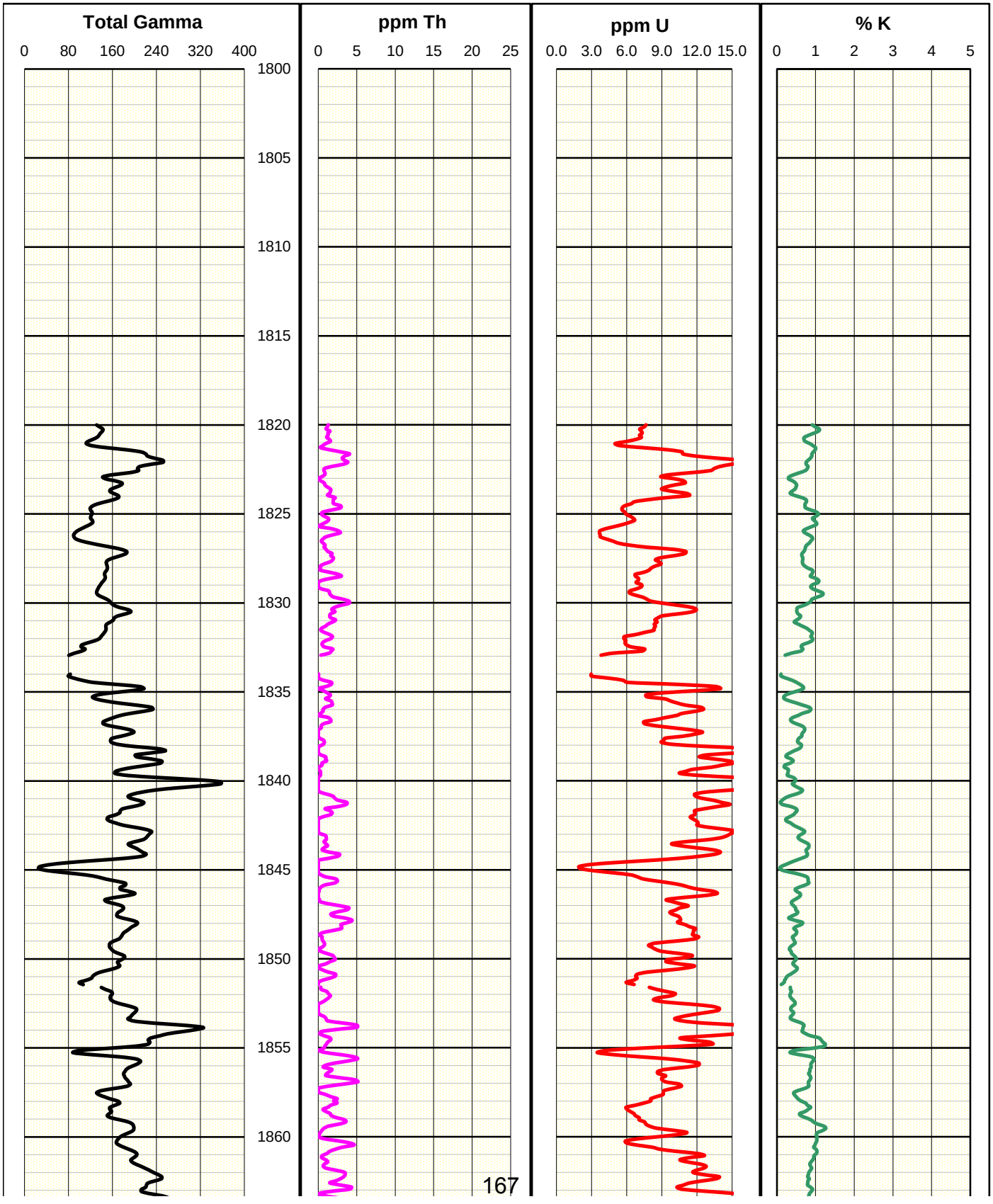
SPECTRAL GAMMA RAY LOG PLOT

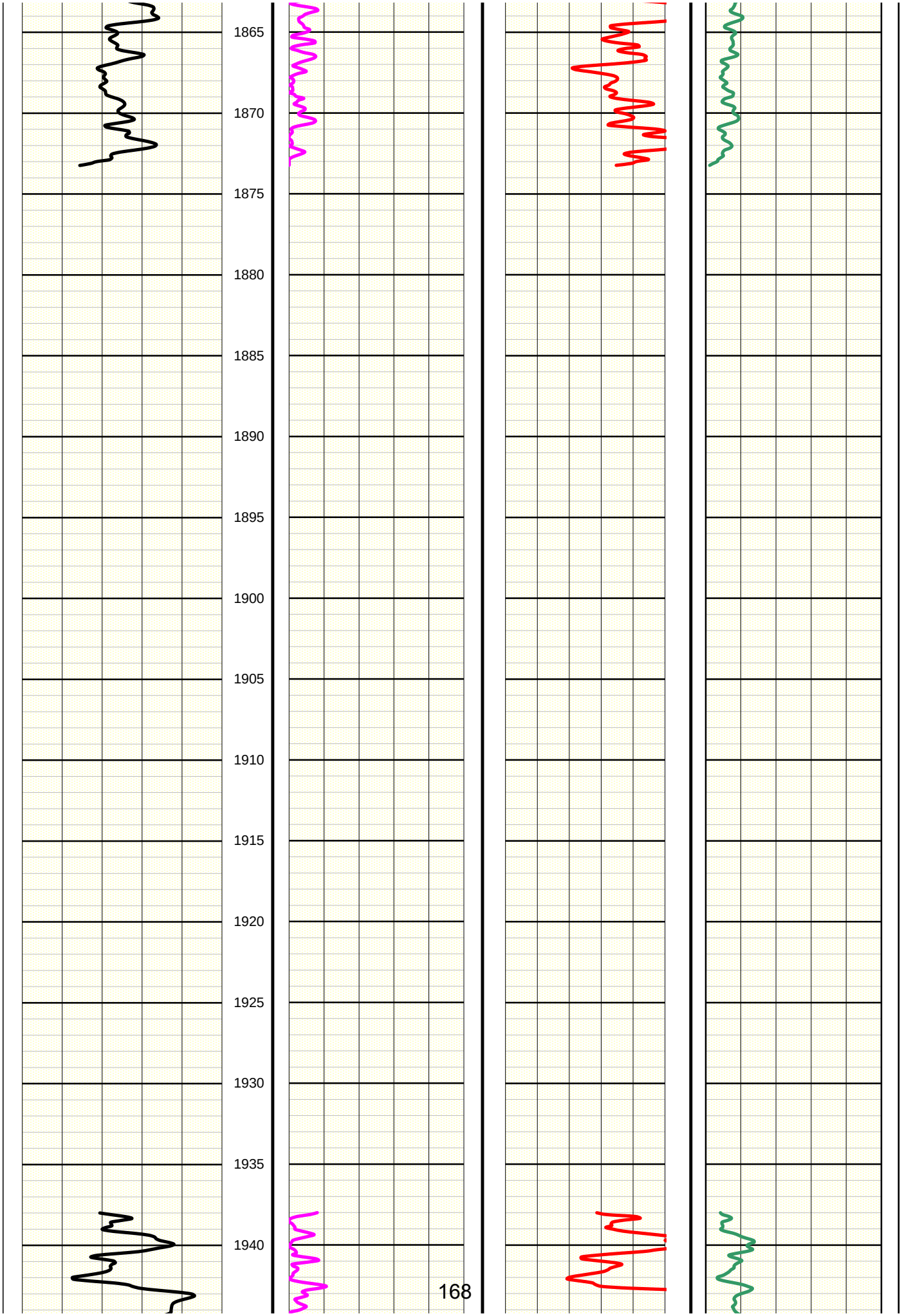
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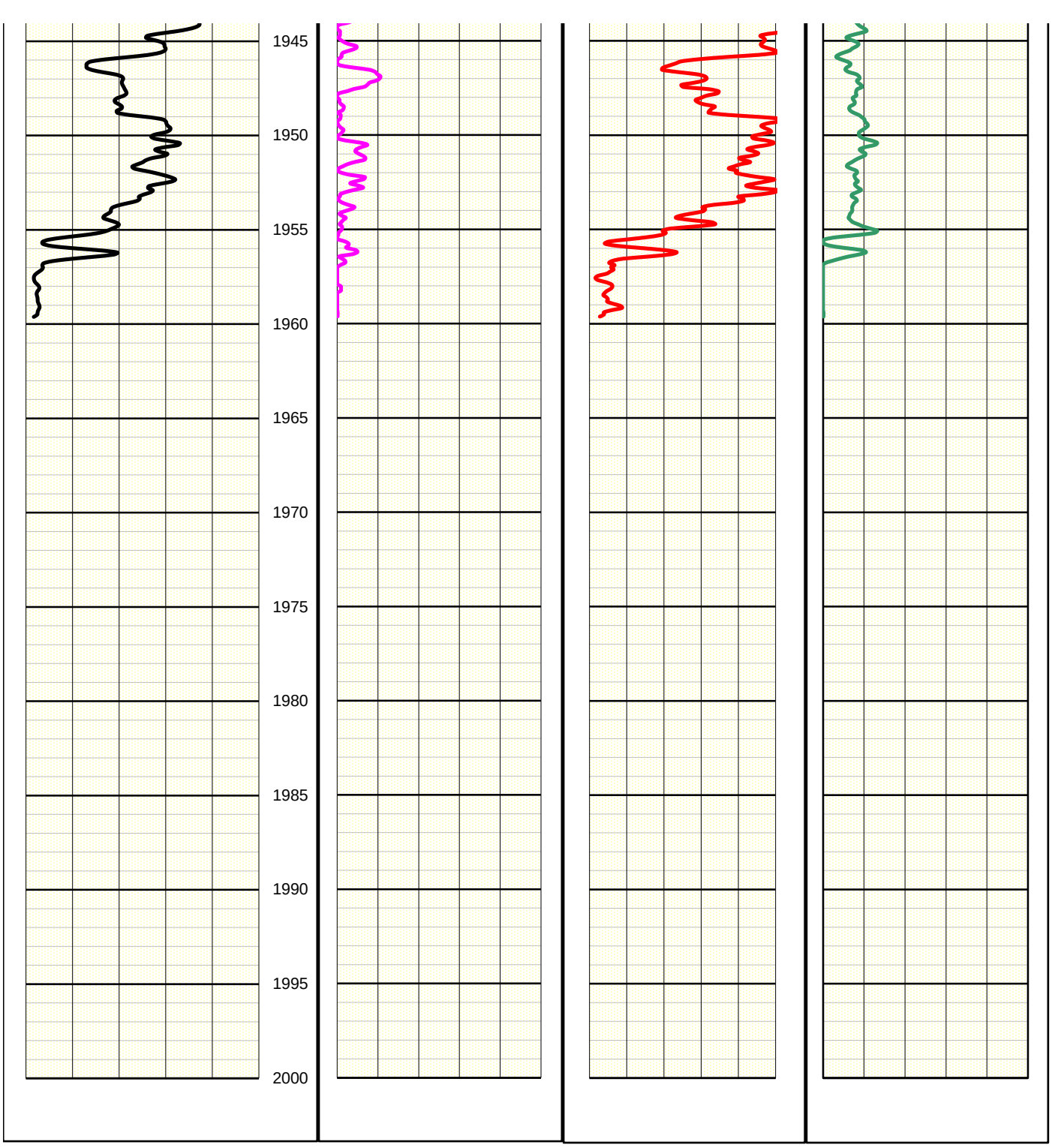
MGM Energy Corporation
MGM Shell East MacKay I-78
East Mackay

Northwest Territories
File: CL-61558
Date: 2-22-13

Core 1 - 4



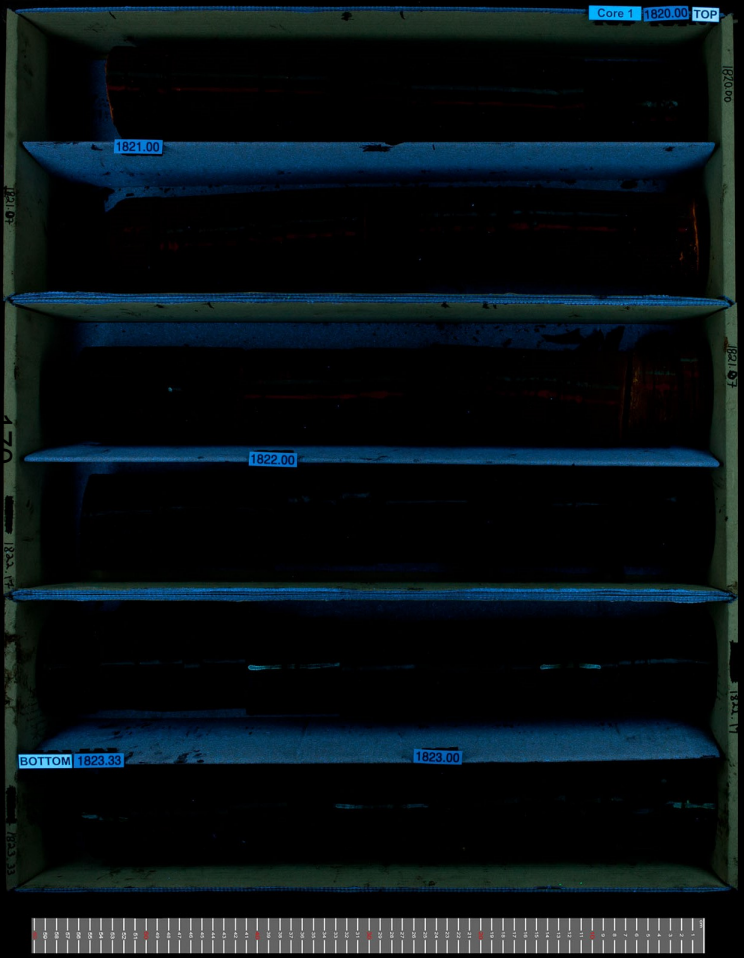

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Weatherford LABORATORIES

MGM Energy Corporation
Well: MGM Shell East MacKay I-78
UWI: 300/I-78-6450-12530/0
Formation: UPPER CANOL
Field: EAST MACKAY

February 28, 2013
CL-61558



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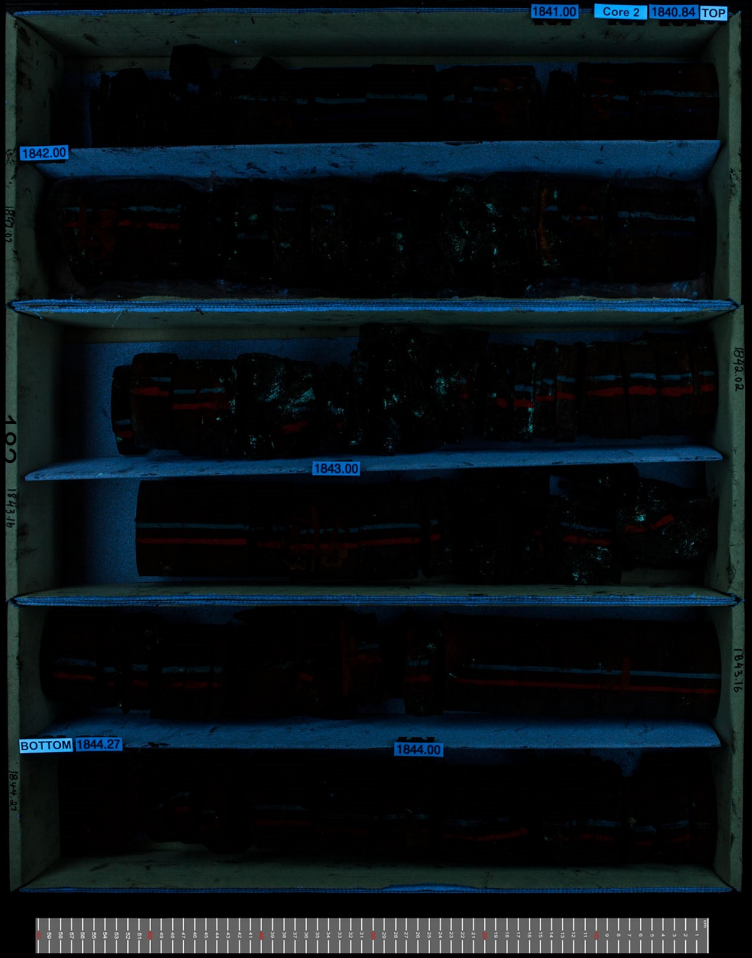
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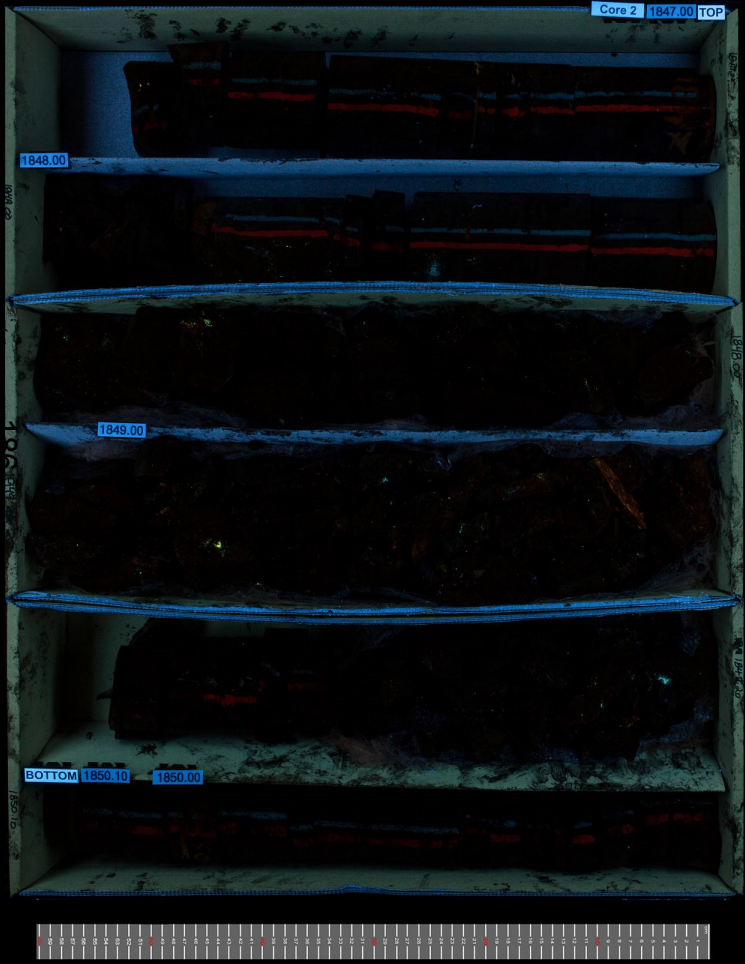
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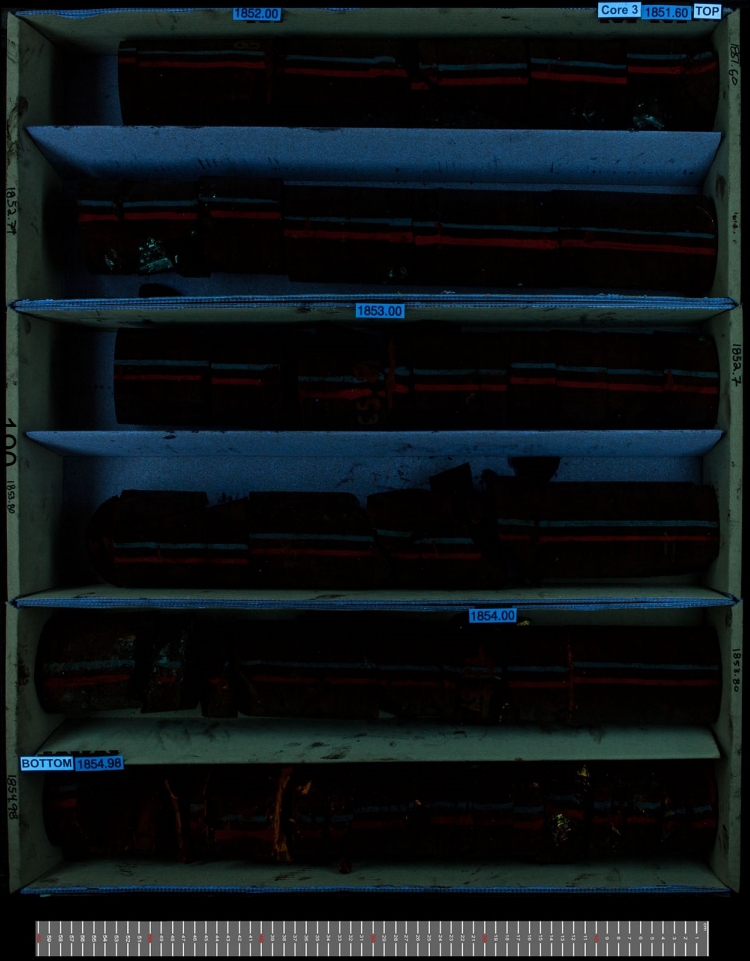
February 28, 2013
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Weatherford LABORATORIES

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UWI: 300/I-78-6450-12530/0
Formation: UPPER CANOL/ MIDDLE CANOL/ LOWER CANOL
Field: EAST MACKAY

February 28, 2013
CL-61558



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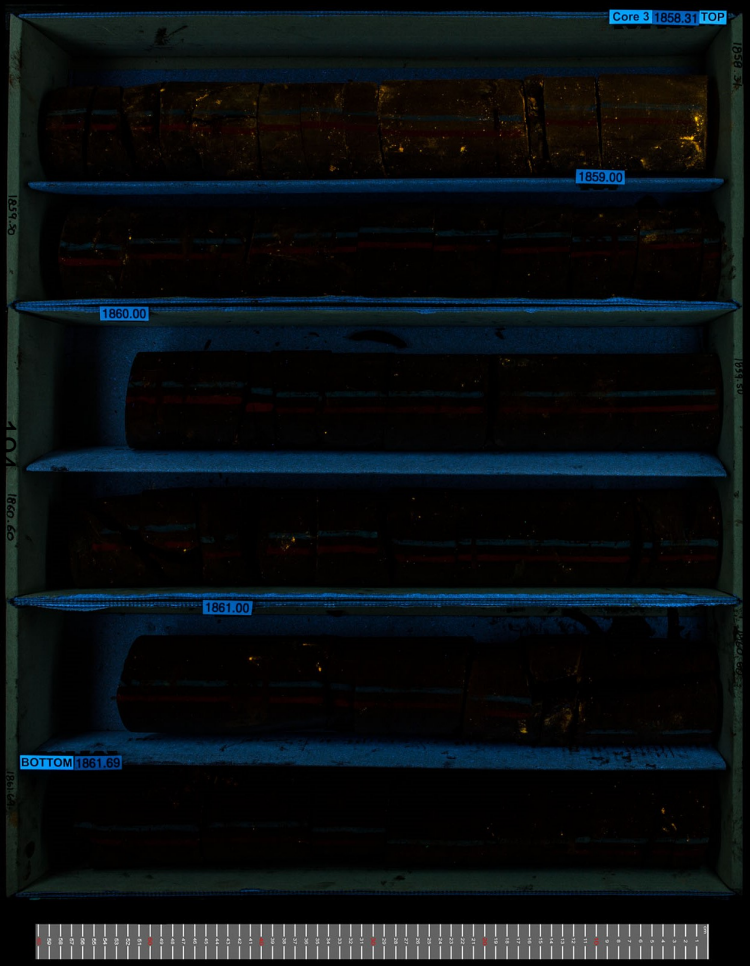
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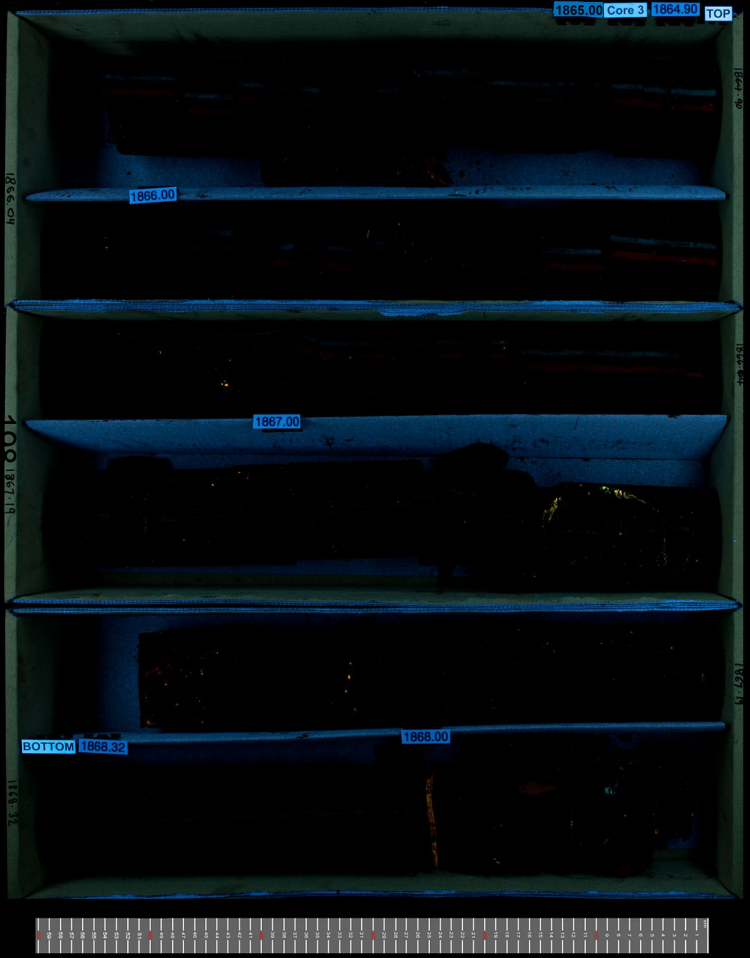
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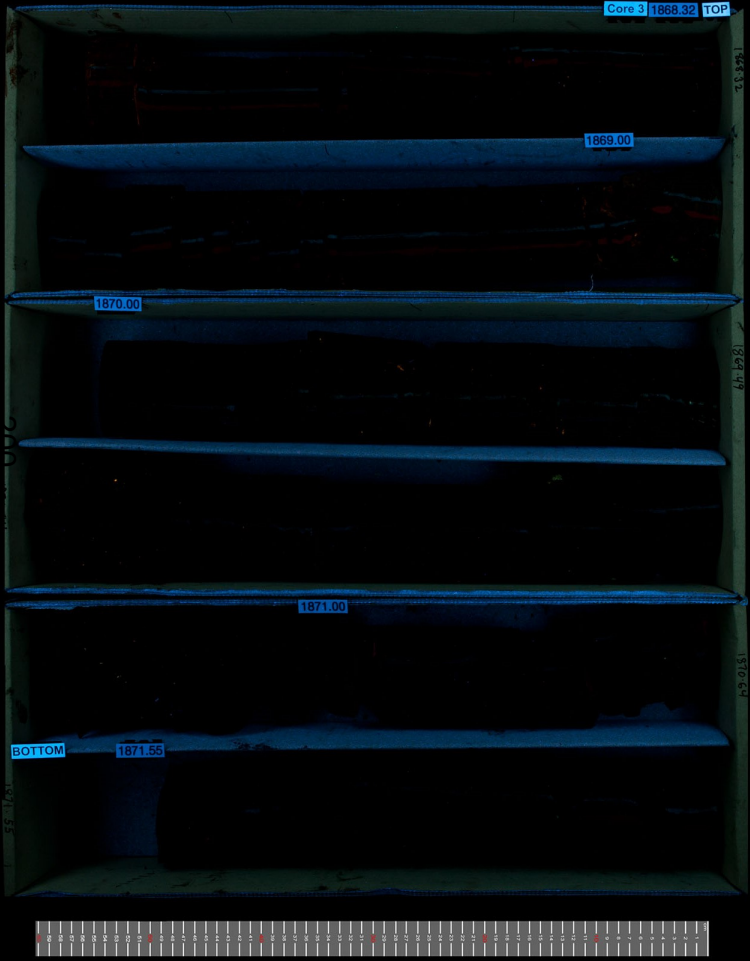
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Field: EAST MACKAY

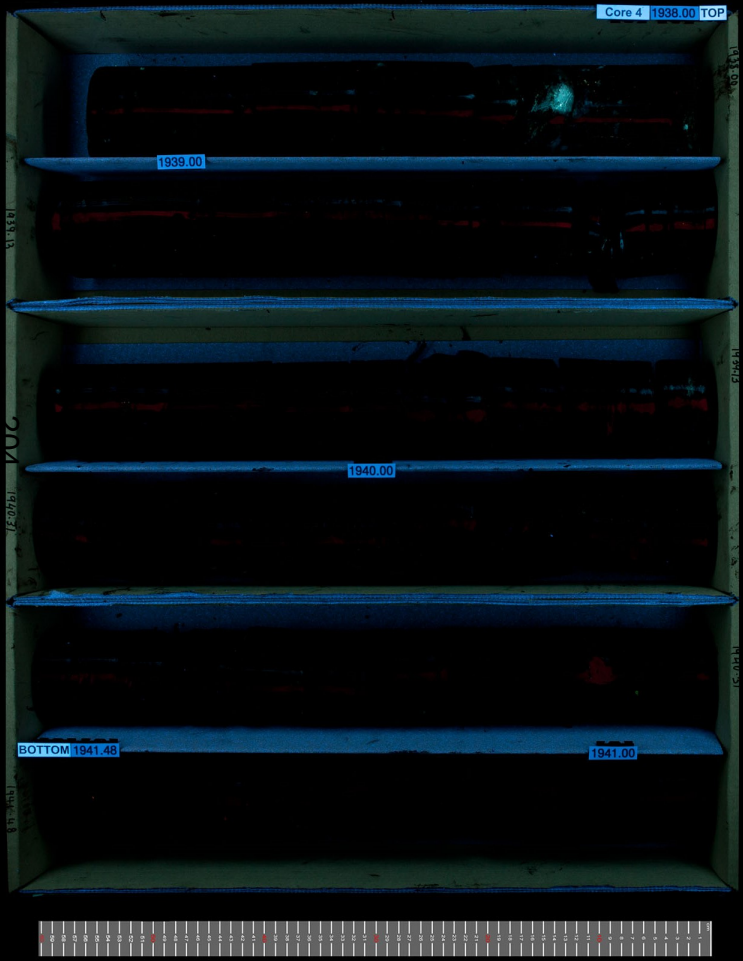
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Weatherford LABORATORIES

MGM Energy Corporation
Well: MGM Shell East MacKay I-78
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Formation: BLUEFISH/ HUME
Field: EAST MACKAY

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Field: EAST MACKAY

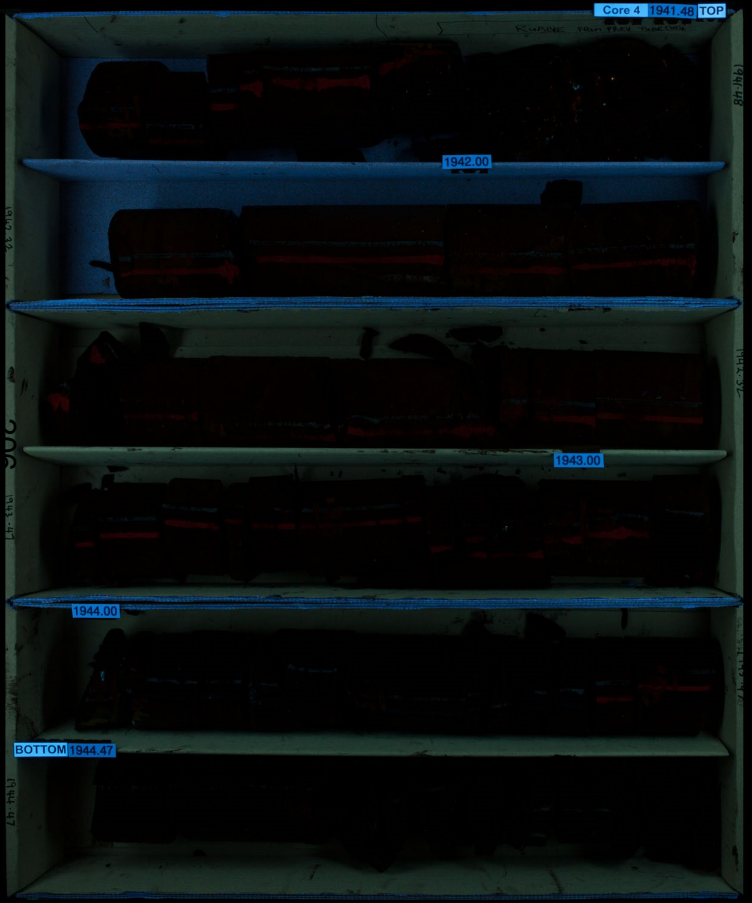
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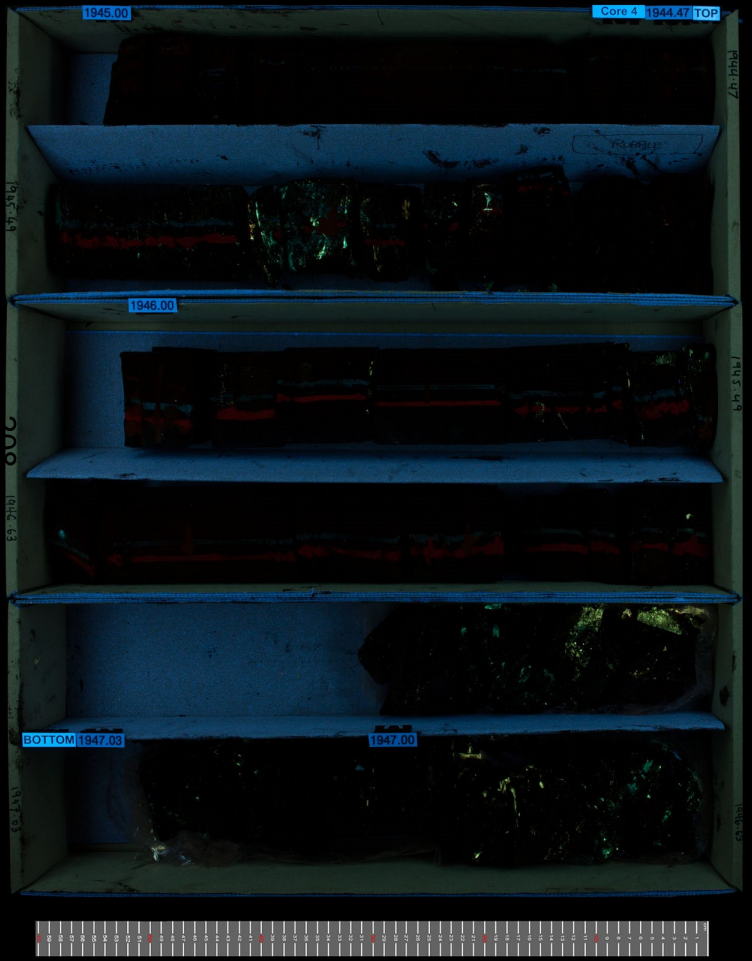
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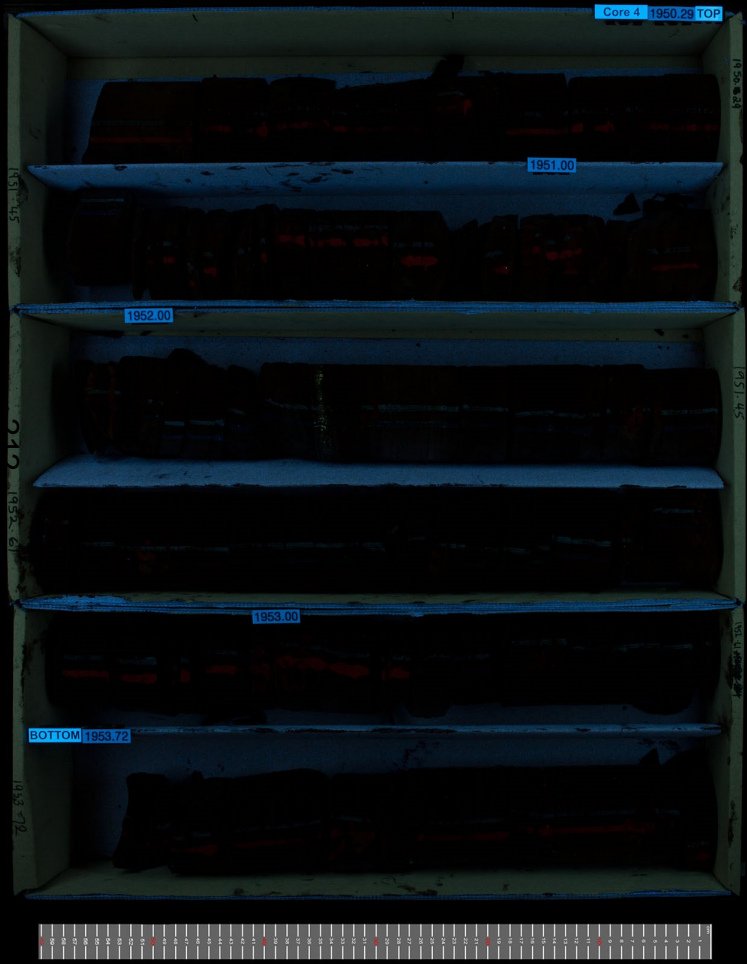
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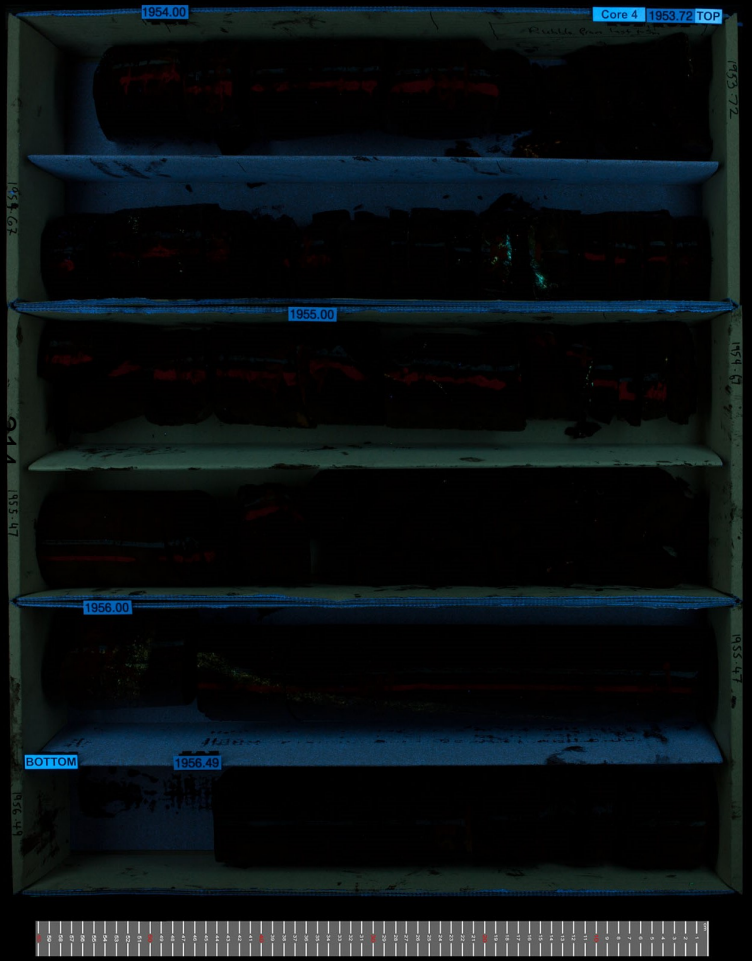
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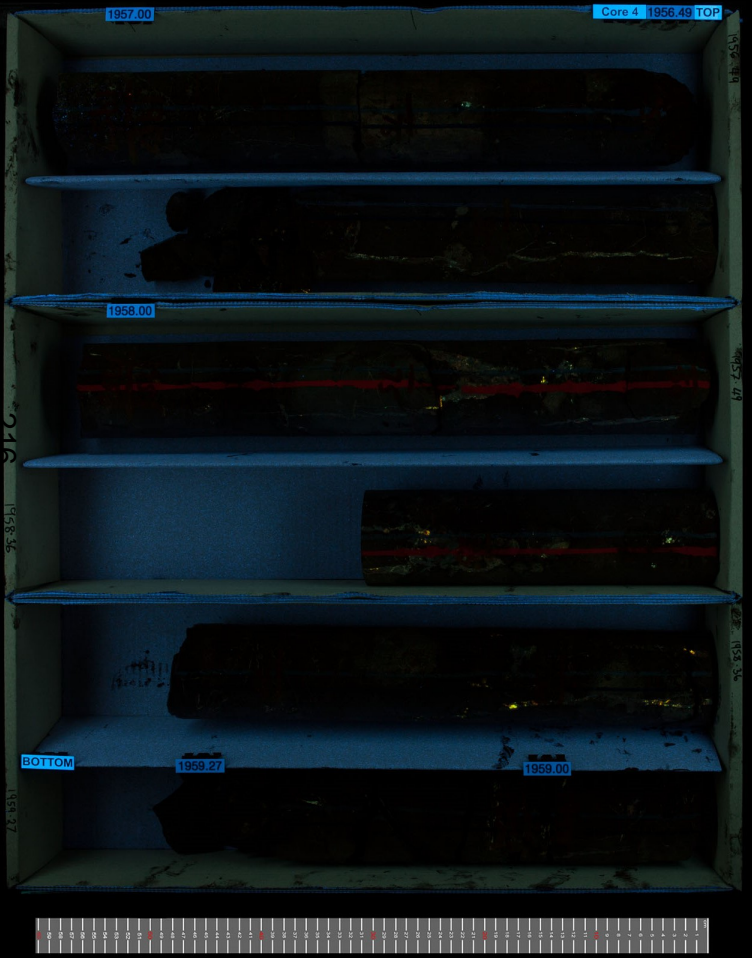
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Depth	API		depth	QL Ko at Swi	Ka	phi		depth	Ka Profile		depth	Kv	phi
1820	141.0272	Core 1											
1820.087724	149.7296												
1820.175448	156.56384												
1820.263172	157.04768												
1820.350897	154.14464												
1820.438621	150.8384												
1820.526345	147.29024												
1820.614069	138.01664												
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1820.789517	137.1296												
1820.877241	122.53376												
1820.964966	106.72832												
1821.05269	100.76096												
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1821.666759	199.86752												
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Weatherford LABORATORIES

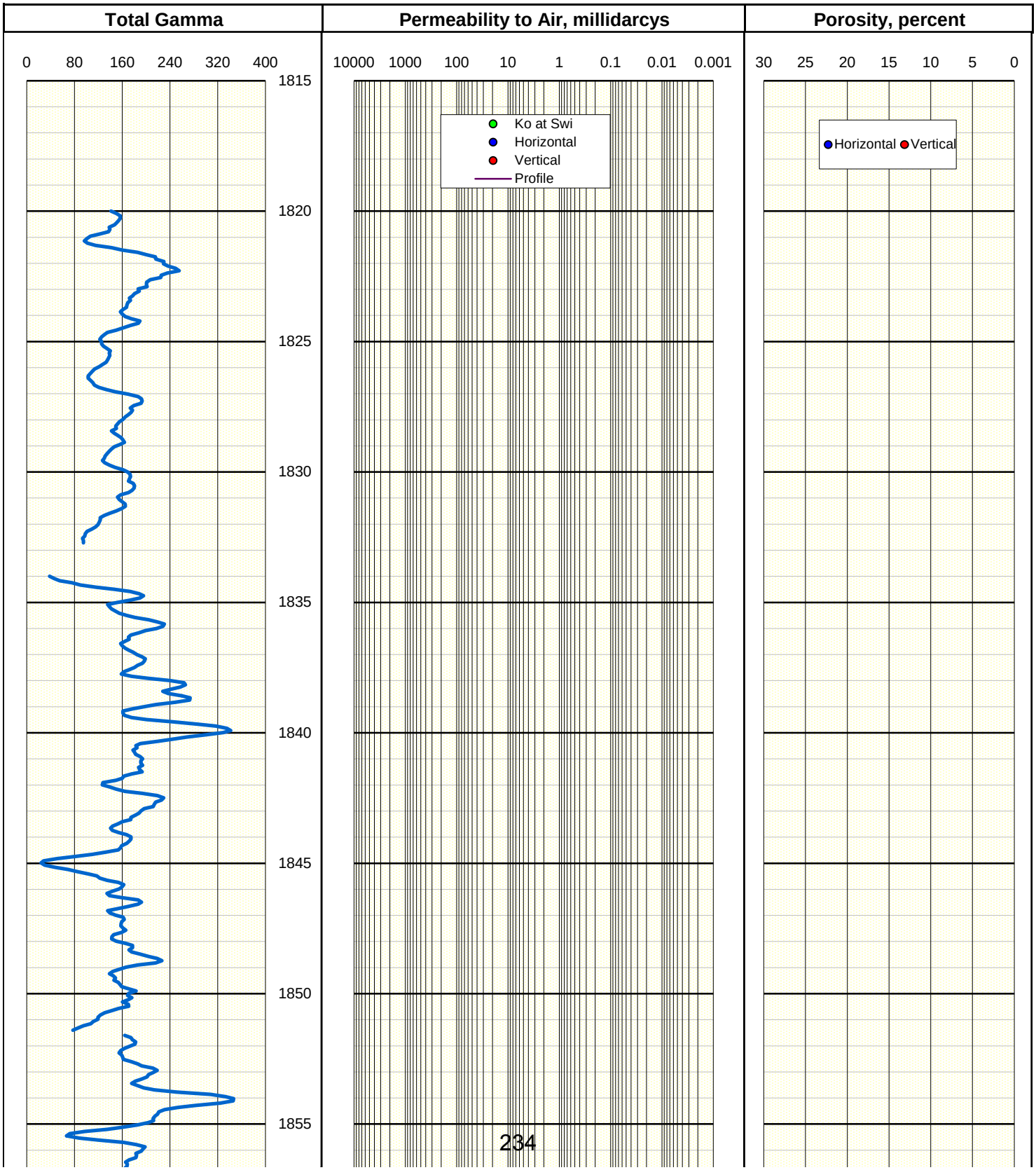
CORE GAMMA, PERMEABILITY, AND POROSITY PROFILE PLOT

VERTICAL SCALE 1 cm: 2 meters

MGM Energy Corporation
MGM Shell East Mackay I-78
East Mackay Field

Northwest Territories
File: CL-61558
Date: 3-1-13

Core 1 - 4



Weatherford LABORATORIES

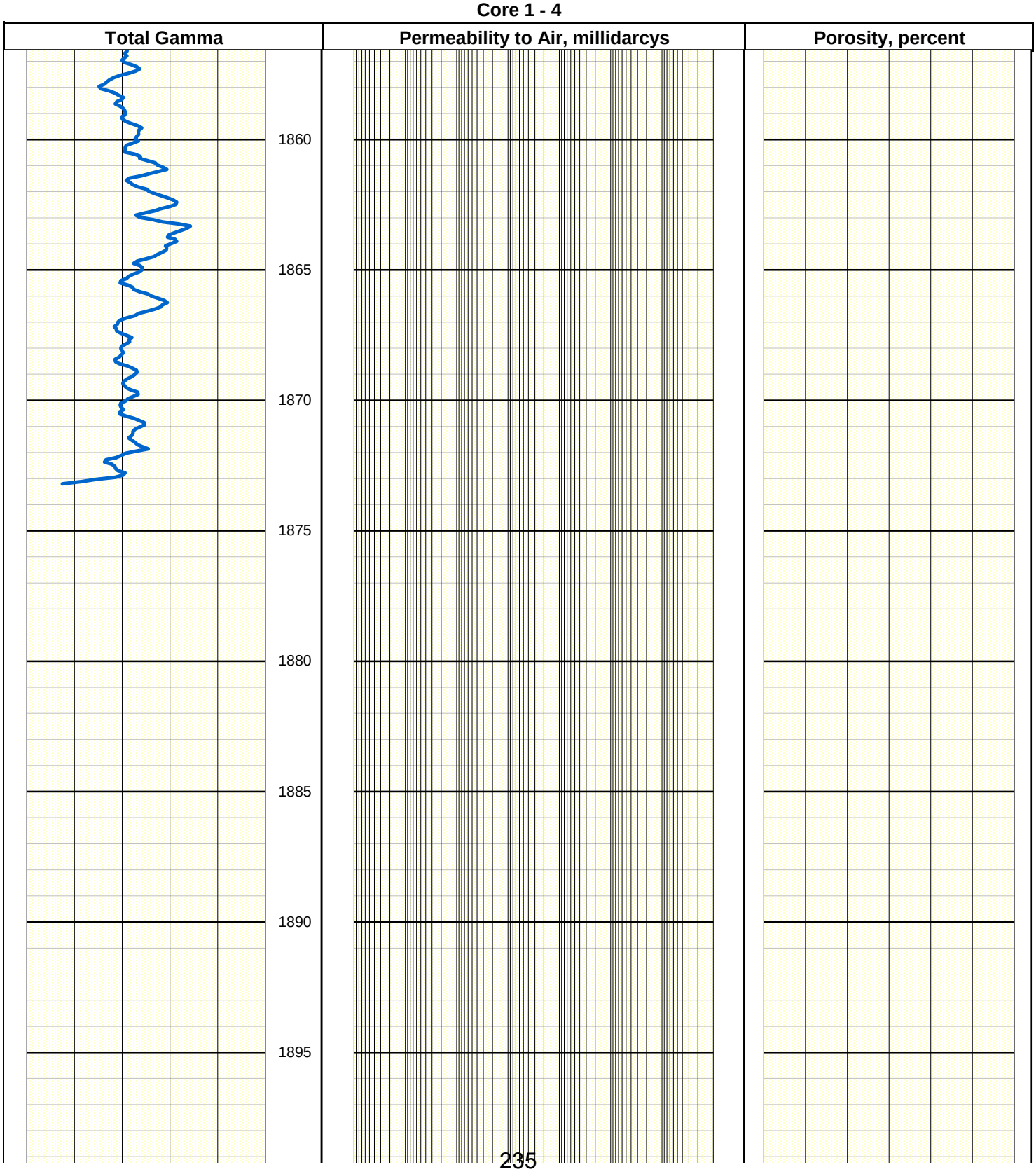
CORE GAMMA, PERMEABILITY, AND POROSITY PROFILE PLOT

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MGM Shell East Mackay I-78
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Northwest Territories
File: CL-61558
Date: 3-1-13

Core 1 - 4



Weatherford LABORATORIES

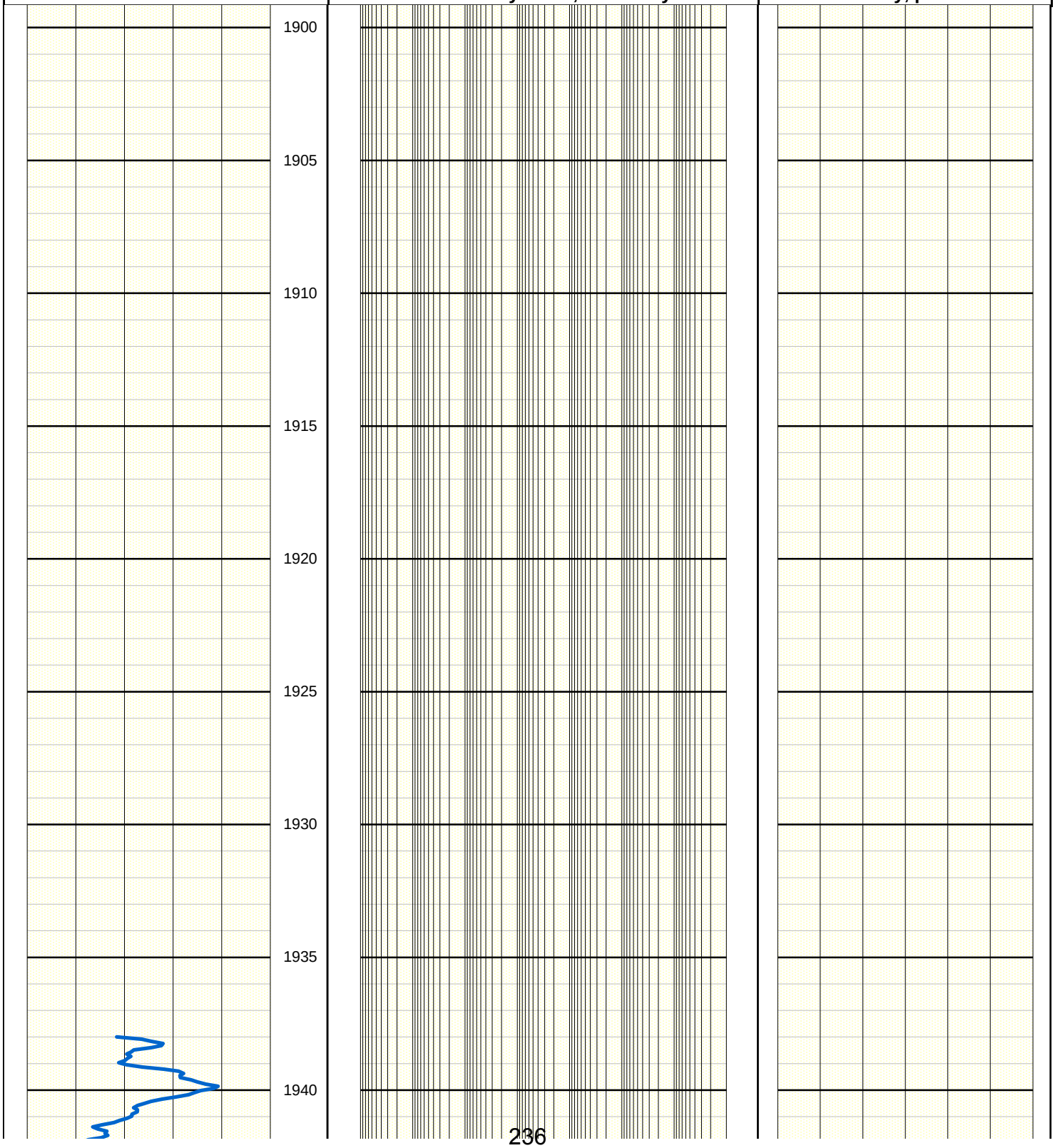
CORE GAMMA, PERMEABILITY, AND POROSITY PROFILE PLOT

VERTICAL SCALE 1 cm: 2 meters

MGM Energy Corporation
MGM Shell East Mackay I-78
East Mackay Field

Northwest Territories
File: CL-61558
Date: 3-1-13

Core 1 - 4



Weatherford LABORATORIES

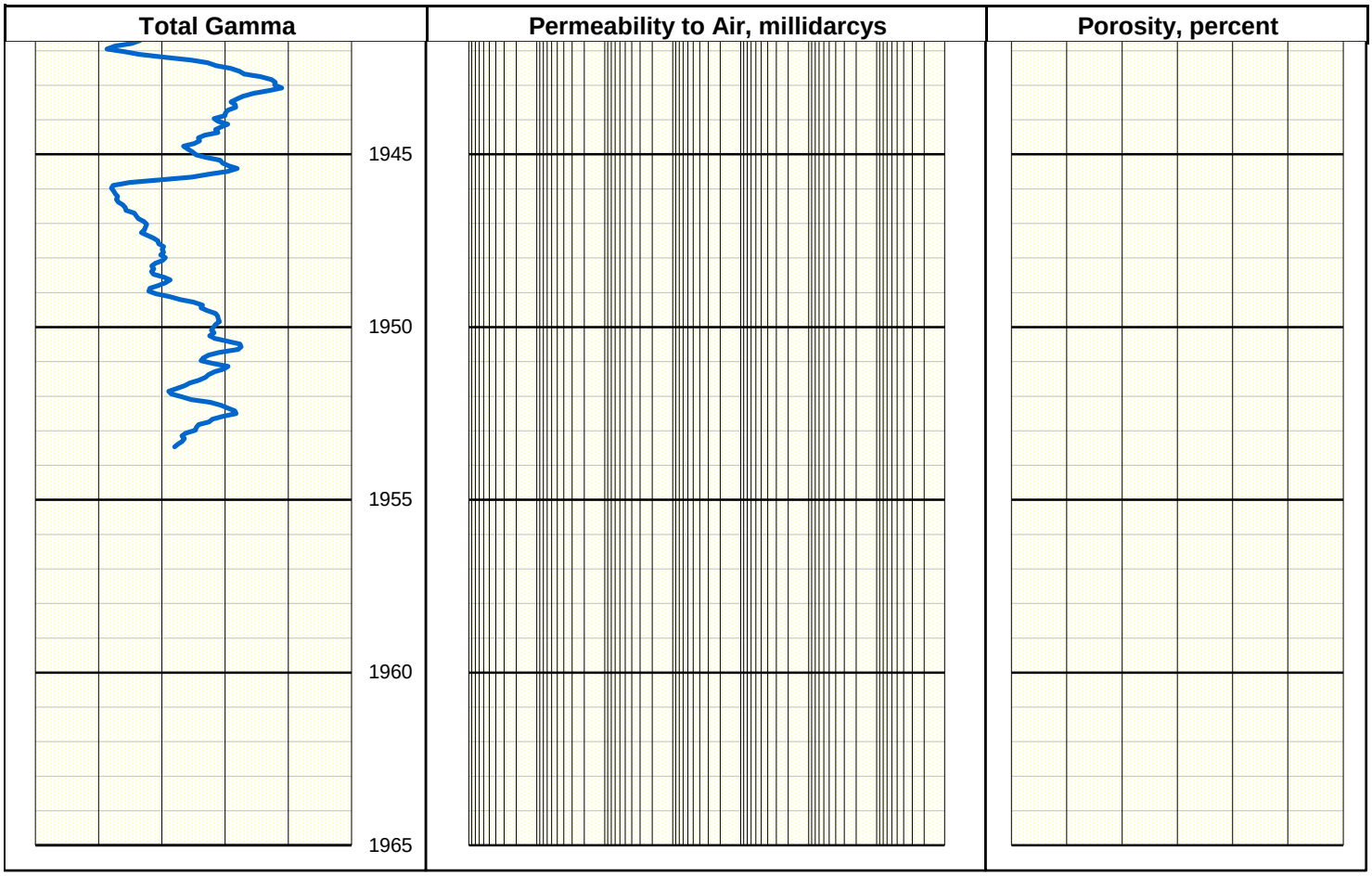
CORE GAMMA, PERMEABILITY, AND POROSITY PROFILE PLOT

VERTICAL SCALE 1 cm: 2 meters

MGM Energy Corporation
MGM Shell East Mackay I-78
East Mackay Field

Northwest Territories
File: CL-61558
Date: 3-1-13

Core 1 - 4



Weatherford LABORATORIES

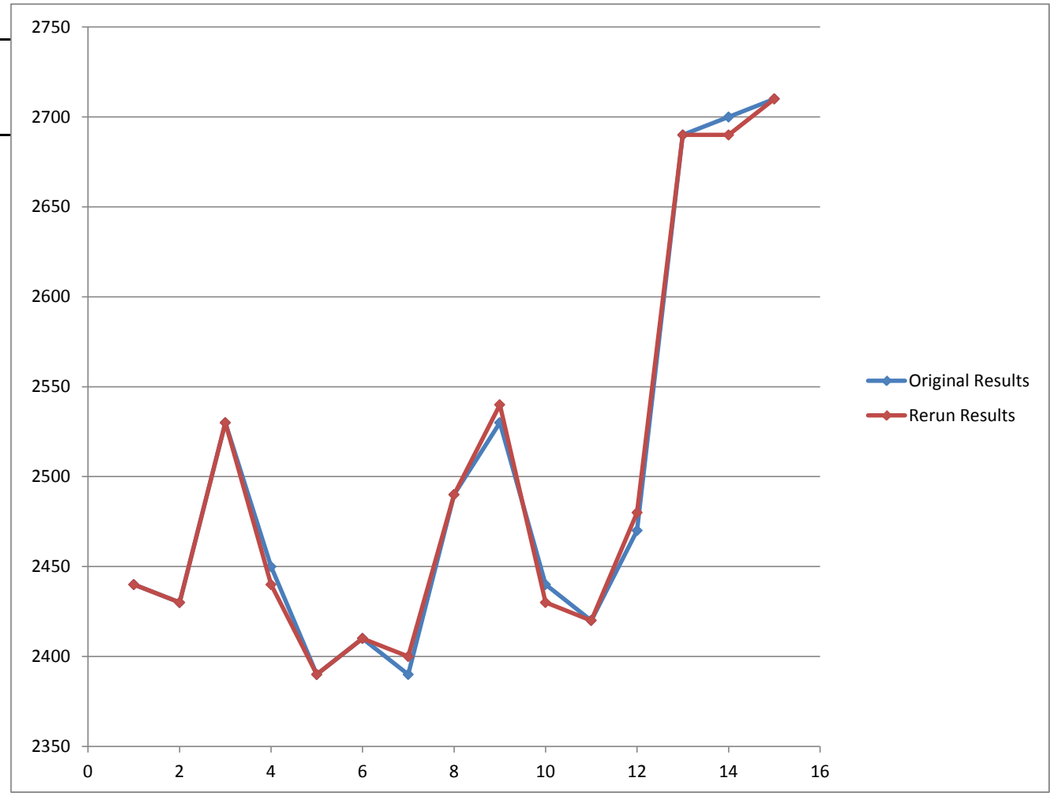
SUMMARY OF CONVENTIONAL CORE ANALYSES RESULTS

Conventional Oven Dried at 95°C

MGM Energy Corp.
MGM Shell East MacKay I-78
East MacKay

JIP Number: CL-61558
Date: June 11, 2013

Sample Number	Sample Depth, m	Permeability, millidarcys to Air	Porosity, fraction	Grain Density, kg/m³	Grain Density, (Rerun) kg/m³	Fluid Saturations fraction Oil	Water	Lithological Description
SP1	1821.57	**	0.011	2440	2440	0.205	0.776	sh, brek
SP2	1824.23	0.0162	0.016	2430	2430	0.039	0.942	sh, frac
SP3	1828.21	**	0.025	2530	2530	0.058	0.920	sh, brek
SP5	1836.58	0.0102	0.007	2450	2440	0.142	0.843	sh, frac
SP7	1842.93	0.0269	0.024	2390	2390	0.142	0.847	sh, frac
SP8	1847.10	**	0.019	2410	2410	0.360	0.635	sh, brek
SP11	1853.33	**	0.020	2390	2400	0.243	0.730	sh, slt lam, brek
SP12	1856.55	0.0085	0.003	2490	2490	0.317	0.674	sh, frac
SP14	1861.08	**	0.013	2530	2540	0.055	0.901	sh, slt lam, brek
SP17	1868.15	**	0.012	2440	2430	0.146	0.798	sh, slt lam, brek
SP18	1869.96	0.0038	0.004	2420	2420	0.370	0.556	sh, frac
SP20	1939.56	**	0.019	2470	2480	0.047	0.905	sh, frac
SP23	1948.84	0.0016	0.014	2690	2690	0.364	0.476	ls, slt, shy, lam
SP26	1957.03	0.0069	0.011	2700	2690	0.064	0.321	ls, sdy
SP27	1958.54	0.0308	0.010	2710	2710	0.071	0.310	ls, sdy, frac



** indicates sample is not suitable for this testing
Note: oil density is assumed as 0.85g/cc

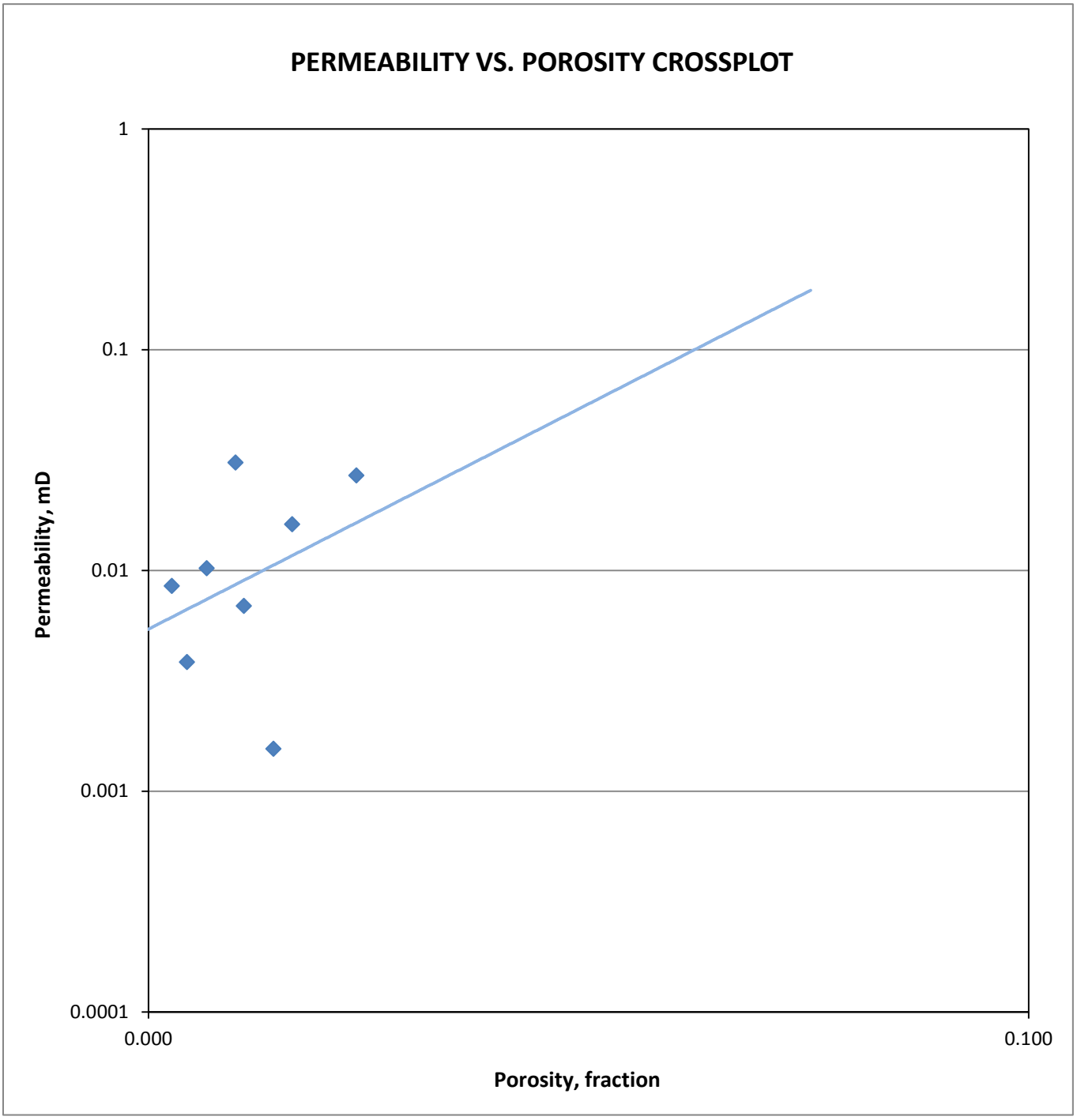
Weatherford LABORATORIES

PERMEABILITY VERSUS POROSITY

Conventional Oven Dried at 95°C

MGM Energy Corp.
MGM Shell East MacKay I-78
East MacKay

JIP Number: CL-61558
Date: June 11, 2013



Weatherford LABORATORIES

Lithological Abbreviations and Symbols

a/a	As Above
abnt	Abundant
anhy	Anhydrite (ic)
arg	Argillaceous
bd	Bed
bdd	Bedded
bdg	Bedding
bioturb	Bioturbated
bit	Bitumen (inous)
brec	Breccia (ted)
brek	Break
c	Coarse (ly)
calc	Calcite (areous)
carb	Carbonaceous
cbl	Cobble (64-256mm)
cgl	Conglomerate
chk	Chalk (y)
cht	Chert
cl	Clast
cly	Clay (ey)
cmt	Cemented
crpxl	Cryptocrystalline
dns	Dense (er)
dol	Dolomite (ic)
f	Fine (ly)
Fe	Iron
Fe-st	Ironstone
fis	Fissile
fr	Friable
frac	Fracture (ed)
frag	Fragment (al)
glau	Glauconite (ic)
gr	Grain (ed)
gran	Granular
gyp	Gypsum (iferous)
HF	Horizontal Fracture
hrtl	Horizontal
intbd	Interbedded
intgran	Intergranular
intlam	Interlaminated
intxl	Intercrystalline
lam	Laminated
lign	Lignite (ic)
lns	Lense
ls	Limestone
m	Medium
mas	Massive
md	Mud
mdst	Mudstone
mic	Micro
mica	Mica (eous)
mnr	Minor
o	Open
ool	Oolite (ic)
por	Porous (sity)
pp	Pin Point
pryb	Pyrobitumen
pyr	Pyrite (ic) (ized)
qtz	Quartz
RBC	Removed by Client
sa	Salt
sd	Sand (1/16-2mm)
sdy	Sandy
sh	Shale
shy	Shaly
slt	Silt (y)
sltst	Siltstone
ss	Sandstone
styl	Stylolite (ic)
tr	trace
uncons	Unconsolidated
vf	Very Fine
VF	Vertical Fracture
vrt	Vertical
vug	Vug (gy) (ular)
xbd	Cross-bedded (ing)
xl	Crystal (line)
xlam	Cross-laminated

Weatherford LABORATORIES

Shale Rock Properties
Summary of Routine Crushed Core Analyses Results
As-Received and Vacuum Dried at 212°F

MGM Energy Corp.
MGM Shell East Mackay I-78
Northwest Territories, Canada
East MacKay

Sample ID	Top Depth, meters	Bottom Depth, meters	A-R Bulk Density, gm/cc	A-R Grain Density, gms/cc	A-R Water Saturation, % of PV	A-R Oil Saturation, % of PV	A-R Gas Saturation, % of PV	A-R Gas Saturation, % of BV	A-R Press Decay Permeability, md	Dry Bulk Density, gm/cc	Dry Grain Density, gm/cc	Dry Helium Porosity, % of BV
1 SRP	1820.53	1820.63	2.52	2.53	81.2	7.8	11.0	0.8		2.46	2.64	6.9
2 SRP	1821.39	1821.48	2.49	2.50	75.9	10.3	13.7	0.8		2.44	2.60	6.1
2A SRP	1821.39	1821.48	2.49	2.49	69.4	19.7	10.9	0.7	8.22E-07	2.43	2.59	6.0
3 SRP	1822.40	1822.50	2.54	2.54	69.0	21.1	9.9	0.4		2.50	2.62	4.5
4 SRP	1823.39	1823.48	2.42	2.43	55.5	31.2	13.2	0.8		2.37	2.52	5.9
5 SRP	1824.50	1824.60	2.50	2.51	77.8	8.5	13.7	0.9		2.44	2.61	6.5
6 SRP	1825.39	1825.50	2.52	2.53	76.5	12.4	11.2	0.9		2.45	2.65	7.8
7 SRP	1826.67	1826.77	2.50	2.51	77.3	7.4	15.3	1.1		2.43	2.63	7.5
7A SRP	1826.67	1826.77	2.49	2.50	73.9	13.3	12.8	1.0	1.22E-06	2.42	2.62	7.6
8 SRP	1827.40	1827.50	2.43	2.45	63.7	20.7	15.6	1.0		2.38	2.54	6.3
9 SRP	1828.44	1828.53	2.49	2.50	79.0	11.5	9.6	0.7		2.42	2.62	7.7
10 SRP	1829.33	1829.43	2.48	2.49	72.4	13.6	14.0	1.1		2.41	2.61	7.5
11 SRP	1830.10	1830.20	2.42	2.43	63.8	27.1	9.1	0.5		2.37	2.51	5.6
12 SRP	1831.63	1831.72	2.49	2.50	81.2	3.6	15.2	1.1		2.42	2.61	7.4
12A SRP	1831.63	1831.72	2.47	2.48	76.0	13.3	10.7	0.8	1.12E-06	2.40	2.60	7.8
13 SRP	1834.31	1834.41	2.71	2.74	62.0	9.2	28.8	1.2		2.68	2.80	4.3
14 SRP	1835.40	1835.50	2.37	2.39	53.4	33.0	13.6	0.9		2.32	2.48	6.7
15 SRP	1836.33	1836.43	2.47	2.48	76.2	9.7	14.1	0.9	8.42E-06	2.42	2.58	6.5
16 SRP	1837.41	1837.51	2.41	2.42	65.3	26.0	8.7	0.5		2.36	2.50	5.8
17 SRP	1838.30	1838.39	2.38	2.38	54.8	36.2	9.0	0.4		2.34	2.45	4.9
18 SRP	1839.43	1839.52	2.38	2.39	46.2	42.0	11.8	0.9		2.31	2.51	7.8
19 SRP	1840.37	1840.47	2.36	2.36	47.3	43.5	9.3	0.5		2.30	2.45	5.9
20 SRP	1841.17	1841.27	2.37	2.39	53.4	32.1	14.6	1.2	7.73E-06	2.30	2.50	8.2
21 SRP	1842.49	1842.58	2.41	2.42	60.8	25.0	14.3	0.8		2.36	2.50	5.6
22 SRP	1843.30	1843.40	2.41	2.41	68.9	18.4	12.7	0.6		2.36	2.48	4.9
24 SRP	1845.69	1845.79	2.41	2.41	54.5	33.6	11.9	0.5		2.37	2.48	4.5
25 SRP	1846.65	1846.75	2.43	2.45	55.0	29.0	16.0	1.0		2.38	2.54	6.2
25A SRP	1846.65	1846.75	2.49	2.50	50.7	39.0	10.3	0.6	2.45E-06	2.44	2.59	5.5
26 SRP	1847.24	1847.34	2.39	2.42	52.0	30.5	17.5	1.5		2.32	2.55	8.8
27 SRP	1847.70	1847.80	2.42	2.42	57.4	34.4	8.1	0.6		2.35	2.53	7.1
28 SRP	1850.03	1850.10	2.40	2.42	54.4	28.6	17.1	1.3		2.34	2.53	7.6
29 SRP	1850.14	1850.24	2.45	2.46	56.7	29.6	13.7	0.9		2.39	2.56	6.5
30 SRP	1851.68	1851.76	2.39	2.40	54.0	32.4	13.6	1.0		2.33	2.52	7.6
30A SRP	1851.68	1851.76	2.38	2.40	46.1	35.8	18.0	1.4	1.99E-05	2.32	2.51	7.6
31 SRP	1852.30	1852.38	2.38	2.39	60.7	28.1	11.2	0.9		2.31	2.51	8.0
32 SRP	1853.17	1853.25	2.37	2.38	51.1	37.1	11.8	0.7		2.32	2.46	5.9
33 SRP	1853.83	1853.93	2.37	2.38	57.0	32.1	10.9	0.5		2.33	2.45	4.7
34 SRP	1855.34	1855.44	2.80	2.81	39.4	26.7	34.0	0.6		2.79	2.84	1.7
35 SRP	1856.09	1856.18	2.50	2.51	66.8	16.6	16.7	0.9	8.85E-06	2.46	2.59	5.2
36 SRP	1857.41	1857.50	2.52	2.52	59.7	30.2	10.1	0.5		2.47	2.60	5.0
37 SRP	1858.31	1858.40	2.62	2.63	66.7	23.7	9.6	0.4		2.58	2.70	4.3
38 SRP	1859.59	1859.69	2.54	2.55	64.0	23.5	12.5	0.6		2.50	2.62	4.9
39 SRP	1860.16	1860.26	2.53	2.53	62.7	30.1	7.2	0.3		2.49	2.61	4.8
40 SRP	1861.21	1861.31	2.54	2.56	58.0	23.0	19.0	1.0	2.35E-05	2.50	2.64	5.3
41 SRP	1862.26	1862.36	2.50	2.50	60.4	31.5	8.1	0.4		2.46	2.58	4.6
44 SRP	1865.34	1865.44	2.47	2.48	59.4	30.6	10.0	0.6		2.42	2.56	5.6
45 SRP	1866.08	1866.18	2.51	2.52	56.7	29.7	13.6	0.7	1.09E-05	2.47	2.60	5.3
46 SRP	1867.42	1867.52	2.46	2.47	62.5	25.8	11.7	0.9		2.39	2.59	7.6
47 SRP	1868.36	1868.44	2.43	2.44	58.7	29.3	12.0	0.9		2.37	2.56	7.8
49 SRP	1870.27	1870.37	2.41	2.41	50.2	42.8	7.0	0.4		2.36	2.49	5.3
50 SRP	1871.69	1871.79	2.37	2.39	58.5	25.1	16.3	1.3	2.42E-05	2.30	2.50	8.0
51 SRP	1872.12	1872.22	2.45	2.47	53.7	30.2	16.1	0.9		2.41	2.55	5.7
52 SRP	1938.40	1938.50	2.60	2.62	32.4	49.7	17.9	1.0		2.56	2.71	5.5
53 SRP	1939.71	1939.81	2.50	2.51	67.8	17.5	14.7	1.0		2.44	2.62	7.0
54 SRP	1940.45	1940.54	2.47	2.48	78.1	9.6	12.3	0.9		2.40	2.60	7.5
55 SRP	1941.30	1941.39	2.47	2.48	67.1	20.9	12.0	0.7	6.21E-06	2.42	2.58	6.1
56 SRP	1942.32	1942.41	2.46	2.47	66.0	20.2	13.8	1.0		2.40	2.58	7.2
57 SRP	1943.33	1943.43	2.42	2.42	65.9	21.8	12.3	0.7		2.37	2.50	5.4
58 SRP	1944.65	1944.75	2.56	2.57	54.2	30.4	15.4	0.6		2.53	2.63	3.9
59 SRP	1945.69	1945.79	2.40	2.41	46.0	40.8	13.2	0.7		2.35	2.49	5.5
60 SRP	1946.45	1946.55	2.64	2.64	50.0	34.5	15.6	0.4	6.38E-06	2.62	2.68	2.3
63 SRP	1949.44	1949.54	2.47	2.47	74.5	14.3	11.2	0.7		2.41	2.57	6.1
64 SRP	1950.75	1950.84	2.66	2.68	32.8	21.1	46.0	0.7		2.65	2.69	1.4
65 SRP	1951.69	1951.79	2.57	2.57	50.3	36.0	13.8	0.5	5.88E-06	2.53	2.63	3.9
66 SRP	1952.91	1953.00	2.44	2.45	49.9	37.8	12.4	0.7		2.39	2.53	5.5
67 SRP	1953.40	1953.49	2.47	2.47	60.0	28.5	11.5	0.5		2.43	2.54	4.5
68 SRP	1954.81	1954.91	2.45	2.46	58.7	27.2	14.1	0.7		2.41	2.53	4.7
69 SRP	1955.36	1955.45	2.65	2.66	32.5	45.4	22.1	0.4		2.64	2.68	1.7
70 SRP	1956.39	1956.48	2.63	2.64	8.8	64.3	26.9	0.6	3.32E-05	2.61	2.68	2.4
71 SRP	1957.25	1957.35	2.67	2.69	15.0	32.1	52.9	0.7		2.66	2.70	1.4
72 SRP	1958.42	1958.52	2.68	2.70	12.1	17.3	70.6	0.8		2.67	2.71	1.2
Average values:			2.48	2.49	58.2	26.4	15.4	0.8	1.22E-05	2.43	2.58	5.7

Weatherford LABORATORIES

Shale Rock Properties
Summary of Routine Crushed Core Analyses Raw Data Results
As-Received and Vacuum Dried at 212°F

MGM Energy Corp.
MGM Shell East Mackay I-78
Northwest Territories, Canada
East MacKay

CL-61558
6-4-13

Sample ID	Top Depth, meters	Bottom Depth, meters	A-R Hg Bulk Volume, cc	A-R Weight, g	Dry Weight, g	Dry Grain Volume, cc	Pore Volume, cc	Water, cc	Oil, cc	Gas, cc	Brine Density, g/cc	Oil Density, g/cc
1 SRP	1820.53	1820.63	68.89	173.598	169.223	64.128	4.760	3.866	0.372	0.522	1.050	0.850
2 SRP	1821.39	1821.48	84.54	210.531	205.945	79.359	5.181	3.935	0.534	0.712		
2A SRP	1821.39	1821.48	37.46	93.197	91.194	35.225	2.235	1.552	0.450	0.234		
3 SRP	1822.40	1822.50	72.66	184.436	181.460	69.368	3.292	2.272	0.695	0.325		
4 SRP	1823.39	1823.48	85.56	206.900	202.608	80.502	5.058	2.808	1.580	0.670		
5 SRP	1824.50	1824.60	67.28	168.054	164.136	62.874	4.406	3.427	0.376	0.603		
6 SRP	1825.39	1825.50	86.88	218.633	212.445	80.065	6.815	5.211	0.843	0.761		
7 SRP	1826.67	1826.77	83.10	207.426	201.988	76.885	6.215	4.804	0.463	0.948		
7A SRP	1826.67	1826.77	31.58	78.605	76.475	29.185	2.395	1.770	0.331	0.294		
8 SRP	1827.40	1827.50	99.50	242.034	236.778	93.280	6.220	3.961	1.290	0.969		

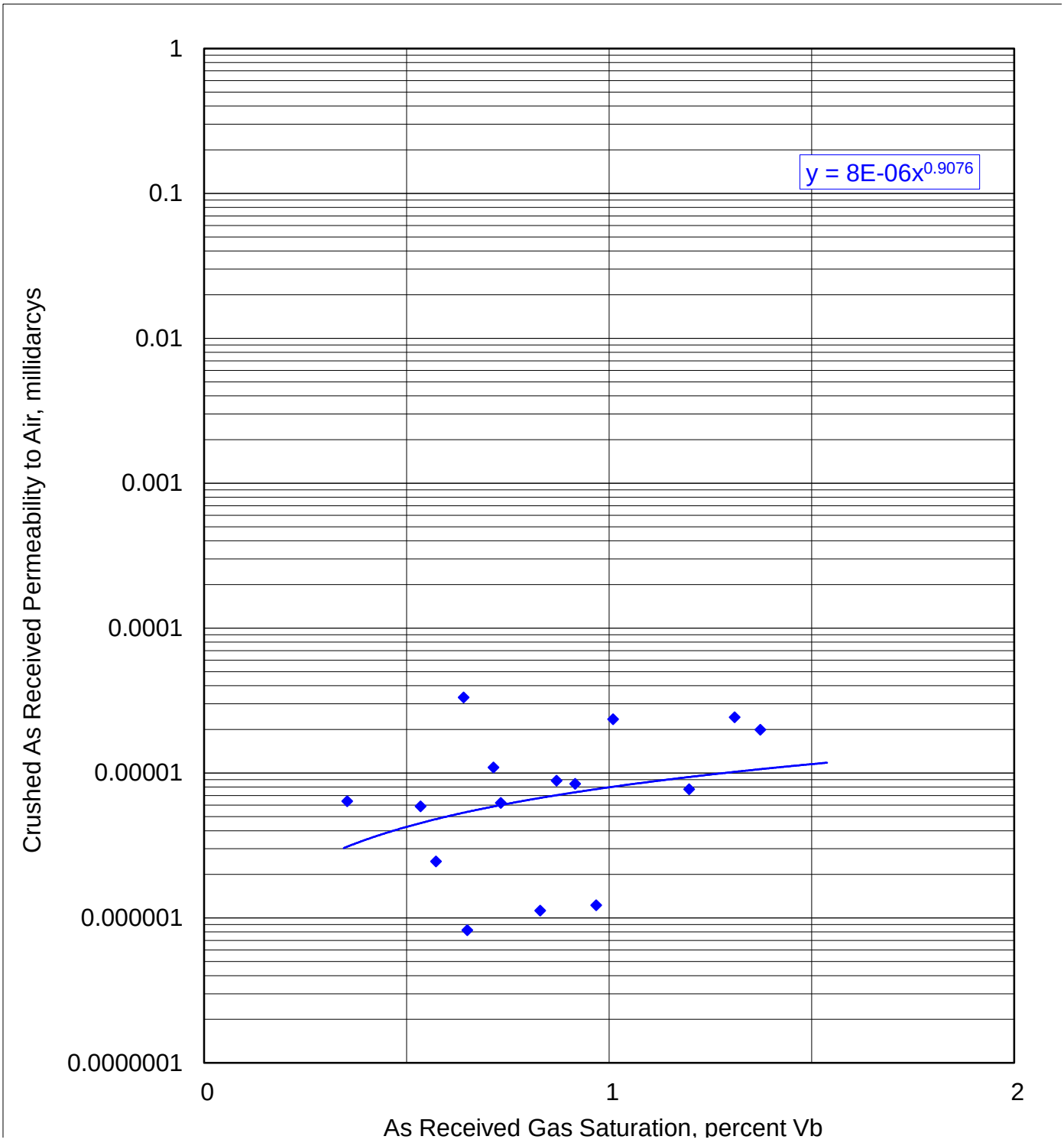
Weatherford LABORATORIES

Permeability versus Percentage Gas Saturation

As Received Crushed Preparation

MGM Energy Corp.
MGM Shell East Mackay I-78
Northwest Territories, Canada
East MacKay

CL-61558
6-4-13
6-26-13
6-27-13



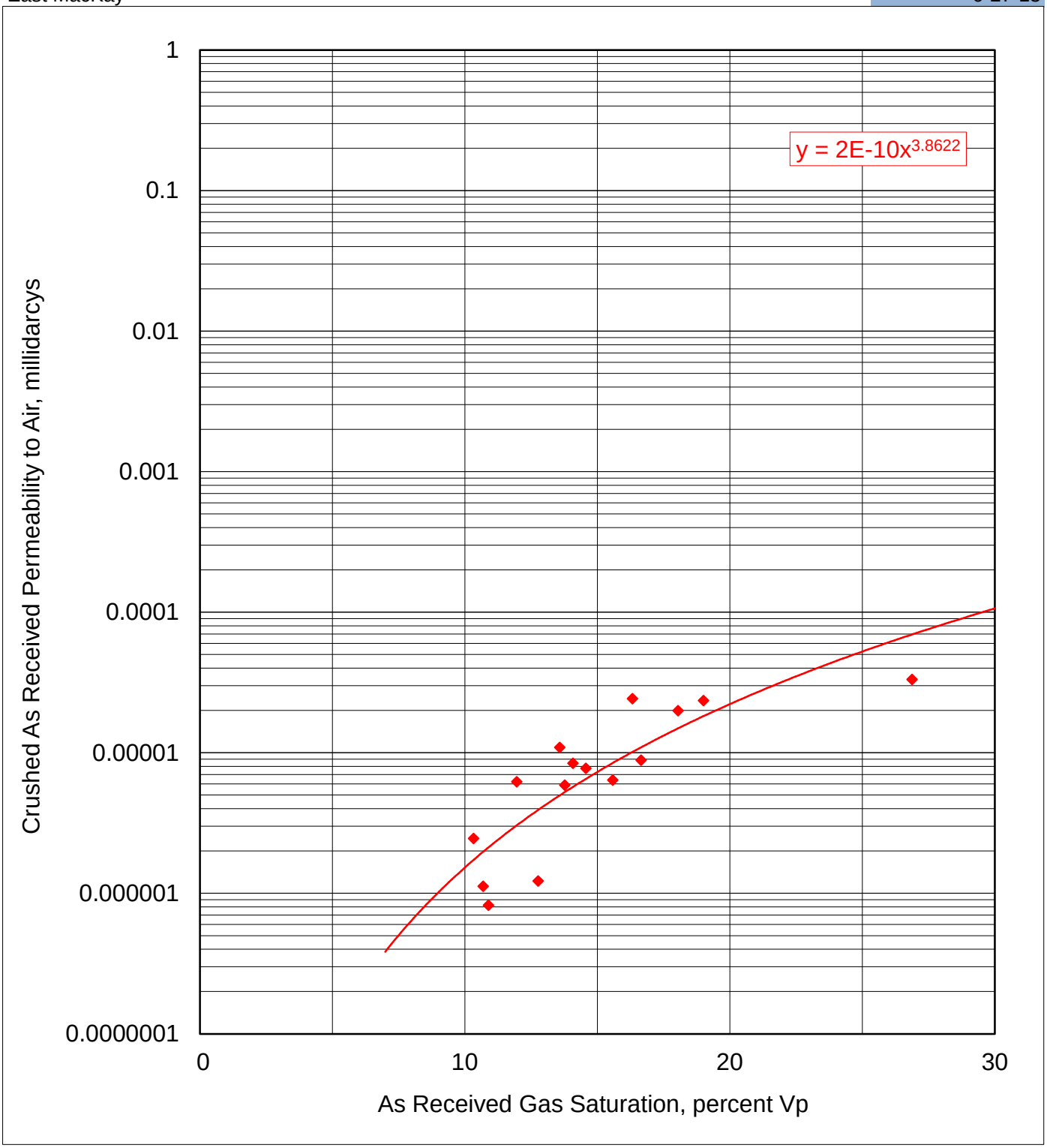
Weatherford LABORATORIES

Permeability versus Percentage Gas Saturation

As Received Crushed Preparation

MGM Energy Corp.
MGM Shell East Mackay I-78
Northwest Territories, Canada
East MacKay

CL-61558
6-4-13
6-26-13
6-27-13



Weatherford LABORATORIES

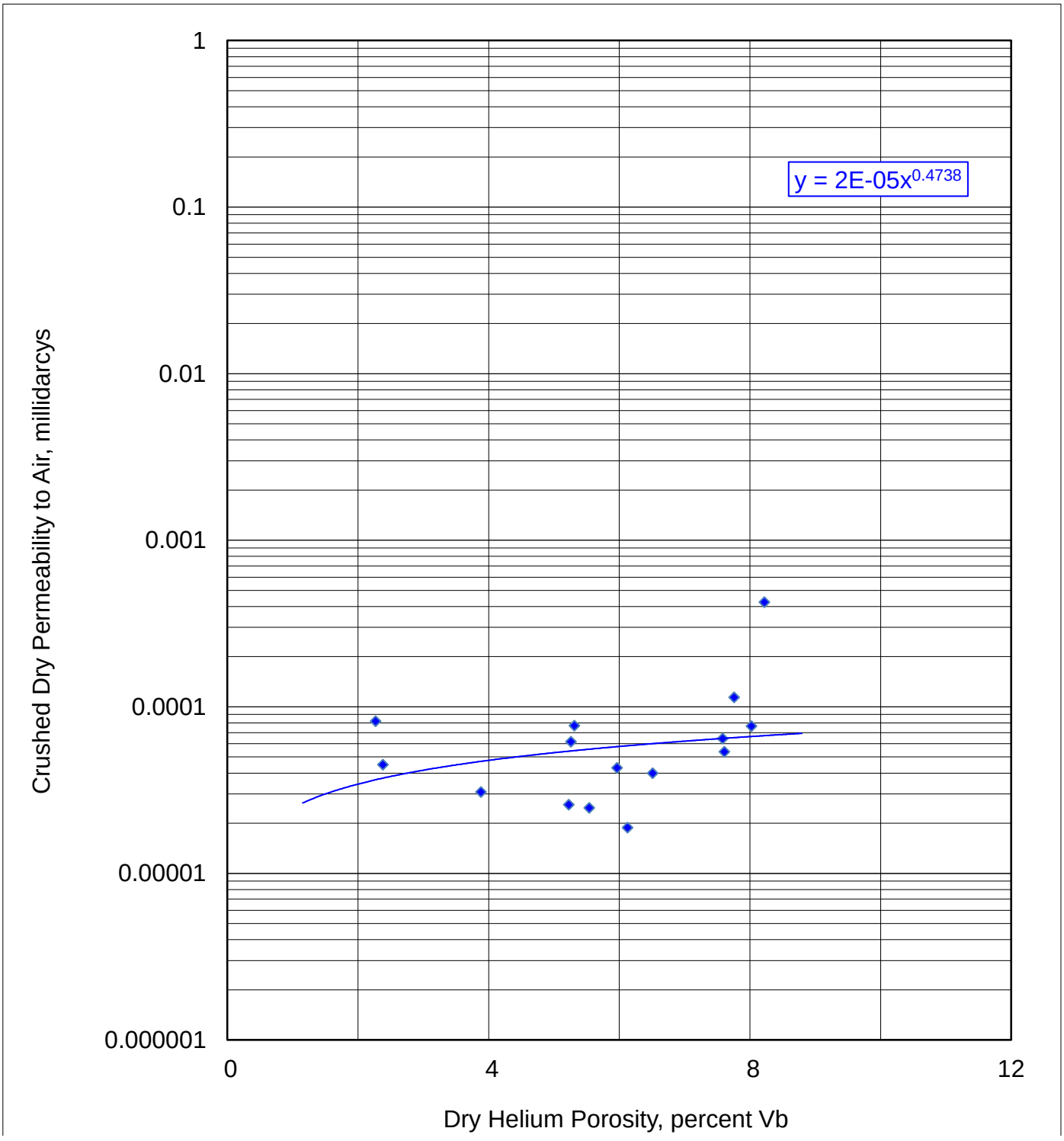
Permeability versus Percentage Total Porosity

Dry Crushed Preparation

MGM Energy Corp.
MGM Shell East Mackay I-78
Northwest Territories, Canada
East MacKay

CL-61558

6-26-13
6-27-13



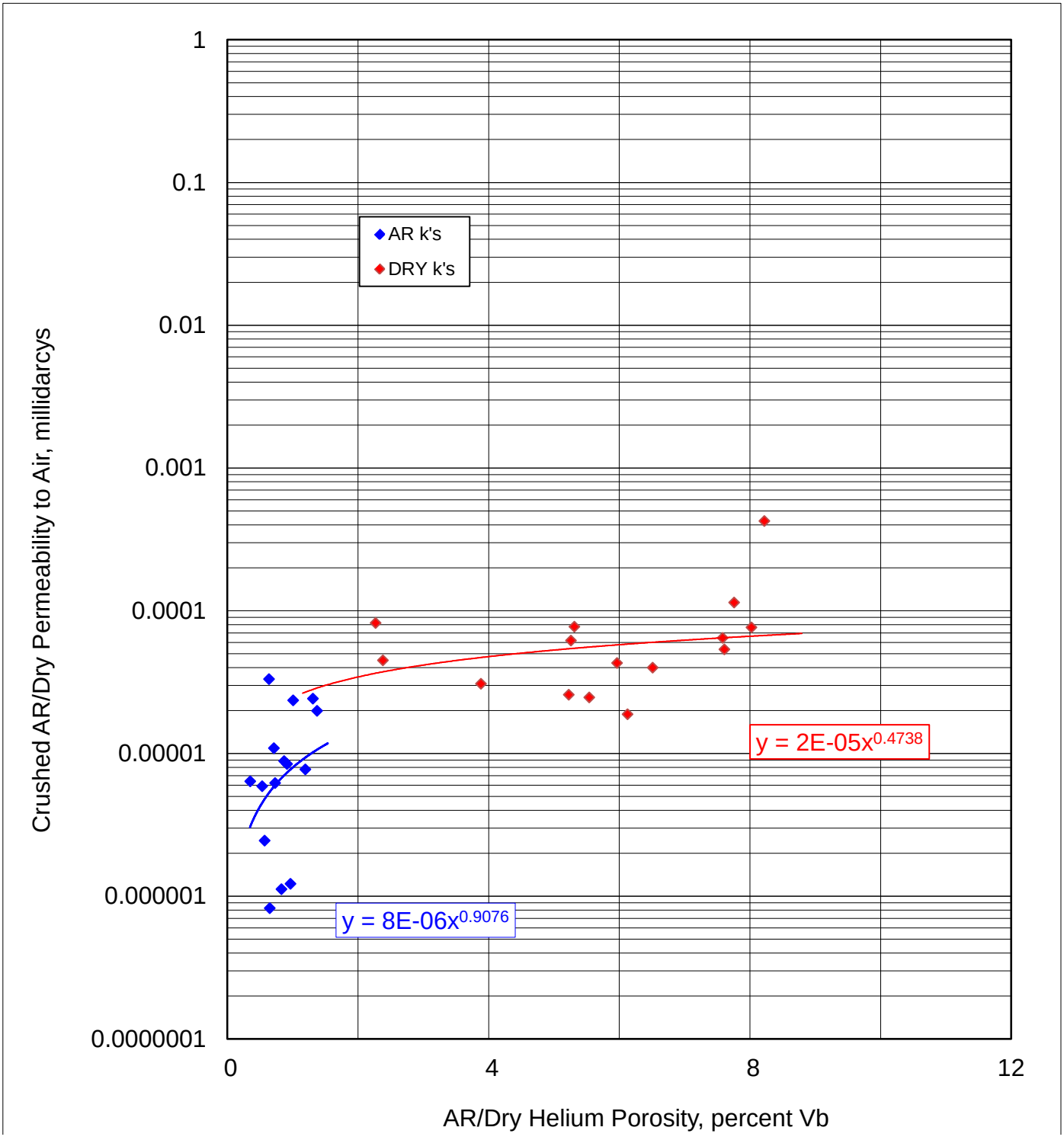
Weatherford LABORATORIES

Permeability versus Percentage Gas Saturation/Total Porosity

AR/Dry Crushed Preparation

MGM Energy Corp.
MGM Shell East Mackay I-78
Northwest Territories, Canada
East MacKay

CL-61558
6-4-13
6-26-13
6-27-13



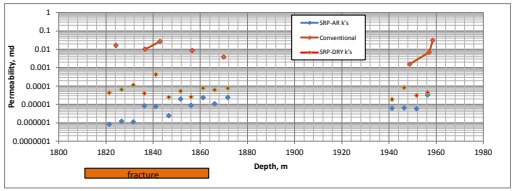
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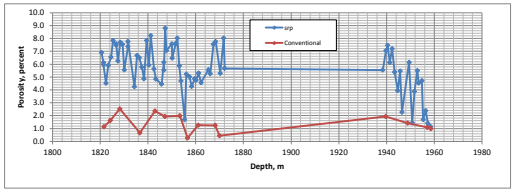
Weatherford LABORATORIES

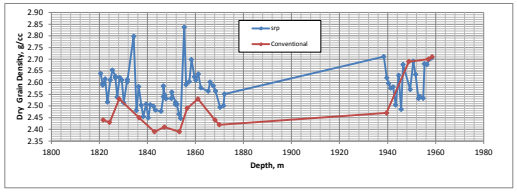
Shale Rock Properties and Conventional Core Analysis Data

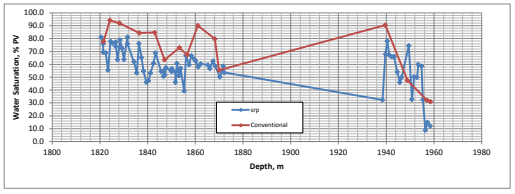
Comparative Results vs. Depth

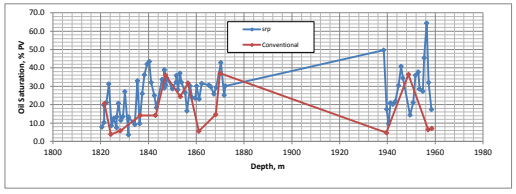
MGM Energy Corp. CL-61558
MGM Shell East Mackay I-78 6-4-13
Northwest Territories. Canada 6-26-13
East MackKay 6-27-13

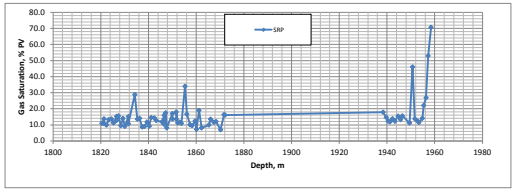












Weatherford LABORATORIES

Shale Rock Properties
Summary of Routine Crushed Core Analyses Results

As-Received and Vacuum Dried at 212°F

MGM Energy Corp. CL-61558
MGM Shell East Mackay I-78 6-4-13
Northwest Territories. Canada 6-26-13
East MackKay 6-27-13

Sample ID	Top Depth, meters	Bottom Depth, meters	A-R Bulk Density, gm/cc	A-R Grain Density, gms/cc	A-R Water Saturation, % of PV	A-R Oil Saturation, % of PV	A-R Gas Saturation, % of PV	A-R Gas Saturation, % of BV	A-R Press Decay Permeability, md	Dry Bulk Density, gm/cc	Dry Grain Density, gm/cc	Dry Helium Porosity, % of BV	Dry Press Decay Permeability, md
1 SRP	1820.53	1820.63	2.52	2.53	81.2	7.8	11.0	0.8		2.46	2.64	6.9	
2 SRP	1821.39	1821.48	2.49	2.50	75.9	10.3	13.7	0.8		2.44	2.60	6.1	
2A SRP	1821.39	1821.48	2.49	2.49	69.4	19.7	10.9	0.7	8.22E-07	2.43	2.59	6.0	4.30E-05
3 SRP	1822.40	1822.50	2.54	2.54	69.0	21.1	9.9	0.4		2.50	2.62	4.5	
4 SRP	1823.39	1823.48	2.42	2.43	55.5	31.2	13.2	0.8		2.37	2.52	5.9	
5 SRP	1824.50	1824.60	2.50	2.51	77.8	8.5	13.7	0.9		2.44	2.61	6.5	
6 SRP	1825.39	1825.50	2.52	2.53	76.5	12.4	11.2	0.9		2.45	2.65	7.8	
7 SRP	1826.67	1826.77	2.50	2.51	77.3	7.4	15.3	1.1		2.43	2.63	7.5	
7A SRP	1826.67	1826.77	2.49	2.50	73.9	13.3	12.8	1.0	1.22E-06	2.42	2.62	7.6	6.44E-05
8 SRP	1827.40	1827.50	2.43	2.45	63.7	20.7	15.6	1.0		2.38	2.54	6.3	
9 SRP	1828.44	1828.53	2.49	2.50	79.0	11.5	9.6	0.7		2.42	2.62	7.7	
10 SRP	1829.33	1829.43	2.48	2.49	72.4	13.6	14.0	1.1		2.41	2.61	7.5	
11 SRP	1830.10	1830.20	2.42	2.43	63.8	27.1	9.1	0.5		2.37	2.51	5.6	
12 SRP	1831.63	1831.72	2.49	2.50	81.2	3.6	15.2	1.1		2.42	2.61	7.4	
12A SRP	1831.63	1831.72	2.47	2.48	76.0	13.3	10.7	0.8	1.12E-06	2.40	2.60	7.8	1.14E-04
13 SRP	1834.31	1834.41	2.71	2.74	62.0	9.2	28.8	1.2		2.68	2.80	4.3	
14 SRP	1835.40	1835.50	2.37	2.39	53.4	33.0	13.6	0.9		2.32	2.48	6.7	
15 SRP	1836.33	1836.43	2.47	2.48	76.2	9.7	14.1	0.9	8.42E-06	2.42	2.58	6.5	3.99E-05
16 SRP	1837.41	1837.51	2.41	2.42	65.3	26.0	8.7	0.5		2.36	2.50	5.8	
17 SRP	1838.30	1838.39	2.38	2.38	54.8	36.2	9.0	0.4		2.34	2.45	4.9	
18 SRP	1839.43	1839.52	2.38	2.39	46.2	42.0	11.8	0.9		2.31	2.51	7.8	
19 SRP	1840.37	1840.47	2.36	2.36	47.3	43.5	9.3	0.5		2.30	2.45	5.9	
20 SRP	1841.17	1841.27	2.37	2.39	53.4	32.1	14.6	1.2	7.73E-06	2.30	2.50	8.2	4.24E-04
21 SRP	1842.49	1842.58	2.41	2.42	60.8	25.0	14.3	0.8		2.36	2.50	5.6	
22 SRP	1843.30	1843.40	2.41	2.41	68.9	18.4	12.7	0.6		2.36	2.48	4.9	
24 SRP	1845.69	1845.79	2.41	2.41	54.5	33.6	11.9	0.5		2.37	2.48	4.5	
25 SRP	1846.65	1846.75	2.43	2.45	55.0	29.0	16.0	1.0		2.38	2.54	6.2	
25A SRP	1846.65	1846.75	2.49	2.50	50.7	39.0	10.3	0.6	2.45E-06	2.44	2.59	5.5	2.47E-05
26 SRP	1847.24	1847.34	2.39	2.42	52.0	30.5	17.5	1.5		2.32	2.55	8.8	
27 SRP	1847.70	1847.80	2.42	2.42	57.4	34.4	8.1	0.6		2.35	2.53	7.1	
28 SRP	1850.03	1850.10	2.40	2.42	54.4	28.6	17.1	1.3		2.34	2.53	7.6	
29 SRP	1850.14	1850.24	2.45	2.46	56.7	29.6	13.7	0.9		2.39	2.56	6.5	
30 SRP	1851.68	1851.76	2.39	2.40	54.0	32.4	13.6	1.0		2.33	2.52	7.6	
30A SRP	1851.68	1851.76	2.38	2.40	46.1	35.8	18.0	1.4	1.99E-05	2.32	2.51	7.6	5.36E-05
31 SRP	1852.30	1852.38	2.38	2.39	60.7	28.1	11.2	0.9		2.31	2.51	8.0	
32 SRP	1853.17	1853.25	2.37	2.38	51.1	37.1	11.8	0.7		2.32	2.46	5.9	
33 SRP	1853.83	1853.93	2.37	2.38	57.0	32.1	10.9	0.5		2.33	2.45	4.7	
34 SRP	1855.34	1855.44	2.80	2.81	39.4	26.7	34.0	0.6		2.79	2.84	1.7	
35 SRP	1856.09	1856.18	2.50	2.51	66.8	16.6	16.7	0.9	8.85E-06	2.46	2.59	5.2	2.58E-05
36 SRP	1857.41	1857.50	2.52	2.52	59.7	30.2	10.1	0.5		2.47	2.60	5.0	
37 SRP	1858.31	1858.40	2.62	2.63	66.7	23.7	9.6	0.4		2.58	2.70	4.3	
38 SRP	1859.59	1859.69	2.54	2.55	64.0	23.5	12.5	0.6		2.50	2.62	4.9	
39 SRP	1860.16	1860.26	2.53	2.53	62.7	30.1	7.2	0.3		2.49	2.61	4.8	
40 SRP	1861.21	1861.31	2.54	2.56	58.0	23.0	19.0	1.0	2.35E-05	2.50	2.64	5.3	7.71E-05
41 SRP	1862.26	1862.36	2.50	2.50	60.4	31.5	8.1	0.4		2.46	2.58	4.6	
44 SRP	1865.34	1865.44	2.47	2.48	59.4	30.6	10.0	0.6		2.42	2.56	5.6	
45 SRP	1866.08	1866.18	2.51	2.52	56.7	29.7	13.6	0.7	1.09E-05	2.47	2.60	5.3	6.17E-05
46 SRP	1867.42	1867.52	2.46	2.47	62.5	25.8	11.7	0.9		2.39	2.59	7.6	
47 SRP	1868.36	1868.44	2.43	2.44	58.7	29.3	12.0	0.9		2.37	2.56	7.8	
49 SRP	1870.27	1870.37	2.41	2.41	50.2	42.8	7.0	0.4		2.36	2.49	5.3	
50 SRP	1871.69	1871.79	2.37	2.39	58.5	25.1	16.3	1.3	2.42E-05	2.30	2.50	8.0	7.64E-05
51 SRP	1872.12	1872.22	2.45	2.47	53.7	30.2	16.1	0.9		2.41	2.55	5.7	
52 SRP	1938.40	1938.50	2.60	2.62	32.4	49.7	17.9	1.0		2.56	2.71	5.5	
53 SRP	1939.71	1939.81	2.50	2.51	67.8	17.5	14.7	1.0		2.44	2.62	7.0	
54 SRP	1940.45	1940.54	2.47	2.48	78.1	9.6	12.3	0.9		2.40	2.60	7.5	
55 SRP	1941.30	1941.39	2.47	2.48	67.1	20.9	12.0	0.7	6.21E-06	2.42	2.58	6.1	1.88E-05
56 SRP	1942.32	1942.41	2.46	2.47	66.0	20.2	13.8	1.0		2.40	2.58	7.2	
57 SRP	1943.33	1943.43	2.42	2.42	65.9	21.8	12.3	0.7		2.37	2.50	5.4	
58 SRP	1944.65	1944.75	2.56	2.57	54.2	30.4	15.4	0.6		2.53	2.63	3.9	
59 SRP	1945.69	1945.79	2.40	2.41	46.0	40.8	13.2	0.7		2.35	2.49	5.5	
60 SRP	1946.45	1946.55	2.64	2.64	50.0	34.5	15.6	0.4	6.38E-06	2.62	2.68	2.3	8.19E-05
63 SRP	1949.44	1949.54	2.47	2.47	74.5	14.3	11.2	0.7		2.41	2.57	6.1	
64 SRP	1950.75	1950.84	2.66	2.68	32.8	21.1	46.0	0.7		2.65	2.69	1.4	
65 SRP	1951.69	1951.79	2.57	2.57	50.3	36.0	13.8	0.5	5.88E-06	2.53	2.63	3.9	3.08E-05
66 SRP	1952.91	1953.00	2.44	2.45	49.9	37.8	12.4	0.7		2.39	2.53	5.5	
67 SRP	1953.40	1953.49	2.47	2.47	60.0	28.5	11.5	0.5		2.43	2.54	4.5	
68 SRP	1954.81	1954.91	2.45	2.46	58.7	27.2	14.1	0.7		2.41	2.53	4.7	
69 SRP	1955.36	1955.45	2.65	2.66	32.5	45.4	22.1	0.4		2.64	2.68	1.7	
70 SRP	1956.39	1956.48	2.63	2.64	8.8	64.3	26.9	0.6	3.32E-05	2.61	2.68	2.4	4.49E-05
71 SRP	1957.25	1957.35	2.67	2.69	15.0	32.1	52.9	0.7		2.66	2.70	1.4	
72 SRP	1958.42	1958.52	2.68	2.70	12.1	17.3	70.6	0.8		2.67	2.71	1.2	
Average values:			2.48	2.49	58.2	26.4	15.4	0.8	1.22E-05	2.43	2.58	5.7	7.87E-05

As-received bulk volumes and bulk densities were determined on intact bulk sample material. The bulk material was crushed and all other analysis reported herein were conducted on the crushed material.

Weatherford LABORATORIES

SUMMARY OF ROUTINE HORIZONTAL PLUG ANALYSES RESULTS

Conventional Oven Dried at 95°C

MGM Energy Corp. JIP Number: CL-61558
MGM Shell East MacKay I-78 Date: May 27, 2013
East MacKay

Sample Number	Sample Depth, meters	Permeability, millidarcys to Air	Porosity, Ambient	Grain Density, gm/cc	Fluid Saturations, % Water	Fluid Saturations, % Oil	Fluid Saturations, % Total
SP1	1821.57	**	1.1	2.44	77.6	20.5	98.2
SP2	1824.23	0.0162	1.6	2.43	94.2	3.9	98.0
SP3	1828.21	**	2.5	2.53	92.0	5.8	97.8
SP5	1836.58	0.0102	0.7	2.45	84.3	14.2	98.5
SP7	1842.93	0.0269	2.4	2.39	84.7	14.2	98.9
SP8	1847.10	**	1.9	2.41	63.5	36.0	99.6
SP11	1853.33	**	2.0	2.39	73.0	24.3	97.3
SP12	1856.55	0.0085	0.3	2.49	67.4	31.7	99.2
SP14	1861.08	**	1.3	2.53	90.1	5.5	95.6
SP17	1868.15	**	1.2	2.44	79.8	14.6	94.4
SP18	1869.96	0.0038	0.4	2.42	55.6	37.0	92.6
SP20	1939.59	**	1.9	2.47	90.5	4.7	95.2
SP23	1948.84	0.0016	1.4	2.69	47.6	36.4	84.0
SP26	1957.03	0.0069	1.1	2.70	32.1	6.4	38.5
SP27	1958.54	0.0308	1.0	2.71	31.0	7.1	38.0

** indicates sample is not suitable for this testing
Note: oil density is assumed as 0.85g/cc

fracture

Appendix A10 Daily Drilling Reports

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DAILY DRILLING REPORT

PROGRAMMED FTD :			
DAYS (MI & RU) :	4.00	**AFE # :**	12D0006
DAYS (FROM SPUD) :		**AFE AMT. :**	
TOTAL DAYS :	4.00	**CO. WI (%) :**	

KB ELEVATION:	161.20	**GROUND ELEVATION:**	155.00	**CBF ELEVATION :**	

Date of First Report: 24-Jan-13

Well Name :	MGM-Shell East Mackay I-78		**Licence # :**	466	**Date:** 24-Jan-13
Dpth @ 24:00	**Progress (m)**	**Operation @ 24:00 Hours** **24-Jan-13**	**Fuel Today**	**Fuel Total**	**Depth @ 07:00 Hr.**
		Preparing to Rig in Torque Tube and Top Drive	2500	2500	

DRILLING FLUID

Type :	**Mud Engineer:**	**Cell # :**	**Office # :**	**Mud Co.:** Matrix Drilling Fluids

MUD CHECK

	#1	#2
Time		
Depth		
Density		
Viscosity		
Water Loss		
pH		
Filter Cake		
P.V.		
Y.P.		
Gels 10 sec.		
Gels 10 min.		
Low "N"		
Low "K"		
Brk YP		
Brk 0.5 rpm		
Chloride		
Calcium		
Sand %		
Solids %		
Oil Content %		
MBT		
Mud Gradient		
Last Csg MD:		
Last Csg TVD:		
MACP:		
RSPP:		
RSP Strokes:		

ADDITIVES

	SKS

DAILY DRILLING REPORT

PROGRAMMED FTD :	2020		
DAYS (MI & RU) :	12.00	**AFE # :**	12D0006
DAYS (FROM SPUD) :		**AFE AMT. :**	
TOTAL DAYS :	12.00	**CO. WI (%) :**	

KB ELEVATION:	161.20	**GROUND ELEVATION:**	155.00	**CBF ELEVATION :**	

Date of First Report: 24-Jan-13

Well Name : MGM-Shell East Mackay I-78			**Licence # :** 466	**Date:** 25-Jan-13
Dpth @ 24:00	**Progress (m)**	**Operation @ 24:00 Hours 25-Jan-13**	**Fuel Today** / **Fuel Total**	**Depth @ 07:00 Hr.**
		picking up topdrive fr catwalk	16000 / 18500	

DRILLING FLUID

Type :	**Mud Engineer:**	**Cell # :**	**Office # :**	**Mud Co.:** Matrix Drilling Fluids

MUD CHECK

	#1	#2
Time		
Depth		
Density		
Viscosity		
Water Loss		
pH		
Filter Cake		
P.V.		
Y.P.		
Gels 10 sec.		
Gels 10 min.		
Low "N"		
Low "K"		
Brk YP		
Brk 0.5 rpm		
Chloride		
Calcium		
Sand %		
Solids %		
Oil Content %		
MBT		
Mud Gradient		
Last Csg MD:		
Last Csg TVD:		
MACP:		
RSPP:		
RSP Strokes:		

ADDITIVES

	SKS

DAILY DRILLING REPORT

PROGRAMMED FTD :	2020		
DAYS (MI & RU) :	13.00	**AFE # :**	12D0006
DAYS (FROM SPUD) :		**AFE AMT. :**	
TOTAL DAYS :	13.00	**CO. WI (%) :**	

KB ELEVATION:	161.20	**GROUND ELEVATION:**	155.00	**CBF ELEVATION :**	

Date of First Report: 24-Jan-13

Well Name :	MGM-Shell East Mackay I-78		**Licence # :**	466	**Date:** 26-Jan-13
Dpth @ 24:00	**Progress (m)**	**Operation @ 24:00 Hours** **26-Jan-13**	**Fuel Today**	**Fuel Total**	**Depth @ 06:00 Hr.**
		Continue to rig up	4000	22500	

DRILLING FLUID

Type :	**Mud Engineer:** Dave Gibson	**Cell # :**	**Office # :**	**Mud Co.:** Matrix Drilling Fluids

MUD CHECK

	#1	#2
Time		
Depth		
Density		
Viscosity		
Water Loss		
pH		
Filter Cake		
P.V.		
Y.P.		
Gels 10 sec.		
Gels 10 min.		
Low "N"		
Low "K"		
Brk YP		
Brk 0.5 rpm		
Chloride		
Calcium		
Sand %		
Solids %		
Oil Content %		
MBT		
Mud Gradient		
Last Csg MD:		
Last Csg TVD:		
MACP:		
RSPP:		
RSP Strokes:		

ADDITIVES

	SKS

DAILY DRILLING REPORT

PROGRAMMED FTD :	2020		
DAYS (MI & RU) :	13.59	**AFE # :**	12D0006
DAYS (FROM SPUD) :	0.41	**AFE AMT. :**	
TOTAL DAYS :	14.00	**CO. WI (%) :**	

Date of First Report: 24-Jan-13

KB ELEVATION:	161.20	**GROUND ELEVATION:**	155.00

CBF ELEVATION :

Well Name :	MGM-Shell East Mackay I-78	**Licence # :**	466	**Date:**	27-Jan-13

Dpth @ 24:00	**Progress (m)**	**Operation @ 24:00 Hours** **27-Jan-13**	**Fuel Today**	**Fuel Total**	**28-Jan-13**	**Depth @ 06:00 Hr.**
100m	100m	Drill 311mm hole	3100	25600		

DRILLING FLUID

Type :	H2O	**Mud Engineer:** Dave Gibson	**Cell # :**	**Office # :**	**Mud Co.:** Matrix Drilling Fluids

MUD CHECK	#1	#2
Time	23:20	
Depth	92	
Density	1045	
Viscosity	34	
Water Loss		
pH	10.50	
Filter Cake		
P.V.		
Y.P.		
Gels 10 sec.		
Gels 10 min.		
Low "N"		
Low "K"		
Brk YP		
Brk 0.5 rpm		
Chloride		
Calcium		
Sand %		
Solids %		
Oil Content %		
MBT		
Mud Gradient	10.25	
Last Csg MD:		
Last Csg TVD:		
MACP:		
RSPP:		
RSP Strokes:		

ADDITIVES	SKS

DAILY DRILLING REPORT

PROGRAMMED FTD :	2020		
DAYS (MI & RU) :	13.59	**AFE # :**	12D0006
DAYS (FROM SPUD) :	1.41	**AFE AMT. :**	
TOTAL DAYS :	15.00	**CO. WI (%) :**	62.50%

KB ELEVATION: 161.20	**GROUND ELEVATION:** 155.00	**CBF ELEVATION :**

Date of First Report: 24-Jan-13

Well Name : MGM-Shell East Mackay I-78			**Licence # :** 466		**Date:** 28-Jan-13
Dpth @ 24:00	**Progress (m)**	**Operation @ 24:00 Hours 28-Jan-13**	**Fuel Today**	**Fuel Total**	**29-Jan-13** / **Depth @ 06:00 Hr.**
395	295	POOH (strapping out Wiper trip)	7100	32700	405 TD

DRILLING FLUID

Type : H2O	**Mud Engineer:** Dave Gibson	**Cell # :**	**Office # :**	**Mud Co.:** Matrix Drilling Fluids

MUD CHECK

	#1	#2
Time	04:00	23:00
Depth	151	395
Density	1050	1110
Viscosity	33	61
Water Loss		
pH		
Filter Cake		
P.V.		
Y.P.		
Gels 10 sec.		
Gels 10 min.		
Low "N"		
Low "K"		
Brk YP		
Brk 0.5 rpm		
Chloride		
Calcium		
Sand %		
Solids %		
Oil Content %		
MBT		
Mud Gradient	10.30	10.89
Last Csg MD:		
Last Csg TVD:		
MACP:		
RSPP:	485	
RSP Strokes:	65	

ADDITIVES

	SKS
Gel	45
sawdust	73
Polyzan	1

	Daily	Cum.
Mud ($)	1,516	2,186
Water ($)		

BOTTOM HOLE ASSEMBLY

Description	OD (mm)	ID (mm)	Length	Thread
Bit	311		0.30	6 5/8 reg
Bit sub	228		0.71	6 5/8 reg
6-6.25 DC's	156	72	56.29	4 1/2 XH
Jar Hyd/mech	156	70	10.02	4 1/2 XH
7-6.25 DC's	156	70	65.20	4 1/2XH
X/O	102	65	1.10	4 1/2XH/4'FH
20-HWDP	102	65	186.44	4' FH
Drill Pipe 7	102	84.48	74.94	
HWDP				
Drill Pipe				
Kelly Down				
BHA Length (m) :	320.06		**Total Length**	395.00

FLUID VOLUMES

Bottoms Up (min)	10
Mud Cycle (min)	14
Main Hole (m3)	23.2
Mud Tanks (m3)	
Sump Vol. (m3)	
Total (m3)	23.2
MUD-UP DEPTH:	**45m**

PRE-MIX TANK

Volume (m3)	
Low "N"	
Low "K"	
Brk YP	
Brk 0.5 rpm	
Viscosity	
Density	

SURVEYS

Depth	Degrees	Azi.
110	.73	
140	.57	
180	.51	
220	.47	
250	.66	
280	.89	
310	.77	
350	.32	
376	1	

HYDRAULICS

Hole Size	**311**	**OD (mm)**	**ID (mm)**
Drill Pipe		102	84.5
Drill Collar		156	70

SOLIDS CONTROL

Item	**UF**	**OF**
Desander		
Desilter		
Centrifuge #1	1080	1860
Centrifuge #2		
Centrifuge #3		

Screen Sz.	**#1**	**#2**	**#3**	**#4**
Shaker #1	100	100	80	80
Shaker #2	100	100	80	80
Shaker #3				

BIT DATA

No.	Size-mm	Type	Serial No.	Jets (mm)							In	Out	Metres	Bit Hrs.	ROP	Cum Hrs	Ti	To	D	Loc	B	G	O	R
1	311	GX-C03	5204676	open	open	open					21													

DRILLING PARAMETERS

No.	WOB	RPM	Str. Wt.	Pressure	SPM #1	SPM #2	SPM #3	DP Vel	DC Vel	Noz Vel	m3 / Min
1	8	140	33	9780	95	95		34	41	74.0	2.33

PUMP DATA

No.	Type	m3 / Stk	Eff (%)	Liner Sz.	Stk.Lgth.
#1	9P-100	0.0129	95%	152	235
#2	9P-100	0.0129	95%	152	235
#3					

FROM	TO	24 HOUR SUMMARY	TIME BREAKDOWN	S	I	P	L1	L2	L3
00:00	05:00	Drill 311mm w/slick assembly from 100mKB to210mKB	**MIRU / TO :**						
05:00	06:15	Accum work pipe & connections	**Drill :**	17.75					
06:15	06:45	Accum wireline surveys	**Ream :**						
06:45	07:00	Crew change safety meeting with MGM rep & Akita crew	**Coring :**						
07:00	07:45	Accum wireline surveys	**Circ :**	0.50					
07:45	08:00	Rig service, function annular c/o 54 sec	**Trips :**	1.50					
08:00	08:15	Diveter drill with Akita crew	**Rig Service :**	0.75					
08:15	14:30	Drill 311mm w/slick assembly from 210mKB to 360mKB	**Rig Repair :**						
14:30	15:45	Accum wireline surveys	**Cut Drlg Ln :**						
15:45	18:45	Accum work pipe & connections	**Dev Survey :**	2.75					
18:45	19:00	Rig service,grease top drive/wash pipe, function annular c/o 54 sec	**Logging :**						
19:00	19:15	Safety meeting with MGM rep & Akita crew	**Run Casing :**						
19:15	21:00	Drill 311mm hole w/slick assembly from 360mKB to 395mKB	**Cementing :**						
21:00	21:30	Accum work pipe & connections	**WOC :**						
21:30	21:45	Rig service, function annular c/o 54 sec	**NU BOP :**						
21:45	22:15	Circulate hole clean	**PT BOP :**						
22:15	22:30	wireline survey	**Abandon :**						
22:30	23:00	Blow out top drive, remove kicker hose, circulate pumps through bleeder,line up trip tank to wiper trip out of hole	**Fishing :**						
23:00	24:00	POOH with flow checks @ 394m, 376m, 132m before collars	**Dir Work :**						
			LDDP :						
			B.O.P / Safety Mt:	0.75					
OPERATION NEXT 24 HRS :		Cont wiper trip,RIH drill ahead to 405mKB-TD, circ clean, POOH to Log,RIH to circ clean,POOH to RIH w/ 244.5mm casing	**TOTAL:**	**24.00**					

Drilling Rig & Number: Akita 37	**HOLE CONDITION :** Gun barrel	**BOILER HRS:**	**24.00** **TOTAL DAILY HRS:** 24.00
Tool Pusher : Guy Cusitar	**Cellular # :** 403-648-0842	**Road / Lease Condition :**	Road is holding together vey well. Location is in good shape
Drilling Consultant : Trevor Mitchell / Jason Duck	**Email:** rig_supervisor@mgmenergy.com	**Shack Cell # :**	(403) 536-9970
Temp (C) : -35	**Weather :** 17kph wind & clear	**Taken By :**	John Williams / Dick Heenan
Date Last BOP Drill : Jan.27, 2013	**Daily Cost :** $126,082	**Cum Cost :** $8,418,825	**AFE Remaining :** $0

DAILY DRILLING REPORT

PROGRAMMED FTD :	2020		
DAYS (MI & RU) :	13.59	**AFE # :**	12D0006
DAYS (FROM SPUD) :	2.41	**AFE AMT. :**	
TOTAL DAYS :	16.00	**CO. WI (%) :**	

KB ELEVATION:	161.20	**GROUND ELEVATION:**	155.00	**CBF ELEVATION :**	

Date of First Report: 24-Jan-13

Well Name : MGM-Shell East Mackay I-78			**Licence # :** 466	**Date:** 29-Jan-13
Dpth @ 24:00	**Progress (m)**	**Operation @ 24:00 Hours** **29-Jan-13**	**Fuel today** / **Fuel total** **30-Jan-13**	**Depth @ 06:00 Hr.**
405	10	Rig out wireliners	8180 / 40880	405

DRILLING FLUID

Type : H2O	**Mud Engineer:** Dave Gibson	**Cell # :**	**Office # :**	**Mud Co.:** Matrix Drilling Fluids	

MUD CHECK

	#1	#2
Time	10:00	
Depth	405	
Density	1190	
Viscosity	75	
Water Loss		
pH	8.5	
Filter Cake		
P.V.		
Y.P.		
Gels 10 sec.		
Gels 10 min.		
Low "N"		
Low "K"		
Brk YP		
Brk 0.5 rpm		
Chloride		
Calcium		
Sand %		
Solids %		
Oil Content %		
MBT		
Mud Gradient	11.67	
Last Csg MD:		
Last Csg TVD:		
MACP:		
RSPP:		
RSP Strokes:		

ADDITIVES

	SKS
Gel	60
sawdust	25

DAILY DRILLING REPORT

PROGRAMMED FTD :	2020		
DAYS (MI & RU) :	13.59	**AFE # :**	12D0006
DAYS (FROM SPUD) :	3.41	**AFE AMT. :**	
TOTAL DAYS :	17.00	**CO. WI (%) :**	

KB ELEVATION:	161.20	**GROUND ELEVATION:**	155.00	**CBF ELEVATION :**	

Date of First Report: 24-Jan-13

Well Name : MGM-Shell East Mackay I-78			**Licence # :** 466	**Date:** 30-Jan-13
Dpth @ 24:00	**Progress (m)**	**Operation @ 24:00 Hours 30-Jan-13**	**Fuel today** / **Fuel total** / **31-Jan-13**	**Depth @ 06:00 Hr.**
405		Head up to Circulate casing & rig out tong hands	8076 / 48956	405

DRILLING FLUID

Type :	H2O	**Mud Engineer:** Dave Gibson	**Cell # :**	**Office # :**	**Mud Co.:** Matrix Drilling Fluids

MUD CHECK

	#1	#2
Time		
Depth		
Density		
Viscosity		
Water Loss		
pH		
Filter Cake		
P.V.		
Y.P.		
Gels 10 sec.		
Gels 10 min.		
Low "N"		
Low "K"		
Brk YP		
Brk 0.5 rpm		
Chloride		
Calcium		
Sand %		
Solids %		
Oil Content %		
MBT		
Mud Gradient		
Last Csg MD:		
Last Csg TVD:		
MACP:		
RSPP:		
RSP Strokes:		

ADDITIVES

	SKS

DAILY DRILLING REPORT

PROGRAMMED FTD :	2020		
DAYS (MI & RU) :	13.59	**AFE # :**	12D0006
DAYS (FROM SPUD) :	4.41	**AFE AMT. :**	
TOTAL DAYS :	18.00	**CO. WI (%) :**	

KB ELEVATION:	161.20	**GROUND ELEVATION:**	155.00	**CBF ELEVATION :**	

Date of First Report: 24-Jan-13

Well Name : MGM-Shell East Mackay I-78			**Licence # :** 1202-002	**Date:** 31-Jan-13
Dpth @ 24:00	**Progress (m)**	**Operation @ 24:00 Hours** **31-Jan-13**	**Fuel today** / **Fuel total** / **01-Feb-13**	**Depth @ 06:00 Hr.**
		N/U BOP's	7318 / 56274	405

DRILLING FLUID

Type : H2O	**Mud Engineer:** Dave Gibson	**Cell # :**	**Office # :**	**Mud Co.:** Matrix Drilling Fluids

MUD CHECK

	#1	#2
Time		
Depth		
Density		
Viscosity		
Water Loss		
pH		
Filter Cake		
P.V.		
Y.P.		
Gels 10 sec.		
Gels 10 min.		
Low "N"		
Low "K"		
Brk YP		
Brk 0.5 rpm		
Chloride		
Calcium		
Sand %		
Solids %		
Oil Content %		
MBT		
Mud Gradient		
Last Csg MD:		
Last Csg TVD:		
MACP:		
RSPP:		
RSP Strokes:		

ADDITIVES

	SKS

DAILY DRILLING REPORT

PROGRAMMED FTD :	2020		
DAYS (MI & RU) :	13.59	**AFE # :**	12D0006
DAYS (FROM SPUD) :	5.41	**AFE AMT. :**	
TOTAL DAYS :	19.00	**CO. WI (%) :**	

KB ELEVATION: 161.20	**GROUND ELEVATION:** 155.00	**CBF ELEVATION :**

Date of First Report: 24-Jan-13

Well Name : MGM-Shell East Mackay I-78			**Licence # :** 1202-002		**Date:** 1-Feb-13
Dpth @ 24:00	**Progress (m)**	**Operation @ 24:00 Hours 01-Feb-13**	**Fuel today**	**Fuel total**	**Depth @ 06:00 Hr.**
405	405	Lay dn 3- 6.25 DC's from stick	5276	61550	405

DRILLING FLUID

Type : H2O	**Mud Engineer:** Dave Gibson	**Cell # :**	**Office # :**	**Mud Co.:** Matrix Drilling Fluids

MUD CHECK

	#1	#2
Time		
Depth		
Density		
Viscosity		
Water Loss		
pH		
Filter Cake		
P.V.		
Y.P.		
Gels 10 sec.		
Gels 10 min.		
Low "N"		
Low "K"		
Brk YP		
Brk 0.5 rpm		
Chloride		
Calcium		
Sand %		
Solids %		
Oil Content %		
MBT		
Mud Gradient		
Last Csg MD:		
Last Csg TVD:		
MACP:		
RSPP:		
RSP Strokes:		

ADDITIVES

	SKS
Aqua star	2
Staflo	1
Polyzan	1
Hyperdrill 247	1
Cal carb 325	5
matrix sheild	3

	Daily	Cum.
Mud ($)	1,709	5,040
Water ($)		

BOTTOM HOLE ASSEMBLY

Description	OD (mm)	ID (mm)	Length	Thread
Drill Pipe				
HWDP				
Drill Pipe				
Kelly Down				
BHA Length (m) :		**Total Length**		

FLUID VOLUMES

Bottoms Up (min)	
Mud Cycle (min)	
Main Hole (m3)	
Mud Tanks (m3)	
Sump Vol. (m3)	
Total (m3)	
MUD-UP DEPTH:	

PRE-MIX TANK

Volume (m3)	
Low "N"	
Low "K"	
Brk YP	
Brk 0.5 rpm	
Viscosity	
Density	

SURVEYS

Depth	Degrees	Azi.

HYDRAULICS

Hole Size		OD (mm)	ID (mm)
Drill Pipe		102	84.5
Drill Collar		156	70

SOLIDS CONTROL

Item	UF	OF
Desander		
Desilter		
Centrifuge #1		
Centrifuge #2		
Centrifuge #3		

Screen Sz.	#1	#2	#3	#4
Shaker #1	100	100	80	80
Shaker #2	100	100	80	80
Shaker #3				

BIT DATA

No.	Size-mm	Type	Serial No.	Jets (mm)	In	Out	Metres	Bit Hrs.	ROP	Cum Hrs	Ti	To	D	Loc	B	G	O	R
										25.50								

DRILLING PARAMETERS

No.	WOB	RPM	Str. Wt.	Pressure	SPM #1	SPM #2	SPM #3	DP Vel	DC Vel	Noz Vel	m3 / Min

PUMP DATA

No.	Type	m3 / Stk	Eff (%)	Liner Sz.	Stk.Lgth.
#1	9P-100	0.0129	95%	152	235
#2	9P-100	0.0129	95%	152	235
#3					

FROM	TO	24 HOUR SUMMARY	TIME BREAKDOWN	S	I	P	L1	L2	L3
00:00	06:30	Nipple up, HCR,kill line valves,run lines to manifold,weld on flow T & install	**MIRU / TO :**						
06:30	06:45	Rig service & grease top drive,function motor kills	**Drill :**						
06:45	07:00	Safety meeting with Akita crew & MGM rep	**Ream :**						
07:00	10:00	Continue to nipple up hydraulic hoses for stack, gut line, insulate steam lines to manifold	**Coring :**						
10:00	10:30	Function test BOP's	**Circ :**						
10:30	10:45	Safety meeting with Rainbow pressure tester	**Trips :**						
10:45	11:30	Rig up to pressure test	**Rig Service :**	0.50					
11:30	18:45	Pressure test inside Bop, stabbing valve, Annular, Pipe rams, Kill line, Upper kelly cock, Blind/Shear rams, I/O HCR, stand pipe.	**Rig Repair :**						
18:45	18:45	All manifold valves Low= 1400kpa, High= 21,000kpa, all tests for 15 min, all tests were good	**Cut Drlg Ln :**						
18:45	19:00	Safety meeting with Akita crew & MGM rep	**Dev Survey :**						
19:00	20:00	Pressure test accumulator, starting system pressure 19,800kpa, Annular= close/16 sec,HCR= close /2 sec,Pipe rams=close/5 sec	**Logging :**						
20:00	20:00	Total pressure loss 8000 kpa, remaining pressure 11,800kpa	**Run Casing :**						
20:00	21:30	Remove & modify flow-T so wear bushing will fit through & install	**Cementing :**						
21:30	22:30	Install wear bushing	**WOC :**						
22:30	22:45	Rig service, function test motor kills	**NU BOP :**	9.50					
22:45	24:00	Weld on top drive, repair proxy sensor	**PT BOP :**	9.50					
			DST :						
			Fishing :						
			Dir Work :						
			LDDP :						
			B.O.P / Safety Mt:	0.75					
			Welding	2.75					
			wear bushing	1.00					
OPERATION NEXT 24 HRS : M/U Directional BHA,RIH, BOP drill, Drill out float collar & shoe , Leak off test & Drill ahead w/222mm bit.			**TOTAL:**	**24.00**					

Drilling Rig & Number: Akita 37	**HOLE CONDITION :**	**BOILER HRS:**	**24.00** **TOTAL DAILY HRS:** 24.00
Tool Pusher : Guy Cusitar	**Cellular # :** 403-648-0842	**Road / Lease Condition :**	Road is holding together vey well. Location is in good shape
Drilling Consultant : Trevor Mitchell / Jason Duck	**Email:** rig_supervisor@mgmenergy.com	**Shack Cell # :**	(403) 536-9970
Temp (C) : -25	**Weather :** 2kph NW wind, clear	**Taken By :**	John Williams / Dick Heenan
Date Last BOP Drill : January 28, 2013	**Daily Cost :** $148,375	**Cum Cost :** $10,129,866	**AFE Remaining :** $0

DAILY DRILLING REPORT

PROGRAMMED FTD :	2020		
DAYS (MI & RU) :	13.59	**AFE # :**	12D0006
DAYS (FROM SPUD) :	6.41	**AFE AMT. :**	
TOTAL DAYS :	20.00	**CO. WI (%) :**	

KB ELEVATION:	161.20	**GROUND ELEVATION:**	155.00	**CBF ELEVATION :**	

Date of First Report: 24-Jan-13

Well Name :	MGM-Shell East Mackay I-78	**Licence # :**	1202-002	**Date:** 2-Feb-13

Dpth @ 24:00	**Progress (m)**	**Operation @ 24:00 Hours 02-Feb-13**	**Fuel today**	**Fuel total**	**Depth @ 06:00 Hr.**
545	140	Drill ahead w/ 222mm bit	8787	70337	636

DRILLING FLUID

Type :	Polymer	**Mud Engineer:** Dave Gibson	**Cell # :**	**Office # :**	**Mud Co.:** Matrix Drilling Fluids

MUD CHECK

	#1	#2
Time	22:30	
Depth	515	
Density	1010	
Viscosity	32	
Water Loss	16	
pH	9.5	
Filter Cake	.5	
P.V.	2	
Y.P.	1.5	
Gels 10 sec.	1	
Gels 10 min.	2	
Low "N"	.35	
Low "K"	2.89	
Brk YP		
Brk 0.5 rpm		
Chloride	360	
Calcium	TR	
Sand %	TR	
Solids %	.040	
Oil Content %		
MBT		
Mud Gradient	9.91	
Last Csg MD:	405.00	
Last Csg TVD:	405.00	
MACP:	6809	
RSPP:	2500	
RSP Strokes:	75	

ADDITIVES

	SKS
Aqua star	2
Staflo	1
Polyzan	1
Hyperdrill 247	1
Cal carb 325	5
Sodium Bi carb	1

	Daily	Cum.
Mud ($)	1,182	6,222
Water ($)		

BOTTOM HOLE ASSEMBLY

Description	OD (mm)	ID (mm)	Length	Thread
PDC bit	222		0.34	4 1/2 reg
Tru Trac	193	88.9	13.04	4 1/2 IF
MWD	176	72	0.77	4 1/2 IF
NM Drill collar	163	72	9.09	4 1/2 IF
NM Drill collar	161	72	8.46	4 1/2 IF
Sub	171	72	1.66	4 1/2 IF
Sub- X/O	160	57	0.58	4 1/2 XH
4- 6.25 DC's	156	70	37.37	4 1/2 XH
Jar	156	70	10.02	4 1/2 XH
3- 6.25 DC's	156	70	28.32	4 1/2 XH
Sub- X/O	102	65	1.10	4-FH / 4 1/2XH
Drill Pipe				
HWDP x 20	102	65	186.25	4-FH
Drill Pipe x 25	102	84.5	248.00	
Kelly Down				

BHA Length (m) : 110.75 **Total Length** 545.00

FLUID VOLUMES

Bottoms Up (min)	11
Mud Cycle (min)	17
Main Hole (m3)	15.1
Mud Tanks (m3)	
Sump Vol. (m3)	
Total (m3)	15.1
MUD-UP DEPTH:	

PRE-MIX TANK

Volume (m3)	25
Low "N"	
Low "K"	
Brk YP	
Brk 0.5 rpm	
Viscosity	
Density	

SURVEYS

Depth	Degrees	Azi.
410.7	.4	128.4
459	.1	157.2
507.1	.6	168

HYDRAULICS

Hole Size	**222**	**OD (mm)**	**ID (mm)**
Drill Pipe		102	84.5
Drill Collar		156	70

SOLIDS CONTROL

Item	**UF**	**OF**
Desander		
Desilter		
Centrifuge #1	1680	1020
Centrifuge #2		
Centrifuge #3		

Screen Sz.	**#1**	**#2**	**#3**	**#4**
Shaker #1	200	200	165	165
Shaker #2	200	200	165	165
Shaker #3				

BIT DATA

No.	Size-mm	Type	Serial No.	Jets (mm)							In	Out	Metres	Bit Hrs.	ROP	Cum Hrs	Ti	To	D	Loc	B	G	O	R
2	222	QD505X	7131618	9.5	9.5	9.5	9.5	9.5	9.5	9.5	405					25.50								

DRILLING PARAMETERS

No.	WOB	RPM	Str. Wt.	Pressure	SPM #1	SPM #2	SPM #3	DP Vel	DC Vel	Noz Vel	m3 / Min
2	5	74	27	5500	115			46	72	47.3	1.41

PUMP DATA

No.	Type	m3 / Stk	Eff (%)	Liner Sz.	Stk.Lgth.
#1	9P-100	0.0129	95%	152	235
#2	9P-100	0.0129	95%	152	235
#3					

24 HOUR SUMMARY

FROM	TO		TIME BREAKDOWN	S	I	P	L1	L2	L3
00:00	01:00	Lay Dn 6.25 Drill collar	**MIRU / TO :**						
01:00	01:15	Rig service, function crown saver	**Drill :**			5.00			
01:15	01:30	Safety meeting with Baker Hughes directional	**Ream :**						
01:30	04:00	Pick up directional BHA	**Coring :**						
04:00	06:45	Trip in the hole,lay out single 6.25 DC & P/U jar	**Circ :**	1.00					
06:45	07:00	Safety meeting with MGM rep & Akita crew	**Trips :**	5.25					
07:00	09:30	Continue to trip in & tag	**Rig Service :**	0.25		0.25			
09:30	13:00	Drill out Float & shoe	**Rig Repair :**						
13:00	14:00	Formation integrity test	**Cut Drlg Ln :**						
14:00	14:30	BOP Drill held with Akita rig crew	**Dev Survey :**			2.50			
14:30	15:30	Displace hole from cement water to polymer	**Logging :**						
15:30	18:00	Drill 222mm hole from 405mkb to 470mkb	**Run Casing :**						
18:00	18:45	Accumulated connections & survey time	**Cementing :**						
18:45	19:00	Safety meeting with MGM rep & Akita crew	**WOC :**						
19:00	21:30	Drill 222mm hole from 470mkb to 545mkb	**NU BOP :**						
21:30	22:00	BOP Drill held with Akita rig crew, 65 sec well secure	**PT BOP :**						
22:00	22:15	Rig service, function test annular 45 sec to c/o	**Formation Int Test**	1.00					
22:15	24:00	Accumulated connections & survey time	**Fishing :**						
			Dir Work :	2.50					
			LDDC :	1.00					
			B.O.P / Safety Mt:	1.00		0.75			
			Drill F/C & Shoe	3.50					
		Formation intergrity test: 6500kpa surface applied pressure - no leak off = 26.72kpa/m calculated gradient							
OPERATION NEXT 24 HRS :		Drill ahead w/ 222mm bit	**TOTAL:**	**15.50**		**8.50**			

Drilling Rig & Number:	Akita 37	**HOLE CONDITION :** good	**BOILER HRS:**	**24.00**	**TOTAL DAILY HRS:** 24.00
Tool Pusher :	Guy Cusitar	**Cellular # :** 403-648-0842	**Road / Lease Condition :**	Road is holding together vey well. Location is in good shape	
Drilling Consultant :	Trevor Mitchell / Jason Duch	**Email:** rig_supervisor@mgmenergy.com	**Shack Cell # :**	(403) 536-9970	
Temp (C) :	-31	**Weather :** 5kph E wind & clear	**Taken By :**	John Williams / Dick Heenan	
Date Last BOP Drill :	February 2, 2013	**Daily Cost :** $127,278	**Cum Cost :**	$10,260,914	**AFE Remaining :** $0

DAILY DRILLING REPORT

PROGRAMMED FTD :	2020		
DAYS (MI & RU) :	13.59	**AFE # :**	12D0006
DAYS (FROM SPUD) :	7.41	**AFE AMT. :**	
TOTAL DAYS :	21.00	**CO. WI (%) :**	

KB ELEVATION:	161.24	**GROUND ELEVATION:**	155.39	**CBF ELEVATION :**	155.89

Date of First Report: 24-Jan-13

Well Name : MGM-Shell East Mackay I-78			**Licence # :** 1202-002	**Date:** 3-Feb-13
Dpth @ 24:00	**Progress (m)**	**Operation @ 24:00 Hours 03-Feb-13**	**Fuel today** / **Fuel total**	**Depth @ 06:00 Hr.**
890	345	Drill ahead w/ 222mm bit	6328 / 76665	990

DRILLING FLUID

Type : Polymer	**Mud Engineer:** Dave Gibson	**Cell # :**	**Office # :**	**Mud Co.:** Matrix Drilling Fluids

MUD CHECK

	#1	#2
Time	08:00	22:30
Depth	681	873
Density	1025	1035
Viscosity	38	40
Water Loss	9.8	9.8
pH	9.5	9.5
Filter Cake	.5	.5
P.V.	9	7
Y.P.	4.5	7.5
Gels 10 sec.	4	2
Gels 10 min.	6	3
Low "N"	.33	.37
Low "K"	12	11.17
Brk YP		
Brk 0.5 rpm		
Chloride	360	360
Calcium	120	120
Sand %	TR	TR
Solids %		
Oil Content %		
MBT		
Mud Gradient	10.06	10.15
Last Csg MD:	405.00	405.00
Last Csg TVD:	405.00	405.00
MACP:	6749	6709
RSPP:	1850	
RSP Strokes:	58	

ADDITIVES

	SKS
Aqua star	6
Staflo	7
Polyzan	7
Hyperdrill 247	3
Cal carb 325	15
Sodium Bi carb	4
sulfamic acid	2
caustic	2
Matrix shield	9

	Daily	Cum.
Mud ($)	7,853	14,075
Water ($)		

BOTTOM HOLE ASSEMBLY

Description	OD (mm)	ID (mm)	Length	Thread
PDC bit	222		0.34	4 1/2 reg
Tru Trac	193	88.9	13.04	4 1/2 IF
MWD	176	72	0.77	4 1/2 IF
NM Drill collar	163	72	9.09	4 1/2 IF
NM Drill collar	161	72	8.46	4 1/2 IF
Sub	171	72	1.66	4 1/2 IF
Sub- X/O	160	57	0.58	4 1/2 XH
4- 6.25 DC's	156	70	37.37	4 1/2 XH
Jar	156	70	10.02	4 1/2 XH
3- 6.25 DC's	156	70	28.32	4 1/2 XH
Sub- X/O	102	65	1.10	4-FH / 4 1/2XH
Drill Pipe				
HWDP 20	102	65	186.25	4-FH
Drill Pipe 61	102	84.5	593.00	4-FH
Kelly Down				
BHA Length (m) : 110.75			**Total Length**	890.00

FLUID VOLUMES

Bottoms Up (min)	18
Mud Cycle (min)	29
Main Hole (m3)	25.3
Mud Tanks (m3)	
Sump Vol. (m3)	
Total (m3)	25.3
MUD-UP DEPTH:	

PRE-MIX TANK

Volume (m3)	
Low "N"	
Low "K"	
Brk YP	
Brk 0.5 rpm	
Viscosity	
Density	

SURVEYS

Depth	Degrees	Azi.
555.60	.20	324.80
603.90	.60	184.30
652.10	.40	4.4
700.30	.60	194.4
748.50	.40	353.3
796.50	.30	197.7
844.70	.40	47.4

HYDRAULICS

Hole Size	**222**	**OD (mm)**	**ID (mm)**
Drill Pipe		102	84.5
Drill Collar		156	70

SOLIDS CONTROL

Item	**UF**	**OF**
Desander		
Desilter		
Centrifuge #1	1670	1020
Centrifuge #2	1670	1020
Centrifuge #3		

Screen Sz.	**#1**	**#2**	**#3**	**#4**
Shaker #1	200	200	165	165
Shaker #2	200	200	165	165
Shaker #3				

BIT DATA

No.	Size-mm	Type	Serial No.	Jets (mm)							In	Out	Metres	Bit Hrs.	ROP	Cum Hrs	Ti	To	D	Loc	B	G	O	R
2	222	QD505X	7131618	9.5	9.5	9.5	9.5	9.5	9.5	9.5	405					25.50								

DRILLING PARAMETERS

No.	WOB	RPM	Str. Wt.	Pressure	SPM #1	SPM #2	SPM #3	DP Vel	DC Vel	Noz Vel	m3 / Min
2	6.5	75	40	8500	115			46	72	47.3	1.41

PUMP DATA

No.	Type	m3 / Stk	Eff (%)	Liner Sz.	Stk.Lgth.
#1	9P-100	0.0129	95%	152	235
#2	9P-100	0.0129	95%	152	235
#3					

FROM	TO	24 HOUR SUMMARY	TIME BREAKDOWN	S	I	P	L1	L2	L3
00:00	03:30	Drill 222mm hole from 545mkb to 630mkb	**MIRU / TO :**						
03:30	06:30	Accumulated survey,connection & work pipe time	**Drill :**			12.00			
06:30	06:45	Rig service, function test pipe rams , 5 sec to c/o	**Ream :**						
06:45	07:00	Safety meeting with Akita crew & MGM rep	**Coring :**						
07:00	12:00	Drill 222mm hole from 630mkb to 817mkb	**Circ :**						
12:00	18:15	Accumulated survey,connection & work pipe time	**Trips :**						
18:15	18:45	Rig service, function test pipe rams , 5 sec to c/o	**Rig Service :**			1.00			
18:45	19:00	Safety meeting with Akita crew & MGM rep	**Rig Repair :**						
19:00	22:30	Drill 222mm hole from 817mkb to 890mkb	**Cut Drlg Ln :**						
22:30	23:45	Accumulated survey,connection & work pipe time	**Dev Survey :**			10.50			
23:45	24:00	Rig service, function test Annular, 55 sec to c/o	**Logging :**						
			Run Casing :						
			Cementing :						
			WOC :						
			NU BOP :						
			PT BOP :						
			DST :						
			Fishing :						
			Dir Work :						
			LDDP :						
			B.O.P / Safety Mt:			0.50			
		Surveyor on I-78 location surveyed CBF elevation to be 155.89m & GL is corrected to 155.39m							
OPERATION NEXT 24 HRS : Drill ahead w/ 222mm bit			**TOTAL:**			**24.00**			

Drilling Rig & Number: Akita 37	**HOLE CONDITION :** good		**BOILER HRS:**	**24.00**	**TOTAL DAILY HRS:** 24.00
Tool Pusher : Guy Cusitar	**Cellular # :** 403-648-0842	**Road / Lease Condition :** Road is holding together vey well. Location is in good shape			
Drilling Consultant : Trevor Mitchell / Jason Duck	**Email:** rig_supervisor@mgmenergy.com	**Shack Cell # :** (403) 536-9970			
Temp (C) : -24	**Weather :** calm & clear	**Taken By :** John Williams / Dick Heenan			
Date Last BOP Drill : February 2, 2013	**Daily Cost :** $962,303	**Cum Cost :** $11,255,436	**AFE Remaining :** $0		

DAILY DRILLING REPORT

PROGRAMMED FTD :	2020		
DAYS (MI & RU) :	13.59	**AFE # :**	12D0006
DAYS (FROM SPUD) :	8.41	**AFE AMT. :**	
TOTAL DAYS :	22.00	**CO. WI (%) :**	

KB ELEVATION:	161.24	**GROUND ELEVATION:**	155.39	**CBF ELEVATION :**	155.89

Date of First Report: 24-Jan-13

Well Name :	MGM-Shell East Mackay I-78		**Licence # :**	1202-002	**Date:**	4-Feb-13
Dpth @ 24:00	**Progress (m)**	**Operation @ 24:00 Hours 04-Feb-13**	**Fuel today**	**Fuel total**		**Depth @ 06:00 Hr.**
1260	370	Drill 222mm hole	8457	85122		1337

DRILLING FLUID

Type :	Polymer	**Mud Engineer:**	Dave Gibson	**Cell # :**		**Office # :**		**Mud Co.:**	Matrix Drilling Fluids

MUD CHECK

	#1	#2
Time	18:00	
Depth	1152	
Density	1040	
Viscosity	42	
Water Loss	9.6	
pH	10	
Filter Cake	1	
P.V.	10	
Y.P.	7	
Gels 10 sec.	2.5	
Gels 10 min.	4	
Low "N"	.39	
Low "K"	10.84	
Brk YP		
Brk 0.5 rpm		
Chloride	360	
Calcium	80	
Sand %	.0025	
Solids %		
Oil Content %		
MBT		
Mud Gradient	10.20	
Last Csg MD:	405.00	405.00
Last Csg TVD:	405.00	405.00
MACP:	6690	7331
RSPP:	2850	
RSP Strokes:	64	

ADDITIVES

ADDITIVES	SKS
Aqua star	2
Staflo	3
Polyzan	3
Hyperdrill 247	2
Cal carb 325	10
Matrix shield	11
sulfamic acid	1
caustic	1

	Daily	Cum.
Mud ($)	4,784	18,859
Water ($)		

BOTTOM HOLE ASSEMBLY

Description	**OD (mm)**	**ID (mm)**	**Length**	**Thread**
PDC bit	222		0.34	4 1/2 reg
Tru Trac	193	88.9	13.04	4 1/2 IF
MWD	176	72	0.77	4 1/2 IF
NM Drill collar	163	72	9.09	4 1/2 IF
NM Drill collar	161	72	8.46	4 1/2 IF
Sub	171	72	1.66	4 1/2 IF
Sub- X/O	160	57	0.58	4 1/2 XH
4- 6.25 DC's	156	70	37.37	4 1/2 XH
Jar	156	70	10.02	4 1/2 XH
3- 6.25 DC's	156	70	28.32	4 1/2 XH
Sub- X/O	102	65	1.10	4-FH / 4 1/2XH
Drill Pipe				
HWDP 20	102	65	186.25	4-FH
Drill Pipe 100	102	84.5	963.00	4-FH
Kelly Down				

BHA Length (m) : 110.75 **Total Length** 1260.00

FLUID VOLUMES

Bottoms Up (min)	26
Mud Cycle (min)	41
Main Hole (m3)	36.3
Mud Tanks (m3)	
Sump Vol. (m3)	
Total (m3)	36.3
MUD-UP DEPTH:	

PRE-MIX TANK

Volume (m3)	
Low "N"	
Low "K"	
Brk YP	
Brk 0.5 rpm	
Viscosity	
Density	

SURVEYS

Depth	**Degrees**	**Azi.**
892.80	.50	222.2
941.0	.60	222.8
988.80	.60	214.1
1036.90	.30	8.9
1085.10	.40	207.90
1133.40	.40	33.90
1181.1	.20	170.6
1229.80	.20	60.6

HYDRAULICS

Hole Size	**222**	**OD (mm)**	**ID (mm)**
Drill Pipe		102	84.5
Drill Collar		156	70

SOLIDS CONTROL

Item	**UF**	**OF**
Desander		
Desilter		
Centrifuge #1	off-line	
Centrifuge #2		
Centrifuge #3		

Screen Sz.	**#1**	**#2**	**#3**	**#4**
Shaker #1	200	200	165	165
Shaker #2	200	200	165	165
Shaker #3				

BIT DATA

No.	**Size-mm**	**Type**	**Serial No.**	**Jets (mm)**							**In**	**Out**	**Metres**	**Bit Hrs.**	**ROP**	**Cum Hrs**	**Ti**	**To**	**D**	**Loc**	**B**	**G**	**O**	**R**
2	222	QD505X	7131618	9.5	9.5	9.5	9.5	9.5	9.5	9.5	405					25.50								

DRILLING PARAMETERS

No.	**WOB**	**RPM**	**Str. Wt.**	**Pressure**	**SPM #1**	**SPM #2**	**SPM #3**	**DP Vel**	**DC Vel**	**Noz Vel**	**m3 / Min**
2	8	75	48	9500		115		46	72	47.3	1.41

PUMP DATA

No.	**Type**	**m3 / Stk**	**Eff (%)**	**Liner Sz.**	**Stk.Lgth.**
#1	9P-100	0.0129	95%	152	235
#2	9P-100	0.0129	95%	152	235
#3					

FROM	TO	24 HOUR SUMMARY	TIME BREAKDOWN	S	I	P	L1	L2	L3
00:00	03:30	Drill 222mm hole from 890mkb to 995mkb	**MIRU / TO :**						
03:30	06:30	Accumulated survey, connection & work pipe time	**Drill :**			13.50			
06:30	06:45	Rig service, function pipe rams, 5 sec to c/o	**Ream :**						
06:45	07:00	Safety meeting with Akita crew & MGM rep	**Coring :**						
07:00	12:45	Drill 222mm hole from 995mkb to 1173mkb	**Circ :**						
12:45	18:30	Accumulated survey, connection & work pipe time	**Trips :**						
18:30	18:45	Rig service, function pipe rams, 5 sec to c/o	**Rig Service :**			0.75			
18:45	19:00	Safety meeting with Akita crew & MGM rep	**Rig Repair :**						
19:00	23:15	Drill 222m hole from 1173mkb to 1260mkb	**Cut Drlg Ln :**						
23:15	23:45	Accumulated survey, connection & work pipe time	**Dev Survey :**			9.25			
23:45	24:00	Rig service, function test choke	**Logging :**						
			Run Casing :						
			Cementing :						
			WOC :						
			NU BOP :						
			PT BOP :						
			DST :						
			Fishing :						
			Dir Work :						
			LDDP :						
			B.O.P / Safety Mt:			0.50			
		Reefer Van for core transport @ staging area							
OPERATION NEXT 24 HRS :		Drill 222mm hole	**TOTAL:**			**24.00**			

Drilling Rig & Number:	Akita 37	**HOLE CONDITION :**	good	**BOILER HRS:**	**24.00** **TOTAL DAILY HRS:** 24.00
Tool Pusher :	Guy Cusitar	**Cellular # :**	403-648-0842	**Road / Lease Condition :**	Road is holding together vey well. Location is in good shape
Drilling Consultant :	Trevor Mitchell / Jason Duck	**Email:**	rig_supervisor@mgmenergy.com	**Shack Cell # :**	(403) 536-9970
Temp (C) :	-24	**Weather :**	calm & clear	**Taken By :**	John Williams / Dick Heenan
Date Last BOP Drill :	February 2, 2013	**Daily Cost :**	$146,228	**Cum Cost :**	$11,307,998 **AFE Remaining :** $0

DAILY DRILLING REPORT

PROGRAMMED FTD :	2020		
DAYS (MI & RU) :	13.59	**AFE # :**	12D0006
DAYS (FROM SPUD) :	9.41	**AFE AMT. :**	
TOTAL DAYS :	23.00	**CO. WI (%) :**	

Date of First Report: 24-Jan-13

KB ELEVATION:	161.24	**GROUND ELEVATION:**	155.39	**CBF ELEVATION :**	155.89

Well Name :	MGM-Shell East Mackay I-78	**Licence # :**	1202-002	**Date:** 5-Feb-13

Dpth @ 24:00	**Progress (m)**	**Operation @ 24:00 Hours** **05-Feb-13**	**Fuel today**	**Fuel total**	**Depth @ 06:00 Hr.**
1600	340	Drill 222mm hole	9905	95027	1693

DRILLING FLUID

Type :	Polymer	**Mud Engineer:** Dave Gibson	**Cell # :**	**Office # :**	**Mud Co.:** Matrix Drilling Fluids

MUD CHECK

	#1	#2
Time	06:00	18:00
Depth	1336	1480
Density	1050	1045
Viscosity	42	46
Water Loss	9.8	8.6
pH	9.5	9.5
Filter Cake	1	1
P.V.	10	12
Y.P.	8	10
Gels 10 sec.	3	4
Gels 10 min.	4	4
Low "N"	.36	.45
Low "K"	14.25	9.79
Brk YP		
Brk 0.5 rpm		
Chloride	360	320
Calcium	80	TR
Sand %	.025	.006
Solids %		
Oil Content %		
MBT		
Mud Gradient	10.30	10.25
Last Csg MD:	401.79	401.79
Last Csg TVD:	401.79	401.79
MACP:	6597	6617
RSPP:	58	64
RSP Strokes:	2400	3095

ADDITIVES

ADDITIVES	SKS
Aqua star	5
Staflo	5
Polyzan	1
Hyperdrill 247	1
Cal carb 325	5
Matrix shield	5
sulfamic acid	1

	Daily	Cum.
Mud ($)	3,416	22,275
Water ($)		

BOTTOM HOLE ASSEMBLY

Description	OD (mm)	ID (mm)	Length	Thread
PDC bit	222		0.34	4 1/2 reg
Tru Trac	193	88.9	13.04	4 1/2 IF
MWD	176	72	0.77	4 1/2 IF
NM Drill collar	163	72	9.09	4 1/2 IF
NM Drill collar	161	72	8.46	4 1/2 IF
Sub	171	72	1.66	4 1/2 IF
Sub- X/O	160	57	0.58	4 1/2 XH
4- 6.25 DC's	156	70	37.37	4 1/2 XH
Jar	156	70	10.02	4 1/2 XH
3- 6.25 DC's	156	70	28.32	4 1/2 XH
Sub- X/O	102	65	1.10	4-FH / 4 1/2XH
Drill Pipe				
HWDP	102	65	186.25	4-FH
Drill Pipe	102	84.5	1303.00	4-FH
Kelly Down				

BHA Length (m) : 110.75 **Total Length** 1600.00

FLUID VOLUMES

Bottoms Up (min)	34
Mud Cycle (min)	52
Main Hole (m3)	46.4
Mud Tanks (m3)	55.0
Waste Vol. (m3)	
Total (m3)	101.4
MUD-UP DEPTH:	**440**

PRE-MIX TANK

Volume (m3)	
Low "N"	
Low "K"	
Brk YP	
Brk 0.5 rpm	
Viscosity	
Density	

SURVEYS

Depth	Degrees	Azi.
1277.90	.20	103.1
1326.10	.10	355.9
1374.20	.20	34.9
1422.40	.40	49.1
1470.50	.40	55.2
1518.60	.30	68
1566.90	.60	60.4

HYDRAULICS

Hole Size	**222**	**OD (mm)**	**ID (mm)**
Drill Pipe		102	84.5
Drill Collar		156	70

SOLIDS CONTROL

Item	**UF**	**OF**
Desander		
Desilter		
Centrifuge #1	off line	
Centrifuge #2	off line	
Centrifuge #3		

Screen Sz.	**#1**	**#2**	**#3**	**#4**
Shaker #1	200	200	165	165
Shaker #2	200	200	165	165
Shaker #3				

BIT DATA

No.	Size-mm	Type	Serial No.	Jets (mm)							In	Out	Metres	Bit Hrs.	ROP	Cum Hrs	Ti	To	D	Loc	B	G	O	R
2	222	QD505X	7131618	9.5	9.5	9.5	9.5	9.5	9.5	9.5	405					25.50								

DRILLING PARAMETERS

No.	WOB	RPM	Str. Wt.	Pressure	SPM #1	SPM #2	SPM #3	DP Vel	DC Vel	Noz Vel	m3 / Min
2	13	75	48	11996	115			46	72	47.3	1.41

PUMP DATA

No.	Type	m3 / Stk	Eff (%)	Liner Sz.	Stk.Lgth.
#1	9P-100	0.0129	95%	152	235
#2	9P-100	0.0129	95%	152	235
#3					

FROM	TO	24 HOUR SUMMARY	TIME BREAKDOWN	S	I	P	L1	L2	L3
00:00	04:00	Drill 222mm hole from 1260mkb -1340mkb	**MIRU / TO :**						
04:00	06:30	Accumulated survey,connection & work pipe	**Drill :**			15.50			
06:30	06:45	Rig service, function pipe rams 5 sec to c/o	**Ream :**						
06:45	07:00	Safety meeting with Akita crew & MGM rep	**Coring :**						
07:00	12:00	Drill 222mm hole from 1340mkb to 1415mkb	**Circ :**						
12:00	13:30	Circulating & changing out Baker stand pipe pressure sensor	**Trips :**						
13:30	17:30	Drill 222mm hole from 1415mkb to 1515mkb	**Rig Service :**			0.75			
17:30	18:45	Accumulated survey,connection & work pipe	**Rig Repair :**						
18:45	19:00	Safety meeting with Akita crew & MGM rep	**Cut Drlg Ln :**						
19:00	19:45	Accumulated survey,connection & work pipe	**Dev Survey :**			5.75			
19:45	20:00	Rig service, function upper pipe rams 7 sec to c/o	**Logging :**						
20:00	22:30	Drill 222mm hole from 1515mkb to 1600mkb	**Run Casing :**						
22:30	23:45	Accumulated survey,connection & work pipe	**Cementing :**						
23:45	24:00	Rig service, function upper pipe rams 7 sec to c/o	**WOC :**						
			NU BOP :						
			PT BOP :						
			DST :						
			Fishing :						
			Dir Work :			1.50			
			LDDP :						
			B.O.P / Safety Mt:			0.50			
OPERATION NEXT 24 HRS : Drill 222mm hole to core point TD			**TOTAL:**			**24.00**			

Drilling Rig & Number:	Akita 37	**HOLE CONDITION :** good	**BOILER HRS:**	**24.00**	**TOTAL DAILY HRS:** 24.00
Tool Pusher :	Guy Cusitar	**Cellular # :** 403-648-0842	**Road / Lease Condition :**	Road is holding together vey well. Location is in good shape	
Drilling Consultant :	Trevor Mitchell / Jason Duck	**Email:** rig_supervisor@mgmenergy.com	**Shack Cell # :**	(403) 536-9970	
Temp (C) :	-25	**Weather :** 7kph sw wind & clear	**Taken By :**	John Williams / Dick Heenan	
Date Last BOP Drill :	February 2, 2013	**Daily Cost :** $296,938	**Cum Cost :** $11,605,236	**AFE Remaining :**	$0

DAILY DRILLING REPORT

PROGRAMMED FTD :	2020		
DAYS (MI & RU) :	13.59	**AFE # :**	12D0006
DAYS (FROM SPUD) :	10.41	**AFE AMT. :**	
TOTAL DAYS :	24.00	**CO. WI (%) :**	

KB ELEVATION:	161.24	**GROUND ELEVATION:**	155.39	**CBF ELEVATION :**	155.89

Date of First Report: 24-Jan-13

Well Name : MGM-Shell East Mackay I-78			**Licence # :** 1202-002	**Date:** 6-Feb-13
Dpth @ 24:00	**Progress (m)**	**Operation @ 24:00 Hours 06-Feb-13**	**Operation @ 06:00 Hours 07-Feb-13**	**Depth @ 06:00 Hr.**
1820	220	POOH	Laying down Jars & 1-6.25 DC @ 82mkb	1820

DRILLING FLUID

Type :	Polymer	**Mud Engineer:** Dave Gibson	**Cell # :**	**Office # :**	**Mud Co.:** Matrix Drilling Fluids

MUD CHECK

	#1	#2
Time	06:00	
Depth	1685	
Density	1045	
Viscosity	44	
Water Loss	8.2	
pH	9.5	
Filter Cake	1	
P.V.	20	
Y.P.	10.5	
Gels 10 sec.	5	
Gels 10 min.	5	
Low "N"	.42	
Low "K"	15.52	
Brk YP		
Brk 0.5 rpm		
Chloride	320	
Calcium	TR	
Sand %	.006	
Solids %	.025	
Oil Content %		
MBT		
Mud Gradient	10.25	
Last Csg MD:	401.79	
Last Csg TVD:	401.79	
MACP:	6617	
RSPP:	3946	
RSP Strokes:	64	

ADDITIVES

	SKS
Aqua star	16
Staflo	7
Polyzan	1
Hyperdrill 247	1
Cal carb 325	5
Matrix shield	8
Corinox	2
Barite	96

	Daily	Cum.
Mud ($)	8,489	30,764
Water ($)		

BOTTOM HOLE ASSEMBLY

Description	OD (mm)	ID (mm)	Length	Thread
PDC bit	222		0.34	4 1/2 reg
Tru Trac	193	88.9	13.04	4 1/2 IF
MWD	176	72	0.77	4 1/2 IF
NM Drill collar	163	72	9.09	4 1/2 IF
NM Drill collar	161	72	8.46	4 1/2 IF
Sub	171	72	1.66	4 1/2 IF
Sub- X/O	160	57	0.58	4 1/2 XH
4- 6.25 DC's	156	70	37.37	4 1/2 XH
Jar	156	70	10.02	4 1/2 XH
3- 6.25 DC's	156	70	28.32	4 1/2 XH
Sub- X/O	102	65	1.10	4-FH / 4 1/2XH
Drill Pipe				
HWDP	102	65	186.25	4-FH
Drill Pipe	102	84.5	1523.00	4-FH
Kelly Down				
BHA Length (m) :	110.75		**Total Length**	1820.00

FLUID VOLUMES

Bottoms Up (min)	39
Mud Cycle (min)	60
Main Hole (m3)	52.9
Mud Tanks (m3)	75.0
Waste Vol. (m3)	
Total (m3)	127.9
MUD-UP DEPTH:	**440**

PRE-MIX TANK

Volume (m3)	
Low "N"	
Low "K"	
Brk YP	
Brk 0.5 rpm	
Viscosity	
Density	

SURVEYS

Depth	Degrees	Azi.
1615.20	.50	84.10
1663.20	1	79.60
1711.30	.20	153.70
1759.20	.70	73.20
1799.00	.60	62.70

HYDRAULICS

Hole Size	**222**	**OD (mm)**	**ID (mm)**
Drill Pipe		102	84.5
Drill Collar		156	70

SOLIDS CONTROL

Item	**UF**	**OF**
Desander		
Desilter		
Centrifuge #1	off line	
Centrifuge #2	off line	
Centrifuge #3		

Screen Sz.	**#1**	**#2**	**#3**	**#4**
Shaker #1	200	200	165	165
Shaker #2	200	200	165	165
Shaker #3				

BIT DATA

No.	Size-mm	Type	Serial No.	Jets (mm)							In	Out	Metres	Bit Hrs.	ROP	Cum Hrs	Ti	To	D	Loc	B	G	O	R
2	222	QD505X	7131618	9.5	9.5	9.5	9.5	9.5	9.5	9.5	405	1820	1415.0	50.50	28.0	50.50								

DRILLING PARAMETERS

No.	WOB	RPM	Str. Wt.	Pressure	SPM #1	SPM #2	SPM #3	DP Vel	DC Vel	Noz Vel	m3 / Min
2	11	75	58	10054	115			46	72	47.3	1.41

PUMP DATA

No.	Type	m3 / Stk	Eff (%)	Liner Sz.	Stk.Lgth.
#1	9P-100	0.0129	95%	152	235
#2	9P-100	0.0129	95%	152	235
#3					

FROM	TO	24 HOUR SUMMARY	TIME BREAKDOWN	S	I	P	L1	L2	L3
00:00	03:15	Drill 222mm hole from 1600mkb to 1722mkb	**MIRU / TO :**						
03:15	06:15	Accumulated surveys,connections & work pipe	**Drill :**			10.25			
06:15	06:45	Rig service function upper pipe rams 7 sec to c/o	**Ream :**						
06:45	07:00	Safety meeting with Akita crew & MGM rep	**Coring :**						
07:00	14:00	Drill 222mm hole from 1722mkb to 1820mkb TD	**Circ :**			2.25			
14:00	16:00	Accumulated surveys,connections & work pipe (re-gama log 1750mkb to 1760mkb)	**Trips :**			4.75			
16:00	16:15	Rig service function upper pipe rams 7 sec to c/o	**Rig Service :**			1.00			
16:15	18:30	Circulate & clean hole	**Rig Repair :**						
18:30	19:00	Blow down top drive, circulate through bleeder	**Cut Drlg Ln :**						
19:00	19:15	Safety meeting with Akita crew & MGM rep	**Dev Survey :**			5.00			
19:15	23:00	Trip out of the hole from 1820mkb to 1024mkb, flow check @ 1810m,1730m, (Strapping out of the hole)	**Logging :**						
23:00	23:30	Rig service function upper pipe rams 7 sec to c/o	**Run Casing :**						
23:30	24:00	Continue to Trip out of the hole	**Cementing :**						
			WOC :						
			NU BOP :						
			PT BOP :						
			DST :						
			Fishing :						
			Dir Work :						
			LDDP :						
			B.O.P / Safety Mt:			0.75			
		Received 5 loads of sawdust, hauled 5 loads of cuttings (approx 120 ton)							
		Daily Fuel: 9509 liters Total Fuel : 104536 liters Received :54000 liters of diesel							
OPERATION NEXT 24 HRS :		Cont to POOH, Lay Dn Directional tools, P/U coring tools & RIH to cut core #1 & retrieve.	**TOTAL:**			**24.00**			

Drilling Rig & Number:	Akita 37	**HOLE CONDITION :** good	**BOILER HRS:**	**24.00**	**TOTAL DAILY HRS:** 24.00
Tool Pusher :	Guy Cusitar	**Cellular # :** 403-648-0842	**Road / Lease Condition :**	Road is holding together vey well. Location is in good shape	
Drilling Consultant :	Trevor Mitchell / Jason Duck	**Email:** rig_supervisor@mgmenergy.com	**Shack Cell # :**	(403) 536-9970	
Temp (C) :	-29	**Weather :** 3kph SW wind & clear	**Taken By :**	John Williams / Dick Heenan	
Date Last BOP Drill :	February 2, 2013	**Daily Cost :** $255,795	**Cum Cost :** $11,888,149	**AFE Remaining :**	$0

DAILY DRILLING REPORT

PROGRAMMED FTD :	2020		
DAYS (MI & RU) :	13.59	**AFE # :**	12D0006
DAYS (FROM SPUD) :	11.41	**AFE AMT. :**	
TOTAL DAYS :	25.00	**CO. WI (%) :**	

Date of First Report: 24-Jan-13

KB ELEVATION:	161.24	**GROUND ELEVATION:**	155.39
CBF ELEVATION :	155.89		

Well Name :	MGM-Shell East Mackay I-78	**Licence # :**	1202-002
Date:	7-Feb-13		

Dpth @ 24:00	**Progress (m)**	**Operation @ 24:00 Hours 07-Feb-13**	**Operation @ 06:00 Hours 08-Feb-13**	**Depth @ 06:00 Hr.**
1820		Trip in the Hole with core run #1	Cut core # 1	1833

DRILLING FLUID

Type :	Polymer	**Mud Engineer:**	Dave Gibson	**Cell # :**	**Office # :**
Mud Co.:	Matrix Drilling Fluids				

MUD CHECK

	#1	#2
Time	17:00	
Depth	1820	
Density	1070	
Viscosity	48	
Water Loss	7.6	
pH	9.5	
Filter Cake	1	
P.V.	20	
Y.P.	14	
Gels 10 sec.	4.5	
Gels 10 min.	5	
Low "N"	.45	
Low "K"	14.68	
Brk YP		
Brk 0.5 rpm		
Chloride	400	
Calcium	TR	
Sand %	.006	
Solids %		
Oil Content %		
MBT		
Mud Gradient	10.50	
Last Csg MD:	401.79	
Last Csg TVD:	401.79	
MACP:	6518	
RSPP:	3946	
RSP Strokes:	64	

ADDITIVES

	SKS

	Daily	Cum.
Mud ($)		30,764
Water ($)		

BOTTOM HOLE ASSEMBLY

Description	OD (mm)	ID (mm)	Length	Thread
PDC core bit	216		0.44	HT-30
Stab & outer tube	214	137	9.14	HT-30
Stab & outer tube	214	137	9.14	HT-30
Stab & outer tube	214	137	9.14	HT-30
Stab & outer tube	214	137	9.14	HT-30
Stab & outer tube	214	137	9.14	HT-30
Stab & outer tube	214	137	9.14	HT-30
Stabilizer	214	137	1.22	HT-30
LD Adjuster	171	137	1.22	HT-30
Top sub	171	137	0.61	HT-30/4 1/2IF
Jars & float sub X/O	171	57	2.72	4 1/2 IF/4 1/2XH
6-6.25 DC's	156	70	56.38	4 1/2 XH
X/O	102	65	1.10	4 1/2XH /4-FH
Drill Pipe				
HWDP	102	65	186.25	4-FH
Drill Pipe	102	84.5	1512.45	4-FH
Kelly Down				
BHA Length (m) :	118.53		**Total Length**	1817.23

FLUID VOLUMES

Bottoms Up (min)	
Mud Cycle (min)	
Main Hole (m3)	52.9
Mud Tanks (m3)	75.0
Sump Vol. (m3)	
Total (m3)	127.9
MUD-UP DEPTH:	**440**

PRE-MIX TANK

Volume (m3)	
Low "N"	
Low "K"	
Brk YP	
Brk 0.5 rpm	
Viscosity	
Density	

SURVEYS

Depth	Degrees	Azi.

HYDRAULICS

Hole Size	**222**	**OD (mm)**	**ID (mm)**
Drill Pipe		102	84.5
Drill Collar		156	70

SOLIDS CONTROL

Item	**UF**	**OF**
Desander		
Desilter		
Centrifuge #1		
Centrifuge #2		
Centrifuge #3		

Screen Sz.	**#1**	**#2**	**#3**	**#4**
Shaker #1	200	200	165	165
Shaker #2	200	200	165	165
Shaker #3				

BIT DATA

No.	Size-mm	Type	Serial No.	Jets (mm)							In	Out	Metres	Bit Hrs.	ROP	Cum Hrs	Ti	To	D	Loc	B	G	O	R
3	216	BHC606C	7103687								1820													

DRILLING PARAMETERS

No.	WOB	RPM	Str. Wt.	Pressure	SPM #1	SPM #2	SPM #3	DP Vel	DC Vel	Noz Vel	m3 / Min
3											

PUMP DATA

No.	Type	m3 / Stk	Eff (%)	Liner Sz.	Stk.Lgth.
#1	9P-100	0.0129	95%	152	235
#2	9P-100	0.0129	95%	152	235
#3					

FROM	TO	24 HOUR SUMMARY	TIME BREAKDOWN	S	I	P	L1	L2	L3
00:00	05:00	Trip out of the hole from 1820m to 82m (flow checks @ 913m, 613m, 82m)	**MIRU / TO :**						
05:00	05:15	Safety meeting with baker directional & mwd	**Drill :**						
05:15	06:15	Lay down one 6.25 DC, jars & rack DC's	**Ream :**						
06:15	06:45	Rig service- grease top drive,draworks & blocks, function annular	**Coring :**						
06:45	07:00	Pre-tour meeting held with both rigs crews & MGM rep	**Circ :**			0.75			
07:00	08:00	Lay down directional tools	**Trips :**			17.75			
08:00	08:15	pre-job safety meeting w/baker hughes before laying out tru trak assembly	**Rig Service :**			0.50			
08:15	09:45	Lay down baker hughes tru trak assembly	**Rig Repair :**						
09:45	10:00	pre-job safety meeting w/baker hughes core hands before picking up coring BHA	**Cut Drlg Ln :**			1.00			
10:00	15:00	pick up baker hughes coring assembly	**Dev Survey :**						
15:00	17:00	Trip in the hole for core run #1	**Logging :**						
17:00	17:15	Pre-job safety meeting w/ rig crew before slip & cut drill line	**Run Casing :**						
17:15	18:15	Slip & cut drill line, SLC-13266mj Accum- 75392mj- 34m cut	**Cementing :**						
18:15	19:00	Cont to trip in the hole for core run #1	**WOC :**						
19:00	19:15	Safety meeting w/rig crews & MGM rep	**NU BOP :**						
19:15	20:00	Fill pipe & break circulation @ 950m	**PT BOP :**						
20:00	24:00	Cont to trip in the hole for core run #1	**DST :**						
			Fishing :						
			Dir Work :			2.50			
			LDDP :						
			B.O.P / Safety Mt:			1.50			
		Core Bit TFA=1.5							
		Daily Fuel : 7896 litres Total Fuel : 112432 litres							
OPERATION NEXT 24 HRS :		Cut core #1 & recover,RIH w/ core run #2	**TOTAL:**			**24.00**			

Drilling Rig & Number:	Akita 37	**HOLE CONDITION :**	good	**BOILER HRS:**	**24.00**
TOTAL DAILY HRS:	24.00				
Tool Pusher :	Guy Cusitar	**Cellular # :**	403-648-0842	**Road / Lease Condition :**	Road is holding together vey well. Location is in good shape
Drilling Consultant :	Trevor Mitchell / Jason Duck	**Email:**	rig_supervisor@mgmenergy.com	**Shack Cell # :**	(403) 536-9970
Temp (C) :	-30	**Weather :**	6kph SE wind & clear	**Taken By :**	John Williams / Dick Heenan
Date Last BOP Drill :	February 2, 2013	**Daily Cost :**	$243,343	**Cum Cost :**	$12,152,842
AFE Remaining :	$0				

PROGRAMMED FTD :	2020		
DAYS (MI & RU) :	13.59	**AFE # :**	12D0006
DAYS (FROM SPUD) :	12.41	**AFE AMT. :**	
TOTAL DAYS :	26.00	**CO. WI (%) :**	

DAILY DRILLING REPORT

KB ELEVATION:	161.24	**GROUND ELEVATION:**	155.39	**CBF ELEVATION :**	155.89

Date of First Report: 24-Jan-13

Well Name :	MGM-Shell East Mackay I-78	**Licence # :** 1202-002	**Date:**	8-Feb-13

Dpth @ 24:00	**Progress (m)**	**Operation @ 24:00 Hours 08-Feb-13**	**Operation @ 06:00 Hours 09-Feb-13**	**Depth @ 06:00 Hr.**
1833.7	13.7	Tripping in the hole w/ slick assembly	Tripping in the hole w/ slick assembly	1833.7

DRILLING FLUID

Type : Polymer	**Mud Engineer:** Dave Gibson	**Cell # :**	**Office # :**	**Mud Co.:** Matrix Drilling Fluids

MUD CHECK

	#1	#2
Time	02:00	
Depth	1820	
Density	1070	
Viscosity	46	
Water Loss	7.2	
pH	9.5	
Filter Cake	1	
P.V.	22	
Y.P.	10.5	
Gels 10 sec.	4	
Gels 10 min.	4	
Low "N"	.52	
Low "K"	8.81	
Brk YP		
Brk 0.5 rpm		
Chloride	400	
Calcium	TR	
Sand %	.006	
Solids %		
Oil Content %		
MBT		
Mud Gradient	10.50	
Last Csg MD:	401.79	
Last Csg TVD:	401.79	
MACP:	6518	
RSPP:	3946	
RSP Strokes:	64	

ADDITIVES

	SKS
matrix shield	8

	Daily	Cum.
Mud ($)	1,472	32,236
Water ($)		

BOTTOM HOLE ASSEMBLY

Description	OD (mm)	ID (mm)	Length	Thread
PDC core bit	216		0.44	HT-30
Stab & outer tube	214	137	9.14	HT-30
Stab & outer tube	214	137	9.14	HT-30
Stab & outer tube	214	137	9.14	HT-30
Stab & outer tube	214	137	9.14	HT-30
Stab & outer tube	214	137	9.14	HT-30
Stab & outer tube	214	137	9.14	HT-30
Stabilizer	214	137	1.22	HT-30
LD Adjuster	171	137	1.22	HT-30
Top sub	171	137	0.61	HT-30/4 1/2IF
Jars & float sub X/O	171	57	2.72	4 1/2 IF/4 1/2XH
6-6.25 DC's	156	70	56.38	4 1/2 XH
X/O	102	65	1.10	4 1/2XH /4-FH
Drill Pipe				
HWDP	102	65	186.25	4-FH
Drill Pipe	102	84.5	1529.22	4-FH
Kelly Down				
BHA Length (m) :	118.53		**Total Length**	1834.00

FLUID VOLUMES

Bottoms Up (min)	49
Mud Cycle (min)	77
Main Hole (m3)	49.5
Mud Tanks (m3)	75.0
Sump Vol. (m3)	
Total (m3)	124.5
MUD-UP DEPTH:	**440**

PRE-MIX TANK

Volume (m3)	
Low "N"	
Low "K"	
Brk YP	
Brk 0.5 rpm	
Viscosity	
Density	

SURVEYS

Depth	Degrees	Azi.

HYDRAULICS

Hole Size	**216**	**OD (mm)**	**ID (mm)**
Drill Pipe		102	84.5
Drill Collar		156	70

SOLIDS CONTROL

Item	**UF**	**OF**
Desander		
Desilter		
Centrifuge #1		
Centrifuge #2		
Centrifuge #3		

Screen Sz.	**#1**	**#2**	**#3**	**#4**
Shaker #1	200	200	165	165
Shaker #2	200	200	165	165
Shaker #3				

BIT DATA

No.	Size-mm	Type	Serial No.	Jets (mm)							In	Out	Metres	Bit Hrs.	ROP	Cum Hrs	Ti	To	D	Loc	B	G	O	R
3	216	BHC606C	7103687	10.0	10.0	10.0	10.0	10.0	10.0		1820			6.25		6.25								

DRILLING PARAMETERS

No.	WOB	RPM	Str. Wt.	Pressure	SPM #1	SPM #2	SPM #3	DP Vel	DC Vel	Noz Vel	m3 / Min
3	4	71	64	5800	84			36	59	36.4	1.03

PUMP DATA

No.	Type	m3 / Stk	Eff (%)	Liner Sz.	Stk.Lgth.
#1	9P-100	0.0129	95%	152	235
#2	9P-100	0.0129	95%	152	235
#3					

FROM	TO	24 HOUR SUMMARY	TIME BREAKDOWN	S	I	P	L1	L2	L3
00:00	01:30	Cont to trip in the hole for core run #1 (tagged bttm,circ bttm's up & drop ball)	**MIRU / TO :**						
01:30	06:45	Cut 89mm core from 1820mkb to 1833mkb	**Drill :**						
06:45	07:00	Safety meeting w/ rig crews & MGM rep	**Ream :**						
07:00	08:00	Cont to cut 89mm core from 1833mkb to 1834mkb	**Coring :**			11.25			
08:00	09:00	Circulate hole clean	**Circ :**			1.00			
09:00	12:00	Trip out of the hole, flow checks @ 1832m, pump pill, blow out top drive,hammer off kicker hose,flow checks @ 1730m & 893m	**Trips :**			7.75			
12:00	12:15	Rig service Top drive	**Rig Service :**			0.25			
12:15	15:30	Continue to trip out of the hole, flow checks @ 336m, every 20 min while out of the hole	**Rig Repair :**						
15:30	15:45	Pre-job safety meeting before handling baker hughes coring assembly	**Cut Drlg Ln :**						
15:45	16:15	Practice shuttle & core barrel recovery	**Dev Survey :**						
16:15	19:00	Disassemble core barrel BHA & recover cut core	**Logging :**						
19:00	19:15	Safety meeting w/ rig crews & MGM rep	**Run Casing :**						
19:15	20:00	Cont to disassemble core barrel BHA & recover cut core	**Cementing :**						
20:00	20:30	Cont to trip out to the bit(racked back 2 stands of core barrels, break off bit & inspect 4 of 6 jets are plugged	**WOC :**						
20:30	21:00	Pick up baker hughes coring assembly (make up bit & run in outter barrels followed by inner barrels)	**NU BOP :**						
21:00	24:00	Waiting on replacement baker top sub arriving by tomorrow	**PT BOP :**						
			DST :						
			Fishing :						
			Dir Work :						
		Core # 1 was cut from 1820mkb to 1834mkb, Recovered from 1820mkb to 1833.7mkb (13.7m of 14m cut= 98% recovered)	**LDDP :**						
			B.O.P / Safety Mt:			0.75			
			Wait on Baker			3.00			
		Daily fuel: 5148 litres Total fuel: 120539 litres							
			TOTAL:			**24.00**			

OPERATION NEXT 24 HRS : RIH w/ slick asssembly, wait on baker replacement parts & install, M/U Baker core assembly & RIH to cut core run # 2

Drilling Rig & Number:	Akita 37	**HOLE CONDITION :**	good	**BOILER HRS:**	**24.00**	**TOTAL DAILY HRS:**	24.00
Tool Pusher :	Guy Cusitar	**Cellular # :**	403-648-0842	**Road / Lease Condition :**	Road is holding together vey well. Location is in good shape		
Drilling Consultant :	Trevor Mitchell / Jason Duck	**Email:**	rig_supervisor@mgmenergy.com	**Shack Cell # :**	(403) 536-9970		
Temp (C) :	-23	**Weather :**	4kph w wind, slight snow	**Taken By :**	John Williams / Dick Heenan		
Date Last BOP Drill :	February 2, 2013	**Daily Cost :**	$160,778	**Cum Cost :**	$12,315,720	**AFE Remaining :**	$0

DAILY DRILLING REPORT

PROGRAMMED FTD :	2020		
DAYS (MI & RU) :	13.59	**AFE # :**	12D0006
DAYS (FROM SPUD) :	13.41	**AFE AMT. :**	
TOTAL DAYS :	27.00	**CO. WI (%) :**	

KB ELEVATION:	161.24	**GROUND ELEVATION:**	155.39	**CBF ELEVATION :**	155.89

Date of First Report: 24-Jan-13

Well Name : MGM-Shell East Mackay I-78			**Licence # :** 1202-002	**Date:** 9-Feb-13
Dpth @ 24:00	**Progress (m)**	**Operation @ 24:00 Hours 09-Feb-13**	**Operation @ 06:00 Hours 10-Feb-13**	**Depth @ 06:00 Hr.**
1834		Tripping in the hole w/ core assembly # 2	Cutting core run # 2	1837.2

DRILLING FLUID

Type : Polymer	**Mud Engineer:** Dave Gibson	**Cell # :**	**Office # :**	**Mud Co.:** Matrix Drilling Fluids

MUD CHECK

	#1	#2
Time	08:45	22:00
Depth	1834	1834
Density	1055	1065
Viscosity	60	55
Water Loss	7.5	6.8
pH	9	9.5
Filter Cake		1
P.V.		20
Y.P.		14
Gels 10 sec.		4
Gels 10 min.		5
Low "N"		.50
Low "K"		14.68
Brk YP		
Brk 0.5 rpm		
Chloride		400
Calcium		TR
Sand %		.006
Solids %		
Oil Content %		
MBT		
Mud Gradient	10.35	10.45
Last Csg MD:	401.79	401.79
Last Csg TVD:	401.79	401.79
MACP:	3114	3075
RSPP:		3946
RSP Strokes:		64

ADDITIVES

	SKS
Cal carb	80

	Daily	Cum.
Mud ($)	480	32,716
Water ($)		

BOTTOM HOLE ASSEMBLY

Description	OD (mm)	ID (mm)	Length	Thread
PDC core bit	216		0.44	HT-30
Stab & outer tube	214	137	9.14	HT-30
Stab & outer tube	214	137	9.14	HT-30
Stab & outer tube	214	137	9.14	HT-30
Stab & outer tube	214	137	9.14	HT-30
Stab & outer tube	214	137	9.14	HT-30
Stab & outer tube	214	137	9.14	HT-30
Stabilizer	214	137	1.22	HT-30
Stabilizer	171	137	1.22	HT-30
Top sub	171	137	0.61	HT-30/4 1/2IF
Jars & float sub X/O	171	57	2.72	4 1/2 IF/4 1/2XH
6-6.25 DC's	156	70	56.38	4 1/2 XH
X/O	102	65	1.10	4 1/2XH /4-FH
Drill Pipe				
HWDP	102	65	186.25	4-FH
Drill Pipe	102	84.5	1529.22	4-FH
Kelly Down				

BHA Length (m) : 118.53 **Total Length** 1834.00

FLUID VOLUMES

Bottoms Up (min)	
Mud Cycle (min)	
Main Hole (m3)	49.5
Mud Tanks (m3)	77.0
Sump Vol. (m3)	
Total (m3)	126.5
MUD-UP DEPTH:	**440**

PRE-MIX TANK

Volume (m3)	
Low "N"	
Low "K"	
Brk YP	
Brk 0.5 rpm	
Viscosity	
Density	

SURVEYS

Depth	Degrees	Azi.

HYDRAULICS

Hole Size	**216**	**OD (mm)**	**ID (mm)**
Drill Pipe		102	84.5
Drill Collar		156	70

SOLIDS CONTROL

Item	**UF**	**OF**
Desander		
Desilter		
Centrifuge #1	off line	
Centrifuge #2	off line	
Centrifuge #3		

Screen Sz.	**#1**	**#2**	**#3**	**#4**
Shaker #1	200	200	165	165
Shaker #2	200	200	165	165
Shaker #3				

BIT DATA

No.	Size-mm	Type	Serial No.	Jets (mm)							In	Out	Metres	Bit Hrs.	ROP	Cum Hrs	Ti	To	D	Loc	B	G	O	R
3	216	BHC606C	7103687	10.0	10.0	10.0	10.0	10.0	10.0		1820					6.25								

DRILLING PARAMETERS

No.	WOB	RPM	Str. Wt.	Pressure	SPM #1	SPM #2	SPM #3	DP Vel	DC Vel	Noz Vel	m3 / Min
3											

PUMP DATA

No.	Type	m3 / Stk	Eff (%)	Liner Sz.	Stk.Lgth.
#1	9P-100	0.0129	95%	152	235
#2	9P-100	0.0129	95%	152	235
#3					

FROM	TO	24 HOUR SUMMARY	TIME BREAKDOWN	S	I	P	L1	L2	L3
00:00	02:00	Lay down top sub & LD extension sub, rack core barrels in derrick, break down top sub,LD extension.	**MIRU / TO :**						
02:00	02:30	Rig service, grease top drive,draworks & blocks, function annular c/o = 18 secs	**Drill :**						
02:30	06:45	Make up new 216mm bit, bit sub & trip in the hole	**Ream :**						
06:45	07:00	Safety meeting with both crews & MGM rep	**Coring :**			10.25			
07:00	08:00	Continue to trip in the hole to 450m, pull back to the shoe & break circulation(waiting on baker replacement tool)	**Circ :**			2.00			
08:00	10:00	Circulating @ shoe waiting on baker hughes coring tool	**Trips :**			10.75			
10:00	11:30	Trip out of the hole	**Rig Service :**			0.50			
11:30	13:30	Make up baker hughes coring assembly	**Rig Repair :**						
13:30	14:45	Waiting on baker hughes top sub & LD adjuster	**Cut Drlg Ln :**						
14:45	19:00	Make up inner barrels, lay out NFG adjuster sub, pick up outer barrel stabilizer to replace adjuster sub & cont to M/U core assembly	**Dev Survey :**						
19:00	19:15	Safety meeting with both crews & MGM rep	**Logging :**						
19:15	20:00	Cont to M/U baker hughes coring BHA	**Run Casing :**						
20:00	24:00	Run in the hole with core assembly #2 fill pipe @ 607m, 1200m & blow back top drive	**Cementing :**						
			WOC :						
			NU BOP :						
			PT BOP :						
			DST :						
			Fishing :						
			Dir Work :						
			LDDP :						
			B.O.P / Safety Mt:			0.50			
		Received 62,164 litres of Diesel from Bassett petroleum							
		Daily fuel : 8047 litres Total fuel: 128,586 litres							
OPERATION NEXT 24 HRS :		Cut core run # 2 & recover	**TOTAL:**			**24.00**			

Drilling Rig & Number: Akita 37	**HOLE CONDITION :** good		**BOILER HRS:**	**24.00**	**TOTAL DAILY HRS:** 24.00
Tool Pusher : Guy Cusitar	**Cellular # :** 403-648-0842	**Road / Lease Condition :** Road is holding together vey well. Location is in good shape			
Drilling Consultant : Trevor Mitchell / Jason Duck	**Email:** rig_supervisor@mgmenergy.com	**Shack Cell # :** (403) 536-9970			
Temp (C) : -26	**Weather :** 14kph E wind & clear	**Taken By :** John Williams / Dick Heenan			
Date Last BOP Drill : February 2, 2013	**Daily Cost :** $217,714	**Cum Cost :** $12,516,865	**AFE Remaining :** $0		

DAILY DRILLING REPORT

PROGRAMMED FTD :	2020		
DAYS (MI & RU) :	13.59	**AFE # :**	12D0006
DAYS (FROM SPUD) :	14.41	**AFE AMT. :**	
TOTAL DAYS :	28.00	**CO. WI (%) :**	
Date of First Report:	24-Jan-13		

KB ELEVATION:	161.24	**GROUND ELEVATION:**	155.39	**CBF ELEVATION :**	155.89

Well Name :	MGM-Shell East Mackay I-78	**Licence # :**	1202-002	**Date:** 10-Feb-13

Dpth @ 24:00	**Progress (m)**	**Operation @ 24:00 Hours 10-Feb-13**	**Operation @ 06:00 Hours 11-Feb-13**	**Depth @ 06:00 Hr.**
1851.6	17.6	Tripping in the hole with core run # 3	reaming to bottom with core run # 3	1851.60

DRILLING FLUID

Type :	Polymer	**Mud Engineer:** Dave Gibson	**Cell # :**	**Office # :**	**Mud Co.:** Matrix Drilling Fluids

MUD CHECK

	#1	#2
Time	02:30	
Depth	1834	
Density	1065	
Viscosity	55	
Water Loss	6.8	
pH	9.5	
Filter Cake	1	
P.V.	20	
Y.P.	14	
Gels 10 sec.	4	
Gels 10 min.	5	
Low "N"	.45	
Low "K"	14.68	
Brk YP		
Brk 0.5 rpm		
Chloride	400	
Calcium	TR	
Sand %	.006	
Solids %		
Oil Content %		
MBT		
Mud Gradient	10.45	
Last Csg MD:	401.79	401.79
Last Csg TVD:	401.79	401.79
MACP:	3075	7272
RSPP:	4200	
RSP Strokes:	67	

ADDITIVES

	SKS

	Daily	Cum.
Mud ($)		32,716
Water ($)		

BOTTOM HOLE ASSEMBLY

Description	OD (mm)	ID (mm)	Length	Thread
PDC core bit	216		0.44	HT-30
Stab & outer tube	214	137	9.14	HT-30
Stab & outer tube	214	137	9.14	HT-30
Stab & outer tube	214	137	9.14	HT-30
Stab & outer tube	214	137	9.14	HT-30
Stab & outer tube	214	137	9.14	HT-30
Stab & outer tube	214	137	9.14	HT-30
Stabilizer	214	137	1.22	HT-30
Stabilizer	214	137	1.22	HT-30
Top sub	171	137	0.71	HT-30/4 1/2IF
Jars & float sub X/O	171	57	2.72	4 1/2 IF/4 1/2XH
6-6.25 DC's	156	70	56.38	4 1/2 XH
X/O	102	65	1.10	4 1/2XH /4-FH
Drill Pipe				
HWDP	102	65	186.25	4-FH
Drill Pipe	102	84.5	1546.72	4-FH
Kelly Down				

BHA Length (m) : 118.63 **Total Length** 1851.60

FLUID VOLUMES

Bottoms Up (min)	45
Mud Cycle (min)	70
Main Hole (m3)	50.0
Mud Tanks (m3)	77.0
Sump Vol. (m3)	
Total (m3)	127.0
MUD-UP DEPTH:	**440**

PRE-MIX TANK

Volume (m3)	
Low "N"	
Low "K"	
Brk YP	
Brk 0.5 rpm	
Viscosity	
Density	

SURVEYS

Depth	Degrees	Azi.

HYDRAULICS

Hole Size	**216**	**OD (mm)**	**ID (mm)**
Drill Pipe		102	84.5
Drill Collar		156	70

SOLIDS CONTROL

Item	**UF**	**OF**
Desander		
Desilter		
Centrifuge #1	off line	
Centrifuge #2	off line	
Centrifuge #3		

Screen Sz.	**#1**	**#2**	**#3**	**#4**
Shaker #1	200	200	165	165
Shaker #2	200	200	165	165
Shaker #3				

BIT DATA

No.	Size-mm	Type	Serial No.	Jets (mm)							In	Out	Metres	Bit Hrs.	ROP	Cum Hrs	Ti	To	D	Loc	B	G	O	R
2	216	BHC606C	7103687	10.0	10.0	10.0	10.0	10.0	10.0		1820	1851.6	31.6	6.25	2.5	12.50	1	2	CC	G	X	1	NO	PR

DRILLING PARAMETERS

No.	WOB	RPM	Str. Wt.	Pressure	SPM #1	SPM #2	SPM #3	DP Vel	DC Vel	Noz Vel	m3 / Min
2	5	70	64	6885	94			40	66	40.7	1.15

PUMP DATA

No.	Type	m3 / Stk	Eff (%)	Liner Sz.	Stk.Lgth.
#1	9P-100	0.0129	95%	152	235
#2	9P-100	0.0129	95%	152	235
#3					

FROM	TO	24 HOUR SUMMARY	TIME BREAKDOWN	S	I	P	L1	L2	L3
00:00	02:00	Continue to trip in to 1807m, washed last stand down, reamed through rat hole to bttm	**MIRU / TO :**						
02:00	02:15	Rig service, greased top drive,draworks & blocks, functioned annular c/o 18 sec	**Drill :**						
02:15	06:45	Cut 89mm core fr 1834mkb to 1838mkb	**Ream :**						
06:45	07:00	Safety meeting w/ rig crews & MGM rep	**Coring :**			11.75			
07:00	08:45	Cut 89mm core fr 1838mkb to 1851.60mkb	**Circ :**			1.00			
08:45	09:45	clean hole & mix pill	**Trips :**			10.00			
09:45	17:00	Control trip out of hole,pulled tight,back reamed out of rat hole,pump pill,Cont trip out. Flow checks@ 1815m,1739m,970m,200m	**Rig Service :**			0.50			
17:00	17:15	Pre-job safety meeting w/ rig crew, baker coring hand before handling core barrel BHA	**Rig Repair :**						
17:15	18:45	Break down Baker hughes coring BHA & recover cut core # 2	**Cut Drlg Ln :**						
18:45	19:00	Rig service, functioned upper pipe rams c/o 7 sec	**Dev Survey :**						
19:00	19:15	Safety meeting w/ rig crews & MGM rep	**Logging :**						
19:15	23:15	Continue to break down Baker hughes coring BHA & recover cut core # 2	**Run Casing :**						
23:15	24:00	Run in the hole with core run# 3	**Cementing :**						
			WOC :						
			NU BOP :						
			PT BOP :						
			DST :						
			Fishing :						
			Dir Work :						
			LDDP :						
			B.O.P / Safety Mt:			0.75			
		Core # 2 was cut from 1834mkb to 1851.60 mkb, Recovered from 1834mkb to 1851.30 mkb (17.3m of 17.6m cut= 98% recovered)							
		1 load of cutting hauled off location (approx 20 ton)							
		Daily Fuel :8531 litres Total fuel : 137117 litres							
OPERATION NEXT 24 HRS :		RIH w/ core BHA # 3, cut core # 3, POOH to recover core # 3	**TOTAL:**			**24.00**			

Drilling Rig & Number:	Akita 37	**HOLE CONDITION :**	good	**BOILER HRS:**	**24.00** **TOTAL DAILY HRS:** 24.00
Tool Pusher :	Guy Cusitar	**Cellular # :**	403-648-0842	**Road / Lease Condition :**	Road is holding together vey well. Location is in good shape
Drilling Consultant :	Trevor Mitchell / Jason Duck	**Email:**	rig_supervisor@mgmenergy.com	**Shack Cell # :**	(403) 536-9970
Temp (C) :	-14	**Weather :**	7kph N-wind & clear	**Taken By :**	John Williams / Dick Heenan
Date Last BOP Drill :	February 2, 2013	**Daily Cost :**	$153,348	**Cum Cost :**	$12,711,326 **AFE Remaining :** $0

DAILY DRILLING REPORT

PROGRAMMED FTD :	2020		
DAYS (MI & RU) :	13.59	**AFE # :**	12D0006
DAYS (FROM SPUD) :	15.41	**AFE AMT. :**	
TOTAL DAYS :	29.00	**CO. WI (%) :**	
Date of First Report:	24-Jan-13		

KB ELEVATION:	161.24	**GROUND ELEVATION:**	155.39	**CBF ELEVATION :**	155.89

Well Name :	MGM-Shell East Mackay I-78	**Licence # :**	1202-002	**Date:**	11-Feb-13

Dpth @ 24:00	**Progress (m)**	**Operation @ 24:00 Hours** **11-Feb-13**	**Operation @ 07:00 Hours** **12-Feb-13**	**Depth @ 07:00 Hr.**
1874.24	22.64	Recovering Core #3	Tripping in Hole with 216mm Insert Bit	1874.24

DRILLING FLUID

Type :	Polymer	**Mud Engineer:**	Dave Gibson	**Cell # :**		**Office # :**		**Mud Co.:**	Matrix Drilling Fluids

MUD CHECK

	#1	#2
Time	09:00	13:30
Depth	1856	1874
Density	1075	1080
Viscosity	54	56
Water Loss	7	6.4
pH	9.5	9.5
Filter Cake	1.0	1.0
P.V.		21
Y.P.		13.5
Gels 10 sec.		4
Gels 10 min.		4.5
Low "N"		.49
Low "K"		11.47
Brk YP		
Brk 0.5 rpm		
Chloride		340
Calcium		Trace
Sand %		.006
Solids %		
Oil Content %		0
MBT		
Mud Gradient	10.55	10.59
Last Csg MD:	401.79	401.79
Last Csg TVD:	401.79	401.79
MACP:	6515	6495
RSPP:	3800	3800
RSP Strokes:	65	65

ADDITIVES

ADDITIVES	SKS
CalCarb 325	260

DAILY DRILLING REPORT

PROGRAMMED FTD :	2020		
DAYS (MI & RU) :	13.59	**AFE # :**	12D0006
DAYS (FROM SPUD) :	16.41	**AFE AMT. :**	
TOTAL DAYS :	30.00	**CO. WI (%) :**	
Date of First Report:	24-Jan-13		

KB ELEVATION:	161.24	**GROUND ELEVATION:**	155.39	**CBF ELEVATION :**	155.89

Well Name :	MGM-Shell East Mackay I-78		**Licence # :**	1202-002	**Date:** 12-Feb-13
Dpth @ 24:00	**Progress (m)**	**Operation @ 24:00 Hours** **12-Feb-13**	**Operation @ 07:00 Hours**	**13-Feb-13**	**Depth @ 07:00 Hr.**
1938	63.76	Circulating at Core Point	Making up Core Assembly #4		1938

DRILLING FLUID

Type :	Polymer	**Mud Engineer:** Dave Gibson	**Cell # :**	**Office # :**	**Mud Co.:** Matrix Drilling Fluids

MUD CHECK

	#1	#2
Time	09:30	20:00
Depth	1874	1914
Density	1080	1075
Viscosity	56	55
Water Loss	7	6.8
pH	9.5	9.5
Filter Cake	1	1
P.V.		20
Y.P.		14
Gels 10 sec.		4
Gels 10 min.		4.5
Low "N"		.49
Low "K"		11.47
Brk YP		
Brk 0.5 rpm		
Chloride		340
Calcium		Trace
Sand %		.006
Solids %		
Oil Content %		0
MBT		
Mud Gradient	10.59	10.55
Last Csg MD:	401.79	401.79
Last Csg TVD:	401.79	401.79
MACP:	6479	6499
RSPP:	3246	3383
RSP Strokes:	65	65

ADDITIVES

	SKS

DAILY DRILLING REPORT

PROGRAMMED FTD :	2020		
DAYS (MI & RU) :	13.59	**AFE # :**	12D0006
DAYS (FROM SPUD) :	17.41	**AFE AMT. :**	
TOTAL DAYS :	31.00	**CO. WI (%) :**	
Date of First Report:	24-Jan-13		

KB ELEVATION:	161.24	**GROUND ELEVATION:**	155.39	**CBF ELEVATION :**	155.89

Well Name :	MGM-Shell East Mackay I-78	**Licence # :**	1202-002	**Date:** 13-Feb-13

Dpth @ 24:00	**Progress (m)**	**Operation @ 24:00 Hours** **13-Feb-13**	**Operation @ 07:00 Hours** **14-Feb-13**	**Depth @ 07:00 Hr.**
1960	22	Cut core # 4	POOH to recover core run #4	1960.5

DRILLING FLUID

Type :	Polymer	**Mud Engineer:** Dave Gibson	**Cell # :**	**Office # :**	**Mud Co.:** Matrix Drilling Fluids

MUD CHECK

	#1	#2
Time	18:00	21:00
Depth	1941	1951
Density	1075	1065
Viscosity	58	56
Water Loss	7	6.4
pH	9	9.5
Filter Cake		1
P.V.		20
Y.P.		14.5
Gels 10 sec.		4
Gels 10 min.		4.5
Low "N"		.50
Low "K"		11.38
Brk YP		
Brk 0.5 rpm		
Chloride		340
Calcium		TR
Sand %		.006
Solids %		
Oil Content %		
MBT		
Mud Gradient	10.55	10.45
Last Csg MD:	401.79	401.79
Last Csg TVD:	401.79	401.79
MACP:	3035	3075
RSPP:		4750
RSP Strokes:		64

ADDITIVES

	SKS
Caustic	1

DAILY DRILLING REPORT

PROGRAMMED FTD :	2020		
DAYS (MI & RU) :	13.59	**AFE # :**	12D0006
DAYS (FROM SPUD) :	18.41	**AFE AMT. :**	
TOTAL DAYS :	32.00	**CO. WI (%) :**	

KB ELEVATION:	161.24	**GROUND ELEVATION:**	155.39	**CBF ELEVATION :**	155.89

Date of First Report: 24-Jan-13

Well Name : MGM-Shell East Mackay I-78			**Licence # :** 1202-002	**Date:** 14-Feb-13
Dpth @ 24:00	**Progress (m)**	**Operation @ 24:00 Hours 14-Feb-13**	**Operation @ 07:00 Hours 15-Feb-13**	**Depth @ 07:00 Hr.**
1960.5	0.5	Drilling ahead w/ 216mm tri-cone bit	Drilling ahead w/ 216mm tri-cone bit	1988

DRILLING FLUID

Type : Polymer	**Mud Engineer:** Dave Gibson	**Cell # :**	**Office # :**	**Mud Co.:** Matrix Drilling Fluids	

MUD CHECK

	#1	#2
Time	15:00	23:00
Depth		1960
Density	1070	1075
Viscosity	58	51
Water Loss	7	6.8
pH	9.5	9.5
Filter Cake		1
P.V.		20
Y.P.		13
Gels 10 sec.		4
Gels 10 min.		4
Low "N"		.48
Low "K"		11.64
Brk YP		
Brk 0.5 rpm		
Chloride		380
Calcium		TR
Sand %		
Solids %		
Oil Content %		
MBT		
Mud Gradient	10.50	10.55
Last Csg MD:	401.79	401.79
Last Csg TVD:	401.79	401.79
MACP:	6518	6499
RSPP:		3111
RSP Strokes:		64

ADDITIVES

	SKS
2K7 Biocide	4
Cal Carb 325	80

	Daily	Cum.
Mud ($)	768	35,083
Water ($)		

BOTTOM HOLE ASSEMBLY

Description	OD (mm)	ID (mm)	Length	Thread
Tri-cone bit	216		0.42	4 1/2 Reg
Bit sub	102	65	0.94	4 1/2Reg/4 1/2XH
Stab & outer tube	156	70	56.38	4 1/2 XH
Jars-Hyd	102	65	10.00	4 1/2 XH
X/O	102	65	1.10	4 1/2XH /4-FH
20 HWDP	102	65.1	186.25	4 FH
Drill Pipe				
HWDP				
Drill Pipe 176	102	84.5	1704.91	4-FH
Kelly Down				
BHA Length (m) : 255.09			**Total Length**	1960.00

FLUID VOLUMES

Bottoms Up (min)	38
Mud Cycle (min)	59
Main Hole (m3)	51.6
Mud Tanks (m3)	38.5
Sump Vol. (m3)	
Total (m3)	90.1
MUD-UP DEPTH:	**440**

PRE-MIX TANK

Volume (m3)	
Low "N"	
Low "K"	
Brk YP	
Brk 0.5 rpm	
Viscosity	
Density	

SURVEYS

Depth	Degrees	Azi.

HYDRAULICS

Hole Size	**216**	**OD (mm)**	**ID (mm)**
Drill Pipe		102	84.5
Drill Collar		156	70

SOLIDS CONTROL

Item	**UF**	**OF**
Desander		
Desilter		
Centrifuge #1		
Centrifuge #2		
Centrifuge #3		

Screen Sz.	**#1**	**#2**	**#3**	**#4**
Shaker #1	200	200	165	165
Shaker #2	200	200	165	165
Shaker #3				

BIT DATA

No.	Size-mm	Type	Serial No.	Jets (mm)							In	Out	Metres	Bit Hrs.	ROP	Cum Hrs	Ti	To	D	Loc	B	G	O	R
9RR	216	GX-20MDX	5202128	15.9	15.9	15.9					1960.5													

DRILLING PARAMETERS

No.	WOB	RPM	Str. Wt.	Pressure	SPM #1	SPM #2	SPM #3	DP Vel	DC Vel	Noz Vel	m3 / Min
9RR	9	100	66	8400		115		49	80	39.4	1.41

PUMP DATA

No.	Type	m3 / Stk	Eff (%)	Liner Sz.	Stk.Lgth.
#1	9P-100	0.0129	95%	152	235
#2	9P-100	0.0129	95%	152	235
#3					

FROM	TO	24 HOUR SUMMARY	TIME BREAKDOWN	S	I	P	L1	L2	L3
00:00	01:00	Cut 216mm core #4 from 1960mkb to 1960.5mkb	**MIRU / TO :**						
01:00	02:00	Pump out of the hole from 1960.5m to 1774m	**Drill :**						
02:00	06:30	Trip out of the hole flow check @ 1760m & pump pill, blow down top drive. Flow checks @ 954m,350m	**Ream :**			3.25			
06:30	06:45	Rig service, grease blocks, crown & wash pipe	**Coring :**			1.00			
06:45	07:00	Safety meeting w/ crews & MGM rep	**Circ :**						
07:00	08:45	Continue to trip out of the hole with core # 4 assembly	**Trips :**			18.25			
08:45	09:00	Safety meeting w/ crew & baker hughes prior to handling core	**Rig Service :**			0.75			
09:00	12:30	Break down core assembly & recover core # 4	**Rig Repair :**						
12:30	15:00	Lay down baker hughes BHA	**Cut Drlg Ln :**						
15:00	15:15	Rig service, function pipe rams 5 sec to c/o	**Dev Survey :**						
15:15	18:45	Trip in the hole, fill pipe/ blow top drive @ 650m	**Logging :**						
18:45	19:00	Safety meeting w/ crews & MGM rep	**Run Casing :**						
19:00	20:30	Continue to trip in the hole to 1820mkb	**Cementing :**						
20:30	23:45	Wash through rat hole w/ slick assembly from 1820mkb to 1939mkb and ream through previously cored interval from 1939mkb to	**WOC :**						
23:45	23:45	1960mkb.	**NU BOP :**						
23:45	24:00	Rig service, function upper pipe rams c/o 7 sec	**PT BOP :**						
			DST :						
			Fishing :						
			Dir Work :						
			LDDP :						
			B.O.P / Safety Mt:			0.75			
		Core # 4 was cut from 1938mkb to 1960.50mkb, Recovered from 1938mkb to 1960.10mkb (21.5m cut= 97% recovered)							
		Daily fuel : 10191 litres Total fuel: 170657 litres							
OPERATION NEXT 24 HRS :		Drill 216mm hole to 2001mkb TD, wiper rat hole, POOH to run wireline logs	**TOTAL:**			**24.00**			

Drilling Rig & Number: Akita 37	**HOLE CONDITION :** Ream tight rat hole from 1820mkb to 1960mkb		**BOILER HRS:**	**24.00**	**TOTAL DAILY HRS:** 24.00
Tool Pusher : Guy Cusitar	**Cellular # :** 403-648-0842	**Road / Lease Condition :** Road is holding together vey well. Location is in good shape			
Drilling Consultant : Trevor Mitchell / Jason Duck	**Email:** rig_supervisor@mgmenergy.com	**Shack Cell # :** (403) 536-9970			
Temp (C) : -27	**Weather :** 14kph E wind & clear	**Taken By :** John Williams / Dick Heenan			
Date Last BOP Drill : February 14, 2013	**Daily Cost :** $162,146	**Cum Cost :** $13,371,802	**AFE Remaining :** $0		

DAILY DRILLING REPORT

PROGRAMMED FTD :	2020		
DAYS (MI & RU) :	13.59	**AFE # :**	12D0006
DAYS (FROM SPUD) :	19.41	**AFE AMT. :**	
TOTAL DAYS :	33.00	**CO. WI (%) :**	

KB ELEVATION:	161.24	**GROUND ELEVATION:**	155.39	**CBF ELEVATION :**	155.89

Date of First Report: 24-Jan-13

Well Name : MGM-Shell East Mackay I-78			**Licence # :** 1202-002	**Date:** 15-Feb-13
Dpth @ 24:00	**Progress (m)**	**Operation @ 24:00 Hours 15-Feb-13**	**Operation @ 07:00 Hours 16-Feb-13**	**Depth @ 07:00 Hr.**
2001	40.5	Rig up baker hughes loggers	stuck in the hole with Logging tools @ 1974m	2001

DRILLING FLUID

Type : Polymer	**Mud Engineer:** Dave Gibson	**Cell # :**	**Office # :**	**Mud Co.:** Matrix Drilling Fluids

MUD CHECK

	#1	#2
Time	05:30	16:00
Depth	1983	2001
Density	1075	1075
Viscosity	51	80
Water Loss	6.6	6.2
pH	9.5	9
Filter Cake	1	1
P.V.	20	22
Y.P.	13.5	24
Gels 10 sec.	4	6
Gels 10 min.	4	10
Low "N"	.49	.35
Low "K"	11.55	40.45
Brk YP		
Brk 0.5 rpm		
Chloride	380	380
Calcium	TR	TR
Sand %	.006	.006
Solids %		
Oil Content %		
MBT		
Mud Gradient	10.55	10.55
Last Csg MD:	401.79	401.79
Last Csg TVD:	401.79	401.79
MACP:	6499	6499
RSPP:	3200	
RSP Strokes:	64	

ADDITIVES

	SKS
Poly zan	7

	Daily	Cum.
Mud ($)	2,702	37,785
Water ($)		

BOTTOM HOLE ASSEMBLY

Description	OD (mm)	ID (mm)	Length	Thread
Tri-cone bit	216		0.42	4 1/2 Reg
Bit sub	102	65	0.94	4 1/2Reg/4 1/2XH
Stab & outer tube	156	70	56.38	4 1/2 XH
Jars-Hyd	102	65	10.00	4 1/2 XH
X/O	102	65	1.10	4 1/2XH /4-FH
20 HWDP	102	65.1	186.25	4 FH
Drill Pipe				
HWDP				
Drill Pipe 180	102	84.5	1745.91	4-FH
Kelly Down				
BHA Length (m) :	255.09		**Total Length**	2001.00

FLUID VOLUMES

Bottoms Up (min)	37
Mud Cycle (min)	58
Main Hole (m3)	52.7
Mud Tanks (m3)	38.0
Sump Vol. (m3)	
Total (m3)	90.7
MUD-UP DEPTH:	**440**

PRE-MIX TANK

Volume (m3)	
Low "N"	
Low "K"	
Brk YP	
Brk 0.5 rpm	
Viscosity	
Density	

SURVEYS

Depth	Degrees	Azi.

HYDRAULICS

Hole Size	**216**	**OD (mm)**	**ID (mm)**
Drill Pipe		102	84.5
Drill Collar		156	70

SOLIDS CONTROL

Item	**UF**	**OF**
Desander		
Desilter		
Centrifuge #1		
Centrifuge #2		
Centrifuge #3		

Screen Sz.	**#1**	**#2**	**#3**	**#4**
Shaker #1	200	200	165	165
Shaker #2	200	200	165	165
Shaker #3				

BIT DATA

No.	Size-mm	Type	Serial No.	Jets (mm)							In	Out	Metres	Bit Hrs.	ROP	Cum Hrs	Ti	To	D	Loc	B	G	O	R
9RR	216	GX-20MDX	5202128	15.9	15.9	15.9					1960.5	2001	40.5	9.50	4.3	9.50	2	1	wt	M	0	G	PN	TD

DRILLING PARAMETERS

No.	WOB	RPM	Str. Wt.	Pressure	SPM #1	SPM #2	SPM #3	DP Vel	DC Vel	Noz Vel	m3 / Min
9RR	15	105	66	7600		120		52	84	41.1	1.47

PUMP DATA

No.	Type	m3 / Stk	Eff (%)	Liner Sz.	Stk.Lgth.
#1	9P-100	0.0129	95%	152	235
#2	9P-100	0.0129	95%	152	235
#3					

FROM	TO	24 HOUR SUMMARY	TIME BREAKDOWN	S	I	P	L1	L2	L3
00:00	06:15	Drill 216mm hole w/ slick assembly from 1960.5mkb to 1990mkb	**MIRU / TO :**						
06:15	06:30	Accum, work pipe & connections	**Drill :**			9.50			
06:30	06:45	Rig service, functioned upper pipe rams c/o 7 sec	**Ream :**			2.50			
06:45	07:00	Safety meeting w/ rig crews & MGM rep	**Coring :**						
07:00	10:15	Drill 216mm hole w/ slick assembly from 1990mkb to 2001mkb =TD	**Circ :**			5.00			
10:15	11:45	Circulate, condition mud & work pipe	**Trips :**			4.25			
11:45	13:45	pump out of the hole from 2001mkb to 1800mkb	**Rig Service :**			0.75			
13:45	14:00	Rig service, functioned annular c/o 55 sec	**Rig Repair :**						
14:00	16:30	Circulate and wash in from 1800m to 1995m, ream tight hole from 1995m to 2001m.	**Cut Drlg Ln :**						
16:30	17:45	Circulate, condition mud & work pipe	**Dev Survey :**						
17:45	18:45	Trip out of the hole	**Logging :**			1.25			
18:45	19:00	Safety meeting w/ rig crews & MGM rep	**Run Casing :**						
19:00	22:15	Continue to trip out of the hole, flow checks @ 1993m,1000m,260m & every 20 min while out of the hole.	**Cementing :**						
22:15	22:30	Pre-job safety meeting w/ rig crew,baker loggers & MGM rep	**WOC :**						
22:30	23:45	Rig up baker hughes wireline loggers	**NU BOP :**						
23:45	24:00	Rig service, function blind/shear rams c/o 7 sec	**PT BOP :**						
			DST :						
			Fishing :						
			Dir Work :						
			LDDP :						
			B.O.P / Safety Mt:			0.75			
		6 loads of cutting hauled off location (approx 130 ton)							
		Basset petroleum delivered 65,000 litres diesel							
		Daily fuel :7982 litres Total fuel : 178639 litres							
OPERATION NEXT 24 HRS :		mobilizing fishing equipment	**TOTAL:**			**24.00**			
			BOILER HRS:	**24.00**		**TOTAL DAILY HRS:**			24.00

Drilling Rig & Number: Akita 37	**HOLE CONDITION :** good		
Tool Pusher : Guy Cusitar	**Cellular # :** 403-648-0842	**Road / Lease Condition :**	Road is holding together vey well. Location is in good shape
Drilling Consultant : Trevor Mitchell / Jason Duck	**Email:** rig_supervisor@mgmenergy.com	**Shack Cell # :**	(403) 536-9970
Temp (C) : -20	**Weather :** 6kph NW wind, w/ light snow	**Taken By :**	John Williams / Dick Heenan
Date Last BOP Drill : February 14, 2013	**Daily Cost :** $139,208	**Cum Cost :** $13,516,710	**AFE Remaining :** $0

DAILY DRILLING REPORT

PROGRAMMED FTD :	2020		
DAYS (MI & RU) :	13.59	**AFE # :**	12D0006
DAYS (FROM SPUD) :	20.41	**AFE AMT. :**	
TOTAL DAYS :	34.00	**CO. WI (%) :**	

KB ELEVATION:	161.24	**GROUND ELEVATION:**	155.39	**CBF ELEVATION :**	155.89

Date of First Report: 24-Jan-13

Well Name : MGM-Shell East Mackay I-78			**Licence # :** 1202-002	**Date:** 16-Feb-13
Dpth @ 24:00	**Progress (m)**	**Operation @ 24:00 Hours 16-Feb-13**	**Operation @ 07:00 Hours 17-Feb-13**	**Depth @ 07:00 Hr.**
2001		Ream in the hole	Circulating on bottom	2001

DRILLING FLUID

Type : Polymer	**Mud Engineer:** Dave Gibson	**Cell # :**	**Office # :**	**Mud Co.:** Matrix Drilling Fluids	

MUD CHECK

	#1	#2
Time	16:00	24:00
Depth	2001	2001
Density	1075	1120
Viscosity	80	90
Water Loss	6.2	7
pH	9	9
Filter Cake	1	
P.V.	22	
Y.P.	24	
Gels 10 sec.	6	
Gels 10 min.	10	
Low "N"	.35	
Low "K"	40.45	
Brk YP		
Brk 0.5 rpm		
Chloride	380	
Calcium	TR	
Sand %	.006	
Solids %		
Oil Content %		
MBT		
Mud Gradient	10.55	10.99
Last Csg MD:	401.79	401.79
Last Csg TVD:	401.79	401.79
MACP:	6499	6321
RSPP:	4414	
RSP Strokes:	64	

ADDITIVES

	SKS

	Daily	Cum.
Mud ($)		37,785
Water ($)		

BOTTOM HOLE ASSEMBLY

Description	OD (mm)	ID (mm)	Length	Thread
Tri-cone bit	216		0.42	4 1/2 Reg
Bit sub	102	65	0.94	4 1/2Reg/4 1/2XH
Stab & outer tube	156	70	56.38	4 1/2 XH
Jars-Hyd	102	65	10.00	4 1/2 XH
X/O	102	65	1.10	4 1/2XH /4-FH
20 HWDP	102	65.1	186.25	4 FH
Drill Pipe				
HWDP				
Drill Pipe	102	84.5	1745.91	4-FH
Kelly Down				
BHA Length (m) :	255.09		**Total Length**	2001.00

FLUID VOLUMES

Bottoms Up (min)	38
Mud Cycle (min)	60
Main Hole (m3)	52.7
Mud Tanks (m3)	28.8
Sump Vol. (m3)	
Total (m3)	81.5
MUD-UP DEPTH:	**440**

PRE-MIX TANK

Volume (m3)	
Low "N"	
Low "K"	
Brk YP	
Brk 0.5 rpm	
Viscosity	
Density	

SURVEYS

Depth	Degrees	Azi.

HYDRAULICS

Hole Size	**216**	**OD (mm)**	**ID (mm)**
Drill Pipe		102	84.5
Drill Collar		156	70

SOLIDS CONTROL

Item	**UF**	**OF**
Desander		
Desilter		
Centrifuge #1		
Centrifuge #2		
Centrifuge #3		

Screen Sz.	**#1**	**#2**	**#3**	**#4**
Shaker #1	200	200	165	165
Shaker #2	200	200	165	165
Shaker #3				

BIT DATA

No.	Size-mm	Type	Serial No.	Jets (mm)							In	Out	Metres	Bit Hrs.	ROP	Cum Hrs	Ti	To	D	Loc	B	G	O	R
10	216	GT-1	5196907	15.9	15.9	15.9					2001													

DRILLING PARAMETERS

No.	WOB	RPM	Str. Wt.	Pressure	SPM #1	SPM #2	SPM #3	DP Vel	DC Vel	Noz Vel	m3 / Min
10	6	110	66	8535		115		49	80	39.4	1.41

PUMP DATA

No.	Type	m3 / Stk	Eff (%)	Liner Sz.	Stk.Lgth.
#1	9P-100	0.0129	95%	152	235
#2	9P-100	0.0129	95%	152	235
#3					

FROM	TO	24 HOUR SUMMARY	TIME BREAKDOWN	S	I	P	L1	L2	L3
00:00	06:30	Wireline Logs with Baker Hughes Wireline. Tagged at 1997mKB and started Logging up until hole got tight at 1976mKB. Attempted	**MIRU / TO :**						
06:30	06:30	to pull free by pulling up to 70% of maximum tension and slacking off with no success.	**Drill :**						
06:30	06:45	Rig Service	**Ream :**			1.50			
06:45	07:00	Safety Meeting with Crews and MGM Rep	**Coring :**						
07:00	07:30	Continue attempting to free stuck wireline tools. Tools came free at 07:30hrs.	**Circ :**						
07:30	14:00	Wireline Logs with Baker Wireline from 1976mKB to Surface.	**Trips :**			4.50			
14:00	16:15	Rig out baker huhes wireline equipment	**Rig Service :**			0.75			
16:15	16:30	Rig service, function pipe rams, 7 sec to c/o	**Rig Repair :**						
16:30	18:45	Trip in the hole, make up collars, pick up jars	**Cut Drlg Ln :**			1.00			
18:45	19:00	Safety Meeting with Crews and MGM Rep	**Dev Survey :**						
19:00	20:00	Slip & cut drill line , SLC-8758mj Accum-91410mj, cut 17m	**Logging :**			15.75			
20:00	22:15	Trip in the hole with slick assembly & 216mm tooth bit	**Run Casing :**						
22:15	23:45	Ream in the hole w/ slick assembly & 216mm tooth bit from 1825mkb to 1830mkb	**Cementing :**						
23:45	23:45	Increasing mud density to 1125kg/m for hole stability while reaming in the hole	**WOC :**						
23:45	24:00	Rig service, function pipe rams, 7 sec to c/o	**NU BOP :**						
			PT BOP :						
			DST :						
			Fishing :						
			Dir Work :						
			LDDP :						
			B.O.P / Safety Mt:			0.50			
		Logs ran XMAC / ORIT / HDIL / DZDL / CN / DSL							
		BOP drill held while tripping on the morning of the Feb 14, 2013, Annular functioned on the Feb 15,2013 @ 13:45hrs							
		Daily fuel :5866 litres Total fuel : 184505 litres							
OPERATION NEXT 24 HRS :		Continue to ream in the hole, POOH to log well	**TOTAL:**			**24.00**			

Drilling Rig & Number: Akita 37	**HOLE CONDITION :** good		**BOILER HRS:**	**24.00**	**TOTAL DAILY HRS:** 24.00
Tool Pusher : Guy Cusitar	**Cellular # :** 403-648-0842	**Road / Lease Condition :** Road is holding together vey well. Location is in good shape			
Drilling Consultant : Trevor Mitchell / Jason Duck	**Email:** rig_supervisor@mgmenergy.com	**Shack Cell # :** (403) 536-9970			
Temp (C) : -24	**Weather :** 8kph E wind & clear	**Taken By :** John Williams / Dick Heenan			
Date Last BOP Drill : February 14, 2013	**Daily Cost :** $222,058	**Cum Cost :** $13,731,728	**AFE Remaining :** $0		

DAILY DRILLING REPORT

PROGRAMMED FTD :	2020		
DAYS (MI & RU) :	13.59	**AFE # :**	12D0006
DAYS (FROM SPUD) :	20.41	**AFE AMT. :**	
TOTAL DAYS :	34.00	**CO. WI (%) :**	

KB ELEVATION:	161.24	**GROUND ELEVATION:**	155.39	**CBF ELEVATION :**	155.89

Date of First Report: 24-Jan-13

Well Name : MGM-Shell East Mackay I-78			**Licence # :** 1202-002	**Date:** 16-Feb-13
Dpth @ 24:00	**Progress (m)**	**Operation @ 24:00 Hours 16-Feb-13**	**Operation @ 07:00 Hours 17-Feb-13**	**Depth @ 07:00 Hr.**
2001		Ream in the hole	Circulating on bottom	2001

DRILLING FLUID

Type : Polymer	**Mud Engineer:** Dave Gibson	**Cell # :**	**Office # :**	**Mud Co.:**	Matrix Drilling Fluids

MUD CHECK

	#1	#2
Time	16:00	24:00
Depth	2001	2001
Density	1075	1120
Viscosity	80	90
Water Loss	6.2	7
pH	9	9
Filter Cake	1	
P.V.	22	
Y.P.	24	
Gels 10 sec.	6	
Gels 10 min.	10	
Low "N"	.35	
Low "K"	40.45	
Brk YP		
Brk 0.5 rpm		
Chloride	380	
Calcium	TR	
Sand %	.006	
Solids %		
Oil Content %		
MBT		
Mud Gradient	10.55	10.99
Last Csg MD:	401.79	401.79
Last Csg TVD:	401.79	401.79
MACP:	6499	6321
RSPP:	4414	
RSP Strokes:	64	

ADDITIVES

	SKS

	Daily	Cum.
Mud ($)		37,785
Water ($)		

BOTTOM HOLE ASSEMBLY

Description	OD (mm)	ID (mm)	Length	Thread
Tri-cone bit	216		0.42	4 1/2 Reg
Bit sub	102	65	0.94	4 1/2Reg/4 1/2XH
Stab & outer tube	156	70	56.38	4 1/2 XH
Jars-Hyd	102	65	10.00	4 1/2 XH
X/O	102	65	1.10	4 1/2XH /4-FH
20 HWDP	102	65.1	186.25	4 FH
Drill Pipe				
HWDP				
Drill Pipe	102	84.5	1745.91	4-FH
Kelly Down				
BHA Length (m) :	255.09		**Total Length**	2001.00

FLUID VOLUMES

Bottoms Up (min)	38
Mud Cycle (min)	60
Main Hole (m3)	52.7
Mud Tanks (m3)	28.8
Sump Vol. (m3)	
Total (m3)	81.5
MUD-UP DEPTH:	**440**

PRE-MIX TANK

Volume (m3)	
Low "N"	
Low "K"	
Brk YP	
Brk 0.5 rpm	
Viscosity	
Density	

SURVEYS

Depth	Degrees	Azi.

HYDRAULICS

Hole Size	**216**	**OD (mm)**	**ID (mm)**
Drill Pipe		102	84.5
Drill Collar		156	70

SOLIDS CONTROL

Item	**UF**	**OF**
Desander		
Desilter		
Centrifuge #1		
Centrifuge #2		
Centrifuge #3		

Screen Sz.	**#1**	**#2**	**#3**	**#4**
Shaker #1	200	200	165	165
Shaker #2	200	200	165	165
Shaker #3				

BIT DATA

No.	Size-mm	Type	Serial No.	Jets (mm)							In	Out	Metres	Bit Hrs.	ROP	Cum Hrs	Ti	To	D	Loc	B	G	O	R
10	216	GT-1	5196907	15.9	15.9	15.9					2001													

DRILLING PARAMETERS

No.	WOB	RPM	Str. Wt.	Pressure	SPM #1	SPM #2	SPM #3	DP Vel	DC Vel	Noz Vel	m3 / Min
10	6	110	66	8535		115		49	80	39.4	1.41

PUMP DATA

No.	Type	m3 / Stk	Eff (%)	Liner Sz.	Stk.Lgth.
#1	9P-100	0.0129	95%	152	235
#2	9P-100	0.0129	95%	152	235
#3					

FROM	TO	24 HOUR SUMMARY	TIME BREAKDOWN	S	I	P	L1	L2	L3
00:00	06:30	Wireline Logs with Baker Hughes Wireline. Tagged at 199mKB and started Logging up until hole got tight at 1976mKB. Attempted	**MIRU / TO :**						
06:30	06:30	to pull free by pulling up to 70% of maximum tension and slacking off with no success.	**Drill :**						
06:30	06:45	Rig Service	**Ream :**			1.50			
06:45	07:00	Safety Meeting with Crews and MGM Rep	**Coring :**						
07:00	07:30	Continue attempting to free stuck wireline tools. Tools came free at 07:30hrs.	**Circ :**						
07:30	14:00	Wireline Logs with Baker Wireline from 1976mKB to Surface.	**Trips :**			4.50			
14:00	16:15	Rig out baker huhes wireline equipment	**Rig Service :**			0.75			
16:15	16:30	Rig service, function pipe rams, 7 sec to c/o	**Rig Repair :**						
16:30	18:45	Trip in the hole, make up collars, pick up jars	**Cut Drlg Ln :**			1.00			
18:45	19:00	Safety Meeting with Crews and MGM Rep	**Dev Survey :**						
19:00	20:00	Slip & cut drill line , SLC-8758mj Accum-91410mj, cut 17m	**Logging :**			15.75			
20:00	22:15	Trip in the hole with slick assembly & 216mm tooth bit	**Run Casing :**						
22:15	23:45	Ream in the hole w/ slick assembly & 216mm tooth bit from 1825mkb to 1830mkb	**Cementing :**						
23:45	23:45	Increasing mud density to 1125kg/m for hole stability while reaming in the hole	**WOC :**						
23:45	24:00	Rig service, function pipe rams, 7 sec to c/o	**NU BOP :**						
			PT BOP :						
			DST :						
			Fishing :						
			Dir Work :						
			LDDP :						
			B.O.P / Safety Mt:			0.50			
		Logs ran XMAC / ORIT / HDIL / DZDL / CN / DSL							
		Daily fuel :5866 litres Total fuel : 184505 litres							
OPERATION NEXT 24 HRS :		Continue to ream in the hole, POOH to log well	**TOTAL:**			**24.00**			

Drilling Rig & Number: Akita 37	**HOLE CONDITION :** good		**BOILER HRS:**	**24.00**	**TOTAL DAILY HRS:** 24.00
Tool Pusher : Guy Cusitar	**Cellular # :** 403-648-0842	**Road / Lease Condition :** Road is holding together vey well. Location is in good shape			
Drilling Consultant : Trevor Mitchell / Jason Duck	**Email:** rig_supervisor@mgmenergy.com	**Shack Cell # :** (403) 536-9970			
Temp (C) : -24	**Weather :** 8kph E wind & clear	**Taken By :** John Williams / Dick Heenan			
Date Last BOP Drill : February 14, 2013	**Daily Cost :** $222,058	**Cum Cost :** $13,731,728	**AFE Remaining :** $0		

DAILY DRILLING REPORT

PROGRAMMED FTD :	2020		
DAYS (MI & RU) :	13.59	**AFE # :**	12D0006
DAYS (FROM SPUD) :	21.41	**AFE AMT. :**	
TOTAL DAYS :	35.00	**CO. WI (%) :**	

KB ELEVATION:	161.24	**GROUND ELEVATION:**	155.39	**CBF ELEVATION :**	155.89

Date of First Report: 24-Jan-13

Well Name : MGM-Shell East Mackay I-78			**Licence # :** 1202-002	**Date:** 17-Feb-13
Dpth @ 24:00	**Progress (m)**	**Operation @ 24:00 Hours 17-Feb-13**	**Operation @ 07:00 Hours 18-Feb-13**	**Depth @ 07:00 Hr.**
2001		Run wireline logs	RIH w/ 216mm tooth bit	2001

DRILLING FLUID

Type : Polymer	**Mud Engineer:** Dave Gibson	**Cell # :**	**Office # :**	**Mud Co.:** Matrix Drilling Fluids

MUD CHECK

	#1	#2
Time	07:00	
Depth	2001	
Density	1125	
Viscosity	94	
Water Loss	6.2	
pH	9	
Filter Cake	1	
P.V.	22	
Y.P.	26	
Gels 10 sec.	7	
Gels 10 min.	14	
Low "N"	.36	
Low "K"	39.67	
Brk YP		
Brk 0.5 rpm		
Chloride	400	
Calcium	TR	
Sand %	.0025	
Solids %		
Oil Content %		
MBT		
Mud Gradient	11.04	
Last Csg MD:	401.79	401.79
Last Csg TVD:	401.79	401.79
MACP:	6302	7272
RSPP:	4940	
RSP Strokes:	63	

ADDITIVES

	SKS
Barite	66

	Daily	Cum.
Mud ($)	1,716	39,501
Water ($)		

BOTTOM HOLE ASSEMBLY

Description	OD (mm)	ID (mm)	Length	Thread
Tri-cone bit	216		0.42	4 1/2 Reg
Bit sub	102	65	0.94	4 1/2Reg/4 1/2XH
6-6.25 DC's	156	70	56.38	4 1/2 XH
Jars-Hyd	102	65	10.00	4 1/2 XH
X/O	102	65	1.10	4 1/2XH /4-FH
20 HWDP	102	65.1	186.25	4 FH
Drill Pipe				
HWDP				
Drill Pipe	102	84.5	1745.91	4-FH
Kelly Down				
BHA Length (m) :	255.09		**Total Length**	2001.00

FLUID VOLUMES

Bottoms Up (min)	38
Mud Cycle (min)	60
Main Hole (m3)	52.7
Mud Tanks (m3)	43.0
Sump Vol. (m3)	
Total (m3)	95.7
MUD-UP DEPTH:	**440**

PRE-MIX TANK

Volume (m3)	
Low "N"	
Low "K"	
Brk YP	
Brk 0.5 rpm	
Viscosity	
Density	

SURVEYS

Depth	Degrees	Azi.
1870.96	1.3	74.5
1940.96	2	79.9
2000.96	2	80

HYDRAULICS

Hole Size	**216**	**OD (mm)**	**ID (mm)**
Drill Pipe		102	84.5
Drill Collar		156	70

SOLIDS CONTROL

Item	**UF**	**OF**
Desander		
Desilter		
Centrifuge #1		
Centrifuge #2		
Centrifuge #3		

Screen Sz.	**#1**	**#2**	**#3**	**#4**
Shaker #1	200	200	165	165
Shaker #2	200	200	165	165
Shaker #3				

BIT DATA

No.	Size-mm	Type	Serial No.	Jets (mm)							In	Out	Metres	Bit Hrs.	ROP	Cum Hrs	Ti	To	D	Loc	B	G	O	R
10RR	216	GT-1	5196907	15.9	15.9	15.9					2001	2001												

DRILLING PARAMETERS

No.	WOB	RPM	Str. Wt.	Pressure	SPM #1	SPM #2	SPM #3	DP Vel	DC Vel	Noz Vel	m3 / Min
10RR	6	105	66	9034		115		49	80	39.4	1.41

PUMP DATA

No.	Type	m3 / Stk	Eff (%)	Liner Sz.	Stk.Lgth.
#1	9P-100	0.0129	95%	152	235
#2	9P-100	0.0129	95%	152	235
#3					

FROM	TO	24 HOUR SUMMARY	TIME BREAKDOWN	S	I	P	L1	L2	L3
00:00	03:30	Ream & wash 216mm rat hole from 1825mkb to 2001mkb, ream tight hole @ 1825m to 1830m & 1992m to 2001m	**MIRU / TO :**						
03:30	04:15	Circulate & clean hole prior to trip out	**Drill :**						
04:15	04:30	Rig service, service loop sock	**Ream :**			4.00			
04:30	05:45	Wiper trip out/in of 216mm rat hole, flow check @ 2000m	**Coring :**						
05:45	06:00	Derrick inspection	**Circ :**			1.75			
06:00	06:15	Continue Wiper trip out/in of 216mm rat hole	**Trips :**			9.00			
06:15	06:45	Ream & wash in 216mm rat hole from 1994m to 2001m	**Rig Service :**			1.00			
06:45	07:00	Safety meeting w/ rig crews & MGM rep	**Rig Repair :**						
07:00	08:00	Circulate & clean hole	**Cut Drlg Ln :**						
08:00	12:00	Trip out of hole from 2001m 1800m, pump pill, blow back top drive	**Dev Survey :**						
12:00	12:15	**BOP Drill while tripping, 1 minute 50 sec to shut in well**	**Logging :**			7.25			
12:15	15:45	Cont trip out of the hole,lay dn jars,flow check@ 2000m, 1812m, 989m, 262m @ out of the hole	**Run Casing :**						
15:45	16:00	Rig service, function blind rams 4 sec to close	**Cementing :**						
16:00	16:15	Safety meeting w/ baker hughes & akita crew	**WOC :**						
16:15	17:30	Rig up baker hughes wireline loggers	**NU BOP :**						
17:30	18:45	Logging run # 2 on bttm @ 18:10	**PT BOP :**						
18:45	19:00	Safety meeting w/ rig crews & MGM rep	**DST :**						
19:00	21:45	Continue logging run # 2 tagged @ 1999m	**Fishing :**						
21:45	23:45	Rig up log run # 3	**Dir Work :**						
23:45	24:00	Rig service, function pipe rams c/o 6 sec while loggers were out of the hole	**LDDP :**						
			B.O.P / Safety Mt:			1.00			
		Logging run #2 XMAC/HDIL							
		Daily fuel :6614 litres Total fuel : 191119 litres							
OPERATION NEXT 24 HRS :		Log well	**TOTAL:**			**24.00**			

Drilling Rig & Number:	Akita 37	**HOLE CONDITION :**	good	**BOILER HRS:**	**24.00** **TOTAL DAILY HRS:** 24.00
Tool Pusher :	Guy Cusitar	**Cellular # :**	403-648-0842	**Road / Lease Condition :**	Road is holding together vey well. Location is in good shape
Drilling Consultant :	Trevor Mitchell / Jason Duck	**Email:**	rig_supervisor@mgmenergy.com	**Shack Cell # :**	(403) 536-9970
Temp (C) :	-26	**Weather :**	16kph NW wind & light snow	**Taken By :**	John Williams / Dick Heenan
Date Last BOP Drill :	February 17, 2013	**Daily Cost :**	$135,762	**Cum Cost :** $13,874,730	**AFE Remaining :** $0

PROGRAMMED FTD :	2020		
DAYS (MI & RU) :	13.59	**AFE # :**	12D0006
DAYS (FROM SPUD) :	22.41	**AFE AMT. :**	
TOTAL DAYS :	36.00	**CO. WI (%) :**	

DAILY DRILLING REPORT

KB ELEVATION:	161.24	**GROUND ELEVATION:**	155.39	**CBF ELEVATION :**	155.89

Date of First Report: 24-Jan-13

Well Name : MGM-Shell East Mackay I-78			**Licence # :** 1202-002	**Date:** 18-Feb-13
Dpth @ 24:00	**Progress (m)**	**Operation @ 24:00 Hours 18-Feb-13**	**Operation @ 07:00 Hours 19-Feb-13**	**Depth @ 07:00 Hr.**
2001		Rig up to & run log # 4	RIH w/216mm bit &slick assembly	2001

DRILLING FLUID

Type :	Polymer	**Mud Engineer:** Dave Gibson	**Cell # :**	**Office # :**	**Mud Co.:** Matrix Drilling Fluids

MUD CHECK

	#1	#2
Time	12:00	13:30
Depth	2001	2001
Density	1130	1130
Viscosity	100	100
Water Loss	6	6
pH	9	9
Filter Cake		1.5
P.V.		18
Y.P.		32.5
Gels 10 sec.		7
Gels 10 min.		14
Low "N"		.36
Low "K"		45.63
Brk YP		
Brk 0.5 rpm		
Chloride		400
Calcium		TR
Sand %		.0025
Solids %		
Oil Content %		
MBT		
Mud Gradient	11.09	11.09
Last Csg MD:	401.79	401.79
Last Csg TVD:	401.79	401.79
MACP:	6282	6282
RSPP:	4930	
RSP Strokes:	63	

ADDITIVES

	SKS
Barite	25

	Daily	Cum.
Mud ($)	650	40,151
Water ($)		

BOTTOM HOLE ASSEMBLY

Description	OD (mm)	ID (mm)	Length	Thread
Tri-cone bit	216		0.42	4 1/2 Reg
Bit sub	102	65	0.94	4 1/2Reg/4 1/2XH
6-6.25 DC's	156	70	56.38	4 1/2 XH
Jars-Hyd	102	65	10.00	4 1/2 XH
X/O	102	65	1.10	4 1/2XH /4-FH
20 HWDP	102	65.1	186.25	4 FH
Drill Pipe				
HWDP				
Drill Pipe	102	84.5	1745.91	4-FH
Kelly Down				
BHA Length (m) :	255.09		**Total Length**	2001.00

FLUID VOLUMES

Bottoms Up (min)	38
Mud Cycle (min)	60
Main Hole (m3)	52.7
Mud Tanks (m3)	42.0
Sump Vol. (m3)	
Total (m3)	94.7
MUD-UP DEPTH:	**440**

PRE-MIX TANK

Volume (m3)	
Low "N"	
Low "K"	
Brk YP	
Brk 0.5 rpm	
Viscosity	
Density	

SURVEYS

Depth	Degrees	Azi.

HYDRAULICS

Hole Size	**216**	**OD (mm)**	**ID (mm)**
Drill Pipe		102	84.5
Drill Collar		156	70

SOLIDS CONTROL

Item	**UF**	**OF**
Desander		
Desilter		
Centrifuge #1		
Centrifuge #2		
Centrifuge #3		

Screen Sz.	**#1**	**#2**	**#3**	**#4**
Shaker #1	200	200	165	165
Shaker #2	200	200	165	165
Shaker #3				

BIT DATA

No.	Size-mm	Type	Serial No.	Jets (mm)							In	Out	Metres	Bit Hrs.	ROP	Cum Hrs	Ti	To	D	Loc	B	G	O	R
12RR	216	GT-1	5196907	15.9	15.9	15.9					2001	2001												

DRILLING PARAMETERS

No.	WOB	RPM	Str. Wt.	Pressure	SPM #1	SPM #2	SPM #3	DP Vel	DC Vel	Noz Vel	m3 / Min
12RR	5	100	66	8200		115		49	80	39.4	1.41

PUMP DATA

No.	Type	m3 / Stk	Eff (%)	Liner Sz.	Stk.Lgth.
#1	9P-100	0.0129	95%	152	235
#2	9P-100	0.0129	95%	152	235
#3					

FROM	TO	24 HOUR SUMMARY	TIME BREAKDOWN	S	I	P	L1	L2	L3
00:00	05:00	Log run # 3 tagged bttm @ 1981m , re-logged tagged bttm @ 1820m	**MIRU / TO :**						
05:00	06:30	Trip in the hole w/ 216mm tooth bit & slick assembly	**Drill :**						
06:30	06:45	Rig service	**Ream :**						
06:45	07:00	Safety meeting w/ rig crews & MGM rep	**Coring :**						
07:00	12:30	Cont to trip in the hole, fill pipe@ 1000m & 1500m, work tight spots @ 1820m & 1995m to 2001m wash in from 1820m to 2001m	**Circ :**			2.00			
12:30	13:30	Circulate & work pipe	**Trips :**			14.00			
13:30	15:30	POOH (pulled tight), wiper out & in of rathole	**Rig Service :**			0.75			
15:30	16:30	Circulate & work pipe	**Rig Repair :**						
16:30	16:45	Rig service, function annular 55sec c/o	**Cut Drlg Ln :**						
16:45	18:45	Trip out of the hole.pump pill, blow out top drive	**Dev Survey :**						
18:45	19:00	Safety meeting w/ rig crews & MGM rep	**Logging :**			6.75			
19:00	22:00	Cont to trip out of hole,flow checks @ 2000m, 1795m, 999m, 262m & every 20min while out of hole	**Run Casing :**						
22:00	23:45	Rig up to & run log # 4	**Cementing :**						
23:45	24:00	Rig service, function blind/shear ram c/o 6 sec	**WOC :**						
			NU BOP :						
			PT BOP :						
			DST :						
			Fishing :						
			Dir Work :						
			LDDP :						
		Log #3-STAR / CBIL	**B.O.P / Safety Mt:**			0.50			
		Log #4- FLEX / MREX / DSL							
		Daily fuel :5727 litres Total fuel : 196846 litres							
OPERATION NEXT 24 HRS :		Run log #4, RIH w/slick assembly,POOH sideways	**TOTAL:**			**24.00**			

Drilling Rig & Number:	Akita 37	**HOLE CONDITION :** good	**BOILER HRS:**	**24.00**	**TOTAL DAILY HRS:** 24.00
Tool Pusher :	Guy Cusitar	**Cellular # :** 403-648-0842	**Road / Lease Condition :**	Road is holding together vey well. Location is in good shape	
Drilling Consultant :	Trevor Mitchell / Jason Duck	**Email:** rig_supervisor@mgmenergy.com	**Shack Cell # :**	(403) 536-9970	
Temp (C) :	-28	**Weather :** 16kph NW wind & light snow	**Taken By :**	John Williams / Dick Heenan	
Date Last BOP Drill :	February 17, 2013	**Daily Cost :** $143,236	**Cum Cost :**	$14,018,281	**AFE Remaining :** $0

DAILY DRILLING REPORT

PROGRAMMED FTD :	2020		
DAYS (MI & RU) :	13.59	**AFE # :**	12D0006
DAYS (FROM SPUD) :	23.41	**AFE AMT. :**	
TOTAL DAYS :	37.00	**CO. WI (%) :**	

KB ELEVATION:	161.24	**GROUND ELEVATION:**	155.39	**CBF ELEVATION :**	155.89

Date of First Report: 24-Jan-13

Well Name : MGM-Shell East Mackay I-78			**Licence # :** 1202-002	**Date:** 19-Feb-13
Dpth @ 24:00	**Progress (m)**	**Operation @ 24:00 Hours** **19-Feb-13**	**Operation @ 07:00 Hours** **20-Feb-13**	**Depth @ 07:00 Hr.**
2001		POOH & lay dn DP	POOH & lay dn DP	2001

DRILLING FLUID

Type : Polymer	**Mud Engineer:** Dave Gibson	**Cell # :**	**Office # :**	**Mud Co.:** Matrix Drilling Fluids	

MUD CHECK

	#1	#2
Time	22:30	
Depth	2001	
Density	1125	
Viscosity	90	
Water Loss	6	
pH	9	
Filter Cake	1.5	
P.V.	21	
Y.P.	27	
Gels 10 sec.	7	
Gels 10 min.	14	
Low "N"	.34	
Low "K"	47.30	
Brk YP		
Brk 0.5 rpm		
Chloride	400	
Calcium	TR	
Sand %	.0025	
Solids %		
Oil Content %		
MBT		
Mud Gradient	11.04	
Last Csg MD:	401.79	401.79
Last Csg TVD:	401.79	401.79
MACP:	6302	7272
RSPP:	4200	
RSP Strokes:	67	

ADDITIVES

	SKS
Barite	25
caustic soda	1

	Daily	Cum.
Mud ($)	689	40,840
Water ($)		

BOTTOM HOLE ASSEMBLY

Description	OD (mm)	ID (mm)	Length	Thread
Tri-cone bit	216		0.42	4 1/2 Reg
Bit sub	102	65	0.94	4 1/2Reg/4 1/2XH
6-6.25 DC's	156	70	56.38	4 1/2 XH
Jars-Hyd	102	65	10.00	4 1/2 XH
X/O	102	65	1.10	4 1/2XH /4-FH
20 HWDP	102	65.1	186.25	4 FH
Drill Pipe				
HWDP				
Drill Pipe	102	84.5	1745.91	4-FH
Kelly Down				

BHA Length (m) : 255.09 **Total Length** 2001.00

FLUID VOLUMES

Bottoms Up (min)	38
Mud Cycle (min)	60
Main Hole (m3)	52.7
Mud Tanks (m3)	35.0
Sump Vol. (m3)	
Total (m3)	87.7
MUD-UP DEPTH:	**440**

PRE-MIX TANK

Volume (m3)	
Low "N"	
Low "K"	
Brk YP	
Brk 0.5 rpm	
Viscosity	
Density	

SURVEYS

Depth	Degrees	Azi.

HYDRAULICS

Hole Size	**216**	**OD (mm)**	**ID (mm)**
Drill Pipe		102	84.5
Drill Collar		156	70

SOLIDS CONTROL

Item	**UF**	**OF**
Desander		
Desilter		
Centrifuge #1		
Centrifuge #2		
Centrifuge #3		

Screen Sz.	**#1**	**#2**	**#3**	**#4**
Shaker #1	200	200	165	165
Shaker #2	200	200	165	165
Shaker #3				

BIT DATA

No.	Size-mm	Type	Serial No.	Jets (mm)							In	Out	Metres	Bit Hrs.	ROP	Cum Hrs	Ti	To	D	Loc	B	G	O	R
13RR	216	GT-1	5196907	15.9	15.9	15.9					2001	2001												

DRILLING PARAMETERS

No.	WOB	RPM	Str. Wt.	Pressure	SPM #1	SPM #2	SPM #3	DP Vel	DC Vel	Noz Vel	m3 / Min
13RR	3	110	66	8650		115		49	80	39.4	1.41

PUMP DATA

No.	Type	m3 / Stk	Eff (%)	Liner Sz.	Stk.Lgth.
#1	9P-100	0.0129	95%	152	235
#2	9P-100	0.0129	95%	152	235
#3					

FROM	TO	24 HOUR SUMMARY	TIME BREAKDOWN	S	I	P	L1	L2	L3
00:00	06:00	Run wireline Logs with Baker Hughes. Run #4 - FLEX / MREX / DSL	**MIRU / TO :**						
06:00	06:15	Rig Service	**Drill :**						
06:15	06:45	Make up Bit and Run in Hole with Slick Assembly	**Ream :**						
06:45	07:00	Safety Meeting with Akita Crews and MGM Rep	**Coring :**						
07:00	09:30	Continue Trip in Hole with Slick Assembly to 641m	**Circ :**			2.00			
09:30	11:15	Trip out of hole to install jars	**Trips :**			14.75			
11:15	11:30	Rig service.function test annular 55 sec to c/o	**Rig Service :**			0.50			
11:30	16:00	Trip in hole,fill pipe & blow out top drive @ 650m & 1300m	**Rig Repair :**						
16:00	16:15	Safety Meeting with Akita Crews and MGM Rep	**Cut Drlg Ln :**						
16:15	18:15	Cont tripping in the hole,wash last 5 stands down	**Dev Survey :**						
18:15	19:15	Circulate hole clean	**Logging :**			6.00			
19:15	20:45	Trip out of rat hole	**Run Casing :**						
20:45	21:45	Trip in hole & wash down last 3 stands	**Cementing :**						
21:45	22:45	Circulate bttm's up	**WOC :**						
22:45	23:00	Safety Meeting with Akita Crews and MGM Rep	**NU BOP :**						
23:00	24:00	Trip out of hole (rack 10 stands & lay dn drill pipe)	**PT BOP :**						
			DST :						
			Fishing :						
			Dir Work :						
			LDDP :						
			B.O.P / Safety Mt:			0.75			
		2 loads of cuttings hauled off location (approx 42 ton)							
		Daily fuel : 7164 litres Total fuel : 204010 litres							
OPERATION NEXT 24 HRS :		POOH & lay dn drill string & BHA, RIH w/ 7" production casing	**TOTAL:**			**24.00**			

Drilling Rig & Number: Akita 37	**HOLE CONDITION :** good		**BOILER HRS:**	**24.00**	**TOTAL DAILY HRS:** 24.00
Tool Pusher : Guy Cusitar	**Cellular # :** 403-648-0842	**Road / Lease Condition :** Road is holding together vey well. Location is in good shape			
Drilling Consultant : Trevor Mitchell / Jason Duckv	**Email:** rig_supervisor@mgmenergy.com	**Shack Cell # :** (403) 536-9970			
Temp (C) : -30	**Weather :** 9kph W wind & light snow	**Taken By :** John Williams / Dick Heenan			
Date Last BOP Drill : February 17, 2013	**Daily Cost :** $1,070,994	**Cum Cost :** $15,085,635	**AFE Remaining :** $0		

DAILY DRILLING REPORT

PROGRAMMED FTD :	2020		
DAYS (MI & RU) :	13.59	**AFE # :**	12D0006
DAYS (FROM SPUD) :	23.41	**AFE AMT. :**	
TOTAL DAYS :	37.00	**CO. WI (%) :**	

KB ELEVATION:	161.24	**GROUND ELEVATION:**	155.39	**CBF ELEVATION :**	155.89

Date of First Report: 24-Jan-13

Well Name :	MGM-Shell East Mackay I-78	**Licence # :**	1202-002	**Date:** 20-Feb-13

Dpth @ 24:00	**Progress (m)**	**Operation @ 24:00 Hours 20-Feb-13**	**Operation @ 07:00 Hours 21-Feb-13**	**Depth @ 07:00 Hr.**
2001		RIH w/ 177.8mm casing	Break circulation & continue to RIH w/ 177.8mm casing	2001

DRILLING FLUID

Type :	Polymer	**Mud Engineer:** Dave Gibson	**Cell # :**	**Office # :**	**Mud Co.:** Matrix Drilling Fluids

MUD CHECK

	#1	#2
Time	19:00	
Depth	2001	
Density	1125	
Viscosity	90	
Water Loss	6	
pH	9	
Filter Cake	1.5	
P.V.	21	
Y.P.	27	
Gels 10 sec.	7	
Gels 10 min.	14	
Low "N"	.34	
Low "K"	47.30	
Brk YP		
Brk 0.5 rpm		
Chloride	400	
Calcium	TR	
Sand %	.0025	
Solids %		
Oil Content %		
MBT		
Mud Gradient	11.04	
Last Csg MD:	401.79	401.79
Last Csg TVD:	401.79	401.79
MACP:	6302	7272
RSPP:	4200	
RSP Strokes:	67	

ADDITIVES

	SKS

	Daily	Cum.
Mud ($)		40,840
Water ($)		

BOTTOM HOLE ASSEMBLY

Description	OD (mm)	ID (mm)	Length	Thread
Drill Pipe				
HWDP				
Drill Pipe				
Kelly Down				

BHA Length (m) : **Total Length**

FLUID VOLUMES

Bottoms Up (min)	
Mud Cycle (min)	
Main Hole (m3)	73.3
Mud Tanks (m3)	25.0
Sump Vol. (m3)	
Total (m3)	98.3
MUD-UP DEPTH:	**440**

PRE-MIX TANK

Volume (m3)	
Low "N"	
Low "K"	
Brk YP	
Brk 0.5 rpm	
Viscosity	
Density	

SURVEYS

Depth	Degrees	Azi.

HYDRAULICS

Hole Size	**216**	**OD (mm)**	**ID (mm)**
Drill Pipe		102	84.5
Drill Collar		156	70

SOLIDS CONTROL

Item	**UF**	**OF**
Desander		
Desilter		
Centrifuge #1		
Centrifuge #2		
Centrifuge #3		

Screen Sz.	**#1**	**#2**	**#3**	**#4**
Shaker #1	200	200	165	165
Shaker #2	200	200	165	165
Shaker #3				

BIT DATA

No.	Size-mm	Type	Serial No.	Jets (mm)	In	Out	Metres	Bit Hrs.	ROP	Cum Hrs	Ti	To	D	Loc	B	G	O	R

DRILLING PARAMETERS

No.	WOB	RPM	Str. Wt.	Pressure	SPM #1	SPM #2	SPM #3	DP Vel	DC Vel	Noz Vel	m3 / Min

PUMP DATA

No.	Type	m3 / Stk	Eff (%)	Liner Sz.	Stk.Lgth.
#1	9P-100	0.0129	95%	152	235
#2	9P-100	0.0129	95%	152	235
#3					

FROM	TO	24 HOUR SUMMARY	TIME BREAKDOWN	S	I	P	L1	L2	L3
00:00	01:15	Trip out of hole from 2001m to 1800m, pump pill, blow down top drive	**MIRU / TO :**						
01:15	01:30	JSA review-laying down drill pipe	**Drill :**						
01:30	06:30	Lay dn drill pipe singles from 1800m to 650m	**Ream :**						
06:30	06:45	Rig service, function annular 55 sec to c/o	**Coring :**						
06:45	07:00	Safety meeting with MGM rep & akita crew	**Circ :**						
07:00	08:00	Continue to lay dn drill pipe	**Trips :**			1.25			
08:00	08:15	safety meeting with rig crew-slip & cut	**Rig Service :**			0.75			
08:15	09:00	Slip & cut drill line 15m	**Rig Repair :**						
09:00	09:15	Rig service, function annular 55 sec to c/o, greased top drive	**Cut Drlg Ln :**			0.75			
09:15	14:30	Continue to lay dn drill pipe & BHA	**Dev Survey :**						
14:30	15:30	Remove wear bushing	**Logging :**						
15:30	16:30	Prep floor & rig up to run casing	**Run Casing :**			5.75			
16:30	16:45	Safety meeting w/ tong hands,akita crew & MGM rep	**Cementing :**						
16:45	18:45	Test run cameron landing joint, run single joint of casing & calibrate tongs & torque monitor	**WOC :**						
18:45	19:00	Safety meeting with MGM rep & akita crew	**NU BOP :**						
19:00	23:45	Run 48 jnts of 177.8mm 53.59kg/m L-80 tenaris blue casing	**PT BOP :**						
23:45	24:00	Rig service, function test crown saver	**DST :**						
			Fishing :						
			Dir Work :						
		Elevator certs 7" SLX-150ton ser#44922, load test # EDM-0505-8596-69459LT, load tested to 225ton, inspection # H-16335	**LDDP :**			11.25			
			B.O.P / Safety Mt:			1.25			
			Cameron work			3.00			
		3 loads of cuttings hauled off location (approx 63 ton)							
		Daily fuel : 6845 litres Total fuel : 210855 litres							
OPERATION NEXT 24 HRS :		Continue to RIH w/ 177.8mm casing,circulate casing, cement casing	**TOTAL:**			**24.00**			

Drilling Rig & Number:	Akita 37	**HOLE CONDITION :** good	**BOILER HRS:**	**24.00**	**TOTAL DAILY HRS:** 24.00
Tool Pusher :	Guy Cusitar	**Cellular # :** 403-648-0842	**Road / Lease Condition :**	Road is holding together vey well. Location is in good shape	
Drilling Consultant :	Trevor Mitchell / Jason Duck	**Email:** rig_supervisor@mgmenergy.com	**Shack Cell # :**	(403) 536-9970	
Temp (C) :	-31	**Weather :** 8kph W wind & clear	**Taken By :**	John Williams / Dick Heenan	
Date Last BOP Drill :	February 17, 2013	**Daily Cost :** $141,484	**Cum Cost :** $15,225,969	**AFE Remaining :**	$0

DAILY DRILLING REPORT

PROGRAMMED FTD :	2020		
DAYS (MI & RU) :	13.59	**AFE # :**	12D0006
DAYS (FROM SPUD) :	25.41	**AFE AMT. :**	
TOTAL DAYS :	39.00	**CO. WI (%) :**	

KB ELEVATION:	161.24	**GROUND ELEVATION:**	155.39	**CBF ELEVATION :**	155.89

Date of First Report: 24-Jan-13

Well Name :	MGM-Shell East Mackay I-78		**Licence # :** 1202-002	**Date:**	21-Feb-13
Dpth @ 24:00	**Progress (m)**	**Operation @ 24:00 Hours 21-Feb-13**	**Operation @ 07:00 Hours 22-Feb-13**		**Depth @ 07:00 Hr.**
2001		Install 4 1/2" pipe rams & begin pressure testing BOP's & related equipment	continue pressure testing		2001

DRILLING FLUID

Type :	Polymer	**Mud Engineer:**	Dave Gibson	**Cell # :**		**Office # :**		**Mud Co.:**	Matrix Drilling Fluids

MUD CHECK

	#1	#2
Time		16:00
Depth		2001
Density		1130
Viscosity		52
Water Loss		7
pH		8.5
Filter Cake		1
P.V.		22
Y.P.		11
Gels 10 sec.		4
Gels 10 min.		6
Low "N"		.52
Low "K"		8.74
Brk YP		
Brk 0.5 rpm		
Chloride		320
Calcium		Tr
Sand %		.0025
Solids %		
Oil Content %		
MBT		
Mud Gradient		11.09
Last Csg MD:		
Last Csg TVD:		
MACP:		
RSPP:		
RSP Strokes:		

ADDITIVES

	SKS
Humilte	8

	Daily	Cum.
Mud ($)	96	40,840
Water ($)		

BOTTOM HOLE ASSEMBLY

Description	**OD (mm)**	**ID (mm)**	**Length**	**Thread**
Drill Pipe				
HWDP				
Drill Pipe				
Kelly Down				

BHA Length (m) : **Total Length**

FLUID VOLUMES

Bottoms Up (min)	
Mud Cycle (min)	
Main Hole (m3)	
Mud Tanks (m3)	
Sump Vol. (m3)	
Total (m3)	
MUD-UP DEPTH:	

PRE-MIX TANK

Volume (m3)	
Low "N"	
Low "K"	
Brk YP	
Brk 0.5 rpm	
Viscosity	
Density	

SURVEYS

Depth	**Degrees**	**Azi.**

HYDRAULICS

Hole Size		**OD (mm)**	**ID (mm)**
Drill Pipe			
Drill Collar			

SOLIDS CONTROL

Item	**UF**	**OF**
Desander		
Desilter		
Centrifuge #1		
Centrifuge #2		
Centrifuge #3		

Screen Sz.	**#1**	**#2**	**#3**	**#4**
Shaker #1				
Shaker #2				
Shaker #3				

BIT DATA

No.	Size-mm	Type	Serial No.	Jets (mm)							In	Out	Metres	Bit Hrs.	ROP	Cum Hrs	Ti	To	D	Loc	B	G	O	R

DRILLING PARAMETERS

No.	WOB	RPM	Str. Wt.	Pressure	SPM #1	SPM #2	SPM #3	DP Vel	DC Vel	Noz Vel	m3 / Min

PUMP DATA

No.	Type	m3 / Stk	Eff (%)	Liner Sz.	Stk.Lgth.
#1	9P-100	0.0129	95%	152	235
#2	9P-100	0.0129	95%	152	235
#3					

FROM	TO	24 HOUR SUMMARY	TIME BREAKDOWN	S	I	P	L1	L2	L3
00:00	06:30	Run 177.8mm casing, break circulation @ 1350m	**MIRU / TO :**						
06:30	06:45	Rig service, function choke	**Drill :**						
06:45	07:00	Safety meeting w/ akita rig crews & MGM rep	**Ream :**						
07:00	12:00	Run 147 jnts of 177.8mm 38.69kg/m - L-80 tenaris blue casing (fill pipe & break circulation @ 1750m)	**Coring :**						
12:00	17:00	Circulate casing & reduce yield point for cement job	**Circ :**			5.00			
17:00	17:15	Safety meeting w/ cementers, akita crew & MGM rep	**Trips :**						
17:15	17:30	Install 7" mbs landing joint	**Rig Service :**			0.50			
17:30	18:45	Rig up cementers	**Rig Repair :**						
18:45	19:00	Safety meeting w/ rig crews & MGM rep	**Cut Drlg Ln :**						
19:00	22:00	Cement 177.8mm Production Casing w/ 22.5 tonne HL-1400 cement +0.90% LT-FL + 0.20%Ati foam & 19.5 tonne class-G cement +	**Dev Survey :**						
22:00	22:00	0.30% FL + 0.50% Dispersant +0.20% Ati foam +0.30%Retarder.Drop plug & displace w/ 39.5m3 KCL & inhibitor brine, bumped plug	**Logging :**						
22:00	22:00	to 17500kpa for 15min,floats held, annulus static, 8m3 good cement returns, plug Dn @ 19:50 hrs	**Run Casing :**			11.75			
22:00	22:30	Lay dn cement head & power tongs	**Cementing :**			4.50			
22:30	23:45	Back off cameron mbs 7" landing joint & retrieve, set pack off & pressure test, install test plug	**WOC :**						
23:45	24:00	Rig service, grease top drive, function crown saver	**NU BOP :**						
			PT BOP :						
			DST :						
			Fishing :						
			Dir Work :						
			LDDP :						
			B.O.P / Safety Mt:			0.75			
			Cameron work			1.50			
		177.8mm casing landed @ 1988.25mkb, float collar landed @ 1974.25mkb							
		Daily fuel : 6921 litres Total fuel : 217776 litres							
OPERATION NEXT 24 HRS :		Install 4 1/2" pipe rams, pressure test BOP's & all related equipment, start completions program	**TOTAL:**			**24.00**			

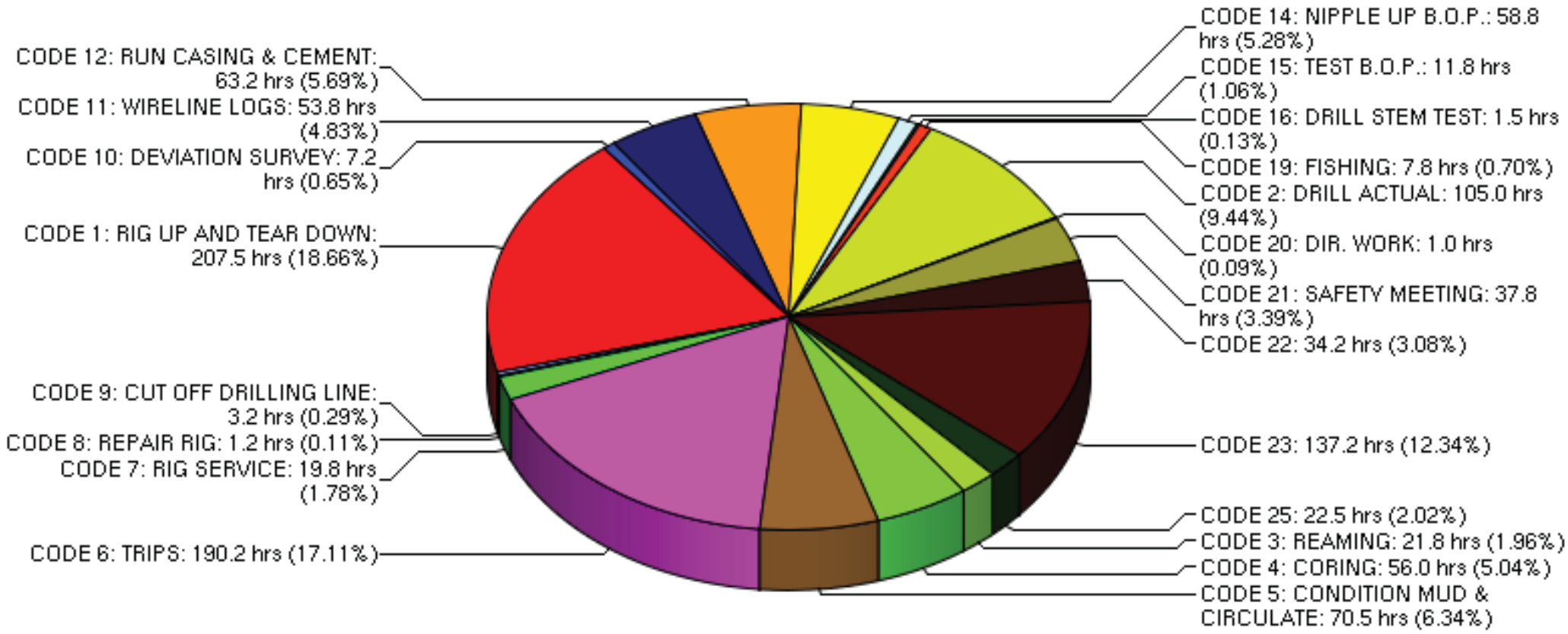
Drilling Rig & Number:	Akita 37	**HOLE CONDITION :**	Cased & cemented	**BOILER HRS:**	**24.00** **TOTAL DAILY HRS:** 24.00
Tool Pusher :	Guy Cusitar	**Cellular # :**	403-648-0842	**Road / Lease Condition :**	Road is holding together vey well. Location is in good shape
Drilling Consultant :	Trevor Mitchell / Jason Duck	**Email:**	rig_supervisor@mgmenergy.com	**Shack Cell # :**	(403) 536-9970
Temp (C) :	-30	**Weather :**	8kph W wind & clear	**Taken By :**	John Williams / Dick Heenan
Date Last BOP Drill :	February 17, 2013	**Daily Cost :**	$309,094	**Cum Cost :**	$15,535,063 **AFE Remaining :** $0

Appendix A11 Time Breakdown

CAODC Tour Sheets

Daily Drilling Reports Time Breakdown

Well name:	MGM-Shell East Mackay I-78	Spud Date:	Jan 27, 2013
Operator:	MGM Energy Corp.	Release Date:	Feb 25, 2013
Contractor:	Akita Drilling Ltd.	From Date:	Dec 30, 2012
Rig:	Akita 37	To Date:	Feb 28, 2013



TOTAL HOURS: 1112.0 hrs

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20121230_2A	Pason	2012	12	30

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3701132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	GUY CUSITAR	

DAILY CHECKS	OP	RM
1) Daily Walk Around Inspection		GC
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted		
5) Flare Lines Staked		
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines		
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		
5) Motor Kills Checked		

Pason

HOURS	CODE 1 Rig Up	2 Drill Actual	3 Reaming	4 Coring	5 Cond Mud & Circ	6 Trips	7 Rig Service	8 Repair Rig	9 Cut Off Drlg Line	10 Dev Survey	11 Wireline Logs	12 Run Csg & Cement	13 Wait On Cement	14 Nipple Up BOP	15 Test BOP	16 Drillstem Test	17 Plug Back	18 Squeeze Cement	19 Fishing	20 Dir Work	21 Safety Meeting	22 Tear Down	23 Waiting On	24 Rig Watch	25 Other	TOTAL
Tour 1																							8.00			8.00
Tour 2	11.50																				0.50					12.00
Tour 3																										
Total	11.50																				0.50		8.00			20.00

Kelly Bushing | Op Fuel 750.00

FUEL @ 08:00 HOURS

Rig 1400.00 | Boiler 0.00

WEATHER

Time 08:00 | Temp -28.00

Current Conditions: CLEAR

Wind Direction: NE | Wind Strength: UP TO 19 KM/H

Road Condition: FAIR

TOUR 1

SIGNATURE OF DRILLER: GUY CUSITAR | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

Drill Pipe		Stands	
Drill Pipe		Singles	
Kelly Down			
Total			
Weight of DC			
Weight of String			

HOLE CONDITION

Hole Drag: Up | Down

Torque at Bottom

Fill on Bottom

MUD RECORD

Mud Type: Water ☐ Oil ☐

Other

Time			
Density			
Funnel Viscosity			
Fluid Loss			
pH			
Location of Sample			
Depth			
PVT			

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure	Strokes/min	Depth
	@	@	
	@	@	
	@	@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	0	1	0

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	08:00	8.00	23	Wait on daylight to dismantal rig loads for the ice roads /No Crew

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130114_1A	Pason	2013	01	14

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
	3701132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	GUY CUSITAR	

DAILY CHECKS

	OP	RM
	JD	GC
1) Daily Walk Around Inspection		
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted		
5) Flare Lines Staked		
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines		
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		
5) Motor Kills Checked		

Pason

HOURS

CODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	TOTAL
	Rig Up	Drill Actual	Reaming	Coring	Cond Mud & Circ	Trips	Rig Service	Repair Rig	Cut Off Drilg Line	Dev Survey	Wireline Logs	Run Csg & Cement	Wait On Cement	Nipple Up BOP	Test BOP	Drillstem Test	Plug Back	Squeeze Cement	Fishing	Dir Work	Safety Meeting	Tear Down	Waiting On	Rig Watch	Other	
Tour 1																										
Tour 2																					0.25	11.75				12.00
Tour 3																									4.00	4.00
Total																					0.25	11.75			4.00	16.00

Kelly Bushing | Op Fuel 0.00

FUEL @ 08:00 HOURS

Rig	Boiler
1400.00	0.00

WEATHER

Time	Temp
08:00	-28.00

Current Conditions: CLEAR

Wind Direction	Wind Strength
NE	UP TO 19 KMH

Road Condition: FAIR

TOUR 1

SIGNATURE OF DRILLER: GUY CUSITAR | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

Drill Pipe		Stands	
Drill Pipe		Singles	
Kelly Down			
Total			
Weight of DC			
Weight of String			

HOLE CONDITION

Hole Drag: Up | Down

Torque at Bottom	
Fill on Bottom	

MUD RECORD

Mud Type: Water ☐ Oil ☐ Other

Time		
Density		
Funnel Viscosity		
Fluid Loss		
pH		
Location of Sample		
Depth		
PVT		

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	0	1	0
A0124704	0	1	0

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130115_1A	Pason	2013	01	15

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
	3701132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	GUY CUSITAR	

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	JD	RP
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted		
5) Flare Lines Staked		
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines		
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		
5) Motor Kills Checked		

Pason

CODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
HOURS	Rig Up	Drill Actual	Reaming	Coring	Cond Mud & Circ	Trips	Rig Service	Repair Rig	Cut Off Drlg Line	Dev Survey	Wireline Logs	Run Csg & Cement	Wait On Cement	Nipple Up BOP	Test BOP	Drillstem Test	Plug Back	Squeeze Cement	Fishing	Dir Work	Safety Meeting	Tear Down	Waiting On	Rig Watch	Other	TOTAL
Tour 1																							8.00			8.00
Tour 2	11.75																				0.25					12.00
Tour 3																							4.00			4.00
Total	11.75																				0.25		12.00			24.00

Kelly Bushing | Op Fuel 0.00

FUEL @ 08:00 HOURS

Rig 1400.00 | Boiler 0.00

WEATHER

Time 08:00 | Temp -30.00

Current Conditions: CLEAR

Wind Direction: NE | Wind Strength: UP TO 19 KM/H

Road Condition: FAIR

TOUR 1

SIGNATURE OF DRILLER: RICK PARKER | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

Drill Pipe	Stands
Drill Pipe	Singles
Kelly Down	
Total	
Weight of DC	
Weight of String	

HOLE CONDITION

Hole Drag: Up | Down

Torque at Bottom

Fill on Bottom

MUD RECORD

Mud Type: Water ☐ Oil ☐

Other

Time	
Density	
Funnel Viscosity	
Fluid Loss	
pH	
Location of Sample	
Depth	
PVT	

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	0	1	0
A0124704	0	1	0

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	08:00	8.00	23	Wait on rig loads

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130116_1B	Pason	2013	01	16

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
	3701132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	GUY CUSITAR	

DAILY CHECKS

	OP	RM
	JD	RP
1) Daily Walk Around Inspection		
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted		
5) Flare Lines Staked		
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines		
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		
5) Motor Kills Checked		

Pason

CODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
HOURS	Rig Up	Drill Actual	Reaming	Coring	Cond Mud & Circ	Trips	Rig Service	Repair Rig	Cut Off Drlg Line	Dev Survey	Wireline Logs	Run Csg & Cement	Wait On Cement	Nipple Up BOP	Test BOP	Drillstem Test	Plug Back	Squeeze Cement	Fishing	Dir Work	Safety Meeting	Tear Down	Waiting On	Rig Watch	Other	TOTAL
Tour 1																							8.00			8.00
Tour 2	11.75																				0.25					12.00
Tour 3																							4.00			4.00
Total	11.75																				0.25		12.00			24.00

Kelly Bushing | Op Fuel 0.00

FUEL @ 08:00 HOURS

Rig 1400.00 | Boiler 0.00

WEATHER

Time 08:00 | Temp -32.00

Current Conditions: CLEAR

Wind Direction: NE | Wind Strength: UP TO 19 KM/H

Road Condition: FAIR

TOUR 1

SIGNATURE OF DRILLER: RICK PARKER | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130117_1B	Pason	2013	01	17

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
	3701132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	GUY CUSITAR	

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	JD	
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted		
5) Flare Lines Staked		
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines		
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		
5) Motor Kills Checked		

Pason

CODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
HOURS	Rig Up	Drill Actual	Reaming	Coring	Cond Mud & Circ	Trips	Rig Service	Repair Rig	Cut Off Drlg Line	Dev Survey	Wireline Logs	Run Csg & Cement	Wait On Cement	Nipple Up BOP	Test BOP	Drillstem Test	Plug Back	Squeeze Cement	Fishing	Dir Work	Safety Meeting	Tear Down	Waiting On	Rig Watch	Other	TOTAL
Tour 1																							8.00			8.00
Tour 2	11.75																				0.25					12.00
Tour 3																							4.00			4.00
Total	11.75																				0.25		12.00			24.00

Kelly Bushing | Op Fuel 0.00

FUEL @ 08:00 HOURS

Rig 1400.00 | Boiler 0.00

WEATHER

Time 08:00 | Temp -28.00

Current Conditions: CLEAR

Wind Direction: NE | Wind Strength: UP TO 19 KM/H

Road Condition: FAIR

TOUR 1

SIGNATURE OF DRILLER: RICK PARKER | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

Drill Pipe	Stands
Drill Pipe	Singles
Kelly Down	
Total	
Weight of DC	
Weight of String	

HOLE CONDITION

Hole Drag: Up | Down

Torque at Bottom

Fill on Bottom

MUD RECORD

Mud Type: Water ☐ Oil ☐

Other

Time			
Density			
Funnel Viscosity			
Fluid Loss			
pH			
Location of Sample			
Depth			
PVT			

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	0	1	0
A0124704	0	1	0

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	08:00	8.00	23	Wait on rig loads

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130118_1B	Pason	2013	01	18

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
	3701132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	GUY CUSITAR	

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	JD	RP
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted		
5) Flare Lines Staked		
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines		
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		
5) Motor Kills Checked		

Pason

HOURS

CODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
	Rig Up	Drill Actual	Reaming	Coring	Cond Mud & Circ	Trips	Rig Service	Repair Rig	Cut Off Drlg Line	Dev Survey	Wireline Logs	Run Csg & Cement	Wait On Cement	Nipple Up BOP	Test BOP	Drillstem Test	Plug Back	Squeeze Cement	Fishing	Dir Work	Safety Meeting	Tear Down	Waiting On	Rig Watch	Other	TOTAL
Tour 1																							8.00			8.00
Tour 2	11.75																				0.25					12.00
Tour 3																							4.00			4.00
Total	11.75																				0.25		12.00			24.00

Kelly Bushing | Op Fuel 0.00

FUEL @ 08:00 HOURS

Rig 1400.00 | Boiler 0.00

WEATHER

Time 08:00 | Temp -35.00

Current Conditions: CLEAR

Wind Direction: NE | Wind Strength: UP TO 19 KM/H

Road Condition: FAIR

TOUR 1

SIGNATURE OF DRILLER: RICK PARKER | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

Drill Pipe	Stands
Drill Pipe	Singles
Kelly Down	
Total	
Weight of DC	
Weight of String	

HOLE CONDITION

Hole Drag: Up | Down

Torque at Bottom

Fill on Bottom

MUD RECORD

Mud Type: Water ☐ Oil ☐

Other

Time	
Density	
Funnel Viscosity	
Fluid Loss	
pH	
Location of Sample	
Depth	
PVT	

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	0	1	0
A0124704	0	1	0

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	08:00	8.00	23	Wait on rig loads

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130119_1B	Pason	2013	01	19

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
	3701132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

DAILY CHECKS

	OP JD	RM G&C
1) Daily Walk Around Inspection		
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted		
5) Flare Lines Staked		
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines		
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		
5) Motor Kills Checked		

Pason

HOURS

CODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
	Rig Up	Drill Actual	Reaming	Coring	Cond Mud & Circ	Trips	Rig Service	Repair Rig	Cut Off Drlg Line	Dev Survey	Wireline Logs	Run Csg & Cement	Wait On Cement	Nipple Up BOP	Test BOP	Drillstem Test	Plug Back	Squeeze Cement	Fishing	Dir Work	Safety Meeting	Tear Down	Waiting On	Rig Watch	Other	TOTAL
Tour 1																							8.00			8.00
Tour 2	11.75																		0.25							12.00
Tour 3																							4.00			4.00
Total	11.75																		0.25				12.00			24.00

Kelly Bushing | Op Fuel 0.00

FUEL @ 08:00 HOURS

Rig 1400.00 | Boiler 0.00

WEATHER

Time 08:00 | Temp -28.00

Current Conditions: CLEAR

Wind Direction: NE | Wind Strength: UP TO 19 KM/H

Road Condition: FAIR

TOUR 1

SIGNATURE OF DRILLER: Guy Cusitar / Cody Hart | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

Drill Pipe	Stands
Drill Pipe	Singles
Kelly Down	
Total	
Weight of DC	
Weight of String	

HOLE CONDITION

Hole Drag: Up | Down

Torque at Bottom

Fill on Bottom

MUD RECORD

Mud Type: Water ☐ Oil ☐

Other

Time	
Density	
Funnel Viscosity	
Fluid Loss	
pH	
Location of Sample	
Depth	
PVT	

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	0	1	0
A0124704	0	1	0

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	08:00	8.00	23	Wait on rig loads

Remarks:

SAFETY

Safety Topic	MEHL	MACP

TOUR 2

SIGNATURE OF DRILLER: Blair Oleksyn | START TIME: 08:00 | END TIME: 20:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

Drill Pipe	Stands
Drill Pipe	Singles
Kelly Down	
Total	
Weight of DC	
Weight of String	

HOLE CONDITION

Hole Drag: Up | Down

Torque at Bottom

Fill on Bottom

MUD RECORD

Mud Type: Water ☐ Oil ☐

Other

Time	
Density	
Funnel Viscosity	
Fluid Loss	
pH	
Location of Sample	
Depth	
PVT	

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	0	1	0
A0124704	0	1	0

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	08:15	0.25	19E	Safety and operational meeting with MGM /Shell Supervisors, Mullen Trucking,Akita crews,all other third party workers
08:15	20:00	11.75	1C	Finish laying enviro liner , Spot remaining sub matting , spot 48 inch riser pony subs

Remarks:

SAFETY

Safety Topic	MEHL	MACP
Unload rig loads ,Spot Matting		

TOUR 3

SIGNATURE OF DRILLER: Guy Cusitar / Cody Hart | START TIME: 20:00 | END TIME: 24:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

Drill Pipe	Stands
Drill Pipe	Singles
Kelly Down	
Total	
Weight of DC	
Weight of String	

HOLE CONDITION

Hole Drag: Up | Down

Torque at Bottom

Fill on Bottom

MUD RECORD

Mud Type: Water ☐ Oil ☐

Other

Time	
Density	
Funnel Viscosity	
Fluid Loss	
pH	
Location of Sample	
Depth	
PVT	

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	0	1	0
A0124704	0	1	0

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
20:00	24:00	4.00	23	Wait on rig loads

Remarks:

SAFETY

Safety Topic	MEHL	MACP

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130120_1C	Pason	2013	01	20

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
	3701132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

DAILY CHECKS

	OP	RM
	JD	G&C
1) Daily Walk Around Inspection		
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted		
5) Flare Lines Staked		
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines		
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		
5) Motor Kills Checked		

Pason

CODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
HOURS	Rig Up	Drill Actual	Reaming	Coring	Cond Mud & Circ	Trips	Rig Service	Repair Rig	Cut Off Drlg Line	Dev Survey	Wireline Logs	Run Csg & Cement	Wait On Cement	Nipple Up BOP	Test BOP	Drillstem Test	Plug Back	Squeeze Cement	Fishing	Dir Work	Safety Meeting	Tear Down	Waiting On	Rig Watch	Other	TOTAL
Tour 1																							8.00			8.00
Tour 2	11.75																				0.25					12.00
Tour 3																							4.00			4.00
Total	11.75																				0.25		12.00			24.00

Kelly Bushing | Op Fuel 0.00

FUEL @ 08:00 HOURS

Rig 1400.00 | Boiler 0.00

WEATHER

Time 08:00 | Temp -33.00

Current Conditions: CLEAR

Wind Direction: NE | Wind Strength: UP TO 19 KM/H

Road Condition: FAIR

TOUR 1

SIGNATURE OF DRILLER: Blair Oleksyn | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

Drill Pipe		Stands	
Drill Pipe		Singles	
Kelly Down			
Total			
Weight of DC			
Weight of String			

HOLE CONDITION

Hole Drag: Up | Down

Torque at Bottom

Fill on Bottom

MUD RECORD

Mud Type: Water ☐ Oil ☐

Other

Time		
Density		
Funnel Viscosity		
Fluid Loss		
pH		
Location of Sample		
Depth		
PVT		

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	0	1	0
A0124704	0	1	0

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	08:00	8.00	23	Wait on rig loads

Remarks:

SAFETY

Safety Topic	MEHL	MACP

TOUR 2

SIGNATURE OF DRILLER: Blair Oleksyn | START TIME: 08:00 | END TIME: 20:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

Drill Pipe		Stands	
Drill Pipe		Singles	
Kelly Down			
Total			
Weight of DC			
Weight of String			

HOLE CONDITION

Hole Drag: Up | Down

Torque at Bottom

Fill on Bottom

MUD RECORD

Mud Type: Water ☐ Oil ☐

Other

Time		
Density		
Funnel Viscosity		
Fluid Loss		
pH		
Location of Sample		
Depth		
PVT		

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	0	1	0
A0124704	0	1	0

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	08:15	0.25	21	Safety and operational meeting with MGM /Shell Supervisors, Mullen Trucking,Akita crews,all other third party workers
08:15	20:00	11.75	1C	Unload rig loads,

Remarks:

SAFETY

Safety Topic	MEHL	MACP

TOUR 3

SIGNATURE OF DRILLER: Blair Oleksyn | START TIME: 20:00 | END TIME: 24:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

Drill Pipe		Stands	
Drill Pipe		Singles	
Kelly Down			
Total			
Weight of DC			
Weight of String			

HOLE CONDITION

Hole Drag: Up | Down

Torque at Bottom

Fill on Bottom

MUD RECORD

Mud Type: Water ☐ Oil ☐

Other

Time		
Density		
Funnel Viscosity		
Fluid Loss		
pH		
Location of Sample		
Depth		
PVT		

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	0	1	0
A0124704	0	1	0

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
20:00	24:00	4.00	23	Wait on rig loads

Remarks:

SAFETY

Safety Topic	MEHL	MACP

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130121_1A	Pason	2013	01	21

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
	3701132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	JD	
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted		
5) Flare Lines Staked		
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines		
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		
5) Motor Kills Checked		

Pason

HOURS

CODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
	Rig Up	Drill Actual	Reaming	Coring	Cond Mud & Circ	Trips	Rig Service	Repair Rig	Cut Off Drilg Line	Dev Survey	Wireline Logs	Run Csg & Cement	Wait On Cement	Nipple Up BOP	Test BOP	Drillstem Test	Plug Back	Squeeze Cement	Fishing	Dir Work	Safety Meeting	Tear Down	Waiting On	Rig Watch	Other	TOTAL
Tour 1	0.25																				0.75		7.00			8.00
Tour 2	10.75																				0.25		1.00			12.00
Tour 3																							4.00			4.00
Total	11.00																				1.00		12.00			24.00

Kelly Bushing | Op Fuel 0.00

FUEL @ 08:00 HOURS

Rig 1400.00 | Boiler 0.00

WEATHER

Time 08:00 | Temp -35.00 | Current Conditions CLEAR | Wind Direction NE | Wind Strength UP TO 19 KM/H | Road Condition FAIR

TOUR 1

SIGNATURE OF DRILLER: Guy Cusitar / Cody Hart | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

Drill Pipe	Stands
Drill Pipe	Singles
Kelly Down	
Total	
Weight of DC	
Weight of String	

HOLE CONDITION

Hole Drag: Up | Down

Torque at Bottom	
Fill on Bottom	

MUD RECORD

Mud Type: Water ☐ Oil ☐ Other

Time		
Density		
Funnel Viscosity		
Fluid Loss		
pH		
Location of Sample		
Depth		
PVT		

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	0	1	0
A0124704	0	1	0

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	07:00	7.00	23B	W/O Daylight to spot Rig Loads
07:00	07:30	0.50	21	Safety and operational meeting with MGM /Shell Supervisors, Mullen
				Trucking,Akita crews,all other third party workers
07:30	07:45	0.25	21	Safety meeting spot rig loads, install pump engines, Prepare Derrick for
				install on carrier
07:45	08:00	0.25	1C	SPOT RIG/LOADS/BUILDINGS Move rig loads from staging area to location
				unload, Catwalk, mudtank,carrier, Derrick ,substructure

Remarks:

SAFETY

Safety Topic	MEHL	MACP
Radio controled road safety		

TOUR 2

SIGNATURE OF DRILLER: Blair Oleksyn | START TIME: 08:00 | END TIME: 20:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

Drill Pipe	Stands
Drill Pipe	Singles
Kelly Down	
Total	
Weight of DC	
Weight of String	

HOLE CONDITION

Hole Drag: Up | Down

Torque at Bottom	
Fill on Bottom	

MUD RECORD

Mud Type: Water ☐ Oil ☐ Other

Time		
Density		
Funnel Viscosity		
Fluid Loss		
pH		
Location of Sample		
Depth		
PVT		

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	0	1	0
A0124704	0	1	0

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	12:00	4.00	1C	SPOT RIG/LOADS/BUILDINGS Install sub on pony riser,Spot shaker tank,Dog
				house riser
12:00	12:15	0.25	21	SAFETY MEETING Install pump engines into pump buildings
12:15	15:00	2.75	1C	Install pump engines into pump buildings
15:00	17:00	2.00	1	RIG UP Install sub wings, floor prefabs , mud tank skeliton (Wait on 2nd
				Picker for Derrick)
17:00	19:00	2.00	1C	SPOT RIG/LOADS/BUILDINGS Spot water tank onto fuel tank , Prepare risers for
				Dog House install Raise derrick wind walls, move drilling line spool back
				onto carrier
19:00	20:00	1.00	23B	W/O DAYLIGHT to spot rig loads

Remarks:

SAFETY

Safety Topic	MEHL	MACP
Spot rig loads ,Working in cold conditions		

TOUR 3

SIGNATURE OF DRILLER: Guy Cusitar / Cody Hart | START TIME: 20:00 | END TIME: 24:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

Drill Pipe	Stands
Drill Pipe	Singles
Kelly Down	
Total	
Weight of DC	
Weight of String	

HOLE CONDITION

Hole Drag: Up | Down

Torque at Bottom	
Fill on Bottom	

MUD RECORD

Mud Type: Water ☐ Oil ☐ Other

Time		
Density		
Funnel Viscosity		
Fluid Loss		
pH		
Location of Sample		
Depth		
PVT		

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	0	1	0
A0124704	0	1	0

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
20:00	24:00	4.00	23B	W/O DAYLIGHT to spot rig loads (No Crew)

Remarks:

SAFETY

Safety Topic	MEHL	MACP

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130121_1A	Pason	2013	01	21

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
	3701132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
1	JSA REVIEW	Spot rig loads	07:45	
1	JSA REVIEW	Installing sub on to pony sub riser	07:45	
2	JSA REVIEW	Install floor wings, prefabs	12:00	
2	JSA REVIEW	Install Pump Engines	12:00	
2	JSA REVIEW	Install sub wings , floor prefabs	15:00	

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130122_1A	Pason	2013	01	22

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
	3701132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

DAILY CHECKS

	OP JD	RM G&C
1) Daily Walk Around Inspection		
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted		
5) Flare Lines Staked		
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines		
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		
5) Motor Kills Checked		

CAODC

pason

Pason

HOURS

CODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
	Rig Up	Drill Actual	Reaming	Coring	Cond Mud & Circ	Trips	Rig Service	Repair Rig	Cut Off Drilg Line	Dev Survey	Wireline Logs	Run Csg & Cement	Wait On Cement	Nipple Up BOP	Test BOP	Drillstem Test	Plug Back	Squeeze Cement	Fishing	Dir Work	Safety Meeting	Tear Down	Waiting On	Rig Watch	Other	TOTAL
Tour 1	0.25																				0.75		7.00			8.00
Tour 2	10.50																				0.50		1.00			12.00
Tour 3																							4.00			4.00
Total	10.75																				1.25		12.00			24.00

FUEL @ 08:00 HOURS

Kelly Bushing	Op Fuel
	0.00

Rig	Boiler
1400.00	0.00

WEATHER

Time	Temp
08:00	-35.00

Current Conditions: CLEAR

Wind Direction	Wind Strength
NE	UP TO 19 KMH

Road Condition: FAIR

TOUR 1

SIGNATURE OF DRILLER: Guy Cusitar / Cody Hart

START TIME: 00:00 END TIME: 08:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

Drill Pipe		Stands	
Drill Pipe		Singles	
Kelly Down			
Total			
Weight of DC			
Weight of String			

HOLE CONDITION

Hole Drag: Up ☐ Down ☐

Torque at Bottom	
Fill on Bottom	

MUD RECORD

Mud Type: Water ☐ Oil ☐ Other

Time		
Density		
Funnel Viscosity		
Fluid Loss		
pH		
Location of Sample		
Depth		
PVT		

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	0	1	0
A0124704	0	1	0

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	07:00	7.00	23B	W/O DAYLIGHT to spot rig loads
07:00	07:30	0.50	21	Safety and operational meeting with MGM /Shell Supervisors, Mullen
				Trucking,Akita crews,all other third party workers
07:30	07:45	0.25	21	SAFETY MEETING spot rig loads and buildings , Install Derrick onto carrier
07:45	08:00	0.25	1C	SPOT RIG/LOADS/BUILDINGS

Remarks:

SAFETY

Safety Topic	MEHL	MACP

TOUR 2

SIGNATURE OF DRILLER: Blair Oleksyn

START TIME: 08:00 END TIME: 20:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

Drill Pipe		Stands	
Drill Pipe		Singles	
Kelly Down			
Total			
Weight of DC			
Weight of String			

HOLE CONDITION

Hole Drag: Up ☐ Down ☐

Torque at Bottom	
Fill on Bottom	

MUD RECORD

Mud Type: Water ☐ Oil ☐ Other

Time		
Density		
Funnel Viscosity		
Fluid Loss		
pH		
Location of Sample		
Depth		
PVT		

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	0	1	0
A0124704	0	1	0

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	10:00	2.00	1C	Spot rig loads ,Install Derrick onto Carrier
10:00	10:15	0.25	21	Safety Meeting , Install Dog House onto water tank supports with pickers
10:15	11:30	1.25	1C	Install Dog house onto Dog house supports with Pickers
11:30	11:45	0.25	21	Safety Meeting Install Carrier onto sub sitting on 48Inch Pony Risers
11:45	13:30	1.75	1C	Suck on carrier , clean packed snow off bottom of Carrier skids, pin carrier
				to sub and pin derrick
13:30	19:00	5.50	1C	Spot rig loads , Line up Dog house, Spot suction tank, spot pump #1 &Pump #
				2, Light plant, Boiler #1,Boiler # 2,Catwalk install v-door, remaining floor
				prefabs,3 Sea Cans
19:00	20:00	1.00	23	Wait on Daylight to spot remaing loads

Remarks:

SAFETY

Safety Topic	MEHL	MACP

TOUR 3

SIGNATURE OF DRILLER: Guy Cusitar / Cody Har

START TIME: 20:00 END TIME: 24:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

Drill Pipe		Stands	
Drill Pipe		Singles	
Kelly Down			
Total			
Weight of DC			
Weight of String			

HOLE CONDITION

Hole Drag: Up ☐ Down ☐

Torque at Bottom	
Fill on Bottom	

MUD RECORD

Mud Type: Water ☐ Oil ☐ Other

Time		
Density		
Funnel Viscosity		
Fluid Loss		
pH		
Location of Sample		
Depth		
PVT		

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	0	1	0
A0124704	0	1	0

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
20:00	24:00	4.00	23	Waiting on daylight to spot remaing loads

Remarks:

SAFETY

Safety Topic	MEHL	MACP

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130123_1A	Pason	2013	01	23

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
	3701132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

DAILY CHECKS

	OP JD	RM G&C
1) Daily Walk Around Inspection		
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted		
5) Flare Lines Staked		
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines		
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		
5) Motor Kills Checked		

Pason

HOURS

CODE	1 Rig Up	2 Drill Actual	3 Reaming	4 Coring	5 Cond Mud & Circ	6 Trips	7 Rig Service	8 Repair Rig	9 Cut Off Drilg Line	10 Dev Survey	11 Wireline Logs	12 Run Csg & Cement	13 Wait On Cement	14 Nipple Up BOP	15 Test BOP	16 Drillstem Test	17 Plug Back	18 Squeeze Cement	19 Fishing	20 Dir Work	21 Safety Meeting	22 Tear Down	23 Waiting On	24 Rig Watch	25 Other	TOTAL
Tour 1	0.75																				0.25		7.00			8.00
Tour 2	11.75																				0.25					12.00
Tour 3	4.00																									4.00
Total	16.50																				0.50		7.00			24.00

Kelly Bushing | Op Fuel 0.00

FUEL @ 08:00 HOURS

Rig 1400.00 | Boiler 0.00

WEATHER

Time 08:00 | Temp -35.00

Current Conditions: CLEAR

Wind Direction: NE | Wind Strength: UP TO 19 KM/H

Road Condition: FAIR

TOUR 1

SIGNATURE OF DRILLER: Guy Cusitar / Cody Hart | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130124_1A	Pason	2013	01	24

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
	3701132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	JD	G&C
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted		
5) Flare Lines Staked		
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines		
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering	GC	
4) Crown Saver Checked		
5) Motor Kills Checked		

Pason

HOURS

CODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
	Rig Up	Drill Actual	Reaming	Coring	Cond Mud & Circ	Trips	Rig Service	Repair Rig	Cut Off Drilg Line	Dev Survey	Wireline Logs	Run Csg & Cement	Wait On Cement	Nipple Up BOP	Test BOP	Drillstem Test	Plug Back	Squeeze Cement	Fishing	Dir Work	Safety Meeting	Tear Down	Waiting On	Rig Watch	Other	TOTAL
Tour 1	7.75																				0.25					8.00
Tour 2	11.50																				0.50					12.00
Tour 3														4.00												4.00
Total	19.25													4.00							0.75					24.00

Kelly Bushing | Op Fuel 1000.00

FUEL @ 08:00 HOURS

Rig 11400.00 | Boiler 0.00

WEATHER

Time 08:00 | Temp -35.00 | Current Conditions CLEAR | Wind Direction NE | Wind Strength UP TO 19 KM/H | Road Condition FAIR

TOUR 1

SIGNATURE OF DRILLER: Guy Cusitar / Cody Hart | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

Drill Pipe		Stands	
Drill Pipe		Singles	
Kelly Down			
Total			
Weight of DC			
Weight of String			

HOLE CONDITION

Hole Drag: Up | Down

Torque at Bottom	
Fill on Bottom	

MUD RECORD

Mud Type: Water ☐ Oil ☐ Other

Time			
Density			
Funnel Viscosity			
Fluid Loss			
pH			
Location of Sample			
Depth			
PVT			

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	8	10	240
A0124704	8	10	260

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	07:00	7.00	1	Boiler watch, rig up air lines ,fire floor motor , clean up buildings Paul
				Rynolds & Cody Hart
07:00	07:15	0.25	21	Pretour , MGM OSR'S , Akita crews, Rigging up , working with steam &
				Operations
07:15	08:00	0.75	1	Rig up Prep to raise derrick , spool drilling line

Remarks:

SAFETY

Safety Topic	MEHL	MACP
Working night shift , Buddy System		

TOUR 2

SIGNATURE OF DRILLER: Joel Doctor | START TIME: 08:00 | END TIME: 20:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

Drill Pipe		Stands	
Drill Pipe		Singles	
Kelly Down			
Total			
Weight of DC			
Weight of String			

HOLE CONDITION

Hole Drag: Up | Down

Torque at Bottom	
Fill on Bottom	

MUD RECORD

Mud Type: Water ☐ Oil ☐ Other

Time			
Density			
Funnel Viscosity			
Fluid Loss			
pH			
Location of Sample			
Depth			
PVT			

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	12	10	240
A0124704	12	10	260

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	09:00	1.00	1	RIG UP, Spool drilling line ,
09:00	09:15	0.25	21F	Safety inspection derrick prior to raising ,
09:15	10:15	1.00	1	Heat up lift cylinders , load points , function hydrauilic ,warm up
				hydrauilics
10:15	10:30	0.25	21	Ssfety Meeting prior to raising Derrick
10:30	11:00	0.50	1	Raise Derrick
11:00	13:00	2.00	1	Prepare to scope deriick ,Work derrick 8 feet to warm up blocks scope
				derrick
13:00	17:00	4.00	1	Rig up Install rear prefabs on floor ,Work on pump engine installation
				,Tention belts , hook up air fuel water and exhausts,Belt gaurds, coolant
				hoses
17:00	20:00	3.00	1C	Cut conductor , Thaw conductor , bail conductor and celler, heat up diverter
				flange,

Remarks:

SAFETY

Safety Topic	MEHL	MACP
Raise Derrick ,		

TOUR 3

SIGNATURE OF DRILLER: Blair Oleksyn | START TIME: 20:00 | END TIME: 24:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

Drill Pipe		Stands	
Drill Pipe		Singles	
Kelly Down			
Total			
Weight of DC			
Weight of String			

HOLE CONDITION

Hole Drag: Up | Down

Torque at Bottom	
Fill on Bottom	

MUD RECORD

Mud Type: Water ☐ Oil ☐ Other

Time			
Density			
Funnel Viscosity			
Fluid Loss			
pH			
Location of Sample			
Depth			
PVT			

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	4	10	240
A0124704	4	10	260

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
20:00	23:30	3.50	14C	Heat up diverter flange to 300 degrees , for welding as per welder
23:30	24:00	0.50	14C	Weld diverter flange

Remarks:

SAFETY

Safety Topic	MEHL	MACP
Picking up diverter flange , Hot work		

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130125_1A	Pason	2013	01	25

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
	3701132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

DAILY CHECKS

	OP JD	RM G&C
1) Daily Walk Around Inspection		
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted		
5) Flare Lines Staked		
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines		
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		
5) Motor Kills Checked		

Pason

CODE	1 Rig Up	2 Drill Actual	3 Reaming	4 Coring	5 Cond Mud & Circ	6 Trips	7 Rig Service	8 Repair Rig	9 Cut Off Drlg Line	10 Dev Survey	11 Wireline Logs	12 Run Csg & Cement	13 Wait On Cement	14 Nipple Up BOP	15 Test BOP	16 Drillstem Test	17 Plug Back	18 Squeeze Cement	19 Fishing	20 Dir Work	21 Safety Meeting	22 Tear Down	23 Waiting On	24 Rig Watch	25 Other	TOTAL
HOURS Tour 1														7.25							0.75					8.00
Tour 2	10.00													1.50							0.50					12.00
Tour 3	1.75						0.25							1.75							0.25					4.00
Total	11.75						0.25							10.50							1.50					24.00

Kelly Bushing | Op Fuel 2000.00

FUEL @ 08:00 HOURS

Rig 9400.00 | Boiler 0.00

WEATHER Time 08:00 | Temp -40.00 | Current Conditions CLEAR | Wind Direction NE | Wind Strength UP TO 19 KM/H | Road Condition FAIR

TOUR 1

SIGNATURE OF DRILLER: Joel Doctor | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130125_1A	Pason	2013	01	25

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
	3701132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
2	SOP	Q19-OVERHEAD TOOL USE	08:00	0
2	SOP	RM13-WORKING AT HEIGHTS	08:00	0
2	SOP	RM21-RIG UP TOP DRIVE	08:00	0
2	SOP	L4-USE OF HAMMER WRENCH	08:00	0
2	SOP	F1-RIG UP SERVICE LOOP	08:00	0
2	SOP	RIG UP TORQUE TUBE	08:00	0

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130125_1A	Pason	2013	01	25

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
	3701132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
3	SOP	L-7 install flow tee, B-5 steam use	20:00	

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130126_1A	Pason	2013	01	26

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
	3701132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	JD	G&C
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted	JD	G&C
5) Flare Lines Staked		
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines		
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		
5) Motor Kills Checked		

CAODC

Pason

HOURS

CODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
	Rig Up	Drill Actual	Reaming	Coring	Cond Mud & Circ	Trips	Rig Service	Repair Rig	Cut Off Drilg Line	Dev Survey	Wireline Logs	Run Csg & Cement	Wait On Cement	Nipple Up BOP	Test BOP	Drillstem Test	Plug Back	Squeeze Cement	Fishing	Dir Work	Safety Meeting	Tear Down	Waiting On	Rig Watch	Other	TOTAL
Tour 1	7.25						0.25														0.50					8.00
Tour 2	11.00						0.25														0.75					12.00
Tour 3	2.75					0.75	0.25														0.25					4.00
Total	21.00					0.75	0.75														1.50					24.00

Kelly Bushing | Op Fuel 4000.00

FUEL @ 08:00 HOURS

Rig 5400.00 | Boiler 0.00

WEATHER

Time 08:00 | Temp -40.00

Current Conditions: CLEAR

Wind Direction: NE | Wind Strength: UP TO 19 KM/H

Road Condition: FAIR

TOUR 1

SIGNATURE OF DRILLER: Joel Doctor | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130126_1A	Pason	2013	01	26

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
	3701132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
1	SOP	RM-21 rig up drive, F-1 rig up service loop	00:00	
3	SOP	C-6 hoist tubular w/ catwalk, C-`1 set up pipe racks	20:00	

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130127_1A	Pason	2013	01	27

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3701132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	JD	G&C
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted	JD	G&C
5) Flare Lines Staked	JD	G&C
6) BOP Drills Performed	JD	G&C
7) Visually Inspected BOPs - Flare Lines & Degasser Lines	JD	G&C
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		G&C
5) Motor Kills Checked		G&C

Pason

CODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
HOURS	Rig Up	Drill Actual	Reaming	Coring	Cond Mud & Circ	Trips	Rig Service	Repair Rig	Cut Off Drilg Line	Dev Survey	Wireline Logs	Run Csg & Cement	Wait On Cement	Nipple Up BOP	Test BOP	Drillstem Test	Plug Back	Squeeze Cement	Fishing	Dir Work	Safety Meeting	Tear Down	Waiting On	Rig Watch	Other	TOTAL
Tour 1	3.75						0.25								3.75						0.25					8.00
Tour 2	3.00	3.50			1.50	2.25	0.25			0.75											0.75					12.00
Tour 3		3.00					0.25			0.25											0.50					4.00
Total	6.75	6.50			1.50	2.25	0.75			1.00					3.75						1.50					24.00

Kelly Bushing | Op Fuel 3100.00

FUEL @ 08:00 HOURS

Rig 18000.00 | Boiler 0.00

WEATHER

Time 08:00 | Temp -35.00

Current Conditions: CLEAR

Wind Direction: NE | Wind Strength: UP TO 19 KM/H

Road Condition: FAIR

TOUR 1

SIGNATURE OF DRILLER: Joel Doctor | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130127_1A	Pason	2013	01	27

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3701132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

DRILLING ASSEMBLY — TOUR 2

No	Component	OD	ID	Length
1	BIT	311.00	0.00	0.30
1	BIT SUB	228.00	0.00	0.71
1	DC (6.25 IN)	156.00	72.00	9.31
1	DC (6.25 IN)	155.00	71.00	9.40
4	DC (6.25 IN)	156.00	70.00	37.58
1	JARS-HYD/MECH	156.00	70.00	10.02
0	Drill Pipe	Stands		0.00
0	Drill Pipe	Singles		0.00
	Kelly Down			0.00
	Total			67.32
	Weight of DC			10.00
	Weight of String			

DRILLING ASSEMBLY — TOUR 3

No	Component	OD	ID	Length
1	BIT	311.00	0.00	0.30
1	BIT SUB	228.00	0.00	0.71
1	DC (6.25 IN)	156.00	72.00	9.31
1	DC (6.25 IN)	155.00	71.00	9.40
4	DC (6.25 IN)	156.00	70.00	37.58
1	JARS-HYD/MECH	156.00	70.00	10.02
4	DC (6.25 IN)	156.00	70.00	32.68
0	Drill Pipe	Stands		0.00
0	Drill Pipe	Singles		0.00
	Kelly Down			0.00
	Total			100.00
	Weight of DC			10.00
	Weight of String			

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe	Stands		
	Drill Pipe	Singles		
	Kelly Down			
	Total			
	Weight of DC			
	Weight of String			

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
1	SOP	D-25 changing elevators, G-21 thaw frozen lines	00:00	
2	SOP	A2-STEAM USE	08:00	0
2	SOP	A2-DOG COLLAR USE	08:00	0
2	SOP	D28-PICK UP DRILL COLLARS	08:00	0
2	SOP	D23-SPOOL TUGGER LINES	08:00	0
3	SOP	D-6 connections w/ top drive, D-8 wireline survey	20:00	

MUD SAMPLE - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130127_1A	Pason	2013	01	27

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3701132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

TOUR 3 **MUD TYPE** WATER **WATER** x **OIL** **OTHER**

Time		20:00	22:00	23:30														
Density		1025kg/m3	1035kg/m3	1045kg/m3														
Funnel Viscosity		32s/l	35s/l	34s/l														
Fluid Loss																		
Fluid pH		10.5	10.5	10.5														
Location of Sample		SHAKER	SHAKER	SHAKER														
Depth																		
PVT																		
Test 1	Type (Ex: Chlorides)																	
	Value																	
Test 2	Type (ex: Sand%)																	
	Value																	
Test 3	Type (ex: Hard Ca)																	
	Value																	
Test 4	Type (ex: Sulfides)																	
	Value																	

MUD SAMPLE REMARKS

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130128_1A	Pason	2013	01	28

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3701132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

DAILY CHECKS	OP	RM
1) Daily Walk Around Inspection	JD	G&C
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted	JD	G&C
5) Flare Lines Staked	JD	G&C
6) BOP Drills Performed	JD	G&C
7) Visually Inspected BOPs - Flare Lines & Degasser Lines	JD	G&C
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		G&C
5) Motor Kills Checked		

Pason

CODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
HOURS	Rig Up	Drill Actual	Reaming	Coring	Cond Mud & Circ	Trips	Rig Service	Repair Rig	Cut Off Drilg Line	Dev Survey	Wireline Logs	Run Csg & Cement	Wait On Cement	Nipple Up BOP	Test BOP	Drillstem Test	Plug Back	Squeeze Cement	Fishing	Dir Work	Safety Meeting	Tear Down	Waiting On	Rig Watch	Other	TOTAL
Tour 1		5.00			1.25		0.25			1.25											0.25					8.00
Tour 2		7.00			3.00		0.25			1.25											0.50					12.00
Tour 3		1.00			1.00	1.50	0.25			0.25																4.00
Total		13.00			5.25	1.50	0.75			2.75											0.75					24.00

Kelly Bushing	Op Fuel
	3100.00

FUEL @ 08:00 HOURS

Rig	Boiler
18000.00	0.00

Time	Temp
08:00	-35.00

WEATHER

Current Conditions	
CLEAR	
Wind Direction	Wind Strength
NE	UP TO 19 KM/H
Road Condition	
FAIR	

TOUR 1

SIGNATURE OF DRILLER: Joel Doctor | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	1
Size	311
IADC Code	
Manufacturer	Western
Type	GX-C03
Serial No	5204676
Jets	
Depth Out (m)	
Depth In (m)	0
Total Drilled (m)	210
Hrs Run Today	5.00
Cumulative Hrs Run	9.00
Entry Date	2013/01/27

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB
100m	210m	DRILL	140	2kdaN

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	311	0	0.30m
1	BIT SUB	228	0	0.71m
1	DC (6.25 IN)	156	72	9.31m
1	DC (6.25 IN)	155	71	9.40m
4	DC (6.25 IN)	156	70	37.58m
1	JARS-HYD/MECH	156	70	10.02m
7	DC (6.25 IN)	156	70	65.20m
1	X/O	102	65	1.10m
8	HWDP(4.0 IN)	102	65	74.96m
0	Drill Pipe	Stands		0.00m
0	Drill Pipe	Singles		0.00m
	Kelly Down			1.42m
	Total			210.00m
	Weight of DC			10kdaN
	Weight of String			

HOLE CONDITION

Hole Drag: Up 0 Down 0

Torque at Bottom	3505.00Nm
Fill on Bottom	0.00m

MUD RECORD

Mud Type: Water [x] Oil [ ] Other

Time	02:00	04:00
Density	1050	1050
Funnel Viscosity	33s/l	33s/l
Fluid Loss		
pH	10.5	10.5
Location of Sample	shaker	shaker
Depth		
PVT		

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1	COMBINED	152	95	4246	8
2	COMBINED	152	95	4246	8

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
2	485	@	65	@	58
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type
01:30	110m	.73	0	WIRELINE
04:00	140m	.57	0	WIRELINE
06:30	180m	.51	0	WIRELINE

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density
centrifuge #1	8	1050	1035	1860
centrifuge #2	0	0	0	0

MUD MATERIALS ADDED

Product	Amount	Type
SAWDUST	45	SX
GEL	25	SX
poly-xax	1	SX

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	8	10.5	200
A0124704	8	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	05:00	5.00	2	Drill 311mm w/ slick assembly from 100m to 210m
05:00	06:15	1.25	5	Accum work pipe & connections
06:15	06:45	0.50	10	Accum wire line surveys
06:45	07:00	0.25	21D	crew change safety meeting with mgm rep & akita crew
07:00	07:45	0.75	10	Accum wire line surveys
07:45	08:00	0.25	7	Rig service, function annular c/o 54 sec.

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor
Functioned : Annular, flare igniter
SLC-6015mj ACCUM-68140mj

SAFETY

Safety Topic	MEHL	MACP
Wildlife	26.00kdaN	

TOUR 2

SIGNATURE OF DRILLER: Blair Oleksyn | START TIME: 08:00 | END TIME: 20:00

BITS

Bit Number	1
Size	311
IADC Code	
Manufacturer	Western
Type	GX-C03
Serial No	5204676
Jets	
Depth Out (m)	
Depth In (m)	0
Total Drilled (m)	
Hrs Run Today	6.25
Cumulative Hrs Run	15.25
Entry Date	2013/01/27

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB
210m	370m	DRILL	140	4kdaN

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	311	0	0.30m
1	BIT SUB	228	0	0.71m
1	DC (6.25 IN)	156	72	9.31m
1	DC (6.25 IN)	155	71	9.40m
4	DC (6.25 IN)	156	70	37.58m
1	JARS-HYD/MECH	156	70	10.02m
7	DC (6.25 IN)	156	70	65.20m
1	X/O	102	65	1.10m
20	HWDP(4.0 IN)	102	65	186.44m
2	Drill Pipe	Stands		38.52m
1	Drill Pipe	Singles		9.59m
	Kelly Down			1.83m
	Total			370.00m
	Weight of DC			10kdaN
	Weight of String			

HOLE CONDITION

Hole Drag: Up 3 Down 2

Torque at Bottom	4000.00Nm
Fill on Bottom	

MUD RECORD

Mud Type: Water [x] Oil [ ] Other

Time	08:00	10:00
Density	1080	1080
Funnel Viscosity	38s/l	40s/l
Fluid Loss		
pH	7.5	7.5
Location of Sample		
Depth		
PVT		

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1	COMBIN-ED	152	100	10000	8
2	COMBIN-ED	152	100	10000	8

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type
09:00	220m	0.47	0	WIRELINE
11:45	250m	0.66	0	WIRELINE
13:30	280m	0.89	0	WIRELINE
15:45	310m	0.77	0	WIRELINE
18:45	350m	.32	0	WIRELINE

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type
GEL	50	SX
SAWDUST	60	SX

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	12	10.5	200
A0124704	12	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	08:15	0.25	21C	Diverter drill with akita crew
08:15	14:30	6.25	2	Drill 311mm w/ slick assembly from 210m to 360m
14:30	15:45	1.25	10	Accum wire line surveys, @ 220m=0.47 , 250m=0.66, 280m=0.88, 310M=0.77
15:45	18:45	3.00	5	Accum work pipe and connection time
18:45	19:00	0.25	7	Rig service, grease top drive/ washpipe, function test annular c/o 55 sec
19:00	19:15	0.25	21	Safety meeting with mgm rep, and akita crew
19:15	20:00	0.75	2	Drill 311mm hole w/ slick assembly from 360m to 370m

Remarks: Diverter drill with crew
Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor
Functioned : Annular, flare igniter, crown saver

SAFETY

Safety Topic	MEHL	MACP
Steam use	40.00kdaN	

TOUR 3

SIGNATURE OF DRILLER: Joel Doctor | START TIME: 20:00 | END TIME: 24:00

BITS

Bit Number	1
Size	311
IADC Code	
Manufacturer	Western
Type	GX-C03
Serial No	5204676
Jets	
Depth Out (m)	
Depth In (m)	0
Total Drilled (m)	395
Hrs Run Today	1.00
Cumulative Hrs Run	16.50
Entry Date	2013/01/27

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB
370m	395m	DRILL	140	10kdaN

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	311	0	0.30m
1	BIT SUB	228	0	0.71m
1	DC (6.25 IN)	156	72	9.31m
1	DC (6.25 IN)	155	71	9.40m
4	DC (6.25 IN)	156	70	37.58m
1	JARS-HYD/MECH	156	70	10.02m
7	DC (6.25 IN)	156	70	65.20m
1	X/O	102	65	1.10m
20	HWDP(4.0 IN)	102	65	186.44m
3	Drill Pipe	Stands		57.76m
1	Drill Pipe	Singles		9.60m
	Kelly Down			7.58m
	Total			395.00m
	Weight of DC			10kdaN
	Weight of String			33kdaN

HOLE CONDITION

Hole Drag: Up 1 Down 1

Torque at Bottom	6300.00Nm
Fill on Bottom	0.00m

MUD RECORD

Mud Type: Water [x] Oil [ ] Other

Time	20:00	22:00
Density	1140	1155
Funnel Viscosity	43s/l	61s/l
Fluid Loss		
pH	9.5	9.5
Location of Sample	shaker	shaker
Depth		
PVT		

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1	COMBIN-ED	152	95	9780	3.5
2	COMBIN-ED	152	95	9780	3.5

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
1	1045	@	58	@	366
2	1369	@	65	@	366
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density
centrifuge #1	4	1140	1125	1835
centrifuge #2	4	1140	1025	1835

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	4	10.5	200
A0124704	4	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
20:00	21:00	1.00	2	Drill 311mm hole w/ slick assembly from 370m to 395m
21:00	21:30	0.50	5	Accum work pipe & connections
21:30	21:45	0.25	7	Rig service, functioned annular c/o 54 sec.
21:45	22:15	0.50	5	Circulate hole clean
22:15	22:30	0.25	10	Survey @ 376m inc. 1 deg
22:30	24:00	1.50	6M	Blow out top drive, remove kicker hose, circulate pumps through bleeder,
				line up trip tank to wiper trip out of the hole, flowchecks@394m, 376m,
				132m, & every 20 min while out of the hole

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor
Functioned : Annular, flare igniter, crown saver

SAFETY

Safety Topic	MEHL	MACP
Tripping hazards	32.00kdaN	

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130128_1A	Pason	2013	01	28

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3701132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

DRILLING ASSEMBLY — TOUR 1

No	Component	OD	ID	Length
1	BIT	311.00	0.00	0.30
1	BIT SUB	228.00	0.00	0.71
1	DC (6.25 IN)	156.00	72.00	9.31
1	DC (6.25 IN)	155.00	71.00	9.40
4	DC (6.25 IN)	156.00	70.00	37.58
1	JARS-HYD/MECH	156.00	70.00	10.02
7	DC (6.25 IN)	156.00	70.00	65.20
1	X/O	102.00	65.00	1.10
8	HWDP(4.0 IN)	102.00	65.00	74.96
0	Drill Pipe	Stands		0.00
0	Drill Pipe	Singles		0.00
	Kelly Down			1.42
	Total			210.00
	Weight of DC			10.00
	Weight of String			

DRILLING ASSEMBLY — TOUR 2

No	Component	OD	ID	Length
1	BIT	311.00	0.00	0.30
1	BIT SUB	228.00	0.00	0.71
1	DC (6.25 IN)	156.00	72.00	9.31
1	DC (6.25 IN)	155.00	71.00	9.40
4	DC (6.25 IN)	156.00	70.00	37.58
1	JARS-HYD/MECH	156.00	70.00	10.02
7	DC (6.25 IN)	156.00	70.00	65.20
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.44
2	Drill Pipe	Stands		38.52
1	Drill Pipe	Singles		9.59
	Kelly Down			1.83
	Total			370.00
	Weight of DC			10.00
	Weight of String			

DRILLING ASSEMBLY — TOUR 3

No	Component	OD	ID	Length
1	BIT	311.00	0.00	0.30
1	BIT SUB	228.00	0.00	0.71
1	DC (6.25 IN)	156.00	72.00	9.31
1	DC (6.25 IN)	155.00	71.00	9.40
4	DC (6.25 IN)	156.00	70.00	37.58
1	JARS-HYD/MECH	156.00	70.00	10.02
7	DC (6.25 IN)	156.00	70.00	65.20
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.44
3	Drill Pipe	Stands		57.76
1	Drill Pipe	Singles		9.60
	Kelly Down			7.58
	Total			395.00
	Weight of DC			10.00
	Weight of String			33.00

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
1	SOP	D-18 dog collar use, C-6 hoist tubulars w/ power catwalk	00:00	
2	JSA REVIEW	hoisting drill pipe with tugger	10:00	
2	JSA REVIEW	making connections	12:00	
3	SOP	D-13 pre trip floor inspection, D-2 trip out of the hole	20:00	

MUD SAMPLE - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130128_1A	Pason	2013	01	28

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3701132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

TOUR 1 **MUD TYPE** water **WATER** x **OIL** **OTHER**

Time		02:00	04:00	06:00														
Density		1050kg/m3	1050kg/m3	1055kg/m3														
Funnel Viscosity		33s/l	33s/l	34s/l														
Fluid Loss																		
Fluid pH		10.5	10.5	10.5														
Location of Sample		shaker	shaker	shaker														
Depth																		
PVT																		
Test 1	Type (Ex: Chlorides)																	
	Value																	
Test 2	Type (ex: Sand%)																	
	Value																	
Test 3	Type (ex: Hard Ca)																	
	Value																	
Test 4	Type (ex: Sulfides)																	
	Value																	

MUD SAMPLE REMARKS

MUD SAMPLE - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130128_1A	Pason	2013	01	28

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3701132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

TOUR 2 **MUD TYPE** gel **WATER** x **OIL** **OTHER**

Time	08:00	10:00	18:30														
Density	1080kg/m3	1080kg/m3	1110kg/m3														
Funnel Viscosity	38s/l	40s/l	41s/l														
Fluid Loss																	
Fluid pH	7.5	7.5	8														
Location of Sample																	
Depth																	
PVT																	
Test 1 Type (Ex: Chlorides)																	
Test 1 Value																	
Test 2 Type (ex: Sand%)																	
Test 2 Value																	
Test 3 Type (ex: Hard Ca)																	
Test 3 Value																	
Test 4 Type (ex: Sulfides)																	
Test 4 Value																	

MUD SAMPLE REMARKS

MUD SAMPLE - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130128_1A	Pason	2013	01	28

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3701132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

TOUR 3 **MUD TYPE** water **WATER** x **OIL** **OTHER**

Time	20:00	22:00															
Density	1140kg/m3	1155kg/m3															
Funnel Viscosity	43s/l	61s/l															
Fluid Loss																	
Fluid pH	9.5	9.5															
Location of Sample	shaker	shaker															
Depth																	
PVT																	
Test 1 Type (Ex: Chlorides)																	
Test 1 Value																	
Test 2 Type (ex: Sand%)																	
Test 2 Value																	
Test 3 Type (ex: Hard Ca)																	
Test 3 Value																	
Test 4 Type (ex: Sulfides)																	
Test 4 Value																	

MUD SAMPLE REMARKS

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130129_1A	Pason	2013	01	29

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3701132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	JD	G&C
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted	JD	G&C
5) Flare Lines Staked	JD	G&C
6) BOP Drills Performed	JD	G&C
7) Visually Inspected BOPs - Flare Lines & Degasser Lines	JD	G&C
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		G&C
5) Motor Kills Checked		G&C

Pason

HOURS

CODE	1 Rig Up	2 Drill Actual	3 Reaming	4 Coring	5 Cond Mud & Circ	6 Trips	7 Rig Service	8 Repair Rig	9 Cut Off Drilg Line	10 Dev Survey	11 Wireline Logs	12 Run Csg & Cement	13 Wait On Cement	14 Nipple Up BOP	15 Test BOP	16 Drillstem Test	17 Plug Back	18 Squeeze Cement	19 Fishing	20 Dir Work	21 Safety Meeting	22 Tear Down	23 Waiting On	24 Rig Watch	25 Other	TOTAL
Tour 1		1.25			1.75	4.75															0.25					8.00
Tour 2					2.50	5.25	0.25				2.00	1.50									0.50					12.00
Tour 3							0.25				3.50										0.25					4.00
Total		1.25			4.25	10.00	0.50				5.50	1.50									1.00					24.00

Kelly Bushing | Op Fuel 6840.00

FUEL @ 08:00 HOURS

Rig 11126.00 | Boiler 0.00

WEATHER

Time 08:00 | Temp -37.00
Current Conditions: CLEAR
Wind Direction: NE | Wind Strength: UP TO 19 KM/H
Road Condition: FAIR

TOUR 1

SIGNATURE OF DRILLER: Joel Doctor | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	1
Size	311
IADC Code	
Manufacturer	Western
Type	GX-C03
Serial No	5204676
Jets	
Depth Out (m)	
Depth In (m)	0
Total Drilled (m)	405
Hrs Run Today	
Cumulative Hrs Run	17.00
Entry Date	2013/01/27

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB
395m	405m	DRILL	140	15kdaN

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	311	0	0.30m
1	BIT SUB	228	0	0.71m
1	DC (6.25 IN)	156	72	9.31m
1	DC (6.25 IN)	155	71	9.40m
4	DC (6.25 IN)	156	70	37.58m
1	JARS-HYD/MECH	156	70	10.02m
7	DC (6.25 IN)	156	70	65.20m
1	X/O	102	65	1.10m
20	HWDP(4.0 IN)	102	65	186.44m
4	Drill Pipe	Stands		77.01m
0	Drill Pipe	Singles		0.00m

Kelly Down	7.93m
Total	405.00m
Weight of DC	10kdaN
Weight of String	33kdaN

HOLE CONDITION

Hole Drag: Up 15 | Down 5

Torque at Bottom	4808.00Nm
Fill on Bottom	0.00m

MUD RECORD

Mud Type: Water [x] Oil [ ]
Other:

Time	05:30
Density	1160
Funnel Viscosity	66s/l
Fluid Loss	
pH	9.5
Location of Sample	shaker
Depth	
PVT	

Remarks:

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1	COMBINED	152	95	14416	3
2	COMBINED	152	95	14416	3

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
1	1045	@	58	@	366
2	1369	@	65	@	366
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type
00:00	376m	1	0	WIRELINE

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density
centrifuge #1	0	0	0	0
centrifuge #2	0	0	0	0

MUD MATERIALS ADDED

Product	Amount	Type
SAWDUST	25	SX
GEL	20	SX

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	8	10.5	200
A0124704	8	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	01:30	1.50	6M	Cont. to trip out of the hole, flowcheck @ 394m, 376m, 132m, every 20 min
				while out of hole
01:30	04:45	3.25	6M	Wiper back in the hole, flowcheck @ 165m fill pipe @ 350m
04:45	06:00	1.25	2	Drill 311mm hole w/ slick assembly from 395m to 405m
06:00	07:00	1.00	5	Circulate hole clean
07:00	07:15	0.25	21	Crew change over meeting with MGM rep & Akita rig crew
07:15	08:00	0.75	5	Circulate hole clean

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor
Functioned : Annular, flare igniter, crown saver
SLC-7055 ACCUM-69180
Trip record : meas - 4.34m3 cal - 3.71m3 diff - 0.63m3

SAFETY

Safety Topic	MEHL	MACP
Pinch points	55.00kdaN	

TOUR 2

SIGNATURE OF DRILLER: Blair Oleksyn | START TIME: 08:00 | END TIME: 20:00

BITS

Bit Number	1
Size	311
IADC Code	
Manufacturer	Western
Type	GX-C03
Serial No	5204676
Jets	
Depth Out (m)	
Depth In (m)	0
Total Drilled (m)	405
Hrs Run Today	
Cumulative Hrs Run	17.00
Entry Date	2013/01/27

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	311	0	0.30m
1	BIT SUB	228	0	0.71m
1	DC (6.25 IN)	156	72	9.31m
1	DC (6.25 IN)	155	71	9.40m
4	DC (6.25 IN)	156	70	37.58m
1	JARS-HYD/MECH	156	70	10.02m
7	DC (6.25 IN)	156	70	65.20m
1	X/O	102	65	1.10m
20	HWDP(4.0 IN)	102	65	186.44m
4	Drill Pipe	Stands		77.01m
0	Drill Pipe	Singles		0.00m

Kelly Down	7.93m
Total	405.00m
Weight of DC	10kdaN
Weight of String	33kdaN

HOLE CONDITION

Hole Drag: Up | Down

Torque at Bottom	
Fill on Bottom	

MUD RECORD

Mud Type: Water [x] Oil [ ]
Other:

Time	10:00
Density	1190
Funnel Viscosity	75s/l
Fluid Loss	
pH	8.5
Location of Sample	
Depth	
PVT	

Remarks:

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1	COMBINED	152	100	11000	3
2	COMBINED	152	100	11000	3

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type
GEL	40	SX

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	12	10.5	200
A0124704	12	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	10:30	2.50	5D	Circulate and condition mud system
10:30	10:45	0.25	7	Rig service, function test annular/ 55 sec, Function test engine kills 3
				seconds to shut down pumps, floor engine
10:45	16:00	5.25	6B	Trip out of hole , lay out 3 collars and jars FC @400M, 200M, 130M, And
				surface, MEAS=4.06m3 CAL=3.77m3 DIFF=.27m3
16:00	16:15	0.25	21	Crew change over meeting with MGM rep & Akita rig crew
16:15	16:30	0.25	21	Safety metting with loggers
16:30	18:00	1.50	12A	Rig up Loggers
18:00	20:00	2.00	11	Wireline Logs

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor
Functioned : Annular, flare igniter, crown saver

SAFETY

Safety Topic	MEHL	MACP
TRIPPING OUT OF THE HOLE		

TOUR 3

SIGNATURE OF DRILLER: Joel Doctor | START TIME: 20:00 | END TIME: 24:00

BITS

Bit Number	1
Size	311
IADC Code	
Manufacturer	Western
Type	GX-C03
Serial No	5204676
Jets	
Depth Out (m)	
Depth In (m)	0
Total Drilled (m)	405
Hrs Run Today	0.00
Cumulative Hrs Run	17.00
Entry Date	2013/01/27

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length
	Drill Pipe	Stands		
	Drill Pipe	Singles		

Kelly Down	
Total	
Weight of DC	
Weight of String	

HOLE CONDITION

Hole Drag: Up | Down

Torque at Bottom	
Fill on Bottom	

MUD RECORD

Mud Type: Water [x] Oil [ ]
Other:

Time	
Density	
Funnel Viscosity	
Fluid Loss	
pH	
Location of Sample	
Depth	
PVT	

Remarks:

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1		152	58	0	4
2		152	0	0	0

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	4	10.5	200
A0124704	4	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
20:00	23:00	3.00	11	Wireline Logs hdil/xmac/dual-zdl/cn/gr/ttrm
23:00	23:15	0.25	7	Rig service, functioned annular/ close/open 55 sec
23:15	23:45	0.50	11	Rig out wireliners
23:45	24:00	0.25	21	Crew change over meeting with MGM rep & Akita rig crew

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor
Functioned : Annular, flare igniter, crown saver

SAFETY

Safety Topic	MEHL	MACP
Wire Line Logging		

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130129_1A	Pason	2013	01	29

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3701132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection		
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted		
5) Flare Lines Staked		
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines		
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		
5) Motor Kills Checked		

CAODC

Pason

CODE	1 Rig Up	2 Drill Actual	3 Reaming	4 Coring	5 Cond Mud & Circ	6 Trips	7 Rig Service	8 Repair Rig	9 Cut Off Drlg Line	10 Dev Survey	11 Wireline Logs	12 Run Csg & Cement	13 Wait On Cement	14 Nipple Up BOP	15 Test BOP	16 Drillstem Test	17 Plug Back	18 Squeeze Cement	19 Fishing	20 Dir Work	21 Safety Meeting	22 Tear Down	23 Waiting On	24 Rig Watch	25 Other	TOTAL
HOURS Tour 1		1.25			1.75	4.75															0.25					8.00
Tour 2					2.50	5.25	0.25				2.00	1.50									0.50					12.00
Tour 3							0.25				3.50										0.25					4.00
Total		1.25			4.25	10.00	0.50				5.50	1.50									1.00					24.00

Kelly Bushing | Op Fuel

FUEL @ 08:00 HOURS

Rig | Boiler

WEATHER

Time | Temp

Current Conditions

Wind Direction | Wind Strength

Road Condition

TOUR 1

SIGNATURE OF DRILLER: Joel Doctor

START TIME: 00:00 END TIME: 08:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

Drill Pipe		Stands	
Drill Pipe		Singles	
Kelly Down			
Total			
Weight of DC			
Weight of String			

HOLE CONDITION

Hole Drag: Up ☐ Down ☐

Torque at Bottom	
Fill on Bottom	

MUD RECORD

Mud Type: Water ☐ Oil ☐ Other

Time		
Density		
Funnel Viscosity		
Fluid Loss		
pH		
Location of Sample		
Depth		
PVT		

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130129_1A	Pason	2013	01	29

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3701132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

DRILLING ASSEMBLY — TOUR 1

No	Component	OD	ID	Length
1	BIT	311.00	0.00	0.30
1	BIT SUB	228.00	0.00	0.71
1	DC (6.25 IN)	156.00	72.00	9.31
1	DC (6.25 IN)	155.00	71.00	9.40
4	DC (6.25 IN)	156.00	70.00	37.58
1	JARS-HYD/MECH	156.00	70.00	10.02
7	DC (6.25 IN)	156.00	70.00	65.20
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.44
4	Drill Pipe Stands			77.01
0	Drill Pipe Singles			0.00
	Kelly Down			7.93
	Total			405.00
	Weight of DC			10.00
	Weight of String			33.00

DRILLING ASSEMBLY — TOUR 2

No	Component	OD	ID	Length
1	BIT	311.00	0.00	0.30
1	BIT SUB	228.00	0.00	0.71
1	DC (6.25 IN)	156.00	72.00	9.31
1	DC (6.25 IN)	155.00	71.00	9.40
4	DC (6.25 IN)	156.00	70.00	37.58
1	JARS-HYD/MECH	156.00	70.00	10.02
7	DC (6.25 IN)	156.00	70.00	65.20
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.44
4	Drill Pipe Stands			77.01
0	Drill Pipe Singles			0.00
	Kelly Down			7.93
	Total			405.00
	Weight of DC			10.00
	Weight of String			33.00

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe Stands			
	Drill Pipe Singles			
	Kelly Down			
	Total			
	Weight of DC			
	Weight of String			

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
1	SOP	D-3 trip in the hole, D-43 rig up wireline loggers	00:00	
2	SOP	D13-FLOOR INSPECTION	08:00	405
2	SOP	D31-USING PIPE SPINNER	08:00	405
2	SOP	D2-TRIPPING OUT OF THE HOLE	08:00	405
2	SOP	D43-RIG UP WIRE LINE LOGGERS	08:00	405
3	SOP	Spooling Tuggers	20:00	0

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130129_1A	Pason	2013	01	29

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3701132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
3	SOP	Rig up Wireline Loggers	21:00	0
3	SOP	Loader Operation pallet forks	22:00	0

V. 1.1

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130130_1A	Pason	2013	01	30

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3701132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	JD	G&C
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted	JD	G&C
5) Flare Lines Staked	JD	G&C
6) BOP Drills Performed	JD	G&C
7) Visually Inspected BOPs - Flare Lines & Degasser Lines	JD	G&C
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		G&C
5) Motor Kills Checked		

Pason

CODE	1 Rig Up	2 Drill Actual	3 Reaming	4 Coring	5 Cond Mud & Circ	6 Trips	7 Rig Service	8 Repair Rig	9 Cut Off Drilg Line	10 Dev Survey	11 Wireline Logs	12 Run Csg & Cement	13 Wait On Cement	14 Nipple Up BOP	15 Test BOP	16 Drillstem Test	17 Plug Back	18 Squeeze Cement	19 Fishing	20 Dir Work	21 Safety Meeting	22 Tear Down	23 Waiting On	24 Rig Watch	25 Other	TOTAL
HOURS Tour 1					1.75	3.00	0.25				2.75										0.25					8.00
Tour 2					0.75	4.75	0.50					5.50									0.50					12.00
Tour 3					0.25		0.25					3.50														4.00
Total					2.75	7.75	1.00				2.75	9.00									0.75					24.00

Kelly Bushing | Op Fuel 6212.00

FUEL @ 08:00 HOURS

Rig 4914.00 | Boiler 0.00

WEATHER

Time 08:00 | Temp -41.00 | Current Conditions CLEAR | Wind Direction NE | Wind Strength UP TO 19 KM/H | Road Condition FAIR

TOUR 1

SIGNATURE OF DRILLER Blair Oleksyn

START TIME 00:00 **END TIME** 08:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	311	0	0.30m
1	BIT SUB	311	0	0.90m
10	DC (6.25 IN)	156	70	93.43m
1	X/O	102	65	1.10m
20	HWDP(4.0 IN)	102	65	186.25m

6	Drill Pipe	Stands	115.58m
0	Drill Pipe	Singles	0.00m
	Kelly Down		7.44m
	Total		405.00m
	Weight of DC		
	Weight of String		

HOLE CONDITION

Hole Drag Up Down

Torque at Bottom

Fill on Bottom

MUD RECORD

Mud Type Water [x] Oil [ ]

Other

Time	07:00
Density	1190
Funnel Viscosity	75s/l
Fluid Loss	
pH	8.5
Location of Sample	
Depth	
PVT	

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1		152	90	9500	1
2		152	90	9500	1

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure	Strokes/min	Depth
	@	@	
	@	@	
	@	@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	8	10.5	200
A0124704	8	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	02:45	2.75	11	cont to rig out wireline loggers
02:45	03:00	0.25	7	Rig service, function annular 55 sec to o/c
03:00	06:00	3.00	6A	Trip in hole to 405m
06:00	07:00	1.00	5	Condition mud and work pipe
07:00	07:15	0.25	21	Safety meeting with MGM rep, and Akita crew
07:15	08:00	0.75	5	Condition mud and work pipe

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor

Functioned : Annular, flare igniter, crown saver

SLC-7304mj ACCUM-69429mj

Enviromental meeting on waste management

SAFETY

Safety Topic	MEHL	MACP
RUNNING IN THE HOLE		

TOUR 2

SIGNATURE OF DRILLER Travis Davson

START TIME 08:00 **END TIME** 20:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

	Drill Pipe	Stands	
	Drill Pipe	Singles	
	Kelly Down		
	Total		
	Weight of DC		
	Weight of String		

HOLE CONDITION

Hole Drag Up Down

Torque at Bottom

Fill on Bottom

MUD RECORD

Mud Type Water [x] Oil [ ]

Other

Time	08:30
Density	1100
Funnel Viscosity	70s/l
Fluid Loss	
pH	
Location of Sample	shaker
Depth	
PVT	

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1		152	58	0	12
2		152	66	0	12

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure	Strokes/min	Depth
	@	@	
	@	@	
	@	@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type
GEL	13	SX

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	12	10.5	200
A0124704	12	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	08:45	0.75	5	Condition mud and work pipe
08:45	13:30	4.75	6B	Trip out of hole from 405m - 0m, Flow chk @ 400m,200m,130m, meas 3.15,calc 3.13, diff .02
13:30	14:00	0.50	7	Rig service, function test crown saver
14:00	16:00	2.00	12A	Rig up Tong Hand
16:00	16:15	0.25	21	Have safety meeting prior to running casing
16:15	19:45	3.50	12	Run Casing
19:45	20:00	0.25	21	Safety meeting crew hand over with MGM rep, Akita crew & hallmark tong hands

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor

Functioned : Annular, flare igniter, crown saver

SLC-7304mj ACCUM-69429mj

Enviromental meeting on waste management

SAFETY

Safety Topic	MEHL	MACP
Rig up Tongs & Running Casing		

TOUR 3

SIGNATURE OF DRILLER Blair Oleksyn

START TIME 20:00 **END TIME** 24:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

	Drill Pipe	Stands	
	Drill Pipe	Singles	
	Kelly Down		
	Total		
	Weight of DC		
	Weight of String		

HOLE CONDITION

Hole Drag Up Down

Torque at Bottom

Fill on Bottom

MUD RECORD

Mud Type Water [ ] Oil [ ]

Other

Time	
Density	
Funnel Viscosity	
Fluid Loss	
pH	
Location of Sample	
Depth	
PVT	

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1		152	75	900	1
2		152	0	900	0

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure	Strokes/min	Depth
	@	@	
	@	@	
	@	@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	4	10.5	210
A0124704	4	10.5	250

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
20:00	23:30	3.50	12B	Continue to Run 29 joints of 244.5mm, 59.53kg/m, L-80 tenaris blue casing
23:30	23:45	0.25	7	Rig service / grease carwalk,
23:45	24:00	0.25	5	head up to circulate casing

Remarks: SAFETY MEETING ONRUNNING CASING

Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor

Functioned : Annular, flare igniter, crown saver

SAFETY

Safety Topic	MEHL	MACP
Running casing		0kPa

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130130_1A	Pason	2013	01	30

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3701132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

DRILLING ASSEMBLY — TOUR 1

No	Component	OD	ID	Length
1	BIT	311.00	0.00	0.30
1	BIT SUB	311.00	0.00	0.90
10	DC (6.25 IN)	156.00	70.00	93.43
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
6	Drill Pipe Stands			115.58
0	Drill Pipe Singles			0.00
	Kelly Down			7.44
	Total			405.00
	Weight of DC			
	Weight of String			

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe Stands			
	Drill Pipe Singles			
	Kelly Down			
	Total			
	Weight of DC			
	Weight of String			

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe Stands			
	Drill Pipe Singles			
	Kelly Down			
	Total			
	Weight of DC			
	Weight of String			

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
1	SOP	D3-TRIPPING IN THE HOLE	00:00	405
1	SOP	D22-INSPECTING SLIPS AND ELEVATORS	00:00	405
1	SOP	Q17-THAW FROZEN LINEAS	00:00	405
1	SOP	B2-ADDING EZ TREAT	00:00	405
2	SOP	Tripping out of hole	09:00	
2	SOP	Mouse hole drill pipe	13:00	

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130130_1A	Pason	2013	01	30

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3701132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
2	SOP	House keeoping on drill floor	14:00	
2	SOP	Using rope to catch tubulars	15:00	

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130131_1A	Pason	2013	01	31

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3701132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	JD	G&C
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted	JD	G&C
5) Flare Lines Staked	JD	G&C
6) BOP Drills Performed	JD	G&C
7) Visually Inspected BOPs - Flare Lines & Degasser Lines	JD	G&C
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		G&C
5) Motor Kills Checked		

CAODC

Pason

HOURS

CODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
	Rig Up	Drill Actual	Reaming	Coring	Cond Mud & Circ	Trips	Rig Service	Repair Rig	Cut Off Drilg Line	Dev Survey	Wireline Logs	Run Csg & Cement	Wait On Cement	Nipple Up BOP	Test BOP	Drillstem Test	Plug Back	Squeeze Cement	Fishing	Dir Work	Safety Meeting	Tear Down	Waiting On	Rig Watch	Other	TOTAL
Tour 1												4.00		3.50							0.50					8.00
Tour 2														11.75							0.25					12.00
Tour 3							0.25							3.75												4.00
Total							0.25					4.00		19.00							0.75					24.00

FUEL @ 08:00 HOURS

Kelly Bushing	Op Fuel
	6351.00

Rig	Boiler
4563.00	0.00

Time	Temp
08:00	-28.00

WEATHER

Current Conditions: CLEAR

Wind Direction	Wind Strength
S	UP TO 19 KM/H

Road Condition: FAIR

TOUR 1

SIGNATURE OF DRILLER: Blair Oleksyn | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130131_1A	Pason	2013	01	31

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3701132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection		
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted		
5) Flare Lines Staked		
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines		
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		
5) Motor Kills Checked		

Pason

HOURS

CODE	1 Rig Up	2 Drill Actual	3 Reaming	4 Coring	5 Cond Mud & Circ	6 Trips	7 Rig Service	8 Repair Rig	9 Cut Off Drlg Line	10 Dev Survey	11 Wireline Logs	12 Run Csg & Cement	13 Wait On Cement	14 Nipple Up BOP	15 Test BOP	16 Drillstem Test	17 Plug Back	18 Squeeze Cement	19 Fishing	20 Dir Work	21 Safety Meeting	22 Tear Down	23 Waiting On	24 Rig Watch	25 Other	TOTAL
Tour 1												4.00		3.50							0.50					8.00
Tour 2														11.75							0.25					12.00
Tour 3							0.25							3.75												4.00
Total							0.25					4.00		19.00							0.75					24.00

FUEL @ 08:00 HOURS

Kelly Bushing	Op Fuel
Rig	Boiler
Time	Temp
Current Conditions	
Wind Direction	Wind Strength
Road Condition	

WEATHER

TOUR 1

SIGNATURE OF DRILLER: Blair Oleksyn | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130131_1A	Pason	2013	01	31

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3701132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
1	SOP	D24-POWER TONG OPERATION	00:00	405
1	SOP	D23-CEMENTING	00:00	405
1	SOP	C4-PICKING UP CASING WITH CATWALK	00:00	405
1	SOP	D14-RIG UP AND CIRCULATE CASING ON BOTTOM	00:00	405
2	SOP	Lock out permitt	08:00	
2	SOP	Rig out diverter	09:00	

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130131_1A	Pason	2013	01	31

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3701132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
2	SOP	Use of hammer wrenches	10:00	
2	SOP	Loader Operations	11:00	
3	JSA REVIEW	Nippling up BOP	20:00	
3	JSA REVIEW	W0rking with picker	21:00	

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130201_1A	Pason	2013	02	01

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

DAILY CHECKS	OP	RM
1) Daily Walk Around Inspection	JD	G&C
2) Detailed Inspection - Weekly (Using Check List)	JD	G&C
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted	JD	G&C
5) Flare Lines Staked	JD	G&C
6) BOP Drills Performed	JD	G&C
7) Visually Inspected BOPs - Flare Lines & Degasser Lines	JD	G&C
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		G&C
5) Motor Kills Checked		G&C

Pason

CODE	1 Rig Up	2 Drill Actual	3 Reaming	4 Coring	5 Cond Mud & Circ	6 Trips	7 Rig Service	8 Repair Rig	9 Cut Off Drilg Line	10 Dev Survey	11 Wireline Logs	12 Run Csg & Cement	13 Wait On Cement	14 Nipple Up BOP	15 Test BOP	16 Drillstem Test	17 Plug Back	18 Squeeze Cement	19 Fishing	20 Dir Work	21 Safety Meeting	22 Tear Down	23 Waiting On	24 Rig Watch	25 Other	TOTAL
HOURS Tour 1							0.25							7.50							0.25					8.00
Tour 2												9.00		2.00	0.50						0.50					12.00
Tour 3							0.25	1.25						2.50												4.00
Total							0.50	1.25				9.00		12.00	0.50						0.75					24.00

Kelly Bushing | Op Fuel 4333.00

FUEL @ 08:00 HOURS

Rig 22230.00 | Boiler 0.00

WEATHER

Time 08:00 | Temp -25.00 | Current Conditions CLEAR | Wind Direction S | Wind Strength UP TO 19 KM/H | Road Condition FAIR

TOUR 1

SIGNATURE OF DRILLER: Blair Oleksyn | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130201_1A	Pason	2013	02	01

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
1	JSA REVIEW	Loader operations	03:00	
1	JSA REVIEW	Using tag lines	05:00	
3	JSA REVIEW	Pressure Testing	20:00	

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130202_1A	Pason	2013	02	02

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

DAILY CHECKS	OP	RM
1) Daily Walk Around Inspection	JD	G&C
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted	JD	G&C
5) Flare Lines Staked	JD	G&C
6) BOP Drills Performed	JD	G&C
7) Visually Inspected BOPs - Flare Lines & Degasser Lines	JD	G&C
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		G&C
5) Motor Kills Checked		G&C

Pason

CODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
HOURS	Rig Up	Drill Actual	Reaming	Coring	Cond Mud & Circ	Trips	Rig Service	Repair Rig	Cut Off Drilg Line	Dev Survey	Wireline Logs	Run Csg & Cement	Wait On Cement	Nipple Up BOP	Test BOP	Drillstem Test	Plug Back	Squeeze Cement	Fishing	Dir Work	Safety Meeting	Tear Down	Waiting On	Rig Watch	Other	TOTAL
Tour 1						7.25	0.25														0.50					8.00
Tour 2		6.75			2.25	1.50									1.00						0.50					12.00
Tour 3		1.50			1.75		0.25														0.50					4.00
Total		8.25			4.00	8.75	0.50								1.00						1.50					24.00

Kelly Bushing | Op Fuel 4787.00

FUEL @ 08:00 HOURS

Rig 17443.00 | Boiler 0.00

WEATHER

Time 08:00 | Temp -22.00 | Current Conditions CLEAR | Wind Direction S | Wind Strength UP TO 19 KMH | Road Condition FAIR

TOUR 1

SIGNATURE OF DRILLER: Blair Oleksyn | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	1
Size	222
IADC Code	
Manufacturer	HC
Type	PDC
Serial No	7131618
Jets	
Depth Out (m)	
Depth In (m)	405
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	0.00
Entry Date	2013/02/02

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	222	0	.34m
1	TRUTRAK	193	89	13.04m
1	MWD	176	72	0.77m
1	NM DRILL COLLAR	163	72	9.09m
1	NM DRILL COLLAR	161	72	8.46m
1	FILTER SUB	171	72	1.66m
1	X/O	160	57	0.58m
4	DC (6.25 IN)	156	70	37.58m
1	JARS-HYD/MECH	156	70	10.02m
3	DC (6.25 IN)	156	70	27.89m
1	X/O	102	65	1.10m
20	HWDP(4.0 IN)	102	65	186.25m
0	Drill Pipe	Stands		0.00m
0	Drill Pipe	Singles		0.00m
	Kelly Down			0.00m
	Total			296.78m
	Weight of DC			
	Weight of String			

HOLE CONDITION

Hole Drag: Up | Down

Torque at Bottom	
Fill on Bottom	

MUD RECORD

Mud Type: Water ☐ Oil ☐ Other

Time		
Density		
Funnel Viscosity		
Fluid Loss		
pH		
Location of Sample		
Depth		
PVT		

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1		152	0	0	0
2		152	0	0	0

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	8	10.5	220
A0124704	8	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	01:00	1.00	6F	Lay down collars,
01:00	01:15	0.25	7	Rig service, function crown saver
01:15	01:30	0.25	21	Safety meeting with baker hughes
01:30	04:00	2.50	6C	Pick up BHA
04:00	06:45	2.75	6A	Trip in hole, lay out single collar and replace with jars
06:45	07:00	0.25	21	Safety meeting with MGM rep and Akita crew
07:00	08:00	1.00	6A	TRIP IN HOLE

Remarks: NIPPLE UP INSPECTION COMPLETED
HOT WORK PERMIT DONE
2-LOCKOUT PERMITS DONE
SAFETY MEETING PRIOR TO HANDLING DIRECTIONAL TOOLS

SAFETY

Safety Topic	MEHL	MACP
HANDLING DIRECTIONAL TOOLS		

TOUR 2

SIGNATURE OF DRILLER: Travis Davson | START TIME: 08:00 | END TIME: 20:00

BITS

Bit Number	1
Size	222
IADC Code	
Manufacturer	HC
Type	PDC
Serial No	7131618
Jets	
Depth Out (m)	
Depth In (m)	405
Total Drilled (m)	65
Hrs Run Today	3.50
Cumulative Hrs Run	3.50
Entry Date	2013/02/02

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB
405m	480m	DRILL	2	5.4kdaN

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	222	0	.34m
1	TRUTRAK	193	89	13.04m
1	MWD	176	72	0.77m
1	NM DRILL COLLAR	163	72	9.09m
1	NM DRILL COLLAR	161	72	8.46m
1	FILTER SUB	171	72	1.66m
1	X/O	160	57	0.58m
4	DC (6.25 IN)	156	70	37.58m
1	JARS-HYD/MECH	156	70	10.02m
3	DC (6.25 IN)	156	70	27.89m
1	X/O	102	65	1.10m
20	HWDP(4.0 IN)	102	65	186.25m
0	Drill Pipe	Stands		0.00m
19	Drill Pipe	Singles		183.22m
	Kelly Down			0.00m
	Total			480.00m
	Weight of DC			
	Weight of String			27kdaN

HOLE CONDITION

Hole Drag: Up 5 | Down 6

Torque at Bottom	1986.00Nm
Fill on Bottom	

MUD RECORD

Mud Type: Water ☒ Oil ☐ Other

Time	12:00	15:00
Density	1000	1000
Funnel Viscosity	31s/l	31s/l
Fluid Loss		
pH		
Location of Sample	shaker	shaker
Depth		
PVT		

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1	SINGLE	152	108	5570	3.25
2	SINGLE	152	109	5570	4.25

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
1	0	@	0	@	0
2	1980	@	84	@	431
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type
15:15	410.7m	0.4	128.4	
18:30	459m	0.1	157.2	

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type
aqua-star	2	SX
STAFLO	1	SX
polyzan	1	SX
hyperdrill 247	1	SX
CAL CARB 'O'	5	SX
sodium bicarbonate	1	SX

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	12	10.5	220
A0124704	12	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	09:30	1.50	6A	Trip in hole until we tag float, tagged at 383m
09:30	09:45	0.25	21A	Bop drill held with Akita rig crew well secure 65 seconds
09:45	13:00	3.25	2C	Drill through Float and Cement
13:00	14:00	1.00	15A	Formation integrity test,6500 kpa surface applied pressure- no leak off,
				26.72kpa/m calculated gradient
14:00	15:30	1.50	5C	Displace hole from cement water to polymer
15:30	18:00	2.50	2	Drill 222mm hole from 405m-470m
18:00	18:45	0.75	5D	Acc connection time & survey
18:45	19:00	0.25	21	Safety meeting with MGM rep and Akita crew
19:00	20:00	1.00	2	Drill 222mm hole from 470m-480m

Remarks: Bop Drill with crew
Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor
Functioned : Annular, flare igniter, crown saver

SAFETY

Safety Topic	MEHL	MACP
Bop Drill		

TOUR 3

SIGNATURE OF DRILLER: Blair Oleksyn | START TIME: 20:00 | END TIME: 24:00

BITS

Bit Number	1
Size	222
IADC Code	M 3 2 3
Manufacturer	baker hughes
Type	QD505X
Serial No	7131618
Jets	
Depth Out (m)	
Depth In (m)	405
Total Drilled (m)	
Hrs Run Today	1.50
Cumulative Hrs Run	5.00
Entry Date	2013/02/02

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB
480m	545m	DRILL	30	5kdaN

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	222	0	.34m
1	TRUTRAK	193	89	13.04m
1	MWD	176	72	0.77m
1	NM DRILL COLLAR	163	72	9.09m
1	NM DRILL COLLAR	161	72	8.46m
1	FILTER SUB	171	72	1.66m
1	X/O	160	57	0.58m
4	DC (6.25 IN)	156	70	37.58m
1	JARS-HYD/MECH	156	70	10.02m
3	DC (6.25 IN)	156	70	27.89m
1	X/O	102	65	1.10m
20	HWDP(4.0 IN)	102	65	186.25m
12	Drill Pipe	Stands		231.35m
1	Drill Pipe	Singles		9.72m
	Kelly Down			7.15m
	Total			545.00m
	Weight of DC			
	Weight of String			27kdaN

HOLE CONDITION

Hole Drag: Up 3 | Down 3

Torque at Bottom	
Fill on Bottom	

MUD RECORD

Mud Type: Water ☒ Oil ☐ Other

Time	21:30	
Density	1020	
Funnel Viscosity	31s/l	
Fluid Loss	18cm3	
pH	8	
Location of Sample		
Depth		
PVT		

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1		152	0	5500	0
2		152	114	5500	4

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
1	2500	@	75	@	545
2	2250	@	63	@	545
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type
21:45	507.1m	0.6	168	

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density
CENTERFUGE	4	1020	1010	1680

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	4	10.5	220
A0124704	4	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
20:00	21:30	1.50	2	Drill 222mm hole from 470m-545m
21:30	22:00	0.50	21A	BOP drill with Akita crew, 65 sec response time
22:00	22:15	0.25	7	Rig service, functioned test annular/ 45 sec to o/c
22:15	24:00	1.75	5D	Acc connection time & survey, and work pipe time

Remarks: Bop Drill with crew
Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor
Functioned : Annular, flare igniter, crown saver
MJ=8298 ACC= 70423

SAFETY

Safety Topic	MEHL	MACP
BOP DRILL		6715kPa

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130202_1A	Pason	2013	02	02

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

DRILLING ASSEMBLY — TOUR 1

No	Component	OD	ID	Length
1	BIT	222	0	.34
1	TRUTRAK	193.00	88.90	13.04
1	MWD	176.	72.0	0.77
1	NM DRILL COLLAR	163.	72.	9.09
1	NM DRILL COLLAR	161.	72.	8.46
1	FILTER SUB	171	72	1.66
1	X/O	160	57	0.58
4	DC (6.25 IN)	156	70	37.58
1	JARS-HYD/MECH	156	70	10.02
3	DC (6.25 IN)	156	70	27.89
1	X/O	102	65	1.10
20	HWDP(4.0 IN)	102	65	186.25
0	Drill Pipe	Stands		0.00
0	Drill Pipe	Singles		0.00
	Kelly Down			0.00
	Total			296.78
	Weight of DC			
	Weight of String			

DRILLING ASSEMBLY — TOUR 2

No	Component	OD	ID	Length
1	BIT	222	0	.34
1	TRUTRAK	193.00	88.90	13.04
1	MWD	176.	72.0	0.77
1	NM DRILL COLLAR	163.	72.	9.09
1	NM DRILL COLLAR	161.	72.	8.46
1	FILTER SUB	171	72	1.66
1	X/O	160	57	0.58
4	DC (6.25 IN)	156	70	37.58
1	JARS-HYD/MECH	156	70	10.02
3	DC (6.25 IN)	156	70	27.89
1	X/O	102	65	1.10
20	HWDP(4.0 IN)	102	65	186.25
0	Drill Pipe	Stands		0.00
19	Drill Pipe	Singles		183.22
	Kelly Down			0.00
	Total			480.00
	Weight of DC			
	Weight of String			27.00

DRILLING ASSEMBLY — TOUR 3

No	Component	OD	ID	Length
1	BIT	222	0	.34
1	TRUTRAK	193.00	88.90	13.04
1	MWD	176.	72.0	0.77
1	NM DRILL COLLAR	163.	72.	9.09
1	NM DRILL COLLAR	161.	72.	8.46
1	FILTER SUB	171	72	1.66
1	X/O	160	57	0.58
4	DC (6.25 IN)	156	70	37.58
1	JARS-HYD/MECH	156	70	10.02
3	DC (6.25 IN)	156	70	27.89
1	X/O	102	65	1.10
20	HWDP(4.0 IN)	102	65	186.25
12	Drill Pipe	Stands		231.35
1	Drill Pipe	Singles		9.72
	Kelly Down			7.15
	Total			545.00
	Weight of DC			
	Weight of String			27.00

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
1	SOP	L19-INSTALL WEAR BUSHING	00:00	405
1	SOP	S13-SERVICE AND INSPECT FLUID END ON PUMPS	00:00	405
1	SOP	C7-LOWER TUBULARS WITH SKATE	00:00	405
1	SOP	D3-TRIPPING IN THE HOLE	00:00	405
2	SOP	Connections with Top Drive	08:00	
2	SOP	Mousehole drill pipe	09:00	

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130202_1A	Pason	2013	02	02

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
2	SOP	Inspecting Slips & Elevators	10:00	
2	SOP	Using Pipe Spinner	11:00	
3	SOP	M1-BOP DRILL WHILE DRILLING	21:30	506
3	SOP	M9-OPERATION OF FLARE STACK IGNITOR	21:30	506

MUD SAMPLE - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130202_1A	Pason	2013	02	02

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

TOUR 2 **MUD TYPE** polymer **WATER** x **OIL** **OTHER**

Time		12:00	15:00	18:00														
Density		1000kg/m3	1000kg/m3	1020kg/m3														
Funnel Viscosity		31s/l	31s/l	33s/l														
Fluid Loss																		
Fluid pH				10														
Location of Sample		shaker	shaker	shaker														
Depth																		
PVT																		
Test 1	Type (Ex: Chlorides)																	
	Value																	
Test 2	Type (ex: Sand%)																	
	Value																	
Test 3	Type (ex: Hard Ca)																	
	Value																	
Test 4	Type (ex: Sulfides)																	
	Value																	

MUD SAMPLE REMARKS

MUD SAMPLE - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130202_1A	Pason	2013	02	02

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

TOUR 3 **MUD TYPE** polalamer **WATER** x **OIL** **OTHER**

Time	21:30																
Density	1020kg/m3																
Funnel Viscosity	31s/l																
Fluid Loss	18cm3																
Fluid pH	8																
Location of Sample																	
Depth																	
PVT																	
Test 1 Type (Ex: Chlorides)																	
Test 1 Value																	
Test 2 Type (ex: Sand%)																	
Test 2 Value																	
Test 3 Type (ex: Hard Ca)																	
Test 3 Value																	
Test 4 Type (ex: Sulfides)																	
Test 4 Value																	

MUD SAMPLE REMARKS

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130203_1A	Pason	2013	02	03

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	JD	G&C
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted	JD	G&C
5) Flare Lines Staked	JD	G&C
6) BOP Drills Performed	JD	G&C
7) Visually Inspected BOPs - Flare Lines & Degasser Lines	JD	G&C
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		G&C
5) Motor Kills Checked		

Pason

HOURS

CODE	1 Rig Up	2 Drill Actual	3 Reaming	4 Coring	5 Cond Mud & Circ	6 Trips	7 Rig Service	8 Repair Rig	9 Cut Off Drilg Line	10 Dev Survey	11 Wireline Logs	12 Run Csg & Cement	13 Wait On Cement	14 Nipple Up BOP	15 Test BOP	16 Drillstem Test	17 Plug Back	18 Squeeze Cement	19 Fishing	20 Dir Work	21 Safety Meeting	22 Tear Down	23 Waiting On	24 Rig Watch	25 Other	TOTAL
Tour 1		4.50			3.00		0.25														0.25					8.00
Tour 2		6.50			4.75		0.50														0.25					12.00
Tour 3		2.50			1.25		0.25																			4.00
Total		13.50			9.00		1.00														0.50					24.00

Kelly Bushing | Op Fuel 6328.00

FUEL @ 08:00 HOURS

Rig 11115.00 | Boiler 0.00

WEATHER

Time 08:00 | Temp -22.00 | Current Conditions CLEAR | Wind Direction S | Wind Strength UP TO 19 KM/H | Road Condition FAIR

TOUR 1

SIGNATURE OF DRILLER: Blair Oleksyn | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	1
Size	222
IADC Code	
Manufacturer	HC
Type	PDC
Serial No	7131618
Jets	
Depth Out (m)	
Depth In (m)	405
Total Drilled (m)	
Hrs Run Today	3.50
Cumulative Hrs Run	8.50
Entry Date	2013/02/02

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB
545m	660m	DRILL	30	5kdaN

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	222	0	.34m
1	TRUTRAK	193	89	13.04m
1	MWD	176	72	0.77m
1	NM DRILL COLLAR	163	72	9.09m
1	NM DRILL COLLAR	161	72	8.46m
1	FILTER SUB	171	72	1.66m
1	X/O	160	57	0.58m
4	DC (6.25 IN)	156	70	37.58m
1	JARS-HYD/MECH	156	70	10.02m
3	DC (6.25 IN)	156	70	27.89m
1	X/O	102	65	1.10m
20	HWDP(4.0 IN)	102	65	186.25m
18	Drill Pipe	Stands		347.46m
1	Drill Pipe	Singles		9.72m
	Kelly Down			6.04m
	Total			660.00m
	Weight of DC			
	Weight of String			27kdaN

HOLE CONDITION

Hole Drag: Up 5 | Down 5

Torque at Bottom:

Fill on Bottom:

MUD RECORD

Mud Type: Water [x] Oil [ ]

Other:

Time	04:00	06:30
Density	1030	1020
Funnel Viscosity	34s/l	39s/l
Fluid Loss	14cm3	13cm3
pH	8.5	9.5
Location of Sample		
Depth	613m	645m
PVT		

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1	SINGLE	152	114	7000	4
2	SINGLE	152	114	7000	3

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type
00:45	555.6m	0.2	324.8	
03:30	603.9m	0.6	184.3	
07:00	652.1m	0.4	4.4	

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density
CENT 1	8	1030	1020	1670
CENT 2	8	1030	1020	1670

MUD MATERIALS ADDED

Product	Amount	Type
aqua-star	4	SX
STAFLO	6	SX
polyzan	6	SX
hyperdrill 247	2	SX
CAL CARB 'O'	10	SX
sodium bicarbonate	4	SX
SULFAMIC ACID	1	SX
CAUSTIC	1	SX
matrix shield	3	SX

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	8	10.5	220
A0124704	8	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	03:30	3.50	2	Drill 222mm hole from 545m-630m
03:30	06:30	3.00	5	Acc connection time & survey, and work pipe time
06:30	06:45	0.25	7	Rig service, functioned test pipe rams, 5 sec to close
06:45	07:00	0.25	21	Safety meeting with Akita crew and MGM rep
07:00	08:00	1.00	2	Drill 222mm hole from 630m to 660m

Remarks: COMPETENCY TRAINING ON ROUTINE DRILL FLOOR WORK

Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor

Functioned : Annular, flare igniter, crown saver

SAFETY

Safety Topic	MEHL	MACP
COMPETENCY TRAINING-ROUTINE DRILL FLOOR WORK		6676kPa

TOUR 2

SIGNATURE OF DRILLER: Travis Davson | START TIME: 08:00 | END TIME: 20:00

BITS

Bit Number	1
Size	222
IADC Code	
Manufacturer	HC
Type	PDC
Serial No	7131618
Jets	
Depth Out (m)	
Depth In (m)	405
Total Drilled (m)	
Hrs Run Today	6.50
Cumulative Hrs Run	15.00
Entry Date	2013/02/02

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB
660m	836m	DRILL	30	6kdaN

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	222	0	.34m
1	TRUTRAK	193	89	13.04m
1	MWD	176	72	0.77m
1	NM DRILL COLLAR	163	72	9.09m
1	NM DRILL COLLAR	161	72	8.46m
1	FILTER SUB	171	72	1.66m
1	X/O	160	57	0.58m
4	DC (6.25 IN)	156	70	37.58m
1	JARS-HYD/MECH	156	70	10.02m
3	DC (6.25 IN)	156	70	27.89m
1	X/O	102	65	1.10m
20	HWDP(4.0 IN)	102	65	186.25m
27	Drill Pipe	Stands		539.22m
0	Drill Pipe	Singles		0.00m
	Kelly Down			0.00m
	Total			836.00m
	Weight of DC			
	Weight of String			32kdaN

HOLE CONDITION

Hole Drag: Up 5 | Down 6

Torque at Bottom: 1450.00Nm

Fill on Bottom:

MUD RECORD

Mud Type: Water [x] Oil [ ]

Other:

Time	09:00	12:00
Density	1025	1030
Funnel Viscosity	38s/l	38s/l
Fluid Loss	13cm3	10cm3
pH	10	10
Location of Sample	shaker	shaker
Depth		
PVT		

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1	SINGLE	152	115	6900	4
2	SINGLE	152	114	6900	1

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
1	1850	@	58	@	800
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type
10:15	700.3m	0.6	194.4	
13:30	748.5m	0.4	353.3	
16:15	796.5m	0.3	197.7	

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density
CENT 1	5	1030	1020	1670
CENT 2	5	1030	1020	1670

MUD MATERIALS ADDED

Product	Amount	Type
CAUSTIC	1	SX
SULFAMIC ACID	1	SX
aqua-star	2	SX
STAFLO	1	SX
polyzan	1	SX
hyperdrill 247	1	SX
CAL CARB 'O'	5	SX
matrix shield	6	PAILS

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	12	10.5	220
A0124704	12	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	13:30	5.50	2	Drill 222mm hole from 660m - 817m
13:30	18:15	4.75	5	Acc connection time & survey, and work pipe time
18:15	18:45	0.50	7	Rig service, functioned test pipe rams, 5 sec to close
18:45	19:00	0.25	21	Safety meeting with Akita crew and MGM rep
19:00	20:00	1.00	2	Drill 222mm hole from 817m - 836m

Remarks: Safety Alert discussed about Top Drive Incident

Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor

Functioned : Annular, flare igniter, crown saver

SAFETY

Safety Topic	MEHL	MACP
Floor Inspection		6676kPa

TOUR 3

SIGNATURE OF DRILLER: Blair Oleksyn | START TIME: 20:00 | END TIME: 24:00

BITS

Bit Number	1
Size	222
IADC Code	
Manufacturer	HC
Type	PDC
Serial No	7131618
Jets	
Depth Out (m)	
Depth In (m)	405
Total Drilled (m)	
Hrs Run Today	2.50
Cumulative Hrs Run	17.50
Entry Date	2013/02/02

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB
836m	890m	DRILL	30	6kdaN

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	222	0	.34m
1	TRUTRAK	193	89	13.04m
1	MWD	176	72	0.77m
1	NM DRILL COLLAR	163	72	9.09m
1	NM DRILL COLLAR	161	72	8.46m
1	FILTER SUB	171	72	1.66m
1	X/O	160	57	0.58m
4	DC (6.25 IN)	156	70	37.58m
1	JARS-HYD/MECH	156	70	10.02m
3	DC (6.25 IN)	156	70	27.89m
1	X/O	102	65	1.10m
20	HWDP(4.0 IN)	102	65	186.25m
30	Drill Pipe	Stands		578.61m
1	Drill Pipe	Singles		9.58m
	Kelly Down			5.03m
	Total			890.00m
	Weight of DC			
	Weight of String			40kdaN

HOLE CONDITION

Hole Drag: Up 5 | Down 5

Torque at Bottom:

Fill on Bottom:

MUD RECORD

Mud Type: Water [x] Oil [ ]

Other:

Time	22:00	23:00
Density	1035	1030
Funnel Viscosity	38s/l	39s/l
Fluid Loss	11cm3	10cm3
pH	9.5	9.5
Location of Sample		
Depth	864m	884m
PVT		

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1	SINGLE	152	0	8500	0
2	SINGLE	152	114	8500	3

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type
20:45	844.7m	0.4	47.4	

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density
cent 1	4	1135	1125	1710

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	4	10.5	220
A0124704	4	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
20:00	22:30	2.50	2	Drill 222mm hole from 836m - 890m
22:30	23:45	1.25	5	Acc connection time & survey, and work pipe time
23:45	24:00	0.25	7	Rig service, functioned test annular, 55 sec open/close

Remarks: Safety Alert discussed about Top Drive Incident

Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor

Functioned : Annular, flare igniter, crown saver

MJ= 9042 ACC= 71168

SAFETY

Safety Topic	MEHL	MACP
Top drive incident		

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130203_1A	Pason	2013	02	03

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

DRILLING ASSEMBLY — TOUR 1

No	Component	OD	ID	Length
1	BIT	222	0	.34
1	TRUTRAK	193.00	88.90	13.04
1	MWD	176.	72.0	0.77
1	NM DRILL COLLAR	163.	72.	9.09
1	NM DRILL COLLAR	161.	72.	8.46
1	FILTER SUB	171	72	1.66
1	X/O	160	57	0.58
4	DC (6.25 IN)	156	70	37.58
1	JARS-HYD/MECH	156	70	10.02
3	DC (6.25 IN)	156	70	27.89
1	X/O	102	65	1.10
20	HWDP(4.0 IN)	102	65	186.25
18	Drill Pipe Stands			347.46
1	Drill Pipe Singles			9.72
	Kelly Down			6.04
	Total			660.00
	Weight of DC			
	Weight of String			27.00

DRILLING ASSEMBLY — TOUR 2

No	Component	OD	ID	Length
1	BIT	222	0	.34
1	TRUTRAK	193.00	88.90	13.04
1	MWD	176.	72.0	0.77
1	NM DRILL COLLAR	163.	72.	9.09
1	NM DRILL COLLAR	161.	72.	8.46
1	FILTER SUB	171	72	1.66
1	X/O	160	57	0.58
4	DC (6.25 IN)	156	70	37.58
1	JARS-HYD/MECH	156	70	10.02
3	DC (6.25 IN)	156	70	27.89
1	X/O	102	65	1.10
20	HWDP(4.0 IN)	102	65	186.25
27	Drill Pipe Stands			539.22
0	Drill Pipe Singles			0.00
	Kelly Down			0.00
	Total			836.00
	Weight of DC			
	Weight of String			32.00

DRILLING ASSEMBLY — TOUR 3

No	Component	OD	ID	Length
1	BIT	222	0	.34
1	TRUTRAK	193.00	88.90	13.04
1	MWD	176.	72.0	0.77
1	NM DRILL COLLAR	163.	72.	9.09
1	NM DRILL COLLAR	161.	72.	8.46
1	FILTER SUB	171	72	1.66
1	X/O	160	57	0.58
4	DC (6.25 IN)	156	70	37.58
1	JARS-HYD/MECH	156	70	10.02
3	DC (6.25 IN)	156	70	27.89
1	X/O	102	65	1.10
20	HWDP(4.0 IN)	102	65	186.25
30	Drill Pipe Stands			578.61
1	Drill Pipe Singles			9.58
	Kelly Down			5.03
	Total			890.00
	Weight of DC			
	Weight of String			40.00

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
1	SOP	D28-HOUSE KEEPING ON DRILL FLOOR	00:00	545
1	SOP	C4-SERVICING CATWALK	00:00	545
2	SOP	Boiler blow down	08:00	
2	SOP	Adding EZ treat	09:00	
2	SOP	Changing tube on greasegun	10:00	
2	SOP	Washing Rig	11:00	

MUD SAMPLE - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130203_1A	Pason	2013	02	03

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

TOUR 1 **MUD TYPE** POLAMER **WATER** x **OIL** **OTHER**

Time		04:00	06:30															
Density		1030kg/m3	1020kg/m3															
Funnel Viscosity		34s/l	39s/l															
Fluid Loss		14cm3	13cm3															
Fluid pH		8.5	9.5															
Location of Sample																		
Depth		613m	645m															
PVT																		
Test 1	Type (Ex: Chlorides)																	
	Value																	
Test 2	Type (ex: Sand%)																	
	Value																	
Test 3	Type (ex: Hard Ca)																	
	Value																	
Test 4	Type (ex: Sulfides)																	
	Value																	

MUD SAMPLE REMARKS

MUD SAMPLE - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130203_1A	Pason	2013	02	03

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

TOUR 2 **MUD TYPE** Polymer **WATER** x **OIL** **OTHER**

Time		09:00	12:00	15:00	18:00													
Density		1025kg/m3	1030kg/m3	1025kg/m3	1025kg/m3													
Funnel Viscosity		38s/l	38s/l	38s/l	37s/l													
Fluid Loss		13cm3	10cm3	10cm3	10cm3													
Fluid pH		10	10	10.5	10													
Location of Sample		shaker	shaker	shaker														
Depth																		
PVT																		
Test 1	Type (Ex: Chlorides)																	
	Value																	
Test 2	Type (ex: Sand%)																	
	Value																	
Test 3	Type (ex: Hard Ca)																	
	Value																	
Test 4	Type (ex: Sulfides)																	
	Value																	

MUD SAMPLE REMARKS

MUD SAMPLE - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130203_1A	Pason	2013	02	03

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

TOUR 3 **MUD TYPE** polamer **WATER** x **OIL** **OTHER**

Time	22:00	23:00															
Density	1035kg/m3	1030kg/m3															
Funnel Viscosity	38s/l	39s/l															
Fluid Loss	11cm3	10cm3															
Fluid pH	9.5	9.5															
Location of Sample																	
Depth	864m	884m															
PVT																	
Test 1 Type (Ex: Chlorides)																	
Test 1 Value																	
Test 2 Type (ex: Sand%)																	
Test 2 Value																	
Test 3 Type (ex: Hard Ca)																	
Test 3 Value																	
Test 4 Type (ex: Sulfides)																	
Test 4 Value																	

MUD SAMPLE REMARKS

EQUIPMENT & SERVICES

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130203_1A	Pason	2013	02	03

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

GENERAL EQUIPMENT & SERVICE

Description	Make	Model	Provided by	Expense of	Rental Company	Serial No	Usage	Quantity	Quantity Used
Remarks:									
Remarks:									
Remarks:									

BOILERS

Boiler No	Make	Model	Provided by	Expense of	Rental Company	Serial No	Hours Today
A0093289	Lidster	100 HP	CONTRACTOR	OPERATOR		A0093289	24
Remarks:							
A0124704	Lidster	100HP	CONTRACTOR	OPERATOR		A0124704	24
Remarks:							
Remarks:							

SHALE SHAKERS

Shaker No	Make	Model	Screen 1				Screen 2				Screen 3				Screen 4			
			Position	Size	ScreenChanged?	New?	Position	Size	Screen Changed?	New?	Position	Size	Screen Changed?	New?	Position	Size	Screen Changed?	New?
1	SWACO	MONGOOSE	1	200	☐	X	2	200	☐	X	3	165	☐	X	4	165	☐	X
Remarks:																		
2	SWACO	MONGOOSE	1	200	☐	X	2	200	☐	X	3	165	☐	X	4	165	☐	X
Remarks:																		
					☐	☐			☐	☐			☐	☐			☐	☐
Remarks:																		

MUD PUMPS

Pump No	Make	Model	Provided by	Expense of	Rental Company	Serial No	Hours Today	Stroke Length	Rod Size	Pump Style
1	NATIONAL	9P-100	CONTRACTOR	CONTRACTOR		PMP-024	8	235mm		TRIPLEX
Remarks:										
2	NATIONAL	9P-100	CONTRACTOR	CONTRACTOR		PMP-023	7	235mm		TRIPLEX
Remarks:										
Remarks:										

BITS

Bit No	Size	IADC Code				Manufacturer	Type	Serial No	Jets								Depth In	Depth Out	Total Drilled	Total Hours Run Today	Cumula-tive Hours Run	Entry Date	Cutting Structure									Tour
		1	2	3	4				1	2	3	4	5	6	7	8							TI	T0	MDC	LOC	BRG	Gage	ODC	Reason Pulled	Total Run m/Hr	
1	222.00-mm					HC	PDC	7131618									405.00m			3.50	8.50	13/02/02										1
1	222.00-mm					HC	PDC	7131618									405.00m	405.00m	0.00m	5.00	13.50	13/02/02									0.00m/hr	2
1	222.00-mm					HC	PDC	7131618									405.00m			6.50	15.00	13/02/02										2
1	222.00-mm					HC	PDC	7131618									405.00m			2.50	17.50	13/02/02										3

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130204_1B	Pason	2013	02	04

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

DAILY CHECKS	OP	RM
1) Daily Walk Around Inspection	JD	G&C
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted	JD	G&C
5) Flare Lines Staked	JD	G&C
6) BOP Drills Performed	JD	G&C
7) Visually Inspected BOPs - Flare Lines & Degasser Lines	JD	G&C
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		G&C
5) Motor Kills Checked		

Pason

CODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
HOURS	Rig Up	Drill Actual	Reaming	Coring	Cond Mud & Circ	Trips	Rig Service	Repair Rig	Cut Off Drilg Line	Dev Survey	Wireline Logs	Run Csg & Cement	Wait On Cement	Nipple Up BOP	Test BOP	Drillstem Test	Plug Back	Squeeze Cement	Fishing	Dir Work	Safety Meeting	Tear Down	Waiting On	Rig Watch	Other	TOTAL
Tour 1		4.50			3.00		0.25														0.25					8.00
Tour 2		5.75			5.75		0.25														0.25					12.00
Tour 3		3.25			0.50		0.25																			4.00
Total		13.50			9.25		0.75														0.50					24.00

Kelly Bushing | Op Fuel 6177.00

FUEL @ 08:00 HOURS

Rig 7956.00 | Boiler 0.00

WEATHER

Time 08:00 | Temp -27.00 | Current Conditions CLEAR | Wind Direction W | Wind Strength UP TO 19 KM/H | Road Condition GOOD

TOUR 1

SIGNATURE OF DRILLER: Blair Oleksyn | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	1
Size	222
IADC Code	
Manufacturer	HC
Type	PDC
Serial No	7131618
Jets	
Depth Out (m)	
Depth In (m)	405
Total Drilled (m)	
Hrs Run Today	4.50
Cumulative Hrs Run	22.00
Entry Date	2013/02/02

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB
890m	1010m	DRILL	30	6kdaN

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	222	0	.34m
1	TRUTRAK	193	89	13.04m
1	MWD	176	72	0.77m
1	NM DRILL COLLAR	163	72	9.09m
1	NM DRILL COLLAR	161	72	8.46m
1	FILTER SUB	171	72	1.66m
1	X/O	160	57	0.58m
4	DC (6.25 IN)	156	70	37.58m
1	JARS-HYD/MECH	156	70	10.02m
3	DC (6.25 IN)	156	70	27.89m
1	X/O	102	65	1.10m
20	HWDP(4.0 IN)	102	65	186.25m
37	Drill Pipe	Stands		713.02m
0	Drill Pipe	Singles		0.00m
	Kelly Down			0.20m
	Total			1010.00m
	Weight of DC			
	Weight of String			40kdaN

HOLE CONDITION

Hole Drag: Up 6 | Down 6

Torque at Bottom:

Fill on Bottom:

MUD RECORD

Mud Type: Water [x] Oil [ ]

Other:

Time	03:00	06:30
Density	1025	1040
Funnel Viscosity	42s/l	41s/l
Fluid Loss	10cm3	10cm3
pH	9.5	9.5
Location of Sample		
Depth	940m	997m
PVT		

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1	SINGLE	152	114	7500	3
2	SINGLE	152	114	7500	3

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
1	2100	@	58	@	970
2	2641	@	64	@	970
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type
00:00	892.8m	0.5	222.2	
03:15	941m	0.6	22.8	
06:15	988.8m	0.6	214.1	

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density
CENTERFUGE	8	1025	1020	1680

MUD MATERIALS ADDED

Product	Amount	Type
aqua-star	2	SX
poly-xax	3	SX
hyperdrill 247	2	SX
CAL CARB 'O'	10	SX
matrix shield	4	PAILS
SULFAMIC ACID	1	SX
STAFLO	3	SX

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	8	10.5	220
A0124704	8	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	03:30	3.50	2	Drill 222mm hole from 890m-995m
03:30	06:30	3.00	5	Acc connection time & survey, and work pipe time
06:30	06:45	0.25	7	Rig service, functioned test pipe rams, 5 sec to close
06:45	07:00	0.25	21	Safety meeting with Akita crew and MGM rep
07:00	08:00	1.00	2	Drill 222mm hole from 995m to 1010m

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor

Functioned : Annular, flare igniter, crown saver

SAFETY

Safety Topic	MEHL	MACP
STEAM USE		6637kPa

TOUR 2

SIGNATURE OF DRILLER: Travis Davson | START TIME: 08:00 | END TIME: 20:00

BITS

Bit Number	1
Size	222
IADC Code	
Manufacturer	HC
Type	PDC
Serial No	7131618
Jets	
Depth Out (m)	
Depth In (m)	405
Total Drilled (m)	787
Hrs Run Today	5.75
Cumulative Hrs Run	27.75
Entry Date	2013/02/02

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB
1010m	1192m	DRILL	30	7kdaN

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	222	0	.34m
1	TRUTRAK	193	89	13.04m
1	MWD	176	72	0.77m
1	NM DRILL COLLAR	163	72	9.09m
1	NM DRILL COLLAR	161	72	8.46m
1	FILTER SUB	171	72	1.66m
1	X/O	160	57	0.58m
4	DC (6.25 IN)	156	70	37.58m
1	JARS-HYD/MECH	156	70	10.02m
3	DC (6.25 IN)	156	70	27.89m
1	X/O	102	65	1.10m
20	HWDP(4.0 IN)	102	65	186.25m
46	Drill Pipe	Stands		886.54m
1	Drill Pipe	Singles		9.60m
	Kelly Down			0.00m
	Total			1192.92m
	Weight of DC			
	Weight of String			48kdaN

HOLE CONDITION

Hole Drag: Up 6 | Down 6

Torque at Bottom:

Fill on Bottom:

MUD RECORD

Mud Type: Water [x] Oil [ ]

Other:

Time	09:00	12:00
Density	1040	1040
Funnel Viscosity	40s/l	42s/l
Fluid Loss	10cm3	10cm3
pH	10	9.5
Location of Sample	shaker	shaker
Depth		
PVT		

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1	SINGLE	152	114	8650	4.75
2	SINGLE	152	114	8650	1

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
1	2300	@	58	@	1130
2	2780	@	64	@	1140
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type
09:15	1036.9m	0.3	8.9	
12:30	1085.1m	0.4	207.9	
16:00	1133.4m	0.4	33.9	

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type
CAUSTIC	1	SX
matrix shield	7	PAILS

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	12	10.5	220
A0124704	12	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	12:45	4.75	2	Drill 222mm hole from 1010m - 1173m
12:45	18:30	5.75	5	Acc connection time & survey, and work pipe time
18:30	18:45	0.25	7	Rig service, functioned test pipe rams, 5 sec to close
18:45	19:00	0.25	21	Safety meeting with Akita crew and MGM rep
19:00	20:00	1.00	2	Drill 222mm hole from 1173m - 1192m

Remarks: REVIEWED FIRE DRILL AT CAMP

Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor

Functioned : Annular, flare igniter, crown saver

SAFETY

Safety Topic	MEHL	MACP
Camp Fire Drill		6676kPa

TOUR 3

SIGNATURE OF DRILLER: Blair Oleksyn | START TIME: 20:00 | END TIME: 24:00

BITS

Bit Number	1
Size	222
IADC Code	
Manufacturer	HC
Type	PDC
Serial No	7131618
Jets	
Depth Out (m)	
Depth In (m)	405
Total Drilled (m)	
Hrs Run Today	3.25
Cumulative Hrs Run	31.00
Entry Date	2013/02/02

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB
1192m	1260m	DRILL	30	8kdaN

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	222	0	.34m
1	TRUTRAK	193	89	13.04m
1	MWD	176	72	0.77m
1	NM DRILL COLLAR	163	72	9.09m
1	NM DRILL COLLAR	161	72	8.46m
1	FILTER SUB	171	72	1.66m
1	X/O	160	57	0.58m
4	DC (6.25 IN)	156	70	37.58m
1	JARS-HYD/MECH	156	70	10.02m
3	DC (6.25 IN)	156	70	27.89m
1	X/O	102	65	1.10m
20	HWDP(4.0 IN)	102	65	186.25m
50	Drill Pipe	Stands		963.22m
0	Drill Pipe	Singles		0.00m
	Kelly Down			0.00m
	Total			1260.00m
	Weight of DC			
	Weight of String			48kdaN

HOLE CONDITION

Hole Drag: Up 7 | Down 7

Torque at Bottom:

Fill on Bottom:

MUD RECORD

Mud Type: Water [x] Oil [ ]

Other:

Time	20:00	23:30
Density	1040	1040
Funnel Viscosity	41s/l	41s/l
Fluid Loss	9.5cm3	10cm3
pH	9.5	9.4
Location of Sample		
Depth	1185m	1248m
PVT	52m3	45.7m3

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1	SINGLE	152	0	9500	0
2	SINGLE	152	114	9500	3

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
1	2380	@	58	@	1220
2	2850	@	64	@	1220
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type
20:00	1181.6m	0.2	170.6	
22:45	1229.8m	0.2	60.6	

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density
cent 1	0	0	0	0
cent 2	0	0	0	0

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	4	10.5	240
A0124704	4	10.5	235

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
20:00	23:15	3.25	2	Drill 222mm hole from 1192m - 1260m
23:15	23:45	0.50	5	Acc connection time & survey, and work pipe time
23:45	24:00	0.25	7	Rig service, functioned test pason choke

Remarks: Fuel Transfer 4500L @ 22:00

Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor

Functioned : Annular, flare igniter, crown saver

MJ = 9894 ACC=72019

SAFETY

Safety Topic	MEHL	MACP
Monthly checks	60.00kdaN	6637kPa

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130204_1B	Pason	2013	02	04

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

DRILLING ASSEMBLY — TOUR 1

No	Component	OD	ID	Length
1	BIT	222	0	.34
1	TRUTRAK	193.00	88.90	13.04
1	MWD	176.	72.0	0.77
1	NM DRILL COLLAR	163.	72.	9.09
1	NM DRILL COLLAR	161.	72.	8.46
1	FILTER SUB	171	72	1.66
1	X/O	160	57	0.58
4	DC (6.25 IN)	156	70	37.58
1	JARS-HYD/MECH	156	70	10.02
3	DC (6.25 IN)	156	70	27.89
1	X/O	102	65	1.10
20	HWDP(4.0 IN)	102	65	186.25
37	Drill Pipe	Stands		713.02
0	Drill Pipe	Singles		0.00
	Kelly Down			0.20
	Total			1010.00
	Weight of DC			
	Weight of String			40.00

DRILLING ASSEMBLY — TOUR 2

No	Component	OD	ID	Length
1	BIT	222	0	.34
1	TRUTRAK	193.00	88.90	13.04
1	MWD	176.	72.0	0.77
1	NM DRILL COLLAR	163.	72.	9.09
1	NM DRILL COLLAR	161.	72.	8.46
1	FILTER SUB	171	72	1.66
1	X/O	160	57	0.58
4	DC (6.25 IN)	156	70	37.58
1	JARS-HYD/MECH	156	70	10.02
3	DC (6.25 IN)	156	70	27.89
1	X/O	102	65	1.10
20	HWDP(4.0 IN)	102	65	186.25
46	Drill Pipe	Stands		886.54
1	Drill Pipe	Singles		9.60
	Kelly Down			0.00
	Total			1192.92
	Weight of DC			
	Weight of String			48.00

DRILLING ASSEMBLY — TOUR 3

No	Component	OD	ID	Length
1	BIT	222	0	.34
1	TRUTRAK	193.00	88.90	13.04
1	MWD	176.	72.0	0.77
1	NM DRILL COLLAR	163.	72.	9.09
1	NM DRILL COLLAR	161.	72.	8.46
1	FILTER SUB	171	72	1.66
1	X/O	160	57	0.58
4	DC (6.25 IN)	156	70	37.58
1	JARS-HYD/MECH	156	70	10.02
3	DC (6.25 IN)	156	70	27.89
1	X/O	102	65	1.10
20	HWDP(4.0 IN)	102	65	186.25
50	Drill Pipe	Stands		963.22
0	Drill Pipe	Singles		0.00
	Kelly Down			0.00
	Total			1260.00
	Weight of DC			
	Weight of String			48.00

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
1	SOP	d33-SPOOLING TUGGER	00:00	890
1	SOP	B5-STEAM USE	00:00	890
1	SOP	E10-ELECTRICAL CORD INSPECTIONS	00:00	890
1	SOP	G22-WASHING THE RIG	00:00	890
2	SOP	Lock out washgun	08:00	
2	SOP	Camp fire drill	09:00	

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130204_1B	Pason	2013	02	04

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
2	SOP	Connection with top drive	10:00	
2	SOP	Shovelling show	11:00	
3	JSA REVIEW	Making connections	20:00	

MUD SAMPLE - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130204_1B	Pason	2013	02	04

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

TOUR 1 **MUD TYPE** polamer **WATER** x **OIL** **OTHER**

Time		03:00	06:30															
Density		1025kg/m3	1040kg/m3															
Funnel Viscosity		42s/l	41s/l															
Fluid Loss		10cm3	10cm3															
Fluid pH		9.5	9.5															
Location of Sample																		
Depth		940m	997m															
PVT																		
Test 1	Type (Ex: Chlorides)																	
	Value																	
Test 2	Type (ex: Sand%)																	
	Value																	
Test 3	Type (ex: Hard Ca)																	
	Value																	
Test 4	Type (ex: Sulfides)																	
	Value																	

MUD SAMPLE REMARKS

MUD SAMPLE - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130204_1B	Pason	2013	02	04

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

TOUR 2 **MUD TYPE** Polymer **WATER** x **OIL** **OTHER**

Time		09:00	12:00	15:00	18:00													
Density		1040kg/m3	1040kg/m3	1040kg/m3	1045kg/m3													
Funnel Viscosity		40s/l	42s/l	42s/l	41s/l													
Fluid Loss		10cm3	10cm3	10cm3	9.5cm3													
Fluid pH		10	9.5	9.5	9.5													
Location of Sample		shaker	shaker	shaker	shaker													
Depth																		
PVT																		
Test 1	Type (Ex: Chlorides)																	
	Value																	
Test 2	Type (ex: Sand%)																	
	Value																	
Test 3	Type (ex: Hard Ca)																	
	Value																	
Test 4	Type (ex: Sulfides)																	
	Value																	

MUD SAMPLE REMARKS

MUD SAMPLE - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130204_1B	Pason	2013	02	04

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

TOUR 3 **MUD TYPE** Polymer **WATER** x **OIL** **OTHER**

Time	20:00	23:30															
Density	1040kg/m3	1040kg/m3															
Funnel Viscosity	41s/l	41s/l															
Fluid Loss	9.5cm3	10cm3															
Fluid pH	9.5	9.4															
Location of Sample																	
Depth	1185m	1248m															
PVT	52m3	45.7m3															
Test 1 Type (Ex: Chlorides)																	
Test 1 Value																	
Test 2 Type (ex: Sand%)																	
Test 2 Value																	
Test 3 Type (ex: Hard Ca)																	
Test 3 Value																	
Test 4 Type (ex: Sulfides)																	
Test 4 Value																	

MUD SAMPLE REMARKS

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130205_1B	Pason	2013	02	05

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

DAILY CHECKS	OP	RM
1) Daily Walk Around Inspection	JD	G&C
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted	JD	G&C
5) Flare Lines Staked	JD	G&C
6) BOP Drills Performed	JD	G&C
7) Visually Inspected BOPs - Flare Lines & Degasser Lines	JD	G&C
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		G&C
5) Motor Kills Checked		

Pason

HOURS	CODE	1 Rig Up	2 Drill Actual	3 Reaming	4 Coring	5 Cond Mud & Circ	6 Trips	7 Rig Service	8 Repair Rig	9 Cut Off Drilg Line	10 Dev Survey	11 Wireline Logs	12 Run Csg & Cement	13 Wait On Cement	14 Nipple Up BOP	15 Test BOP	16 Drillstem Test	17 Plug Back	18 Squeeze Cement	19 Fishing	20 Dir Work	21 Safety Meeting	22 Tear Down	23 Waiting On	24 Rig Watch	25 Other	TOTAL
	Tour 1		5.00			2.50		0.25														0.25					8.00
	Tour 2		8.00			2.75					0.75											0.50					12.00
	Tour 3		2.50			0.50					0.75											0.25					4.00
	Total		15.50			5.75		0.25			1.50											1.00					24.00

Kelly Bushing | Op Fuel 6177.00

FUEL @ 08:00 HOURS

Rig 7956.00 | Boiler 0.00

WEATHER

Time 08:00 | Temp -27.00 | Current Conditions CLEAR | Wind Direction W | Wind Strength UP TO 19 KM/H | Road Condition GOOD

TOUR 1

SIGNATURE OF DRILLER: Blair Oleksyn | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	1
Size	222
IADC Code	
Manufacturer	HC
Type	PDC
Serial No	7131618
Jets	
Depth Out (m)	
Depth In (m)	405
Total Drilled (m)	
Hrs Run Today	5.00
Cumulative Hrs Run	36.00
Entry Date	2013/02/02

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB
1260m	1360m	DRILL	30	9kdaN

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	222	0	.34m
1	TRUTRAK	193	89	13.04m
1	MWD	176	72	0.77m
1	NM DRILL COLLAR	163	72	9.09m
1	NM DRILL COLLAR	161	72	8.46m
1	FILTER SUB	171	72	1.66m
1	X/O	160	57	0.58m
4	DC (6.25 IN)	156	70	37.58m
1	JARS-HYD/MECH	156	70	10.02m
3	DC (6.25 IN)	156	70	27.89m
1	X/O	102	65	1.10m
20	HWDP(4.0 IN)	102	65	186.25m
55	Drill Pipe	Stands		1059.96m
0	Drill Pipe	Singles		0.00m
	Kelly Down			3.26m
	Total			1360.00m
	Weight of DC			
	Weight of String			48kdaN

HOLE CONDITION

Hole Drag: Up 7 | Down 7

Torque at Bottom	
Fill on Bottom	

MUD RECORD

Mud Type: Water [x] Oil [ ] Other

Time	03:30	06:00
Density	1045	1045
Funnel Viscosity	41s/l	41s/l
Fluid Loss	10cm3	10cm3
pH	9.5	9.5
Location of Sample		
Depth		1336m
PVT		48m3

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1	SINGLE	152	114	8000	3
2	SINGLE	152	114	8000	2

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
1	2400	@	58	@	1300
2	2950	@	64	@	1300
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type
02:00	1277.9m	0.2	103.1	
05:30	1326.1m	0	355.9	

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density
cent 1	0	0	0	0
cent 2	0	0	0	0

MUD MATERIALS ADDED

Product	Amount	Type
aqua-star	2	SX
poly-xax	1	SX
STAFLO	1	SX
hyperdrill 247	1	SX
CAL CARB 'O'	5	SX
matrix shield	1	SX

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	8	10.5	220
A0124704	8	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	04:00	4.00	2	Drill 222mm hole from 1260m-1340m
04:00	06:30	2.50	5	Acc connection time & survey, and work pipe time
06:30	06:45	0.25	7	Rig service, functioned test pipe rams, 5 sec to close
06:45	07:00	0.25	21	Safety meeting with Akita crew and MGM rep
07:00	08:00	1.00	2	Drill 222mm hole from 1340m to 1360m

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor

Functioned : Annular, flare igniter, crown saver

SAFETY

Safety Topic	MEHL	MACP
Journey managment	61.00kdaN	6637kPa

TOUR 2

SIGNATURE OF DRILLER: Travis Davson | START TIME: 08:00 | END TIME: 20:00

BITS

Bit Number	1
Size	222
IADC Code	
Manufacturer	HC
Type	PDC
Serial No	7131618
Jets	
Depth Out (m)	
Depth In (m)	405
Total Drilled (m)	1110
Hrs Run Today	6.00
Cumulative Hrs Run	42.00
Entry Date	2013/02/02

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB
1360m	1515m	DRILL	30	9kdaN

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	222	0	.34m
1	TRUTRAK	193	89	13.04m
1	MWD	176	72	0.77m
1	NM DRILL COLLAR	163	72	9.09m
1	NM DRILL COLLAR	161	72	8.46m
1	FILTER SUB	171	72	1.66m
1	X/O	160	57	0.58m
4	DC (6.25 IN)	156	70	37.58m
1	JARS-HYD/MECH	156	70	10.02m
3	DC (6.25 IN)	156	70	27.89m
1	X/O	102	65	1.10m
20	HWDP(4.0 IN)	102	65	186.25m
63	Drill Pipe	Stands		1214.02m
0	Drill Pipe	Singles		0.00m
	Kelly Down			4.20m
	Total			1515.00m
	Weight of DC			10kdaN
	Weight of String			48kdaN

HOLE CONDITION

Hole Drag: Up 3 | Down 3

Torque at Bottom	2678.00Nm
Fill on Bottom	

MUD RECORD

Mud Type: Water [x] Oil [ ] Other

Time	09:00	12:00
Density	1050	1050
Funnel Viscosity	41s/l	42s/l
Fluid Loss	9.5cm3	9.5cm3
pH	9.5	9.5
Location of Sample	shaker	shaker
Depth		
PVT		

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1	SINGLE	152	119	10886	6

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
1	3030	@	64	@	1430
1	3095	@	64	@	1465
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type
09:00	1374.2m	0.2	34.9	
14:00	1422.4m	0.4	49.1	
17:15	1470.5m	0.4	55.2	

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type
matrix shield	4	PAILS
STAFLO	4	SX
aqua-star	3	SX
SULFAMIC ACID	1	SX

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	12	10.5	220
A0124704	12	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	12:00	4.00	2	Drill 222mm hole from 1360m to 1415m
12:00	13:30	1.50	5	Circulating and changing out Baker Stand pipe pressure sensor
13:30	17:30	4.00	2	Drill 222mm hole from 1415m to 1515m
17:30	18:45	1.25	5	Accum work pipe & connections
18:45	19:00	0.25	21	Safety meeting with Akita crew and MGM rep
19:00	19:45	0.75	10	Acc Survey's
19:45	20:00	0.25	21A	BOP drill held with Crew well secure 65 seconds / Rig service

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor

Functioned : Annular, flare igniter, crown saver,

SAFETY

Safety Topic	MEHL	MACP
Fall Protection	55.00kdaN	6637kPa

TOUR 3

SIGNATURE OF DRILLER: Joel Docto | START TIME: 20:00 | END TIME: 24:00

BITS

Bit Number	1
Size	222
IADC Code	
Manufacturer	HC
Type	PDC
Serial No	7131618
Jets	
Depth Out (m)	
Depth In (m)	405
Total Drilled (m)	1195
Hrs Run Today	2.50
Cumulative Hrs Run	44.50
Entry Date	2013/02/02

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB
1515m	1600m	DRILL	1	13kdaN

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	222	0	.34m
1	TRUTRAK	193	89	13.04m
1	MWD	176	72	0.77m
1	NM DRILL COLLAR	163	72	9.09m
1	NM DRILL COLLAR	161	72	8.46m
1	FILTER SUB	171	72	1.66m
1	X/O	160	57	0.58m
4	DC (6.25 IN)	156	70	37.58m
1	JARS-HYD/MECH	156	70	10.02m
3	DC (6.25 IN)	156	70	27.89m
1	X/O	102	65	1.10m
20	HWDP(4.0 IN)	102	65	186.25m
67	Drill Pipe	Stands		1291.16m
1	Drill Pipe	Singles		9.51m
	Kelly Down			2.55m
	Total			1600.00m
	Weight of DC			10kdaN
	Weight of String			48kdaN

HOLE CONDITION

Hole Drag: Up 2 | Down 2

Torque at Bottom	2555.00Nm
Fill on Bottom	0.00m

MUD RECORD

Mud Type: Water [x] Oil [ ] Other

Time	23:00
Density	1045
Funnel Viscosity	46s/l
Fluid Loss	
pH	
Location of Sample	Shakers
Depth	
PVT	

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1	SINGLE	152	120	11996	2.5

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
1	3095	@	64	@	1465
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type
20:00	1518.6m	0.3	68	

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type
STAFLO	6	SX
aqua-star	6	SX
corinox	2	SX

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	4	10.5	220
A0124704	4	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
20:00	22:30	2.50	2	Drill 222mm hole from 1515m to 1600m
22:30	23:00	0.50	5	Accum work pipe & connections
23:00	23:45	0.75	10	Accum surveys
23:45	24:00	0.25	21A	BOP Drill held with crew Well secure 59 Seconds

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor

Functioned : Annular, flare igniter, crown saver

Mj = 11394 Acc = 73519

SAFETY

Safety Topic	MEHL	MACP
Slips & trips	55.00kdaN	6637kPa

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130205_1B	Pason	2013	02	05

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

DRILLING ASSEMBLY — TOUR 1

No	Component	OD	ID	Length
1	BIT	222	0	.34
1	TRUTRAK	193.00	88.90	13.04
1	MWD	176.	72.0	0.77
1	NM DRILL COLLAR	163.	72.	9.09
1	NM DRILL COLLAR	161.	72.	8.46
1	FILTER SUB	171	72	1.66
1	X/O	160	57	0.58
4	DC (6.25 IN)	156	70	37.58
1	JARS-HYD/MECH	156	70	10.02
3	DC (6.25 IN)	156	70	27.89
1	X/O	102	65	1.10
20	HWDP(4.0 IN)	102	65	186.25
55	Drill Pipe	Stands		1059.96
0	Drill Pipe	Singles		0.00
	Kelly Down			3.26
	Total			1360.00
	Weight of DC			
	Weight of String			48.00

DRILLING ASSEMBLY — TOUR 2

No	Component	OD	ID	Length
1	BIT	222	0	.34
1	TRUTRAK	193.00	88.90	13.04
1	MWD	176.	72.0	0.77
1	NM DRILL COLLAR	163.	72.	9.09
1	NM DRILL COLLAR	161.	72.	8.46
1	FILTER SUB	171	72	1.66
1	X/O	160	57	0.58
4	DC (6.25 IN)	156	70	37.58
1	JARS-HYD/MECH	156	70	10.02
3	DC (6.25 IN)	156	70	27.89
1	X/O	102	65	1.10
20	HWDP(4.0 IN)	102	65	186.25
63	Drill Pipe	Stands		1214.02
0	Drill Pipe	Singles		0.00
	Kelly Down			4.20
	Total			1515.00
	Weight of DC			10.00
	Weight of String			48.00

DRILLING ASSEMBLY — TOUR 3

No	Component	OD	ID	Length
1	BIT	222	0	.34
1	TRUTRAK	193.00	88.90	13.04
1	MWD	176.	72.0	0.77
1	NM DRILL COLLAR	163.	72.	9.09
1	NM DRILL COLLAR	161.	72.	8.46
1	FILTER SUB	171	72	1.66
1	X/O	160	57	0.58
4	DC (6.25 IN)	156	70	37.58
1	JARS-HYD/MECH	156	70	10.02
3	DC (6.25 IN)	156	70	27.89
1	X/O	102	65	1.10
20	HWDP(4.0 IN)	102	65	186.25
67	Drill Pipe	Stands		1291.16
1	Drill Pipe	Singles		9.51
	Kelly Down			2.55
	Total			1600.00
	Weight of DC			10.00
	Weight of String			48.00

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
1	JSA REVIEW	Steam use	02:00	
1	JSA REVIEW	Connections	04:00	
2	SOP	Removing lid from pail	08:00	
2	SOP	Using the MSDS book	09:00	
2	SOP	Change tong dies	10:00	
2	SOP	Using steam blanket	11:00	

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130205_1B	Pason	2013	02	05

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
3	SOP	D-6 connections w/ top drive	20:00	
3	SOP	D-28 house keeping on drill floor	20:00	
3	SOP	D-12 daily tong maintence	20:00	
3	SOP	D-32 using rope to catch tubulars	20:00	

MUD SAMPLE - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130205_1B	Pason	2013	02	05

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

TOUR 1 **MUD TYPE** polamer **WATER** x **OIL** **OTHER**

Time		03:30	06:00															
Density		1045kg/m3	1045kg/m3															
Funnel Viscosity		41s/l	41s/l															
Fluid Loss		10cm3	10cm3															
Fluid pH		9.5	9.5															
Location of Sample																		
Depth			1336m															
PVT			48m3															
Test 1	Type (Ex: Chlorides)																	
	Value																	
Test 2	Type (ex: Sand%)																	
	Value																	
Test 3	Type (ex: Hard Ca)																	
	Value																	
Test 4	Type (ex: Sulfides)																	
	Value																	

MUD SAMPLE REMARKS

MUD SAMPLE - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130205_1B	Pason	2013	02	05

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

TOUR 2 **MUD TYPE** polymer **WATER** x **OIL** **OTHER**

Time	09:00	12:00	15:00	17:00	19:00												
Density	1050kg/m3	1050kg/m3	1050kg/m3	1045kg/m3	1045kg/m3												
Funnel Viscosity	41s/l	42s/l	43s/l	46s/l	47s/l												
Fluid Loss	9.5cm3	9.5cm3	9cm3	8.5cm3	8cm3												
Fluid pH	9.5	9.5	9.5	9.5	9.5												
Location of Sample	shaker	shaker	shaker	shaker	shaker												
Depth																	
PVT																	
Test 1 Type (Ex: Chlorides)																	
Test 1 Value																	
Test 2 Type (ex: Sand%)																	
Test 2 Value																	
Test 3 Type (ex: Hard Ca)																	
Test 3 Value																	
Test 4 Type (ex: Sulfides)																	
Test 4 Value																	

MUD SAMPLE REMARKS

MUD SAMPLE - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130205_1B	Pason	2013	02	05

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

TOUR 3 **MUD TYPE** Polymer **WATER** x **OIL** **OTHER**

Time	23:00																
Density	1045kg/m3																
Funnel Viscosity	46s/l																
Fluid Loss																	
Fluid pH																	
Location of Sample	Shakers																
Depth																	
PVT																	
Test 1 Type (Ex: Chlorides)																	
Test 1 Value																	
Test 2 Type (ex: Sand%)																	
Test 2 Value																	
Test 3 Type (ex: Hard Ca)																	
Test 3 Value																	
Test 4 Type (ex: Sulfides)																	
Test 4 Value																	

MUD SAMPLE REMARKS

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130206_1A	Pason	2013	02	06

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Shane Welles	

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	JD	G&S
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted	JD	G&S
5) Flare Lines Staked	JD	G&S
6) BOP Drills Performed	JD	G&S
7) Visually Inspected BOPs - Flare Lines & Degasser Lines	JD	G&S
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		G&S
5) Motor Kills Checked		

Pason

CODE	1 Rig Up	2 Drill Actual	3 Reaming	4 Coring	5 Cond Mud & Circ	6 Trips	7 Rig Service	8 Repair Rig	9 Cut Off Drilg Line	10 Dev Survey	11 Wireline Logs	12 Run Csg & Cement	13 Wait On Cement	14 Nipple Up BOP	15 Test BOP	16 Drillstem Test	17 Plug Back	18 Squeeze Cement	19 Fishing	20 Dir Work	21 Safety Meeting	22 Tear Down	23 Waiting On	24 Rig Watch	25 Other	TOTAL
HOURS Tour 1		6.75					0.50			0.50											0.25					8.00
Tour 2		6.00			2.75	1.25	0.25			1.50											0.25					12.00
Tour 3						3.50	0.50																			4.00
Total		12.75			2.75	4.75	1.25			2.00											0.50					24.00

Kelly Bushing | Op Fuel 7430.00

FUEL @ 08:00 HOURS

Rig 20358.00 | Boiler 0.00

WEATHER Time 08:00 | Temp -27.00 | Current Conditions CLEAR | Wind Direction W | Wind Strength UP TO 19 KM/H | Road Condition GOOD

TOUR 1

SIGNATURE OF DRILLER: Travis Davson | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	1
Size	222
IADC Code	
Manufacturer	HC
Type	PDC
Serial No	7131618
Jets	
Depth Out (m)	
Depth In (m)	405
Total Drilled (m)	1335
Hrs Run Today	4.25
Cumulative Hrs Run	44.50
Entry Date	2013/02/02

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB
1600m	1740m	DRILL	2	12kdaN

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	222	0	.34m
1	TRUTRAK	193	89	13.04m
1	MWD	176	72	0.77m
1	NM DRILL COLLAR	163	72	9.09m
1	NM DRILL COLLAR	161	72	8.46m
1	FILTER SUB	171	72	1.66m
1	X/O	160	57	0.58m
4	DC (6.25 IN)	156	70	37.58m
1	JARS-HYD/MECH	156	70	10.02m
3	DC (6.25 IN)	156	70	27.89m
1	X/O	102	65	1.10m
20	HWDP(4.0 IN)	102	65	186.25m
75	Drill Pipe	Stands		1441.28m
0	Drill Pipe	Singles		0.00m
	Kelly Down			1.94m
	Total			1740.00m
	Weight of DC			10kdaN
	Weight of String			49kdaN

HOLE CONDITION

Hole Drag Up 5 Down 5

Torque at Bottom	2550.00Nm
Fill on Bottom	

MUD RECORD

Mud Type: Water [x] Oil [ ] Other

Time	02:00	04:00
Density	1055	1060
Funnel Viscosity	46s/l	47s/l
Fluid Loss	8.5cm3	8cm3
pH	9.5	9.5
Location of Sample	shaker	shaker
Depth		
PVT		

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1	SINGLE	152	119	12115	4.25

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
1	3630	@	64	@	1620
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type
01:30	1615.2m	0.5	84.1	
04:15	1663.2m	1	79.6	

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type
aqua-star	9	SX
STAFLO	1	SX
polyzan	1	SX
hyperdrill 247	1	SX
CAL CARB 'O'	5	SX
matrix shield	6	PAILS
corinox	2	PAILS

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	8	10.5	220
A0124704	8	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	03:15	3.25	2	Drill 222mm hole from 1600m - 1722m
03:15	05:45	2.50	2	Accum work pipe & connections
05:45	06:15	0.50	10	Accum surveys
06:15	06:45	0.50	7	Rig service, function upper pipe rams c/o 7 sec.
06:45	07:00	0.25	21	Safety meeting with Akita crew and MGM rep
07:00	08:00	1.00	2	Drill 222mm hole from 1722m - 1740m

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor
Functioned : Annular, flare igniter, crown saver

SAFETY

Safety Topic	MEHL	MACP
Short Change Shift		6558kPa

TOUR 2

SIGNATURE OF DRILLER: Joel Doctor | START TIME: 08:00 | END TIME: 20:00

BITS

Bit Number	1
Size	222
IADC Code	
Manufacturer	HC
Type	PDC
Serial No	7131618
Jets	
Depth Out (m)	
Depth In (m)	405
Total Drilled (m)	1415
Hrs Run Today	6.00
Cumulative Hrs Run	50.50
Entry Date	2013/02/02

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB
1740m	1820.05m	DRILL	1	11kdaN

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	222	0	.34m
1	TRUTRAK	193	89	13.04m
1	MWD	176	72	0.77m
1	NM DRILL COLLAR	163	72	9.09m
1	NM DRILL COLLAR	161	72	8.46m
1	FILTER SUB	171	72	1.66m
1	X/O	160	57	0.58m
4	DC (6.25 IN)	156	70	37.58m
1	JARS-HYD/MECH	156	70	10.02m
3	DC (6.25 IN)	156	70	27.89m
1	X/O	102	65	1.10m
20	HWDP(4.0 IN)	102	65	186.25m
79	Drill Pipe	Stands		1522.06m
0	Drill Pipe	Singles		0.00m
	Kelly Down			1.21m
	Total			1820.05m
	Weight of DC			10kdaN
	Weight of String			58kdaN

HOLE CONDITION

Hole Drag Up 3 Down 3

Torque at Bottom	2935.00Nm
Fill on Bottom	0.00m

MUD RECORD

Mud Type: Water [x] Oil [ ] Other

Time	08:30	10:00
Density	1055	1055
Funnel Viscosity	46s/l	46s/l
Fluid Loss	7.5cm3	7cm3
pH	9.5	9.5
Location of Sample	shakers	shakers
Depth	1701m	1741m
PVT	39.9m3	44.4m3

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1	SINGLE	152	120	10054	6

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
1	3946	@	64	@	1817
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type
08:00	1711.3m	0.2	153.7	
11:00	1759.2m	0.7	73.2	
14:45	1799m	0.6	62.7	

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type
aqua-star	8	SX
STAFLO	6	SX
BARITE	96	SX
matrix shield	2	PAILS

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	12	10.5	220
A0124704	12	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	14:00	6.00	2	Directional drill 222mm hole w/ Baker Hughes TruTrak assembly from 1740m to
				1820m TD
14:00	14:30	0.50	5	Accum work pipe & connections
14:30	16:00	1.50	10	Accum surveys, re-gamma log & tool orientation
16:00	16:15	0.25	7	Rig service, functioned upper pipe rams c/o 7 sec.
16:15	18:30	2.25	5	Circulate and clean hole
18:30	19:00	0.50	6B	Flowcheck @ 1810m, blow back top drive, disconnect kicker hose, circ. pump
				through bleeder, trip out of the hole to change out BHA, flowcheck @ xxxxm,
				pump pill, cont. to POOH
19:00	19:15	0.25	21	Safety meeting w/ rig crews & MGM rep.
19:15	20:00	0.75	6B	Flowcheck @ 1810m, blow back top drive, disconnect kicker hose, circ. pump
				through bleeder, trip out of the hole to change out BHA, flowcheck @ 1810m,
				pump pill, cont. to POOH

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor
Functioned : Annular, flare igniter, crown saver

SAFETY

Safety Topic	MEHL	MACP
Routine drill floor work	58.00kdaN	6637kPa

TOUR 3

SIGNATURE OF DRILLER: Travis Davson | START TIME: 20:00 | END TIME: 24:00

BITS

Bit Number	1
Size	222
IADC Code	
Manufacturer	HC
Type	PDC
Serial No	7131618
Jets	
Depth Out (m)	
Depth In (m)	405
Total Drilled (m)	1415
Hrs Run Today	0.00
Cumulative Hrs Run	50.50
Entry Date	2013/02/02

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	222	0	.34m
1	TRUTRAK	193	89	13.04m
1	MWD	176	72	0.77m
1	NM DRILL COLLAR	163	72	9.09m
1	NM DRILL COLLAR	161	72	8.46m
1	FILTER SUB	171	72	1.66m
1	X/O	160	57	0.58m
4	DC (6.25 IN)	156	70	37.58m
1	JARS-HYD/MECH	156	70	10.02m
3	DC (6.25 IN)	156	70	27.89m
1	X/O	102	65	1.10m
20	HWDP(4.0 IN)	102	65	186.25m
79	Drill Pipe	Stands		1522.06m
0	Drill Pipe	Singles		0.00m
	Kelly Down			1.21m
	Total			1820.05m
	Weight of DC			10kdaN
	Weight of String			58kdaN

HOLE CONDITION

Hole Drag Up Down

Torque at Bottom	
Fill on Bottom	

MUD RECORD

Mud Type: Water [x] Oil [ ] Other

Time	22:00	
Density	1050	
Funnel Viscosity	48s/l	
Fluid Loss	8.cm3	
pH	9.5	
Location of Sample	shaker	
Depth		
PVT		

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1		152	66	0	4
2		152	0	0	0

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	4	10.5	220
A0124704	4	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
20:00	20:30	0.50	6	Trip out of hole from 1820m - 0m, Flow check @ 910m, 913m
20:30	21:00	0.50	7	Rig service, functioned upper pipe rams c/o 7 sec.
21:00	24:00	3.00	6	Continued tripping out of hole

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor
Functioned : Annular, flare igniter, crown saver
Mj=12847 ACC= 74972

SAFETY

Safety Topic	MEHL	MACP
Tripping out of hole	75.00kdaN	6637kPa

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130206_1A	Pason	2013	02	06

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Shane Welles	

Pason

DRILLING ASSEMBLY — TOUR 1

No	Component	OD	ID	Length
1	BIT	222	0	.34
1	TRUTRAK	193.00	88.90	13.04
1	MWD	176.	72.0	0.77
1	NM DRILL COLLAR	163.	72.	9.09
1	NM DRILL COLLAR	161.	72.	8.46
1	FILTER SUB	171	72	1.66
1	X/O	160	57	0.58
4	DC (6.25 IN)	156	70	37.58
1	JARS-HYD/MECH	156	70	10.02
3	DC (6.25 IN)	156	70	27.89
1	X/O	102	65	1.10
20	HWDP(4.0 IN)	102	65	186.25
75	Drill Pipe Stands			1441.28
0	Drill Pipe Singles			0.00

Kelly Down	1.94
Total	1740.00
Weight of DC	10.00
Weight of String	49.00

DRILLING ASSEMBLY — TOUR 2

No	Component	OD	ID	Length
1	BIT	222	0	.34
1	TRUTRAK	193.00	88.90	13.04
1	MWD	176.	72.0	0.77
1	NM DRILL COLLAR	163.	72.	9.09
1	NM DRILL COLLAR	161.	72.	8.46
1	FILTER SUB	171	72	1.66
1	X/O	160	57	0.58
4	DC (6.25 IN)	156	70	37.58
1	JARS-HYD/MECH	156	70	10.02
3	DC (6.25 IN)	156	70	27.89
1	X/O	102	65	1.10
20	HWDP(4.0 IN)	102	65	186.25
79	Drill Pipe Stands			1522.06
0	Drill Pipe Singles			0.00

Kelly Down	1.21
Total	1820.05
Weight of DC	10.00
Weight of String	58.00

DRILLING ASSEMBLY — TOUR 3

No	Component	OD	ID	Length
1	BIT	222	0	.34
1	TRUTRAK	193.00	88.90	13.04
1	MWD	176.	72.0	0.77
1	NM DRILL COLLAR	163.	72.	9.09
1	NM DRILL COLLAR	161.	72.	8.46
1	FILTER SUB	171	72	1.66
1	X/O	160	57	0.58
4	DC (6.25 IN)	156	70	37.58
1	JARS-HYD/MECH	156	70	10.02
3	DC (6.25 IN)	156	70	27.89
1	X/O	102	65	1.10
20	HWDP(4.0 IN)	102	65	186.25
79	Drill Pipe Stands			1522.06
0	Drill Pipe Singles			0.00

Kelly Down	1.21
Total	1820.05
Weight of DC	10.00
Weight of String	58.00

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
1	SOP	Bench grinder use	00:00	
1	SOP	Cam lock use	01:00	
1	SOP	Insepecting Slips & Elevators	02:00	
1	SOP	Rig Service	03:00	
2	SOP	C-2 Rolling drill pipe	08:00	
2	SOP	C-6 Hoisting tubular with catwalk	08:00	

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130206_1A	Pason	2013	02	06

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Shane Welles	

Pason

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
2	SOP	G-3 Shoveling snow	08:00	
3	SOP	Tripping out of hole	20:00	
3	SOP	daily check on manifold and bop alignment	20:00	
3	SOP	lower tubulars with skate	20:00	

MUD SAMPLE - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130206_1A	Pason	2013	02	06

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Shane Welles	

Pason

TOUR 1 **MUD TYPE** Polymer **WATER** x **OIL** **OTHER**

Time	02:00	04:00	06:00														
Density	1055kg/m3	1060kg/m3	1060kg/m3														
Funnel Viscosity	46s/l	47s/l	47s/l														
Fluid Loss	8.5cm3	8cm3	7.5cm3														
Fluid pH	9.5	9.5	9.5														
Location of Sample	shaker	shaker	shaker														
Depth																	
PVT																	
Test 1 Type (Ex: Chlorides)																	
Test 1 Value																	
Test 2 Type (ex: Sand%)																	
Test 2 Value																	
Test 3 Type (ex: Hard Ca)																	
Test 3 Value																	
Test 4 Type (ex: Sulfides)																	
Test 4 Value																	

MUD SAMPLE REMARKS

MUD SAMPLE - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130206_1A	Pason	2013	02	06

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Shane Welles	

Pason

TOUR 2 **MUD TYPE** Polymer **WATER** x **OIL** **OTHER**

Time	08:30	10:00																
Density	1055kg/m3	1055kg/m3																
Funnel Viscosity	46s/l	46s/l																
Fluid Loss	7.5cm3	7cm3																
Fluid pH	9.5	9.5																
Location of Sample	shakers	shakers																
Depth	1701m	1741m																
PVT	39.9m3	44.4m3																
Test 1 Type (Ex: Chlorides)																		
Test 1 Value																		
Test 2 Type (ex: Sand%)																		
Test 2 Value																		
Test 3 Type (ex: Hard Ca)																		
Test 3 Value																		
Test 4 Type (ex: Sulfides)																		
Test 4 Value																		

MUD SAMPLE REMARKS

MUD SAMPLE - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130206_1A	Pason	2013	02	06

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Shane Welles	

Pason

TOUR 3 **MUD TYPE** Polymer **WATER** x **OIL** **OTHER**

Time	22:00																
Density	1050kg/m3																
Funnel Viscosity	48s/l																
Fluid Loss	8.cm3																
Fluid pH	9.5																
Location of Sample	shaker																
Depth																	
PVT																	
Test 1 Type (Ex: Chlorides)																	
Test 1 Value																	
Test 2 Type (ex: Sand%)																	
Test 2 Value																	
Test 3 Type (ex: Hard Ca)																	
Test 3 Value																	
Test 4 Type (ex: Sulfides)																	
Test 4 Value																	

MUD SAMPLE REMARKS

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130207_1B	Pason	2013	02	07

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Shane Welles	

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	JD	G&S
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted	JD	G&S
5) Flare Lines Staked	JD	G&S
6) BOP Drills Performed	JD	G&S
7) Visually Inspected BOPs - Flare Lines & Degasser Lines	JD	G&S
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		G&S
5) Motor Kills Checked		

Pason

HOURS

CODE	1 Rig Up	2 Drill Actual	3 Reaming	4 Coring	5 Cond Mud & Circ	6 Trips	7 Rig Service	8 Repair Rig	9 Cut Off Drilg Line	10 Dev Survey	11 Wireline Logs	12 Run Csg & Cement	13 Wait On Cement	14 Nipple Up BOP	15 Test BOP	16 Drillstem Test	17 Plug Back	18 Squeeze Cement	19 Fishing	20 Dir Work	21 Safety Meeting	22 Tear Down	23 Waiting On	24 Rig Watch	25 Other	TOTAL
Tour 1						7.00	0.50														0.50					8.00
Tour 2				5.00		5.00			1.00												1.00					12.00
Tour 3						3.75	0.25																			4.00
Total				5.00		15.75	0.75		1.00												1.50					24.00

Kelly Bushing | Op Fuel 5967.00

FUEL @ 08:00 HOURS

Rig 14391.00 | Boiler 0.00

WEATHER

Time 08:00 | Temp -27.00 | Current Conditions CLEAR | Wind Direction W | Wind Strength UP TO 19 KM/H | Road Condition GOOD

TOUR 1

SIGNATURE OF DRILLER: Travis Davson | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	1
Size	222
IADC Code	
Manufacturer	HC
Type	PDC
Serial No	7131618
Jets	
Depth Out (m)	
Depth In (m)	405
Total Drilled (m)	1415
Hrs Run Today	0.00
Cumulative Hrs Run	50.50
Entry Date	2013/02/02

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	222	0	0.34m
1	TRUTRAK	193	89	13.04m
1	MWD	176	72	0.77m
1	NM DRILL COLLAR	163	72	9.09m
1	NM DRILL COLLAR	161	72	8.46m
1	FILTER SUB	171	72	1.66m
1	X/O	160	57	0.58m
4	DC (6.25 IN)	156	70	37.58m
1	JARS-HYD/MECH	156	70	10.02m
3	DC (6.25 IN)	156	70	27.89m
1	X/O	102	65	1.10m
20	HWDP(4.0 IN)	102	65	186.25m
79	Drill Pipe	Stands		1522.06m
0	Drill Pipe	Singles		0.00m

Kelly Down	1.21m
Total	1820.05m
Weight of DC	10kdaN
Weight of String	58kdaN

HOLE CONDITION

Hole Drag: Up | Down

Torque at Bottom	
Fill on Bottom	

MUD RECORD

Mud Type: Water [x] Oil [ ]

Other:

Time			
Density			
Funnel Viscosity			
Fluid Loss			
pH			
Location of Sample			
Depth			
PVT			

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1		152	66	0	8
2		152	0	0	0

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure	Strokes/min	Depth
	@	@	
	@	@	
	@	@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	8	10.5	220
A0124704	8	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	05:00	5.00	6B	Trip out of hole from 1820m to 82m (Flow check @ 913m,613m,82m)
05:00	05:15	0.25	21	Safety meeting with baker hands before laying out Jars & Motor
05:15	06:15	1.00	6D	Lay down one 6.25 collar, and jars & rack dc's .
06:15	06:45	0.50	7	RIG SERVICE;- greased topdrive, drawworks and blocks. Functioned annular o/c
				= 18secs
06:45	07:00	0.25	21	Pre-tour meeting held with both rig crews and MGM rep.
07:00	08:00	1.00	6D	Lay down directional tools & mud motor.

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor

Functioned : Annular, flare igniter, crown saver

SAFETY

Safety Topic	MEHL	MACP
Tripping out of hole		

TOUR 2

SIGNATURE OF DRILLER: Joel Doctor | START TIME: 08:00 | END TIME: 20:00

BITS

Bit Number	3
Size	216
IADC Code	
Manufacturer	Baker Hughes
Type	BHC606c
Serial No	7103687
Jets	
Depth Out (m)	
Depth In (m)	1820
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	0.00
Entry Date	2013/02/07

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	214	137	0.44m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
0	Drill Pipe	Stands		0.00m
0	Drill Pipe	Singles		0.00m

Kelly Down	0.00m
Total	304.28m
Weight of DC	9kdaN
Weight of String	

HOLE CONDITION

Hole Drag: Up 2 | Down 2

Torque at Bottom	0.00Nm
Fill on Bottom	0.00m

MUD RECORD

Mud Type: Water [x] Oil [ ]

Other:

Time			
Density			
Funnel Viscosity			
Fluid Loss			
pH			
Location of Sample			
Depth			
PVT			

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure	Strokes/min	Depth
	@	@	
	@	@	
	@	@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	12	10.5	220
A0124704	12	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	08:15	0.25	21D	Pre-job safety meeting w/ Baker Huges before laying out TruTrak drilling
				assembly
08:15	09:45	1.50	6D	Lay down Baker Hughes TruTrak drilling assembly
09:45	10:00	0.25	21D	Pre-job safety meeting w/ Baker Hughes core hands before picking up coring
				BHA assmebly
10:00	15:00	5.00	4A	Pick up Baker Hughes coring assembly
15:00	17:00	2.00	6A	Trip in the hole for CORE run # 1
17:00	17:15	0.25	21D	Pre-job safety meeting w/ rig crew before slip and cut
17:15	18:15	1.00	9A	Slip & cut drilling line, SLC-13266mj ACCUM-75392mj - 24 wraps
18:15	19:00	0.75	6A	cont. to trip in the hole for CORE run # 1
19:00	19:15	0.25	21	Safety meeting w/ rig crews & MGM rep.
19:15	20:00	0.75	6A	Fill pipe & break circulation @ 900m

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor

Functioned : Annular, flare igniter, crown saver

Trip record : meas - 7.47m3 cal - 7.08m3 diff - 0.39m3

Functioned blind/shear rams while out of the hole c/0 7 sec.

SAFETY

Safety Topic	MEHL	MACP
Steam use	50.00kdaN	6400kPa

TOUR 3

SIGNATURE OF DRILLER: Travis Davson | START TIME: 20:00 | END TIME: 24:00

BITS

Bit Number	3
Size	216
IADC Code	
Manufacturer	Baker Hughes
Type	BHC606c
Serial No	7103687
Jets	
Depth Out (m)	
Depth In (m)	1820
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	0.00
Entry Date	2013/02/07

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	216	137	0.44m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
0	Drill Pipe	Stands		0.00m
0	Drill Pipe	Singles		0.00m

Kelly Down	0.00m
Total	304.28m
Weight of DC	9kdaN
Weight of String	

HOLE CONDITION

Hole Drag: Up | Down

Torque at Bottom	
Fill on Bottom	

MUD RECORD

Mud Type: Water [ ] Oil [ ]

Other:

Time			
Density			
Funnel Viscosity			
Fluid Loss			
pH			
Location of Sample			
Depth			
PVT			

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1		152	0	0	0
2		152	0	0	0

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure	Strokes/min	Depth
	@	@	
	@	@	
	@	@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	4	10.5	220
A0124704	4	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
20:00	23:45	3.75	6A	cont. to trip in the hole for CORE run # 1
23:45	24:00	0.25	7	RIG SERVICE;- greased topdrive, drawworks and blocks. Functioned annular o/c
				= 18secs

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor

Functioned : Annular, flare igniter, crown saver

MJ=800 ACC=76595

SAFETY

Safety Topic	MEHL	MACP
Working at heights		

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130207_1B	Pason	2013	02	07

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Shane Welles	

Pason

DRILLING ASSEMBLY — TOUR 1

No	Component	OD	ID	Length
1	BIT	222	0.00	0.34
1	TRUTRAK	193.00	88.90	13.04
1	MWD	176.00	72.00	0.77
1	NM DRILL COLLAR	163.00	72.00	9.09
1	NM DRILL COLLAR	161.00	72.00	8.46
1	FILTER SUB	171.00	72.00	1.66
1	X/O	160.00	57.00	0.58
4	DC (6.25 IN)	156.00	70.00	37.58
1	JARS-HYD/MECH	156.00	70.00	10.02
3	DC (6.25 IN)	156.00	70.00	27.89
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
79	Drill Pipe	Stands		1522.06
0	Drill Pipe	Singles		0.00
	Kelly Down			1.21
	Total			1820.05
	Weight of DC			10.00
	Weight of String			58.00

DRILLING ASSEMBLY — TOUR 2

No	Component	OD	ID	Length
1	BIT	222	0.00	0.34
1	TRUTRAK	193.00	88.90	13.04
1	MWD	176.00	72.00	0.77
1	NM DRILL COLLAR	163.00	72.00	9.09
1	NM DRILL COLLAR	161.00	72.00	8.46
1	FILTER SUB	171.00	72.00	1.66
1	X/O	160.00	57.00	0.58
4	DC (6.25 IN)	156.00	70.00	37.58
1	JARS-HYD/MECH	156.00	70.00	10.02
3	DC (6.25 IN)	156.00	70.00	27.89
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
79	Drill Pipe	Stands		1522.06
0	Drill Pipe	Singles		0.00
	Kelly Down			1.21
	Total			1820.05
	Weight of DC			10.00
	Weight of String			58.00

DRILLING ASSEMBLY — TOUR 2

No	Component	OD	ID	Length
1	BIT	214.00	137.00	0.44
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	0.72
1	L.D. Adjuster	171.00	137.00	1.22
1	Top sub	171.00	0.61	0.61
1	JARS-HYD/MECH	171.00	57.00	2.16
	Drill Pipe	Stands		
	Drill Pipe	Singles		
	Kelly Down			
	Total			
	Weight of DC			
	Weight of String			

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
1	SOP	Lower tubulars with skate	01:00	
1	SOP	Daily check on manifold and bop alignment	02:00	
1	SOP	Tripping P.O.O.H	03:00	
1	SOP	Dog collar use	04:00	
2	SOP	D-15 lay out drill collars	08:00	
2	SOP	D-51 rig up core barrels	08:00	

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130207_1B	Pason	2013	02	07

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Shane Welles	

Pason

DRILLING ASSEMBLY — TOUR 2

No	Component	OD	ID	Length
1	FLOAT SUB	171.00	57.00	0.56
6	DC (6.25 IN)	156.00	70.00	56.38
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
0	Drill Pipe	Stands		0.00
0	Drill Pipe	Singles		0.00
	Kelly Down			0.00
	Total			304.28
	Weight of DC			9.00
	Weight of String			

DRILLING ASSEMBLY — TOUR 3

No	Component	OD	ID	Length
1	BIT	216	137.00	0.44
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	0.72
1	L.D. Adjuster	171.00	137.00	1.22
1	Top sub	171.00	0.61	0.61
1	JARS-HYD/MECH	171.00	57.00	2.16
	Drill Pipe	Stands		
	Drill Pipe	Singles		
	Kelly Down			
	Total			
	Weight of DC			
	Weight of String			

DRILLING ASSEMBLY — TOUR 3

No	Component	OD	ID	Length
1	FLOAT SUB	171.00	57.00	0.56
6	DC (6.25 IN)	156.00	70.00	56.38
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
0	Drill Pipe	Stands		0.00
0	Drill Pipe	Singles		0.00
	Kelly Down			0.00
	Total			304.28
	Weight of DC			9.00
	Weight of String			

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
2	SOP	D-3 tripping in the hole	08:00	
2	SOP	D-32 Slip & cut	08:00	
3	SOP	Tripping	20:00	
3	SOP	Blow out Top Drive	21:00	

EQUIPMENT & SERVICES

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130207_1B	Pason	2013	02	07

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Shane Welles	

Pason

GENERAL EQUIPMENT & SERVICE

Description	Make	Model	Provided by	Expense of	Rental Company	Serial No	Usage	Quantity	Quantity Used
Remarks:									
Remarks:									
Remarks:									

BOILERS

Boiler No	Make	Model	Provided by	Expense of	Rental Company	Serial No	Hours Today
A0093289	Lidster	100 HP	CONTRACTOR	OPERATOR		A0093289	24
Remarks:							
A0124704	Lidster	100HP	CONTRACTOR	OPERATOR		A0124704	24
Remarks:							
Remarks:							

SHALE SHAKERS

Shaker No	Make	Model	Screen 1				Screen 2				Screen 3				Screen 4			
			Position	Size	ScreenChanged?	New?	Position	Size	Screen Changed?	New?	Position	Size	Screen Changed?	New?	Position	Size	Screen Changed?	New?
1	SWACO	MONGOOSE	1	200	☐	X	2	200	☐	X	3	165	☐	X	4	165	☐	X
Remarks:																		
2	SWACO	MONGOOSE	1	200	☐	X	2	200	☐	X	3	165	☐	X	4	165	☐	X
Remarks:																		
					☐	☐			☐	☐			☐	☐			☐	☐
Remarks:																		

MUD PUMPS

Pump No	Make	Model	Provided by	Expense of	Rental Company	Serial No	Hours Today	Stroke Length	Rod Size	Pump Style
1	NATIONAL	9P-100	CONTRACTOR	CONTRACTOR		PMP-024	8	235mm		TRIPLEX
Remarks:										
2	NATIONAL	9P-100	CONTRACTOR	CONTRACTOR		PMP-023	0	235mm		TRIPLEX
Remarks:										
Remarks:										

BITS

Bit No	Size	IADC Code				Manufacturer	Type	Serial No	Jets								Depth In	Depth Out	Total Drilled	Total Hours Run Today	Cumula-tive Hours Run	Entry Date	Cutting Structure									Tour
		1	2	3	4				1	2	3	4	5	6	7	8							TI	T0	MDC	LOC	BRG	Gage	ODC	Reason Pulled	Total Run m/Hr	
1	222.00-mm					HC	PDC	7131618									405.00m		1415.0-0m	0.00	50.50	13/02/02										1
2	222.00-mm					HC	PDC	7131618									405.00m	1820.0-0m	1415.0-0m	0.00	50.50	13/02/02	1	1	NO	A	X	222.00-mm	NO	CP	28.02m/hr	2
3	216.00-mm					Baker Hughes	BHC60-6c	7103687									1820.0-5m				0.00	13/02/07										2
3	216.00-mm					Baker Hughes	BHC60-6c	7103687									1820.0-5m				0.00	13/02/07										3

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130208_1C	Pason	2013	02	08

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Shane Welles	

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	JD	G&S
2) Detailed Inspection - Weekly (Using Check List)	JD	G&S
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted	JD	G&S
5) Flare Lines Staked	JD	G&S
6) BOP Drills Performed	JD	G&S
7) Visually Inspected BOPs - Flare Lines & Degasser Lines	JD	G&S
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		G&S
5) Motor Kills Checked		

Pason

CODE	1 Rig Up	2 Drill Actual	3 Reaming	4 Coring	5 Cond Mud & Circ	6 Trips	7 Rig Service	8 Repair Rig	9 Cut Off Drilg Line	10 Dev Survey	11 Wireline Logs	12 Run Csg & Cement	13 Wait On Cement	14 Nipple Up BOP	15 Test BOP	16 Drillstem Test	17 Plug Back	18 Squeeze Cement	19 Fishing	20 Dir Work	21 Safety Meeting	22 Tear Down	23 Waiting On	24 Rig Watch	25 Other	TOTAL
HOURS Tour 1				6.25		1.50															0.25					8.00
Tour 2				4.00	1.00	6.25	0.25														0.50					12.00
Tour 3				0.50		0.50																	3.00			4.00
Total				10.75	1.00	8.25	0.25														0.75		3.00			24.00

Kelly Bushing | Op Fuel 5149.00

FUEL @ 08:00 HOURS

Rig 9243.00 | Boiler 0.00

WEATHER: Time 08:00 | Temp -30.00 | Current Conditions CLEAR | Wind Direction W | Wind Strength UP TO 19 KMH | Road Condition GOOD

TOUR 1

SIGNATURE OF DRILLER: Travis Davson | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	3
Size	216
IADC Code	
Manufacturer	Baker Hughes
Type	BHC606c
Serial No	7103687
Jets	
Depth Out (m)	
Depth In (m)	1820
Total Drilled (m)	14
Hrs Run Today	5.25
Cumulative Hrs Run	5.25
Entry Date	2013/02/07

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB
1820m	1834m	CORE	66	3.4kdaN

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	216	137	0.44m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
79	Drill Pipe	Stands		1522.06m
0	Drill Pipe	Singles		0.00m

Kelly Down	7.66m
Total	1834.00m
Weight of DC	9kdaN
Weight of String	64kdaN

HOLE CONDITION

Hole Drag: Up 2 | Down 2

Torque at Bottom	9350.00Nm
Fill on Bottom	0.00m

MUD RECORD

Mud Type: Water [x] Oil [ ] | Other

Time	02:00	04:00
Density	1070	1065
Funnel Viscosity	47s/l	51s/l
Fluid Loss	7cm3	7cm3
pH	9.5	9.5
Location of Sample		
Depth		
PVT		

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1	SINGLE	152	84	5925	5.25
2	SINGLE	152	0	5925	0

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
1	3946	@	64	@	1820
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type
matrix shield	8	PAILS

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	8	10.5	220
A0124704	8	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	01:30	1.50	6A	cont. to trip in the hole for CORE run # 1 (Tagged bottom/circ bottoms up,
				dropped ball)
01:30	06:45	5.25	4	Cut 89mm Core in 216 hole #1 from 1820m to 1833m
06:45	07:00	0.25	21	Safety meeting w/ rig crews & MGM rep.
07:00	08:00	1.00	4	cont to Cut 89mm Core in 216 hole # 1 from 1833m to 1834m

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor
Functioned : Annular, flare igniter, crown saver

SAFETY

Safety Topic	MEHL	MACP
Tripping in Hole	64.00kdaN	6558kPa

TOUR 2

SIGNATURE OF DRILLER: Joel Doctor | START TIME: 08:00 | END TIME: 20:00

BITS

Bit Number	3
Size	216
IADC Code	
Manufacturer	Baker Hughes
Type	BHC606c
Serial No	7103687
Jets	
Depth Out (m)	
Depth In (m)	1820
Total Drilled (m)	14
Hrs Run Today	0.00
Cumulative Hrs Run	5.25
Entry Date	2013/02/07

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	216	137	0.44m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
79	Drill Pipe	Stands		1522.06m
0	Drill Pipe	Singles		0.00m

Kelly Down	7.66m
Total	1834.00m
Weight of DC	9kdaN
Weight of String	64kdaN

HOLE CONDITION

Hole Drag: Up 15 | Down 0

Torque at Bottom	3382.00Nm
Fill on Bottom	0.00m

MUD RECORD

Mud Type: Water [x] Oil [ ] | Other

Time	08:00	
Density		
Funnel Viscosity		
Fluid Loss		
pH		
Location of Sample		
Depth		
PVT		

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
1	3946	@	64	@	1820
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	12	10.5	220
A0124704	12	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	09:00	1.00	5	Circulate hole clean & mix pill
09:00	12:00	3.00	6B	Trip out of the hole, flowcheck @ 1832m, pump pill, blow out top drive,
				hammer off kicker hose, circulate pump through bleeder, lay out one single &
				drillable sub, flowchecks @ 1730m, 893m
12:00	12:15	0.25	7	Warrior top drive hand rig service
12:15	15:30	3.25	6B	Cont. to trip out of the hole, flowcheck @ 336m, every 20 min while out of
				the hole
15:30	15:45	0.25	21D	Pre-job safety meeting before handling Baker Hughes coring assembly
15:45	16:15	0.50	4A	Practice shuttle & core barrel recovery run
16:15	19:00	2.75	4A	Disassemble core barrel BHA & recover cut core
19:00	19:15	0.25	21	Safety meeting w/ rig crews & MGM rep
19:15	20:00	0.75	4A	Disassemble core barrel BHA & recover cut core # 1

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor
Functioned : Annular, flare igniter, crown saver
Trip record : meas - 8.16m3 cal - 6.91m3 diff - 1.7m3
Functioned blind/shear rams c/o 7 sec.

SAFETY

Safety Topic	MEHL	MACP
ice plugs	65.00kdaN	6558kPa

TOUR 3

SIGNATURE OF DRILLER: Travis Davson | START TIME: 20:00 | END TIME: 24:00

BITS

Bit Number	3
Size	216
IADC Code	
Manufacturer	Baker Hughes
Type	BHC606c
Serial No	7103687
Jets	
Depth Out (m)	
Depth In (m)	1820
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	5.25
Entry Date	2013/02/07

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	216	137	0.44m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
79	Drill Pipe	Stands		1522.06m
0	Drill Pipe	Singles		0.00m

Kelly Down	7.66m
Total	1834.00m
Weight of DC	9kdaN
Weight of String	64kdaN

HOLE CONDITION

Hole Drag: Up | Down

Torque at Bottom	
Fill on Bottom	

MUD RECORD

Mud Type: Water [x] Oil [ ] | Other

Time		
Density		
Funnel Viscosity		
Fluid Loss		
pH		
Location of Sample		
Depth		
PVT		

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1		152	67	0	4
2		152	0	0	0

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	4	10.5	220
A0124704	4	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
20:00	20:30	0.50	6	Cont. trip out to bit (racked back 2 stands of core barrells, break off bit
				and inspected 4 out 6 jets plugged)
20:30	21:00	0.50	4A	Pick up Baker Hughes coring assembly (make up bit and run in outter barrels
				followed by innner barrells)
21:00	24:00	3.00	23E	Waiting on replacement Baker top sub arriving by tomorrow

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor
Functioned : Annular, flare igniter, crown saver

SAFETY

Safety Topic	MEHL	MACP
Working with third party tools	65.00kdaN	6558kPa

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130208_1C	Pason	2013	02	08

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Shane Welles	

Pason

DRILLING ASSEMBLY — TOUR 1

No	Component	OD	ID	Length
1	BIT	216	137.00	0.44
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	0.72
1	L.D. Adjuster	171.00	137.00	1.22
1	Top sub	171.00	0.61	0.61
1	JARS-HYD/MECH	171.00	57.00	2.16
	Drill Pipe		Stands	
	Drill Pipe		Singles	
	Kelly Down			
	Total			
	Weight of DC			
	Weight of String			

DRILLING ASSEMBLY — TOUR 1

No	Component	OD	ID	Length
1	FLOAT SUB	171.00	57.00	0.56
6	DC (6.25 IN)	156.00	70.00	56.38
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
79	Drill Pipe		Stands	1522.06
0	Drill Pipe		Singles	0.00
	Kelly Down			7.66
	Total			1834.00
	Weight of DC			9.00
	Weight of String			64.00

DRILLING ASSEMBLY — TOUR 2

No	Component	OD	ID	Length
1	BIT	216	137.00	0.44
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	0.72
1	L.D. Adjuster	171.00	137.00	1.22
1	Top sub	171.00	0.61	0.61
1	JARS-HYD/MECH	171.00	57.00	2.16
	Drill Pipe		Stands	
	Drill Pipe		Singles	
	Kelly Down			
	Total			
	Weight of DC			
	Weight of String			

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
1	SOP	House keeping on Drill floor	02:00	
1	SOP	Using rope to catch tubulars	04:00	
2	SOP	D-13 pre-trip inspection	08:00	
2	SOP	D-14 blow out top drive	08:00	
2	SOP	H-10 mixing mud product	08:00	
2	SOP	D-2 tripping out of the hole	08:00	

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130208_1C	Pason	2013	02	08

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Shane Welles	

Pason

DRILLING ASSEMBLY — TOUR 2

No	Component	OD	ID	Length
1	FLOAT SUB	171.00	57.00	0.56
6	DC (6.25 IN)	156.00	70.00	56.38
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
79	Drill Pipe	Stands		1522.06
0	Drill Pipe	Singles		0.00
	Kelly Down			7.66
	Total			1834.00
	Weight of DC			9.00
	Weight of String			64.00

DRILLING ASSEMBLY — TOUR 3

No	Component	OD	ID	Length
1	BIT	216	137.00	0.44
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	0.72
1	L.D. Adjuster	171.00	137.00	1.22
1	Top sub	171.00	0.61	0.61
1	JARS-HYD/MECH	171.00	57.00	2.16
	Drill Pipe	Stands		
	Drill Pipe	Singles		
	Kelly Down			
	Total			
	Weight of DC			
	Weight of String			

DRILLING ASSEMBLY — TOUR 3

No	Component	OD	ID	Length
1	FLOAT SUB	171.00	57.00	0.56
6	DC (6.25 IN)	156.00	70.00	56.38
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
79	Drill Pipe	Stands		1522.06
0	Drill Pipe	Singles		0.00
	Kelly Down			7.66
	Total			1834.00
	Weight of DC			9.00
	Weight of String			64.00

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
3	SOP	Hoisting tubular with Catwalk	20:00	
3	SOP	Pre trip floor Inspection	22:00	

MUD SAMPLE - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130208_1C	Pason	2013	02	08

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Shane Welles	

Pason

TOUR 1 **MUD TYPE** Polymer **WATER** x **OIL** **OTHER**

Time	02:00	04:00	06:00														
Density	1070kg/m3	1065kg/m3	1060kg/m3														
Funnel Viscosity	47s/l	51s/l	52s/l														
Fluid Loss	7cm3	7cm3	7cm3														
Fluid pH	9.5	9.5	9.5														
Location of Sample																	
Depth																	
PVT																	
Test 1 Type (Ex: Chlorides)																	
Test 1 Value																	
Test 2 Type (ex: Sand%)																	
Test 2 Value																	
Test 3 Type (ex: Hard Ca)																	
Test 3 Value																	
Test 4 Type (ex: Sulfides)																	
Test 4 Value																	

MUD SAMPLE REMARKS

MUD SAMPLE - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130208_1C	Pason	2013	02	08

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Shane Welles	

Pason

TOUR 2 **MUD TYPE** Polymer **WATER** x **OIL** **OTHER**

Time	08:00																
Density																	
Funnel Viscosity																	
Fluid Loss																	
Fluid pH																	
Location of Sample																	
Depth																	
PVT																	
Test 1 Type (Ex: Chlorides)																	
Test 1 Value																	
Test 2 Type (ex: Sand%)																	
Test 2 Value																	
Test 3 Type (ex: Hard Ca)																	
Test 3 Value																	
Test 4 Type (ex: Sulfides)																	
Test 4 Value																	

MUD SAMPLE REMARKS

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130209_1C	Pason	2013	02	09

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Shane Welles	

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	JD	G&S
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted	JD	G&S
5) Flare Lines Staked	JD	G&S
6) BOP Drills Performed	JD	G&S
7) Visually Inspected BOPs - Flare Lines & Degasser Lines	JD	
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		G&S
5) Motor Kills Checked		

Pason

HOURS

CODE	1 Rig Up	2 Drill Actual	3 Reaming	4 Coring	5 Cond Mud & Circ	6 Trips	7 Rig Service	8 Repair Rig	9 Cut Off Drilg Line	10 Dev Survey	11 Wireline Logs	12 Run Csg & Cement	13 Wait On Cement	14 Nipple Up BOP	15 Test BOP	16 Drillstem Test	17 Plug Back	18 Squeeze Cement	19 Fishing	20 Dir Work	21 Safety Meeting	22 Tear Down	23 Waiting On	24 Rig Watch	25 Other	TOTAL
Tour 1						6.25	0.50														0.25		1.00			8.00
Tour 2				5.00																	0.25		6.75			12.00
Tour 3						4.00																				4.00
Total				5.00		10.25	0.50														0.50		7.75			24.00

WEATHER

Kelly Bushing | Op Fuel 5525.00

FUEL @ 08:00 HOURS

Rig 6318.00 | Boiler 0.00 | Time 08:00 | Temp -17.00 | Current Conditions CLEAR | Wind Direction W | Wind Strength UP TO 19 KM/H | Road Condition GOOD

TOUR 1

SIGNATURE OF DRILLER: Travis Davson | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	4
Size	216
IADC Code	
Manufacturer	Baker Hughes
Type	GX-20MDX1
Serial No	5202128
Jets	
Depth Out (m)	
Depth In (m)	1834
Total Drilled (m)	0
Hrs Run Today	0.00
Cumulative Hrs Run	0.00
Entry Date	2013/02/09

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	214	137	0.42m
1	BIT SUB	102	65	0.94m
6	DC (6.25 IN)	156	70	56.38m
1	X/O	102	65	1.10m
20	HWDP(4.0 IN)	102	65	186.25m
82	Drill Pipe	Stands		1579.55m
0	Drill Pipe	Singles		0.00m
	Kelly Down			9.50m
	Total			1834.14m
	Weight of DC			10kdaN
	Weight of String			65kdaN

HOLE CONDITION

Hole Drag: Up | Down

Torque at Bottom

Fill on Bottom

MUD RECORD

Mud Type: Water [x] Oil [ ] Other

Time	
Density	
Funnel Viscosity	
Fluid Loss	
pH	
Location of Sample	
Depth	
PVT	

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1		152	66	0	8
2		152	0	0	0

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	8	10.5	220
A0124704	8	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	02:00	2.00	6	Lay down top sub and LD extension sub, racked back core barrells, Break
				apart pick up sub from top sub also take extension off of top sub)
02:00	02:30	0.50	7	RIG SERVICE;- greased topdrive, drawworks and blocks. Functioned annular o/c
				= 18secs
02:30	06:45	4.25	6A	Make up new 216mm bit and bitsub and trip in hole.
06:45	07:00	0.25	21	Safety meeting with both crews & MGM rep
07:00	08:00	1.00	23F	Waiting on Baker Hughes tools, tripped into to 450m, pulled back up to the
				shoe and broke circultation

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor

Functioned : Annular, flare igniter, crown saver

SAFETY

Safety Topic	MEHL	MACP
Tripping in hole		

TOUR 2

SIGNATURE OF DRILLER: Joel Doctor | START TIME: 08:00 | END TIME: 20:00

BITS

Bit Number	5RR
Size	216
IADC Code	
Manufacturer	Baker Hughes
Type	BHC606c
Serial No	7103687
Jets	
Depth Out (m)	
Depth In (m)	1834
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	0.00
Entry Date	2013/02/09

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	214	137	0.44m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
0	Drill Pipe	Stands		0.00m
0	Drill Pipe	Singles		0.00m
	Kelly Down			0.00m
	Total			304.88m
	Weight of DC			9kdaN
	Weight of String			63kdaN

HOLE CONDITION

Hole Drag: Up 1 | Down 1

Torque at Bottom: 1024.00Nm

Fill on Bottom

MUD RECORD

Mud Type: Water [x] Oil [ ] Other

Time	08:45
Density	1050
Funnel Viscosity	60s/l
Fluid Loss	7.5cm3
pH	9
Location of Sample	shakers
Depth	1834m
PVT	38.3m3

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1	SINGLE	152	67	1062	2

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type
CAL CARB 325	80	SX

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	12	10.5	220
A0124704	12	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	10:00	2.00	23F	Circulating @ shoe waiting on Baker Hughes coring tools
10:00	11:30	1.50	23F	Trip out of the hole
11:30	13:30	2.00	23F	Make up Baker Hughes coring assembly while waiting on tool
13:30	14:45	1.25	23F	Wait on Baker Hughes top sub & L.D. adjuster
14:45	19:00	4.25	4A	Make up inner barrels, lay out NFG I.D. adjuster sub, pick up outer barrel
				stabilizer as replacement adjuster sub, cont. making up core barrel assembly
19:00	19:15	0.25	21	Safety meeting w/ rig crews & MGM rep.
19:15	20:00	0.75	4A	Cont. making up Baker Hughes coring BHA assembly

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor

Functioned : Annular, flare igniter, crown saver

SAFETY

Safety Topic	MEHL	MACP
Pressure systems	45.00kdaN	6558kPa

TOUR 3

SIGNATURE OF DRILLER: Travis Davson | START TIME: 20:00 | END TIME: 24:00

BITS

Bit Number	5RR
Size	216
IADC Code	
Manufacturer	Baker Hughes
Type	BHC606c
Serial No	7103687
Jets	
Depth Out (m)	
Depth In (m)	1834
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	5.25
Entry Date	2013/02/09

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	216	137	0.44m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
0	Drill Pipe	Stands		0.00m
0	Drill Pipe	Singles		0.00m
	Kelly Down			0.00m
	Total			304.88m
	Weight of DC			9kdaN
	Weight of String			63kdaN

HOLE CONDITION

Hole Drag: Up | Down

Torque at Bottom

Fill on Bottom

MUD RECORD

Mud Type: Water [x] Oil [ ] Other

Time	
Density	
Funnel Viscosity	
Fluid Loss	
pH	
Location of Sample	
Depth	
PVT	

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1		152	66	0	4
2		152	0	0	0

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	4	10.5	220
A0124704	4	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
20:00	24:00	4.00	6A	Run in hole with core assembly #2 Fill pipe @ 607M,1200M blow back top drive

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor

Functioned : Annular, flare igniter, crown saver

MJ= 3301, ACC = 79096

SAFETY

Safety Topic	MEHL	MACP
Tripping in hole		

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130209_1C	Pason	2013	02	09

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Shane Welles	

Pason

DRILLING ASSEMBLY — TOUR 1

No	Component	OD	ID	Length
1	BIT	214.00	137.00	0.42
1	BIT SUB	102.00	65.00	0.94
6	DC (6.25 IN)	156.00	70.00	56.38
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
82	Drill Pipe	Stands		1579.55
0	Drill Pipe	Singles		0.00

Kelly Down	9.50
Total	0
Weight of DC	10.00
Weight of String	65.00

DRILLING ASSEMBLY — TOUR 2

No	Component	OD	ID	Length
1	BIT	216	137.00	0.42
1	BIT SUB	102.00	65.00	0.94
6	DC (6.25 IN)	156.00	70.00	56.38
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
82	Drill Pipe	Stands		1579.55
0	Drill Pipe	Singles		0.00

Kelly Down	9.50
Total	1834.14
Weight of DC	10.00
Weight of String	65.00

DRILLING ASSEMBLY — TOUR 2

No	Component	OD	ID	Length
1	BIT	214.00	137.00	0.44
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	STAB-NM	171.00	137.00	1.22
1	Top sub	171.00	0.61	.71
1	JARS-HYD/MECH	171.00	57.00	2.16
	Drill Pipe	Stands		
	Drill Pipe	Singles		

Kelly Down	
Total	
Weight of DC	
Weight of String	

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
1	SOP	Rig up Core Barrell	01:00	
1	SOP	Rig up Inner Core Barrell	02:00	
2	SOP	N-5 working in icy conditions	08:00	
2	SOP	K-6 adding methanol	08:00	
2	SOP	D-2 tripping out of the hole	12:00	
2	SOP	D-3 tripping in the hole	12:00	

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130209_1C	Pason	2013	02	09

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Shane Welles	

Pason

DRILLING ASSEMBLY — TOUR 2

No	Component	OD	ID	Length
1	FLOAT SUB	171.00	57.00	0.56
6	DC (6.25 IN)	156.00	70.00	56.38
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
0	Drill Pipe	Stands		0.00
0	Drill Pipe	Singles		0.00
	Kelly Down			0.00
	Total			304.88
	Weight of DC			9.00
	Weight of String			63.00

DRILLING ASSEMBLY — TOUR 3

No	Component	OD	ID	Length
1	BIT	216	137.00	0.44
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	STAB-NM	171.00	137.00	1.22
1	Top sub	171.00	0.61	.71
1	JARS-HYD/MECH	171.00	57.00	2.16
	Drill Pipe	Stands		
	Drill Pipe	Singles		
	Kelly Down			
	Total			
	Weight of DC			
	Weight of String			

DRILLING ASSEMBLY — TOUR 3

No	Component	OD	ID	Length
1	FLOAT SUB	171.00	57.00	0.56
6	DC (6.25 IN)	156.00	70.00	56.38
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
0	Drill Pipe	Stands		0.00
0	Drill Pipe	Singles		0.00
	Kelly Down			0.00
	Total			304.88
	Weight of DC			9.00
	Weight of String			63.00

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
3	SOP	Using rope to catch tubulars	21:00	
3	SOP	Blow out top drive	22:00	

EQUIPMENT & SERVICES

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130209_1C	Pason	2013	02	09

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Shane Welles	

Pason

GENERAL EQUIPMENT & SERVICE

Description	Make	Model	Provided by	Expense of	Rental Company	Serial No	Usage	Quantity	Quantity Used
Remarks:									
Remarks:									
Remarks:									

BOILERS

Boiler No	Make	Model	Provided by	Expense of	Rental Company	Serial No	Hours Today
A0093289	Lidster	100 HP	CONTRACTOR	OPERATOR		A0093289	24
Remarks:							
A0124704	Lidster	100HP	CONTRACTOR	OPERATOR		A0124704	24
Remarks:							
Remarks:							

SHALE SHAKERS

Shaker No	Make	Model	Screen 1				Screen 2				Screen 3				Screen 4			
			Position	Size	ScreenChanged?	New?	Position	Size	Screen Changed?	New?	Position	Size	Screen Changed?	New?	Position	Size	Screen Changed?	New?
1	SWACO	MONGOOSE	1	200	☐	X	2	200	X	☐	3	165	X	☐	4	165	☐	X
Remarks:																		
2	SWACO	MONGOOSE	1	200	☐	X	2	200	☐	X	3	165	☐	X	4	165	☐	X
Remarks:																		
					☐	☐			☐	☐			☐	☐			☐	☐
Remarks:																		

MUD PUMPS

Pump No	Make	Model	Provided by	Expense of	Rental Company	Serial No	Hours Today	Stroke Length	Rod Size	Pump Style
1	NATIONAL	9P-100	CONTRACTOR	CONTRACTOR		PMP-024	14	235mm		TRIPLEX
Remarks:										
2	NATIONAL	9P-100	CONTRACTOR	CONTRACTOR		PMP-023	0	235mm		TRIPLEX
Remarks:										
Remarks:										

BITS

Bit No	Size	IADC Code				Manufacturer	Type	Serial No	Jets								Depth In	Depth Out	Total Drilled	Total Hours Run Today	Cumula-tive Hours Run	Entry Date	Cutting Structure									Tour
		1	2	3	4				1	2	3	4	5	6	7	8							TI	T0	MDC	LOC	BRG	Gage	ODC	Reason Pulled	Total Run m/Hr	
3	216.00-mm					Baker Hughes	BHC60-6c	7103687									1820.0-5m	1834.1-4m	14.09m	0.00	5.50	13/02/07	1	1	CT	H	X	0.00mm	WT	BHA	2.56m/hr	1
4	216.00-mm					Baker Hughes	GX-20-MDX1	5202128									1834.0-0m		0.00m	0.00	0.00	13/02/09										1
4	216.00-mm					Baker Hughes	GX-20-MDX1	5202128									1834.0-0m	1834.0-0m	0.00m	0.00	0.00	13/02/09										2
5RR	216.00-mm					Baker Hughes	BHC60-6c	7103687									1834.1-4m				0.00	13/02/09										2

EQUIPMENT & SERVICES

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130209_1C	Pason	2013	02	09

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Shane Welles	

Pason

GENERAL EQUIPMENT & SERVICE

Description	Make	Model	Provided by	Expense of	Rental Company	Serial No	Usage	Quantity	Quantity Used
Remarks:									
Remarks:									
Remarks:									

BOILERS

Boiler No	Make	Model	Provided by	Expense of	Rental Company	Serial No	Hours Today
Remarks:							
Remarks:							
Remarks:							

SHALE SHAKERS

Shaker No	Make	Model	Screen 1				Screen 2				Screen 3				Screen 4			
			Position	Size	ScreenChanged?	New?	Position	Size	Screen Changed?	New?	Position	Size	Screen Changed?	New?	Position	Size	Screen Changed?	New?
					☐	☐			☐	☐			☐	☐			☐	☐
Remarks:																		
					☐	☐			☐	☐			☐	☐			☐	☐
Remarks:																		
					☐	☐			☐	☐			☐	☐			☐	☐
Remarks:																		

MUD PUMPS

Pump No	Make	Model	Provided by	Expense of	Rental Company	Serial No	Hours Today	Stroke Length	Rod Size	Pump Style
Remarks:										
Remarks:										
Remarks:										

BITS

Bit No	Size	IADC Code				Manufacturer	Type	Serial No	Jets								Depth In	Depth Out	Total Drilled	Total Hours Run Today	Cumula-tive Hours Run	Entry Date	Cutting Structure									Tour
		1	2	3	4				1	2	3	4	5	6	7	8							TI	T0	MDC	LOC	BRG	Gage	ODC	Reason Pulled	Total Run m/Hr	
5RR	216.00-mm					Baker Hughes	BHC60-6c	7103687									1834.1-4m				5.25	13/02/09										3

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130210_1A	Pason	2013	02	10

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Shane Welles	

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	JD	G&S
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted	JD	G&S
5) Flare Lines Staked	JD	G&S
6) BOP Drills Performed	JD	G&S
7) Visually Inspected BOPs - Flare Lines & Degasser Lines	JD	G&S
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		G&S
5) Motor Kills Checked		

CAODC

Pason

HOURS

CODE	1 Rig Up	2 Drill Actual	3 Reaming	4 Coring	5 Cond Mud & Circ	6 Trips	7 Rig Service	8 Repair Rig	9 Cut Off Drilg Line	10 Dev Survey	11 Wireline Logs	12 Run Csg & Cement	13 Wait On Cement	14 Nipple Up BOP	15 Test BOP	16 Drillstem Test	17 Plug Back	18 Squeeze Cement	19 Fishing	20 Dir Work	21 Safety Meeting	22 Tear Down	23 Waiting On	24 Rig Watch	25 Other	TOTAL
Tour 1				5.50		2.00	0.25														0.25					8.00
Tour 2				3.00	1.00	7.25	0.25														0.50					12.00
Tour 3				3.25		0.75																				4.00
Total				11.75	1.00	10.00	0.50														0.75					24.00

Kelly Bushing | Op Fuel 5600.00

FUEL @ 08:00 HOURS

Rig 25974.00 | Boiler 0.00

WEATHER

Time 08:00 | Temp -17.00 | Current Conditions CLEAR | Wind Direction W | Wind Strength UP TO 19 KM/H | Road Condition GOOD

TOUR 1

SIGNATURE OF DRILLER: Travis Davson | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	5RR
Size	216
IADC Code	
Manufacturer	Baker Hughes
Type	BHC606c
Serial No	7103687
Jets	
Depth Out (m)	
Depth In (m)	1834
Total Drilled (m)	9
Hrs Run Today	4.50
Cumulative Hrs Run	4.50
Entry Date	2013/02/09

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB
1834m	1843m	CORE	55	3kdaN

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	216	137	0.44m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
79	Drill Pipe	Stands		1522.06m
1	Drill Pipe	Singles		9.72m

Kelly Down	6.34m
Total	1843.00m
Weight of DC	9kdaN
Weight of String	63kdaN

HOLE CONDITION

Hole Drag Up 2 Down 2

Torque at Bottom	6400.00Nm
Fill on Bottom	

MUD RECORD

Mud Type Water [x] Oil [ ] Other

Time	02:00	04:00
Density	1070	1065
Funnel Viscosity	54s/l	55s/l
Fluid Loss	7cm3	7cm3
pH	9.5	9.5
Location of Sample	shaker	shaker
Depth		
PVT		

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1	SINGLE	152	94	6885	6
2	SINGLE	152	0	6885	0

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
1	4200	@	65	@	1832
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	8	10.5	220
A0124704	8	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	02:00	2.00	6A	Cont. tripping in until 1807/washed last stand down/ reamed through the rat
				hole until bottom
02:00	02:15	0.25	7	RIG SERVICE;- greased topdrive, drawworks and blocks. Functioned annular o/c
				= 18secs
02:15	06:45	4.50	4	Cut 89mm Core in 216 hole #2 from 1834M to 1838M
06:45	07:00	0.25	21	Safety meeting w/ rig crews & MGM rep.
07:00	08:00	1.00	4	Cut 89mm Core in 216 hole #2 from 1838M to 1839M

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor
Functioned : Annular, flare igniter, crown saver

SAFETY

Safety Topic	MEHL	MACP
Using Catwalk	66.00kdaN	6518kPa

TOUR 2

SIGNATURE OF DRILLER: Joel Doctor | START TIME: 08:00 | END TIME: 20:00

BITS

Bit Number	5RR
Size	216
IADC Code	
Manufacturer	Baker Hughes
Type	BHC606c
Serial No	7103687
Jets	
Depth Out (m)	
Depth In (m)	1834
Total Drilled (m)	18
Hrs Run Today	1.50
Cumulative Hrs Run	6.00
Entry Date	2013/02/09

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB
1843m	1851.6m	CORE	60	6kdaN

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	216	137	0.44m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
79	Drill Pipe	Stands		1522.06m
2	Drill Pipe	Singles		19.00m

Kelly Down	5.66m
Total	1851.60m
Weight of DC	9kdaN
Weight of String	63kdaN

HOLE CONDITION

Hole Drag Up 17 Down 8

Torque at Bottom	10455.00Nm
Fill on Bottom	

MUD RECORD

Mud Type Water [x] Oil [ ] Other

Time		
Density		
Funnel Viscosity		
Fluid Loss		
pH		
Location of Sample		
Depth		
PVT		

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1	SINGLE	152	65	6883	2

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
1	4200	@	67	@	1832
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	12	10.5	220
A0124704	12	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	08:45	0.75	4	Cut 216mm core w/ Baker Hughes coring assembly from 1843m tom 1851m
08:45	09:45	1.00	5	Clean hole & mix pill
09:45	17:00	7.25	6B	Pump pill on bottom, controlled trip out of the hole, pulled tight in rat
				hole, circulated & backreamed out of rathole, pump pill #2, flowcheck@1815m,
				blow out top drive, circulate pump through bleeder, hammer off kicker hose,
				flowcheck@1739m, 970m, 200m
17:00	17:15	0.25	21D	Pre-job safety meeting w/ rig crew & Baker Hughes before handling core
				barrel BHA
17:15	18:45	1.50	4A	Disassembly Baker Hughes coring BHA & recover cut core #2
18:45	19:00	0.25	7	Rig service, functioned upper pipe rams c/o 7 sec.
19:00	19:15	0.25	21	Safety meeting w/ rig crews & MGM rep.
19:15	20:00	0.75	4A	Cont. to disassembly Baker Hughes coring BHA & recover cut core #2

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor
Functioned : Annular, flare igniter, crown saver
Trip record : meas-9.56m3 cal-6.94m3 diff-2.62m3

SAFETY

Safety Topic	MEHL	MACP
Over head equipment	85.00kdaN	6558kPa

TOUR 3

SIGNATURE OF DRILLER: Travis Davson | START TIME: 20:00 | END TIME: 24:00

BITS

Bit Number	6
Size	216
IADC Code	
Manufacturer	Baker Hughes
Type	409c
Serial No	7137198
Jets	
Depth Out (m)	
Depth In (m)	1852
Total Drilled (m)	0
Hrs Run Today	0.00
Cumulative Hrs Run	0.00
Entry Date	2013/02/10

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	216	137	0.44m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
79	Drill Pipe	Stands		1522.06m
2	Drill Pipe	Singles		19.00m

Kelly Down	5.66m
Total	1851.60m
Weight of DC	9kdaN
Weight of String	63kdaN

HOLE CONDITION

Hole Drag Up Down

Torque at Bottom	
Fill on Bottom	

MUD RECORD

Mud Type Water [x] Oil [ ] Other

Time		
Density		
Funnel Viscosity		
Fluid Loss		
pH		
Location of Sample		
Depth		
PVT		

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1		152	67	0	4
2		152	0	0	0

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	4	10	200
A0124704	4	10	210

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
20:00	23:15	3.25	4A	Cont. to disassembly Baker Hughes coring BHA & recover cut core, rack back
				outter core barrells inspect bit, changed bit out. Make up new bit run in
				hole, assemble core barrell run number 3
23:15	24:00	0.75	6A	Run in hole for core run #3

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor
Functioned : Annular, flare igniter, crown saver

SAFETY

Safety Topic	MEHL	MACP
Working with making up tools		

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130210_1A	Pason	2013	02	10

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Shane Welles	

Pason

DRILLING ASSEMBLY — TOUR 1

No	Component	OD	ID	Length
1	BIT	216	137.00	0.44
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	171.00	137.00	1.22
1	Top sub	171.00	0.61	.71
1	JARS-HYD/MECH	171.00	57.00	2.16
	Drill Pipe		Stands	
	Drill Pipe		Singles	
	Kelly Down			
	Total			
	Weight of DC			
	Weight of String			

DRILLING ASSEMBLY — TOUR 1

No	Component	OD	ID	Length
1	FLOAT SUB	171.00	57.00	0.56
6	DC (6.25 IN)	156.00	70.00	56.38
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
79	Drill Pipe		Stands	1522.06
1	Drill Pipe		Singles	9.72
	Kelly Down			6.34
	Total			1843.00
	Weight of DC			9.00
	Weight of String			63.00

DRILLING ASSEMBLY — TOUR 2

No	Component	OD	ID	Length
1	BIT	216	137.00	0.44
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	171.00	137.00	1.22
1	Top sub	171.00	0.61	.71
1	JARS-HYD/MECH	171.00	57.00	2.16
	Drill Pipe		Stands	
	Drill Pipe		Singles	
	Kelly Down			
	Total			
	Weight of DC			
	Weight of String			

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
1	SOP	Hoisting tubulars with catwalk	01:00	
1	SOP	Rolling drill pipe	02:00	
2	SOP	D-2 tripping out of hole	08:00	
2	SOP	D-31 pipe spinner	08:00	
2	SOP	D-18 dog collar use	12:00	
2	SOP	D-52 handle core and core barrels	12:00	

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130210_1A	Pason	2013	02	10

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Shane Welles	

Pason

DRILLING ASSEMBLY — TOUR 2

No	Component	OD	ID	Length
1	FLOAT SUB	171.00	57.00	0.56
6	DC (6.25 IN)	156.00	70.00	56.38
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
79	Drill Pipe		Stands	1522.06
2	Drill Pipe		Singles	19.00
	Kelly Down			5.66
	Total			1851.60
	Weight of DC			9.00
	Weight of String			63.00

DRILLING ASSEMBLY — TOUR 3

No	Component	OD	ID	Length
1	BIT	216	137.00	0.44
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	STAB-NM	171.00	137.00	1.22
1	Top sub	171.00	0.61	.71
1	JARS-HYD/MECH	171.00	57.00	2.16
	Drill Pipe		Stands	
	Drill Pipe		Singles	
	Kelly Down			
	Total			
	Weight of DC			
	Weight of String			

DRILLING ASSEMBLY — TOUR 3

No	Component	OD	ID	Length
1	FLOAT SUB	171.00	57.00	0.56
6	DC (6.25 IN)	156.00	70.00	56.38
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
79	Drill Pipe		Stands	1522.06
2	Drill Pipe		Singles	19.00
	Kelly Down			5.66
	Total			1851.60
	Weight of DC			9.00
	Weight of String			63.00

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
3	SOP	Dog collar use	21:00	
3	SOP	Lay down inner core barrells	22:00	

MUD SAMPLE - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130210_1A	Pason	2013	02	10

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Shane Welles	

Pason

TOUR 1 **MUD TYPE** polymer **WATER** x **OIL** **OTHER**

Time		02:00	04:00	06:00														
Density		1070kg/m3	1065kg/m3	1070kg/m3														
Funnel Viscosity		54s/l	55s/l	57s/l														
Fluid Loss		7cm3	7cm3	7cm3														
Fluid pH		9.5	9.5	9.5														
Location of Sample		shaker	shaker	shaker														
Depth																		
PVT																		
Test 1	Type (Ex: Chlorides)																	
	Value																	
Test 2	Type (ex: Sand%)																	
	Value																	
Test 3	Type (ex: Hard Ca)																	
	Value																	
Test 4	Type (ex: Sulfides)																	
	Value																	

MUD SAMPLE REMARKS

EQUIPMENT & SERVICES

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130210_1A	Pason	2013	02	10

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Shane Welles	

Pason

GENERAL EQUIPMENT & SERVICE

Description	Make	Model	Provided by	Expense of	Rental Company	Serial No	Usage	Quantity	Quantity Used
Remarks:									
Remarks:									
Remarks:									

BOILERS

Boiler No	Make	Model	Provided by	Expense of	Rental Company	Serial No	Hours Today
A0093289	Lidster	100 HP	CONTRACTOR	OPERATOR		A0093289	24
Remarks:							
A0124704	Lidster	100HP	CONTRACTOR	OPERATOR		A0124704	24
Remarks:							
Remarks:							

SHALE SHAKERS

Shaker No	Make	Model	Screen 1				Screen 2				Screen 3				Screen 4			
			Position	Size	ScreenChanged?	New?	Position	Size	Screen Changed?	New?	Position	Size	Screen Changed?	New?	Position	Size	Screen Changed?	New?
1	SWACO	MONGOOSE	1	200	☐	X	2	200	☐	☐	3	165	☐	☐	4	165	☐	X
Remarks:																		
2	SWACO	MONGOOSE	1	200	☐	X	2	200	☐	X	3	165	☐	X	4	165	☐	X
Remarks:																		
					☐	☐			☐	☐			☐	☐			☐	☐
Remarks:																		

MUD PUMPS

Pump No	Make	Model	Provided by	Expense of	Rental Company	Serial No	Hours Today	Stroke Length	Rod Size	Pump Style
1	NATIONAL	9P-100	CONTRACTOR	CONTRACTOR		PMP-024	12	235mm		TRIPLEX
Remarks:										
2	NATIONAL	9P-100	CONTRACTOR	CONTRACTOR		PMP-023	0	235mm		TRIPLEX
Remarks:										
Remarks:										

BITS

Bit No	Size	IADC Code				Manufacturer	Type	Serial No	Jets								Depth In	Depth Out	Total Drilled	Total Hours Run Today	Cumula-tive Hours Run	Entry Date	Cutting Structure									Tour
		1	2	3	4				1	2	3	4	5	6	7	8							TI	T0	MDC	LOC	BRG	Gage	ODC	Reason Pulled	Total Run m/Hr	
5RR	216.00-mm					Baker Hughes	BHC60-6c	7103687									1834.0-0m		9.00m	4.50	4.50	13/02/09										1
5RR	216.00-mm					Baker Hughes	BHC60-6c	7103687									1834.0-0m		17.60m	1.50	6.00	13/02/09										2
5RR	216.00-mm					Baker Hughes	BHC60-6c	7103687									1834.0-0m	1851.6-0m	17.60m	0.00	6.00	13/02/09	1	2	CT	N	X	0.00mm	PN	BHA	2.93m/hr	3
6	216.00-mm					Baker Hughes	409c	7137198									1851.6-0m		0.00m	0.00	0.00	13/02/10										3

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130211_1B	Pason	2013	02	11

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Shane Welles	

DAILY CHECKS	OP	RM
1) Daily Walk Around Inspection	TM	G&S
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted	TM	G&S
5) Flare Lines Staked	TM	G&S
6) BOP Drills Performed	TM	G&S
7) Visually Inspected BOPs - Flare Lines & Degasser Lines	TM	
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		G&S
5) Motor Kills Checked		

Pason

CODE	1 Rig Up	2 Drill Actual	3 Reaming	4 Coring	5 Cond Mud & Circ	6 Trips	7 Rig Service	8 Repair Rig	9 Cut Off Drlg Line	10 Dev Survey	11 Wireline Logs	12 Run Csg & Cement	13 Wait On Cement	14 Nipple Up BOP	15 Test BOP	16 Drillstem Test	17 Plug Back	18 Squeeze Cement	19 Fishing	20 Dir Work	21 Safety Meeting	22 Tear Down	23 Waiting On	24 Rig Watch	25 Other	TOTAL
HOURS Tour 1					1.25	6.25	0.25														0.25					8.00
Tour 2				5.50		6.00	0.25														0.25					12.00
Tour 3				1.00		2.75															0.25					4.00
Total				6.50	1.25	15.00	0.50														0.75					24.00

Kelly Bushing | Op Fuel 4797.00

FUEL @ 08:00 HOURS

Rig 21177.00 | Boiler 0.00

WEATHER

Time 08:00 | Temp -20.00 | Current Conditions CLEAR | Wind Direction W | Wind Strength UP TO 19 KM/H | Road Condition GOOD

TOUR 1

SIGNATURE OF DRILLER: Travis Davson | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	6
Size	216
IADC Code	
Manufacturer	Baker Hughes
Type	409c
Serial No	7137198
Jets	8.0 8.0 8.0 8.0
	8.0 8.0 8.0 8.0
Depth Out (m)	
Depth In (m)	1852
Total Drilled (m)	2
Hrs Run Today	0.00
Cumulative Hrs Run	0.00
Entry Date	2013/02/10

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB
1851m	1854m	CORE	40	2kdaN

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	216	137	0.44m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
80	Drill Pipe	Stands		1545.93m
0	Drill Pipe	Singles		0.00m

Kelly Down	3.19m
Total	1854.00m
Weight of DC	9kdaN
Weight of String	65kdaN

HOLE CONDITION

Hole Drag Up 4 Down 4

Torque at Bottom	
Fill on Bottom	37.00m

MUD RECORD

Mud Type Water [x] Oil [ ] Other

Time	06:00
Density	1060
Funnel Viscosity	58s/l
Fluid Loss	7cm3
pH	9.5
Location of Sample	shaker
Depth	
PVT	

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1	SINGLE	152	92	6227	8
2	SINGLE	152	0	6227	0

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	8	10.5	220
A0124704	8	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	04:30	4.50	6A	Cont. running in the hole with core assembly #3, fill pipe @ 600m, 1200m
				blow back top drive after every fill
04:30	04:45	0.25	7	RIG SERVICE;- greased topdrive, drawworks and blocks. Functioned annular o/c
				= 18secs
04:45	06:30	1.75	6A	Cont. running in hole wash down stand 78,79 until bottom
06:30	06:45	0.25	5	Circulate bottoms up.
06:45	07:00	0.25	21	Safety meeting w/ rig crews & MGM rep.
07:00	08:00	1.00	5	Cont.Circulate bottoms up.

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor
Functioned : Annular, flare igniter, crown saver
MJ = 4913 ACC = 80708

SAFETY

Safety Topic	MEHL	MACP
Inspecting equipment	68.00kdaN	6558kPa

TOUR 2

SIGNATURE OF DRILLER: Joel Doctor | START TIME: 08:00 | END TIME: 20:00

BITS

Bit Number	6
Size	216
IADC Code	
Manufacturer	Baker Hughes
Type	409c
Serial No	7137198
Jets	8.0 8.0 8.0 8.0
	8.0 8.0 8.0 8.0
Depth Out (m)	
Depth In (m)	1852
Total Drilled (m)	23
Hrs Run Today	6.50
Cumulative Hrs Run	6.50
Entry Date	2013/02/10

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB
1851.60m	1874.24m	CORE	35	4.5kdaN

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	216	137	0.44m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
81	Drill Pipe	Stands		1569.21m
0	Drill Pipe	Singles		0.00m

Kelly Down	0.15m
Total	1874.24m
Weight of DC	9kdaN
Weight of String	65kdaN

HOLE CONDITION

Hole Drag Up 16 Down 15

Torque at Bottom	6766.00Nm
Fill on Bottom	

MUD RECORD

Mud Type Water [x] Oil [ ] Other

Time	08:00	09:00
Density	1075	1075
Funnel Viscosity	56s/l	54s/l
Fluid Loss	7cm3	7cm3
pH	9.5	9.5
Location of Sample	shakers	shakers
Depth	1852m	1856m
PVT	39.9m3	43.1m3

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1	SINGLE	152	93	6918	6

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
1	3979	@	65	@	1850
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type
CAL CARB 325	260	SX

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	12	10.5	220
A0124704	12	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	13:30	5.50	4	Cut core #3 w/ Baker Hughes coring assembly from 1851.60m to 1874.24m
13:30	14:45	1.25	6B	Pump out of the rat hole from 1874m to 1785m, flowcheck@1785m, pump pill,
				blow back top drive, circulate pump through bleeder, hammer off kicker hose
14:45	15:30	0.75	6B	Racked one stand, pulled tight on the next stand 16Kdan up & 15kDan down,
				screwed in & started circulating hole clean, pumped out two stands, straight
				pulled 5 stands while screwed in, static hookload, pumped pill #2
15:30	18:30	3.00	6B	Continue controlled trip out of the hole to recover cut core #3,
				flowcheck@676m
18:30	18:45	0.25	7	Rig service, functioned upper pipe rams c/o 7 sec.
18:45	19:00	0.25	21	Safety meeting w/ rig crews & MGM rep.
19:00	20:00	1.00	6B	Continue controlled trip out of the hole to recover cut core #3,
				flowcheck@676m

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor
Functioned : Annular, flare igniter, crown saver

SAFETY

Safety Topic	MEHL	MACP
Spill response	68.00kdaN	6558kPa

TOUR 3

SIGNATURE OF DRILLER: Travis Davson | START TIME: 20:00 | END TIME: 24:00

BITS

Bit Number	6
Size	216
IADC Code	
Manufacturer	Baker Hughes
Type	409c
Serial No	7137198
Jets	8.0 8.0 8.0 8.0
	8.0 8.0 8.0 8.0
Depth Out (m)	1874
Depth In (m)	1852
Total Drilled (m)	23
Hrs Run Today	0.00
Cumulative Hrs Run	6.50
Entry Date	2013/02/10

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	3.48
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	216	137	0.44m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
81	Drill Pipe	Stands		1569.21m
0	Drill Pipe	Singles		0.00m

Kelly Down	0.15m
Total	1874.24m
Weight of DC	9kdaN
Weight of String	65kdaN

HOLE CONDITION

Hole Drag Up Down

Torque at Bottom	
Fill on Bottom	

MUD RECORD

Mud Type Water [ ] Oil [ ] Other

Time		
Density		
Funnel Viscosity		
Fluid Loss		
pH		
Location of Sample		
Depth		
PVT		

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1		152	66	0	4
2		152	0	0	0

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	4	10.5	220
A0124704	4	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
20:00	22:45	2.75	6B	Continue controlled trip out of the hole to recover cut core #3, flowcheck@
				124m,0m
22:45	23:00	0.25	21	Safety meeting with core hands
23:00	24:00	1.00	4	Disassemble Baker Hughes coring BHA & recover cut core #3

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor
Functioned : Annular, flare igniter, crown saver
MJ=6698 , ACC 82497

SAFETY

Safety Topic	MEHL	MACP
Handling core barrells		

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130211_1B	Pason	2013	02	11

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Shane Welles	

Pason

DRILLING ASSEMBLY — TOUR 1

No	Component	OD	ID	Length
1	BIT	216	137.00	0.44
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	STAB-NM	171.00	137.00	1.22
1	Top sub	171.00	0.61	.71
1	JARS-HYD/MECH	171.00	57.00	2.16
	Drill Pipe		Stands	
	Drill Pipe		Singles	
	Kelly Down			
	Total			
	Weight of DC			
	Weight of String			

DRILLING ASSEMBLY — TOUR 1

No	Component	OD	ID	Length
1	FLOAT SUB	171.00	57.00	0.56
6	DC (6.25 IN)	156.00	70.00	56.38
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
80	Drill Pipe		Stands	1545.93
0	Drill Pipe		Singles	0.00
	Kelly Down			3.19
	Total			1854.00
	Weight of DC			9.00
	Weight of String			65.00

DRILLING ASSEMBLY — TOUR 2

No	Component	OD	ID	Length
1	BIT	216	137.00	0.44
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	STAB-NM	171.00	137.00	1.22
1	Top sub	171.00	0.61	.71
1	JARS-HYD/MECH	171.00	57.00	2.16
	Drill Pipe		Stands	
	Drill Pipe		Singles	
	Kelly Down			
	Total			
	Weight of DC			
	Weight of String			

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
1	SOP	Tripping in hole	01:00	
1	SOP	hoisting tubulars with catwalk	03:00	
2	SOP	G-22 washing rig	08:00	
2	SOP	B-5 steam use	08:00	
2	SOP	K-7 adding antifreeze	12:00	
2	SOP	Q-3 bench grinder use	12:00	

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130211_1B	Pason	2013	02	11

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Shane Welles	

Pason

DRILLING ASSEMBLY — TOUR 2

No	Component	OD	ID	Length
1	FLOAT SUB	171.00	57.00	0.56
6	DC (6.25 IN)	156.00	70.00	56.38
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
81	Drill Pipe	Stands		1569.21
0	Drill Pipe	Singles		0.00
	Kelly Down			0.15
	Total			1874.24
	Weight of DC			9.00
	Weight of String			65.00

DRILLING ASSEMBLY — TOUR 3

No	Component	OD	ID	Length
1	BIT	216	137.00	0.44
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	STAB-NM	171.00	137.00	1.22
1	Top sub	171.00	0.61	.71
1	JARS-HYD/MECH	171.00	57.00	2.16
	Drill Pipe	Stands		
	Drill Pipe	Singles		
	Kelly Down			
	Total			
	Weight of DC			
	Weight of String			

DRILLING ASSEMBLY — TOUR 3

No	Component	OD	ID	Length
1	FLOAT SUB	171.00	57.00	0.56
6	DC (6.25 IN)	156.00	70.00	56.38
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
81	Drill Pipe	Stands		1569.21
0	Drill Pipe	Singles		0.00
	Kelly Down			0.15
	Total			1874.24
	Weight of DC			9.00
	Weight of String			65.00

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
3	SOP	P.O.OH	21:00	
3	SOP	Dog collar use	22:00	

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130212_1A	Pason	2013	02	12

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Cody Hart & Shane Welles	

DAILY CHECKS	OP	RM
1) Daily Walk Around Inspection	TM	G&S
2) Detailed Inspection - Weekly (Using Check List)	TM	G&S
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted	TM	G&S
5) Flare Lines Staked	TM	G&S
6) BOP Drills Performed	TM	G&S
7) Visually Inspected BOPs - Flare Lines & Degasser Lines	TM	G&S
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		G&S
5) Motor Kills Checked		

Pason

CODE	1 Rig Up	2 Drill Actual	3 Reaming	4 Coring	5 Cond Mud & Circ	6 Trips	7 Rig Service	8 Repair Rig	9 Cut Off Drilg Line	10 Dev Survey	11 Wireline Logs	12 Run Csg & Cement	13 Wait On Cement	14 Nipple Up BOP	15 Test BOP	16 Drillstem Test	17 Plug Back	18 Squeeze Cement	19 Fishing	20 Dir Work	21 Safety Meeting	22 Tear Down	23 Waiting On	24 Rig Watch	25 Other	TOTAL
HOURS Tour 1				1.75		5.75	0.25														0.25					8.00
Tour 2		5.25	5.75				0.25		0.50												0.25					12.00
Tour 3		2.00			1.50		0.25														0.25					4.00
Total		7.25	5.75	1.75	1.50	5.75	0.75		0.50												0.75					24.00

Kelly Bushing | Op Fuel 5499.00

FUEL @ 08:00 HOURS

Rig 15678.00 | Boiler 0.00 | Time 08:00 | Temp -20.00

WEATHER

Current Conditions: CLEAR | Wind Direction: W | Wind Strength: UP TO 19 KM/H | Road Condition: GOOD

TOUR 1

SIGNATURE OF DRILLER: Blair Oleksyn | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	RR4
Size	216
IADC Code	
Manufacturer	Baker Hughes
Type	GX-20MDX
Serial No	5202128
Jets	
Depth Out (m)	
Depth In (m)	1874
Total Drilled (m)	0
Hrs Run Today	0.00
Cumulative Hrs Run	0.00
Entry Date	2013/02/12

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	216	137	0.44m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
81	Drill Pipe	Stands		1569.21m
0	Drill Pipe	Singles		0.00m

Kelly Down	0.15m
Total	1874.24m
Weight of DC	9kdaN
Weight of String	65kdaN

HOLE CONDITION

Hole Drag: Up | Down

Torque at Bottom	
Fill on Bottom	

MUD RECORD

Mud Type: Water [x] Oil [ ] Other

Time	
Density	
Funnel Viscosity	
Fluid Loss	
pH	
Location of Sample	
Depth	
PVT	

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1		152	66	0	8
2		152	0	0	0

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	8	10.5	220
A0124704	8	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	01:45	1.75	4A	Disassemble Baker Hughes coring BHA & recover cut core #3
01:45	03:00	1.25	6B	Cont. tripping out of hole to rack back outter core barrells
03:00	06:30	3.50	6A	Make up new bit and bit sub, run in three stands of collars and pick up
				jars. Continue tripping in hole stopping to fill pipe @ 600m and 1200m/Blow
				back top drive
06:30	06:45	0.25	7	RIG SERVICE;- greased blocks, topdrive and washpipe. Functioned pipe rams
				o/c = 7secs.
06:45	07:00	0.25	21	Pre-tour meeting held with both rig crews and MGM rep.
07:00	08:00	1.00	6A	Continue tripping in hole.

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor
Functioned : Annular, flare igniter, crown saver
Trip Record - Meas 8.5, Cal 6.96, Diff 1.54

SAFETY

Safety Topic	MEHL	MACP
Locking out equipment	65.00kdaN	6558kPa

TOUR 2

SIGNATURE OF DRILLER: Joel Doctor | START TIME: 08:00 | END TIME: 20:00

BITS

Bit Number	RR4
Size	216
IADC Code	
Manufacturer	Baker Hughes
Type	GX-20MDX
Serial No	5202128
Jets	
Depth Out (m)	
Depth In (m)	1874
Total Drilled (m)	
Hrs Run Today	5.25
Cumulative Hrs Run	5.25
Entry Date	2013/02/12

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB
1816m	1874m	REAM	120	6.5kdaN
1874m	1915m	DRILL	120	13kdaN

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	216	137	0.42m
1	BIT SUB	102	65	0.94m
6	DC (6.25 IN)	156	70	56.38m
1	JARS-HYD	102	65	10.00m
1	X/O	102	65	1.10m
20	HWDP(4.0 IN)	102	65	186.25m
86	Drill Pipe	Stands		1656.65m
0	Drill Pipe	Singles		0.00m

Kelly Down	3.26m
Total	1915.00m
Weight of DC	9kdaN
Weight of String	63kdaN

HOLE CONDITION

Hole Drag: Up 4 | Down 4

Torque at Bottom	5200.00Nm
Fill on Bottom	18.00m

MUD RECORD

Mud Type: Water [x] Oil [ ] Other

Time	09:30
Density	1095
Funnel Viscosity	56s/l
Fluid Loss	7cm3
pH	9.5
Location of Sample	shakers
Depth	1874m
PVT	42.7m3

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1	SINGLE	152	119	8531	4
2	SINGLE	152	119	8531	3

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
1	3246	@	65	@	1861
2	3383	@	65	@	1815
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	12	10.5	220
A0124704	12	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	10:45	2.75	3A	Ream & clean hole to bottom w/ slick assembly from 1816m to 1870m
10:45	11:15	0.50	3B	Backream out of rat hole from 1870m to 1813m
11:15	11:45	0.50	9A	Slip & cut damaged drill line, SLC 7884mj - ACCUM 83669mj, 30wraps, 42m
11:45	14:15	2.50	3C	Continue to ream & clean hole to bottom w/ slick assembly from 1813m to
				1874m
14:15	14:30	0.25	2	Drill 216mm hole w/ slick assembly from 1874m to 1880m
14:30	14:45	0.25	7	Rig service, functioned upper pipe ram c/o 7 sec.
14:45	15:00	0.25	21	Safety meeting w/ rig crew & MGM rep.
15:00	20:00	5.00	2	Drill 216mm hole w/ slick assembly from 1880m to 1915m

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor
Functioned : upper pipe ram, flare igniter, crown saver, choke

SAFETY

Safety Topic	MEHL	MACP
Incinerator use	66.00kdaN	6558kPa

TOUR 3

SIGNATURE OF DRILLER: Blair Oleksyn | START TIME: 20:00 | END TIME: 24:00

BITS

Bit Number	RR4
Size	216
IADC Code	
Manufacturer	Baker Hughes
Type	GX-20MDX
Serial No	5202128
Jets	
Depth Out (m)	
Depth In (m)	1874
Total Drilled (m)	
Hrs Run Today	2.00
Cumulative Hrs Run	7.25
Entry Date	2013/02/12

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB
1915m	1938m	DRILL	130	13kdaN

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	216	137	0.42m
1	BIT SUB	102	65	0.94m
6	DC (6.25 IN)	156	70	56.38m
1	JARS-HYD	102	65	10.00m
1	X/O	102	65	1.10m
20	HWDP(4.0 IN)	102	65	186.25m
87	Drill Pipe	Stands		1675.65m
0	Drill Pipe	Singles		0.00m

Kelly Down	7.26m
Total	1938.00m
Weight of DC	9kdaN
Weight of String	63kdaN

HOLE CONDITION

Hole Drag: Up 6 | Down 6

Torque at Bottom	5500.00Nm
Fill on Bottom	

MUD RECORD

Mud Type: Water [x] Oil [ ] Other

Time	20:30
Density	1075
Funnel Viscosity	56s/l
Fluid Loss	7cm3
pH	9.5
Location of Sample	
Depth	1918m
PVT	40m3

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1	SINGLE	152	115	7700	3
2	SINGLE	152	0	7700	0

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
1	3340	@	65	@	1890
2	3383	@	65	@	1815
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density
cent 1	4	1075	1065	1750

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	4	10.5	220
A0124704	4	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
20:00	20:15	0.25	21A	BOP Drill with Akita crew
20:15	22:15	2.00	2	Drill 216mm hole w/ slick assembly from 1915m to 1938m
22:15	23:00	0.75	5	Acc work pipe, connection, and circulation time
23:00	23:15	0.25	7	Rig service, function test pason choke
23:15	24:00	0.75	5	Circulate & clean hole

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor
Functioned : upper pipe ram, flare igniter, crown saver, choke
SLC-596mj ACCUM-84265mj

SAFETY

Safety Topic	MEHL	MACP
BOP DRILL	70.00kdaN	6558kPa

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130212_1A	Pason	2013	02	12

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Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Cody Hart & Shane Welles	

Pason

DRILLING ASSEMBLY — TOUR 1

No	Component	OD	ID	Length
1	BIT	216	137.00	0.44
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
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1	STAB-NM	214.00	137.00	1.22
1	STAB-NM	171.00	137.00	1.22
1	Top sub	171.00	0.61	.71
1	JARS-HYD/MECH	171.00	57.00	2.16
	Drill Pipe		Stands	
	Drill Pipe		Singles	

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR 1

No	Component	OD	ID	Length
1	FLOAT SUB	171.00	57.00	0.56
6	DC (6.25 IN)	156.00	70.00	56.38
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
81	Drill Pipe		Stands	1569.21
0	Drill Pipe		Singles	0.00

Kelly Down	0.15
Total	1874.24
Weight of DC	9.00
Weight of String	65.00

DRILLING ASSEMBLY — TOUR 2

No	Component	OD	ID	Length
1	BIT	216	137.00	0.42
1	BIT SUB	102.00	65.00	0.94
6	DC (6.25 IN)	156.00	70.00	56.38
1	JARS-HYD	102.00	65.00	10.00
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
86	Drill Pipe		Stands	1656.65
0	Drill Pipe		Singles	0.00

Kelly Down	3.26
Total	1915.00
Weight of DC	9.00
Weight of String	63.00

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
1	SOP	Handling core barrells	01:00	
1	SOP	House keeping on drill floor	02:00	
2	SOP	D-3 run in the hole	08:00	
2	SOP	D-14 blow out top drive	08:00	
2	SOP	D-29 changing tong dies	12:00	
2	SOP	D-2 trip out of the hole	12:00	

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130212_1A	Pason	2013	02	12

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Cody Hart & Shane Welles	

Pason

DRILLING ASSEMBLY — TOUR 3

No	Component	OD	ID	Length
1	BIT	216	137.00	0.42
1	BIT SUB	102.00	65.00	0.94
6	DC (6.25 IN)	156.00	70.00	56.38
1	JARS-HYD	102.00	65.00	10.00
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
87	Drill Pipe Stands			1675.65
0	Drill Pipe Singles			0.00
	Kelly Down			7.26
	Total			1938.00
	Weight of DC			9.00
	Weight of String			63.00

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe Stands			
	Drill Pipe Singles			
	Kelly Down			
	Total			
	Weight of DC			
	Weight of String			

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe Stands			
	Drill Pipe Singles			
	Kelly Down			
	Total			
	Weight of DC			
	Weight of String			

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
3	SOP	D6-Connections with top drive	20:00	1912
3	SOP	D7-Mouseholing drill pipe	20:00	1912
3	SOP	Using rope to catch tubulars	20:00	1912
3	SOP	D40-Tugger operation	20:00	1912

EQUIPMENT & SERVICES

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130212_1A	Pason	2013	02	12

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Cody Hart & Shane Welles	

Pason

GENERAL EQUIPMENT & SERVICE

Description	Make	Model	Provided by	Expense of	Rental Company	Serial No	Usage	Quantity	Quantity Used
Remarks:									
Remarks:									
Remarks:									

BOILERS

Boiler No	Make	Model	Provided by	Expense of	Rental Company	Serial No	Hours Today
A0093289	Lidster	100 HP	CONTRACTOR	OPERATOR		A0093289	24
Remarks:							
A0124704	Lidster	100HP	CONTRACTOR	OPERATOR		A0124704	24
Remarks:							
Remarks:							

SHALE SHAKERS

Shaker No	Make	Model	Screen 1				Screen 2				Screen 3				Screen 4			
			Position	Size	ScreenChanged?	New?	Position	Size	Screen Changed?	New?	Position	Size	Screen Changed?	New?	Position	Size	Screen Changed?	New?
1	SWACO	MONGOOSE	1	200	☐	X	2	200	☐	☐	3	165	☐	☐	4	165	☐	X
Remarks:																		
2	SWACO	MONGOOSE	1	200	☐	X	2	200	☐	X	3	165	☐	X	4	165	☐	X
Remarks:																		
					☐	☐			☐	☐			☐	☐			☐	☐
Remarks:																		

MUD PUMPS

Pump No	Make	Model	Provided by	Expense of	Rental Company	Serial No	Hours Today	Stroke Length	Rod Size	Pump Style
1	NATIONAL	9P-100	CONTRACTOR	CONTRACTOR		PMP-024	15	235mm		TRIPLEX
Remarks:										
2	NATIONAL	9P-100	CONTRACTOR	CONTRACTOR		PMP-023	3	235mm		TRIPLEX
Remarks:										
Remarks:										

BITS

Bit No	Size	IADC Code				Manufacturer	Type	Serial No	Jets								Depth In	Depth Out	Total Drilled	Total Hours Run Today	Cumula-tive Hours Run	Entry Date	Cutting Structure									Tour
		1	2	3	4				1	2	3	4	5	6	7	8							TI	T0	MDC	LOC	BRG	Gage	ODC	Reason Pulled	Total Run m/Hr	
6	216.00-mm					Baker Hughes	409c	7137198	8.00mm	8.00mm	8.00mm	8.00-mm	8.00-mm	8.00-mm	8.00-mm	8.00mm	1851.6-0m	1874.2-4m	22.64m	0.00	6.50	13/02/10	1	1	NO	A	X	0.00mm	NO	BHA	3.48m/hr	1
RR4	216.00-mm					Baker Hughes	GX-20-MDX	5202128									1874.2-4m		0.00m	0.00	0.00	13/02/12										1
RR4	216.00-mm					Baker Hughes	GX-20-MDX	5202128									1874.2-4m			5.25	5.25	13/02/12										2
RR4	216.00-mm					Baker Hughes	GX-20-MDX	5202128									1874.2-4m			2.00	7.25	13/02/12										3

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130213_1A	Pason	2013	02	13

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Cody Hart & Shane Welles	

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	JD	C&S
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted	JD	C&S
5) Flare Lines Staked	JD	C&S
6) BOP Drills Performed	JD	C&S
7) Visually Inspected BOPs - Flare Lines & Degasser Lines	JD	C&S
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		C&S
5) Motor Kills Checked		

Pason

CODE	1 Rig Up	2 Drill Actual	3 Reaming	4 Coring	5 Cond Mud & Circ	6 Trips	7 Rig Service	8 Repair Rig	9 Cut Off Drilg Line	10 Dev Survey	11 Wireline Logs	12 Run Csg & Cement	13 Wait On Cement	14 Nipple Up BOP	15 Test BOP	16 Drillstem Test	17 Plug Back	18 Squeeze Cement	19 Fishing	20 Dir Work	21 Safety Meeting	22 Tear Down	23 Waiting On	24 Rig Watch	25 Other	TOTAL
HOURS Tour 1			0.75	3.75		3.25															0.25					8.00
Tour 2				3.50	0.50	7.50	0.25														0.25					12.00
Tour 3				3.50			0.25														0.25					4.00
Total			0.75	10.75	0.50	10.75	0.50														0.75					24.00

Kelly Bushing | Op Fuel 5967.00

FUEL @ 08:00 HOURS

Rig 9711.00 | Boiler 0.00 | Time 08:00 | Temp -20.00

WEATHER

Current Conditions: CLEAR | Wind Direction: W | Wind Strength: UP TO 19 KM/H | Road Condition: GOOD

TOUR 1

SIGNATURE OF DRILLER: Joel Doctor | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	5RR
Size	216
IADC Code	
Manufacturer	Baker Hughes
Type	BHC409C
Serial No	1731798
Jets	8.0 8.0 8.0 8.0
	8.0 8.0 8.0 8.0
Depth Out (m)	
Depth In (m)	1938
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	7.50
Entry Date	2013/02/13

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	214	137	0.44m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
0	Drill Pipe	Stands		0.00m
0	Drill Pipe	Singles		0.00m

Kelly Down	0.00m
Total	304.88m
Weight of DC	9kdaN
Weight of String	64kdaN

HOLE CONDITION

Hole Drag: Up 4 | Down 4

Torque at Bottom	
Fill on Bottom	

MUD RECORD

Mud Type: Water [x] Oil [ ] Other

Time	
Density	
Funnel Viscosity	
Fluid Loss	
pH	
Location of Sample	
Depth	
PVT	

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	8	10.5	220
A0124704	8	10.5	230

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	00:45	0.75	3B	Backream out of the hole from 1938m to 1816m
00:45	03:15	2.50	6B	Trip out of the hole, flowcheck@1670m,948m,261m
03:15	04:00	0.75	6D	Lay out jars & break down slick assembly
04:00	07:00	3.00	4A	Pick up Baker Hughes coring assembly
07:00	07:15	0.25	21	Safety meeting w/ rig crews & MGM. rep
07:15	08:00	0.75	4A	Pick up Baker Hughes coring assembly

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor
Functioned : upper pipe ram, flare igniter, crown saver, choke
Trip record : meas - 9.41m3 cal - 6.82m3 diff - 2.59m3
Functioned blind/shear rams c/o 7sec

SAFETY

Safety Topic	MEHL	MACP
Three point contact	64.00kdaN	6558kPa

TOUR 2

SIGNATURE OF DRILLER: Blair Oleksyn | START TIME: 08:00 | END TIME: 20:00

BITS

Bit Number	5RR
Size	216
IADC Code	
Manufacturer	Baker Hughes
Type	BHC409C
Serial No	1731798
Jets	8.0 8.0 8.0 8.0
	8.0 8.0 8.0 8.0
Depth Out (m)	
Depth In (m)	1938
Total Drilled (m)	8
Hrs Run Today	3.00
Cumulative Hrs Run	10.50
Entry Date	2013/02/13

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB
1938m	1946m	CORE	40	3.5kdaN

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	214	137	0.44m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
84	Drill Pipe	Stands		1618.09m
2	Drill Pipe	Singles		19.00m

Kelly Down	4.03m
Total	1946.00m
Weight of DC	9kdaN
Weight of String	66kdaN

HOLE CONDITION

Hole Drag: Up 5 | Down 5

Torque at Bottom	5000.00Nm
Fill on Bottom	

MUD RECORD

Mud Type: Water [x] Oil [ ] Other

Time	18:00	19:45
Density	1075	1085
Funnel Viscosity	58s/l	55s/
Fluid Loss	7cm3	7cm3
pH	9	9
Location of Sample		shakers
Depth	1941m	1944m
PVT	36.5m3	39m3

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1		152	75	8250	1
2		152	90	8250	2

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
2	4750	@	64	@	1938
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density
cent 1	2	1075	1065	1710

MUD MATERIALS ADDED

Product	Amount	Type
CAUSTIC	1	SX

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	12	10.5	230
A0124704	12	10.5	230

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	08:30	0.50	4A	Continue to assemble core barrel
08:30	08:45	0.25	7	Rig service, grease blocks and washpipe, function annular/ 55 sec o/c
08:45	16:15	7.50	6A	Trip in hole , fill pipe and blow out top drive at 500m, 1000m, 1500m , wash
				to bottom from 1820m to 1938m
16:15	16:45	0.50	5	Circulate and pump down ball
16:45	18:45	2.00	4	Cut 216mm core w/ Baker Hughes coring assembly from 1938m to 1942m
18:45	19:00	0.25	21	Safety meeting with MGM rep and Akita crew
19:00	20:00	1.00	4	Cut 216mm core w/ Baker Hughes coring assembly from 1942m to 1946m

Remarks: Safety meeting prior to handling core barrels
Fuel Transfer from Bulk to Rig Tank: 9250L + 9250L = 18500L @ 11:00
Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor
Functioned : upper pipe ram, flare igniter, crown saver, choke

SAFETY

Safety Topic	MEHL	MACP
Coring	70.00kdaN	6518kPa

TOUR 3

SIGNATURE OF DRILLER: Joel Doctor | START TIME: 20:00 | END TIME: 24:00

BITS

Bit Number	5RR
Size	216
IADC Code	
Manufacturer	Baker Hughes
Type	BHC409C
Serial No	1731798
Jets	8.0 8.0 8.0 8.0
	8.0 8.0 8.0 8.0
Depth Out (m)	
Depth In (m)	1938
Total Drilled (m)	23
Hrs Run Today	4.00
Cumulative Hrs Run	14.50
Entry Date	2013/02/13

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB
1946m	1960.51m	CORE	55	5kdaN

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	214	137	0.44m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
86	Drill Pipe	Stands		1653.71m
0	Drill Pipe	Singles		0.00m

Kelly Down	1.41m
Total	1960.00m
Weight of DC	9kdaN
Weight of String	66kdaN

HOLE CONDITION

Hole Drag: Up | Down

Torque at Bottom	6264.00Nm
Fill on Bottom	

MUD RECORD

Mud Type: Water [x] Oil [ ] Other

Time	20:00
Density	
Funnel Viscosity	
Fluid Loss	
pH	
Location of Sample	
Depth	
PVT	

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
2	SINGLE	152	93	7447	4

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
2	4750	@	64	@	1938
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	4	10.5	220
A0124704	4	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
20:00	23:30	3.50	4	Cut 216mm core w/ Baker Hughes coring assembly from 1946m to 1960.51m
23:30	23:45	0.25	7	Rig service
23:45	24:00	0.25	21A	Silent B.O.P. drill w/ rig crew while coring

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor
Functioned : upper pipe ram, flare igniter, crown saver, choke
Megajoules SLC =3817mj , ACC = 87488mj

SAFETY

Safety Topic	MEHL	MACP
BOP Drill	66.00kdaN	6440kPa

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130213_1A	Pason	2013	02	13

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Cody Hart & Shane Welles	

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection		
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted		
5) Flare Lines Staked		
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines		
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		
5) Motor Kills Checked		

CAODC

pason

Pason

CODE	1 Rig Up	2 Drill Actual	3 Reaming	4 Coring	5 Cond Mud & Circ	6 Trips	7 Rig Service	8 Repair Rig	9 Cut Off Drilg Line	10 Dev Survey	11 Wireline Logs	12 Run Csg & Cement	13 Wait On Cement	14 Nipple Up BOP	15 Test BOP	16 Drillstem Test	17 Plug Back	18 Squeeze Cement	19 Fishing	20 Dir Work	21 Safety Meeting	22 Tear Down	23 Waiting On	24 Rig Watch	25 Other	TOTAL
HOURS Tour 1			0.75	3.75		3.25															0.25					8.00
Tour 2				3.50	0.50	7.50	0.25														0.25					12.00
Tour 3				3.50			0.25														0.25					4.00
Total			0.75	10.75	0.50	10.75	0.50														0.75					24.00

Kelly Bushing | Op Fuel

FUEL @ 08:00 HOURS

Rig | Boiler

WEATHER

Time | Temp

Current Conditions

Wind Direction | Wind Strength

Road Condition

TOUR 1

SIGNATURE OF DRILLER: Joel Doctor

START TIME: 00:00 END TIME: 08:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130213_1A	Pason	2013	02	13

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Cody Hart & Shane Welles	

Pason

DRILLING ASSEMBLY — TOUR 1

No	Component	OD	ID	Length
1	BIT	216	137.00	0.42
1	BIT SUB	102.00	65.00	0.94
6	DC (6.25 IN)	156.00	65.00	56.38
1	JARS-HYD	102.00	65.00	10.00
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
87	Drill Pipe Stands			1675.65
0	Drill Pipe Singles			0.00
	Kelly Down			7.26
	Total			1938.00
	Weight of DC			9.00
	Weight of String			63.00

DRILLING ASSEMBLY — TOUR 1

No	Component	OD	ID	Length
1	BIT	214.00	137.00	0.44
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	STAB-NM	171.00	137.00	1.22
1	Top sub	171.00	0.61	0.71
1	JARS-HYD/MECH	171.00	57.00	2.16
	Drill Pipe Stands			
	Drill Pipe Singles			
	Kelly Down			
	Total			
	Weight of DC			
	Weight of String			

DRILLING ASSEMBLY — TOUR 1

No	Component	OD	ID	Length
1	FLOAT SUB	171.00	57.00	0.56
6	DC (6.25 IN)	156.00	70.00	56.38
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
0	Drill Pipe Stands			0.00
0	Drill Pipe Singles			0.00
	Kelly Down			0.00
	Total			304.88
	Weight of DC			9.00
	Weight of String			64.00

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
1	SOP	D-13 pre-trip floor inspection	00:00	
1	SOP	D-2 trip out of hole	00:00	
1	SOP	D-31 using pipe spinner	00:00	
1	SOP	D-50 rig up core barrel	00:00	
2	SOP	D52-Handle core and core barrels	08:00	1938
2	SOP	D51-Rig up core barrels	08:00	1938

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130213_1A	Pason	2013	02	13

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Cody Hart & Shane Welles	

Pason

DRILLING ASSEMBLY — TOUR 2

No	Component	OD	ID	Length
1	BIT	214.00	137.00	0.44
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	STAB-NM	171.00	137.00	1.22
1	Top sub	171.00	0.61	0.71
1	JARS-HYD/MECH	171.00	57.00	2.16
	Drill Pipe		Stands	
	Drill Pipe		Singles	

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR 2

No	Component	OD	ID	Length
1	FLOAT SUB	171.00	57.00	0.56
6	DC (6.25 IN)	156.00	70.00	56.38
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
84	Drill Pipe		Stands	1618.09
2	Drill Pipe		Singles	19.00

Kelly Down	4.03
Total	1946.00
Weight of DC	9.00
Weight of String	66.00

DRILLING ASSEMBLY — TOUR 3

No	Component	OD	ID	Length
1	BIT	214.00	137.00	0.44
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	STAB-NM	171.00	137.00	1.22
1	Top sub	171.00	0.61	0.71
1	JARS-HYD/MECH	171.00	57.00	2.16
	Drill Pipe		Stands	
	Drill Pipe		Singles	

Kelly Down	
Total	
Weight of DC	
Weight of String	

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
2	SOP	D50-Rig up inner core barrel	08:00	1938
3	SOP	D-28 house keeping on drill floor	20:00	
3	SOP	E-1 lock out wash gun	20:00	
3	SOP	G-21 thaw out frozen lines	20:00	
3	SOP	Q-15 use of snipe	20:00	

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130213_1A	Pason	2013	02	13

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Cody Hart & Shane Welles	

Pason

DRILLING ASSEMBLY — TOUR 3

No	Component	OD	ID	Length
1	FLOAT SUB	171.00	57.00	0.56
6	DC (6.25 IN)	156.00	70.00	56.38
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
86	Drill Pipe Stands			1653.71
0	Drill Pipe Singles			0.00
	Kelly Down			1.41
	Total			1960.00
	Weight of DC			9.00
	Weight of String			66.00

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe Stands			
	Drill Pipe Singles			
	Kelly Down			
	Total			
	Weight of DC			
	Weight of String			

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe Stands			
	Drill Pipe Singles			
	Kelly Down			
	Total			
	Weight of DC			
	Weight of String			

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth

EQUIPMENT & SERVICES

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130213_1A	Pason	2013	02	13

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Cody Hart & Shane Welles	

Pason

GENERAL EQUIPMENT & SERVICE

Description	Make	Model	Provided by	Expense of	Rental Company	Serial No	Usage	Quantity	Quantity Used
Remarks:									
Remarks:									
Remarks:									

BOILERS

Boiler No	Make	Model	Provided by	Expense of	Rental Company	Serial No	Hours Today
A0093289	Lidster	100 HP	CONTRACTOR	OPERATOR		A0093289	24
Remarks:							
A0124704	Lidster	100HP	CONTRACTOR	OPERATOR		A0124704	24
Remarks:							
Remarks:							

SHALE SHAKERS

Shaker No	Make	Model	Screen 1				Screen 2				Screen 3				Screen 4			
			Position	Size	ScreenChanged?	New?	Position	Size	Screen Changed?	New?	Position	Size	Screen Changed?	New?	Position	Size	Screen Changed?	New?
1	SWACO	MONGOOSE	1	200	☐	X	2	200	☐	☐	3	165	☐	☐	4	165	☐	X
Remarks:																		
2	SWACO	MONGOOSE	1	200	☐	X	2	200	☐	X	3	165	☐	X	4	165	☐	X
Remarks:																		
					☐	☐			☐	☐			☐	☐			☐	☐
Remarks:																		

MUD PUMPS

Pump No	Make	Model	Provided by	Expense of	Rental Company	Serial No	Hours Today	Stroke Length	Rod Size	Pump Style
1	NATIONAL	9P-100	CONTRACTOR	CONTRACTOR		PMP-024	1	235mm		TRIPLEX
Remarks:										
2	NATIONAL	9P-100	CONTRACTOR	CONTRACTOR		PMP-023	6	235mm		TRIPLEX
Remarks:										
Remarks:										

BITS

Bit No	Size	IADC Code				Manufacturer	Type	Serial No	Jets								Depth In	Depth Out	Total Drilled	Total Hours Run Today	Cumula-tive Hours Run	Entry Date	Cutting Structure									Tour
		1	2	3	4				1	2	3	4	5	6	7	8							TI	T0	MDC	LOC	BRG	Gage	ODC	Reason Pulled	Total Run m/Hr	
RR4	216.00-mm					Baker Hughes	GX-20-MDX	5202128									1874.2-4m	1938.0-0m	63.76m		7.50	13/02/12	1	1	NO	A		F	216.00-mm	NO	CP	8.50m/hr	1
5RR	216.00-mm					Baker Hughes	BHC40-9C	1731798	8.00mm	8.00mm	8.00mm	8.00-mm	8.00-mm	8.00-mm	8.00-mm	8.00mm	1938.0-0m				7.50	13/02/13											1
5RR	216.00-mm					Baker Hughes	BHC40-9C	1731798	8.00mm	8.00mm	8.00mm	8.00-mm	8.00-mm	8.00-mm	8.00-mm	8.00mm	1938.0-0m		8.00m	3.00	10.50	13/02/13											2
5RR	216.00-mm					Baker Hughes	BHC40-9C	1731798	8.00mm	8.00mm	8.00mm	8.00-mm	8.00-mm	8.00-mm	8.00-mm	8.00mm	1938.0-0m		22.51m	4.00	14.50	13/02/13											3

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130214_1A	Pason	2013	02	14

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Cody Hart & Shane Welles	

DAILY CHECKS	OP	RM
1) Daily Walk Around Inspection	JD	C&S
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted	JD	C&S
5) Flare Lines Staked	JD	C&S
6) BOP Drills Performed	JD	
7) Visually Inspected BOPs - Flare Lines & Degasser Lines	JD	C&S
1) Rig Site Health & Safety Meeting (one/crew/month)		C&S
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		C&S
5) Motor Kills Checked		

CAODC

Pason

HOURS	CODE	1 Rig Up	2 Drill Actual	Reaming	Coring	Cond Mud & Circ	6 Trips	7 Rig Service	Repair Rig	Cut Off Drilg Line	Dev Survey	Wireline Logs	Run Csg & Cement	Wait On Cement	Nipple Up BOP	Test BOP	Drillstem Test	Plug Back	Squeeze Cement	Fishing	Dir Work	21 Safety Meeting	Tear Down	Waiting On	Rig Watch	Other	TOTAL
	Tour 1				1.00		6.50	0.25														0.25					8.00
	Tour 2				3.50		7.75	0.25														0.50					12.00
	Tour 3			3.25			0.50	0.25																			4.00
	Total			3.25	4.50		14.75	0.75														0.75					24.00

WEATHER	
Kelly Bushing	Op Fuel 6000.00
FUEL @ 08:00 HOURS	
Rig 14625.00	Boiler 0.00
Time 08:00	Temp -25.00
Current Conditions CLEAR	
Wind Direction W	Wind Strength UP TO 19 KM/H
Road Condition GOOD	

TOUR 1

SIGNATURE OF DRILLER: Joel Doctor | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	5RR
Size	216
IADC Code	
Manufacturer	Baker Hughes
Type	BHC409C
Serial No	1731798
Jets	8.0 8.0 8.0 8.0
	8.0 8.0 8.0 8.0
Depth Out (m)	1960
Depth In (m)	1938
Total Drilled (m)	22
Hrs Run Today	0.50
Cumulative Hrs Run	15.00
Entry Date	2013/02/13

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	1.47
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	214	137	0.44m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
1	STAB-NM	214	137	1.22m
1	Outer tube	171	137	7.92m
86	Drill Pipe	Stands		1653.71m
0	Drill Pipe	Singles		0.00m

Kelly Down	1.41m
Total	1960.00m
Weight of DC	9kdaN
Weight of String	66kdaN

HOLE CONDITION

Hole Drag Up 2 Down 2

Torque at Bottom

Fill on Bottom

MUD RECORD

Mud Type: Water [x] Oil [ ] Other

Time	03:00	05:30
Density	1080	1075
Funnel Viscosity	51s/l	51s/l
Fluid Loss	7.5cm3	7.5cm3
pH	8	8.5
Location of Sample	shakers	shakers
Depth	1978m	1984m
PVT	37.2m3	36.7m3

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
2	SINGLE	152	93	7482	1

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
2	4750	@	64	@	1938
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type
SULFAMIC ACID	1	SX
CAUSTIC	1	SX
poly-xax	4	SX

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	8	10.5	220
A0124704	8	10.5	230

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	01:00	1.00	4	Cut 216mm core w/ Baker Hughes coring assembly from 1960m to 1960.5m
01:00	02:00	1.00	6B	Pump out of the hole from 1960.5m to 1774m, controlled trip out of the hole
02:00	06:30	4.50	6	Flow check @ 1760m. Pump pill and blow out top drive and standpipe. Continue
				tripping out of hole. Fow check @1760m, @954m and @350m
06:30	06:45	0.25	7	RIG SERVICE;-Greased blocks, crown and washpipe.
06:45	07:00	0.25	21	Pre-tour meeting held with both crew members and MGM rep.
07:00	08:00	1.00	6B	Continue tripping out of hole

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor

Functioned : upper pipe ram, flare igniter, crown saver, choke

SAFETY

Safety Topic	MEHL	MACP
Boiler maintanance	66.00kdaN	6164kPa

TOUR 2

SIGNATURE OF DRILLER: Blair Oleksyn | START TIME: 08:00 | END TIME: 20:00

BITS

Bit Number	RR4
Size	216
IADC Code	
Manufacturer	Baker Hughes
Type	GX-20MDX
Serial No	5202128
Jets	
Depth Out (m)	
Depth In (m)	1874
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	12.50
Entry Date	2013/02/12

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	216	137	0.42m
1	BIT SUB	102	65	0.94m
6	DC (6.25 IN)	156	70	56.38m
1	JARS-HYD	102	65	10.00m
1	X/O	102	65	1.10m
20	HWDP(4.0 IN)	102	65	186.25m
88	Drill Pipe	Stands		1695.10m
1	Drill Pipe	Singles		9.65m

Kelly Down	0.16m
Total	1960.00m
Weight of DC	9kdaN
Weight of String	66kdaN

HOLE CONDITION

Hole Drag Up Down

Torque at Bottom

Fill on Bottom

MUD RECORD

Mud Type: Water [x] Oil [ ] Other

Time	15:00	
Density	1070	
Funnel Viscosity	58s/l	
Fluid Loss	7cm3	
pH	9.5	
Location of Sample		
Depth	0m	
PVT	35m3	

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1		152	0	0	0
2		152	0	0	0

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density
cent 1	0	0	0	0
cent 2	0	0	0	0

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	12	10.5	220
A0124704	12	10.5	230

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	08:45	0.75	6B	Trip out of hole
08:45	09:00	0.25	21	Safety meeting with baker huges prior to handling cores
09:00	12:30	3.50	4A	Disassembly Baker Hughes coring, recover cut core #4
12:30	15:00	2.50	6D	Lay down Baker Hughes Bottom hole assembly
15:00	15:15	0.25	7	Rig service, function Pipe rams 5 sec to c/o
15:15	18:45	3.50	6A	Trip in hole , fill pipe /blow top drive @ 650m,
18:45	19:00	0.25	21	Safety meeting with MGM and Akita crew
19:00	20:00	1.00	6A	Continue to trip in hole

Remarks: Safety metting prior to handling core barrel/recovering core

Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor

Functioned : upper pipe ram, flare igniter, crown saver, choke

Monthly hazard hunt-Welded on chains

SAFETY

Safety Topic	MEHL	MACP
Handling cores	50.00kdaN	6479kPa

TOUR 3

SIGNATURE OF DRILLER: Joel Doctor | START TIME: 20:00 | END TIME: 24:00

BITS

Bit Number	RR4
Size	216
IADC Code	
Manufacturer	Baker Hughes
Type	GX-20MDX
Serial No	5202128
Jets	
Depth Out (m)	
Depth In (m)	1874
Total Drilled (m)	86
Hrs Run Today	3.00
Cumulative Hrs Run	15.50
Entry Date	2013/02/12

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB
1815m	1960m	REAM	100	8kdaN

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	216	137	0.42m
1	BIT SUB	102	65	0.94m
6	DC (6.25 IN)	156	70	56.38m
1	JARS-HYD	102	65	10.00m
1	X/O	102	65	1.10m
20	HWDP(4.0 IN)	102	65	186.25m
88	Drill Pipe	Stands		1695.10m
1	Drill Pipe	Singles		9.65m

Kelly Down	0.16m
Total	1960.00m
Weight of DC	9kdaN
Weight of String	66kdaN

HOLE CONDITION

Hole Drag Up 3 Down 3

Torque at Bottom 7605.00Nm

Fill on Bottom

MUD RECORD

Mud Type: Water [x] Oil [ ] Other

Time	23:30	
Density	1075	
Funnel Viscosity	53s/l	
Fluid Loss	7cm3	
pH	9	
Location of Sample	shakers	
Depth	1960m	
PVT	38.9m3	

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
2	SINGLE	152	119	8887	2.5

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
1	2692	@	58	@	1935
2	3111	@	64	@	1935
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type
biocide	4	SX
CAL CARB 'O'	80	SX

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	4	10.5	220
A0124704	4	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
20:00	20:30	0.50	6A	Trip in the hole w/ slick assembly
20:30	23:45	3.25	3C	Ream rat hole w/ slick assembly from 1820m to 1960m
23:45	24:00	0.25	7	Rig service, function upper pipe ram c/o 7 sec.

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor

Functioned : upper pipe ram, flare igniter, crown saver, choke

transfered 9000 litres from source tank to rig tank.

SLC-5590mj ACCUM-89259mj

SAFETY

Safety Topic	MEHL	MACP
Oil under pressure	69.00kdaN	6440kPa

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130214_1A	Pason	2013	02	14

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Cody Hart & Shane Welles	

Pason

DRILLING ASSEMBLY — TOUR 1

No	Component	OD	ID	Length
1	BIT	214.00	137.00	0.44
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
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1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	Outer tube	171.00	137.00	7.92
1	STAB-NM	214.00	137.00	1.22
1	STAB-NM	171.00	137.00	1.22
1	Top sub	171.00	0.61	0.71
1	JARS-HYD/MECH	171.00	57.00	2.16
	Drill Pipe		Stands	
	Drill Pipe		Singles	

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR 1

No	Component	OD	ID	Length
1	FLOAT SUB	171.00	57.00	0.56
6	DC (6.25 IN)	156.00	70.00	56.38
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
86	Drill Pipe		Stands	1653.71
0	Drill Pipe		Singles	0.00

Kelly Down	1.41
Total	1960.00
Weight of DC	9.00
Weight of String	66.00

DRILLING ASSEMBLY — TOUR 2

No	Component	OD	ID	Length
1	BIT	216	137.00	0.42
1	BIT SUB	102.00	65.00	0.94
6	DC (6.25 IN)	156.00	70.00	56.38
1	JARS-HYD	102.00	65.00	10.00
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
88	Drill Pipe		Stands	1695.10
1	Drill Pipe		Singles	9.65

Kelly Down	0.16
Total	1960.00
Weight of DC	9.00
Weight of String	66.00

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
1	SOP	Housekeeping on drill floor	00:00	
1	SOP	Lockout wash gun	00:00	
1	SOP	Thawing out frozen lines	00:00	
1	SOP	Use of snipe	00:00	
2	SOP	C7-Lowering tubulars with skate	08:00	1960
2	SOP	K6-Adding methanol	08:00	1960

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130214_1A	Pason	2013	02	14

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Cody Hart & Shane Welles	

Pason

DRILLING ASSEMBLY — TOUR 3

No	Component	OD	ID	Length
1	BIT	216	137.00	0.42
1	BIT SUB	102.00	65.00	0.94
6	DC (6.25 IN)	156.00	70.00	56.38
1	JARS-HYD	102.00	65.00	10.00
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
88	Drill Pipe Stands			1695.10
1	Drill Pipe Singles			9.65
	Kelly Down			0.16
	Total			1960.00
	Weight of DC			9.00
	Weight of String			66.00

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe Stands			
	Drill Pipe Singles			
	Kelly Down			
	Total			
	Weight of DC			
	Weight of String			

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe Stands			
	Drill Pipe Singles			
	Kelly Down			
	Total			
	Weight of DC			
	Weight of String			

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
2	SOP	N5-Working in icy conditions	08:00	1960
2	SOP	N17-Operating incinerator	08:00	1960
3	SOP	D-3 running in the hole	20:00	
3	SOP	D-31 using pipe spinner	20:00	
3	SOP	C-10 level & load pipe racks w/ casing	20:00	
3	SOP	H-1 catching samples	20:00	

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130215_1A	Pason	2013	02	15

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Cody Hart & Shane Welles	

DAILY CHECKS	OP	RM
1) Daily Walk Around Inspection	JD	C&S
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted	JD	C&S
5) Flare Lines Staked	JD	C&S
6) BOP Drills Performed	JD	C&S
7) Visually Inspected BOPs - Flare Lines & Degasser Lines	JD	C&S
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		C&S
5) Motor Kills Checked		

Pason

CODE	1 Rig Up	2 Drill Actual	3 Reaming	4 Coring	5 Cond Mud & Circ	6 Trips	7 Rig Service	8 Repair Rig	9 Cut Off Drilg Line	10 Dev Survey	11 Wireline Logs	12 Run Csg & Cement	13 Wait On Cement	14 Nipple Up BOP	15 Test BOP	16 Drillstem Test	17 Plug Back	18 Squeeze Cement	19 Fishing	20 Dir Work	21 Safety Meeting	22 Tear Down	23 Waiting On	24 Rig Watch	25 Other	TOTAL
HOURS Tour 1		7.25			0.25		0.25														0.25					8.00
Tour 2		2.25	4.50		2.75	2.00	0.25														0.25					12.00
Tour 3						2.25	0.25				1.25										0.25					4.00
Total		9.50	4.50		3.00	4.25	0.75				1.25										0.75					24.00

Kelly Bushing | Op Fuel 6192.00

FUEL @ 08:00 HOURS

Rig 17433.00 | Boiler 0.00 | Time 08:00 | Temp -20.00

WEATHER: Current Conditions CLEAR | Wind Direction W | Wind Strength UP TO 19 KM/H | Road Condition GOOD

TOUR 1

SIGNATURE OF DRILLER: Joel Doctor | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	RR4
Size	216
IADC Code	
Manufacturer	Baker Hughes
Type	GX-20MDX
Serial No	5202128
Jets	
Depth Out (m)	
Depth In (m)	1874
Total Drilled (m)	
Hrs Run Today	7.00
Cumulative Hrs Run	22.50
Entry Date	2013/02/12

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB
1960m	1995m	DRILL	100	15kdaN

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	216	137	0.42m
1	BIT SUB	102	65	0.94m
6	DC (6.25 IN)	156	70	56.38m
1	JARS-HYD	102	65	10.00m
1	X/O	102	65	1.10m
20	HWDP(4.0 IN)	102	65	186.25m

90	Drill Pipe	Stands	1733.70m
0	Drill Pipe	Singles	0.00m
	Kelly Down		6.21m
	Total		1995.00m
	Weight of DC		9kdaN
	Weight of String		66kdaN

HOLE CONDITION

Hole Drag Up 3 Down 3

Torque at Bottom	7135.00Nm
Fill on Bottom	

MUD RECORD

Mud Type: Water [x] Oil [ ] Other

Time	01:30	02:30
Density	1080	1085
Funnel Viscosity	51s/l	51s/l
Fluid Loss	8cm3	8cm3
pH	8	8
Location of Sample	shakers	shakers
Depth	1967m	1970m
PVT	38.3m3	37.5m3

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
2	SINGLE	152	119	8345	7

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
2	3111	@	64	@	1935
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	8	10.5	220
A0124704	8	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	06:15	6.25	2	Drill 216mm hole w/ slick assembly from 1960m to 1990m
06:15	06:30	0.25	5	Accum. work pipe & connections
06:30	06:45	0.25	7	Rig service, functioned upper pipe rams c/o 7 sec.
06:45	07:00	0.25	21	Safety meeting w/ rig crews & MGM rep.
07:00	08:00	1.00	2	Drill 216mm hole w/ slick assembly from 1990m to 1995m

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor
Functioned : upper pipe ram, flare igniter, crown saver, choke
SLC-5590mj ACCUM-89259mj

SAFETY

Safety Topic	MEHL	MACP
Oil under pressure	68.00kdaN	6518kPa

TOUR 2

SIGNATURE OF DRILLER: Blair Oleksyn | START TIME: 08:00 | END TIME: 20:00

BITS

Bit Number	RR4
Size	216
IADC Code	
Manufacturer	Baker Hughes
Type	GX-20MDX
Serial No	5202128
Jets	
Depth Out (m)	
Depth In (m)	1874
Total Drilled (m)	127
Hrs Run Today	2.25
Cumulative Hrs Run	24.75
Entry Date	2013/02/12

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB
1995m	2001m	DRILL	105	15kdaN

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	216	137	0.42m
1	BIT SUB	102	65	0.94m
6	DC (6.25 IN)	156	70	56.38m
1	JARS-HYD	102	65	10.00m
1	X/O	102	65	1.10m
20	HWDP(4.0 IN)	102	65	186.25m

90	Drill Pipe	Stands	1733.70m
1	Drill Pipe	Singles	9.65m
	Kelly Down		2.56m
	Total		2001.00m
	Weight of DC		9kdaN
	Weight of String		66kdaN

HOLE CONDITION

Hole Drag Up 4 Down 4

Torque at Bottom	4500.00Nm
Fill on Bottom	

MUD RECORD

Mud Type: Water [x] Oil [ ] Other

Time	15:30	17:00
Density	1075	1075
Funnel Viscosity	80s/l	80s/l
Fluid Loss	7cm3	6.5cm3
pH	9	9
Location of Sample		
Depth	2001m	2001m
PVT	35m3	34m3

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
2	SINGLE	152	120	7600	4

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
2	3200	@	64	@	1995
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density
cent 1	0	0	0	0
cent 2	0	0	0	0

MUD MATERIALS ADDED

Product	Amount	Type
poly-xax	7	SX

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	12	10.5	220
A0124704	12	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	10:15	2.25	2	Drill 216mm hole w/ slick assembly from 1995m to 2001m
10:15	11:45	1.50	5D	Circulate, condition mud and work pipe
11:45	13:45	2.00	3B	Pump out of hole from 2001m to 1800m
13:45	14:00	0.25	7	Rig service, function annular , 55 sec to close/open
14:00	16:30	2.50	3A	Wash in from 1800m to 2001m, work tight hole from 1995m to 2001m
16:30	17:45	1.25	5D	Circulate, condition mud and work pipe
17:45	18:45	1.00	6B	Trip out of hole
18:45	19:00	0.25	21	Safety meeting with MGM rep and Akita crew
19:00	20:00	1.00	6B	Trip out of hole

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor
Functioned : upper pipe ram, flare igniter, crown saver, choke
Weekly safety topic-Lock out procedure//Energy isolation
Monthly drill-Spill response

SAFETY

Safety Topic	MEHL	MACP
Steam use	70.00kdaN	6440kPa

TOUR 3

SIGNATURE OF DRILLER: Joel Doctor | START TIME: 20:00 | END TIME: 24:00

BITS

Bit Number	RR4
Size	216
IADC Code	
Manufacturer	Baker Hughes
Type	GX-20MDX
Serial No	5202128
Jets	
Depth Out (m)	
Depth In (m)	1874
Total Drilled (m)	127
Hrs Run Today	0.00
Cumulative Hrs Run	24.75
Entry Date	2013/02/12

CUTTING STRUCTURE

TI	2	Gage	0
TO	1	ODC	PN
MDC	WT	Reason Pulled	LOG
LOC	M	Total Run (m/hr)	
BRG	0		

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	216	137	0.42m
1	BIT SUB	102	65	0.94m
6	DC (6.25 IN)	156	70	56.38m
1	JARS-HYD	102	65	10.00m
1	X/O	102	65	1.10m
20	HWDP(4.0 IN)	102	65	186.25m

90	Drill Pipe	Stands	1733.70m
1	Drill Pipe	Singles	9.65m
	Kelly Down		2.56m
	Total		2001.00m
	Weight of DC		9kdaN
	Weight of String		66kdaN

HOLE CONDITION

Hole Drag Up 2 Down 2

Torque at Bottom	
Fill on Bottom	

MUD RECORD

Mud Type: Water [x] Oil [ ] Other

Time		
Density		
Funnel Viscosity		
Fluid Loss		
pH		
Location of Sample		
Depth		
PVT		

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	4	10.5	220
A0124704	4	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
20:00	22:15	2.25	6B	Trip out of the hole to log, flowchecks@1993m, 1000m, 260m, & every 20 min
				while out of the hole
22:15	22:30	0.25	21D	Pre-job safety meeting w/ rig crew, Baker Hughes wirelines, MGM rep. before
				rigging up logging equipment
22:30	23:45	1.25	11	Rig up Baker Hughes wireline loggers
23:45	24:00	0.25	7	Rig service, function blind/shear rams c/o 7 sec.

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor
Functioned : upper pipe ram, flare igniter, crown saver, choke
Trip record : meas - 9.41m3 cal - 6.71m3 diff - 2.70m3
Functioned blind/shear rams c/o 7sec.

SAFETY

Safety Topic	MEHL	MACP
Rig up loggers	68.00kdaN	6448kPa

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130215_1A	Pason	2013	02	15

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Cody Hart & Shane Welles	

DAILY CHECKS	OP	RM
1) Daily Walk Around Inspection		
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted		
5) Flare Lines Staked		
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines		
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		
5) Motor Kills Checked		

CAODC

pason

Pason

HOURS	CODE 1 Rig Up	2 Drill Actual	3 Reaming	4 Coring	5 Cond Mud & Circ	6 Trips	7 Rig Service	8 Repair Rig	9 Cut Off Drlg Line	10 Dev Survey	11 Wireline Logs	12 Run Csg & Cement	13 Wait On Cement	14 Nipple Up BOP	15 Test BOP	16 Drillstem Test	17 Plug Back	18 Squeeze Cement	19 Fishing	20 Dir Work	21 Safety Meeting	22 Tear Down	23 Waiting On	24 Rig Watch	25 Other	TOTAL
Tour 1		7.25			0.25		0.25														0.25					8.00
Tour 2		2.25	4.50		2.75	2.00	0.25														0.25					12.00
Tour 3						2.25	0.25				1.25										0.25					4.00
Total		9.50	4.50		3.00	4.25	0.75				1.25										0.75					24.00

FUEL @ 08:00 HOURS			
Kelly Bushing		Op Fuel	
Rig		Boiler	

WEATHER	
Time	Temp
Current Conditions	
Wind Direction	Wind Strength
Road Condition	

TOUR 1

SIGNATURE OF DRILLER: Joel Doctor | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130215_1A	Pason	2013	02	15

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Cody Hart & Shane Welles	

Pason

DRILLING ASSEMBLY — TOUR 1

No	Component	OD	ID	Length
1	BIT	216	137.00	0.42
1	BIT SUB	102.00	65.00	0.94
6	DC (6.25 IN)	156.00	65.00	56.38
1	JARS-HYD	102.00	65.00	10.00
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
90	Drill Pipe	Stands		1733.70
0	Drill Pipe	Singles		0.00
	Kelly Down			6.21
	Total			1995.00
	Weight of DC			9.00
	Weight of String			66.00

DRILLING ASSEMBLY — TOUR 2

No	Component	OD	ID	Length
1	BIT	216	137.00	0.42
1	BIT SUB	102.00	65.00	0.94
6	DC (6.25 IN)	156.00	65.00	56.38
1	JARS-HYD	102.00	65.00	10.00
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
90	Drill Pipe	Stands		1733.70
1	Drill Pipe	Singles		9.65
	Kelly Down			2.56
	Total			2001.00
	Weight of DC			9.00
	Weight of String			66.00

DRILLING ASSEMBLY — TOUR 3

No	Component	OD	ID	Length
1	BIT	216	137.00	0.42
1	BIT SUB	102.00	65.00	0.94
6	DC (6.25 IN)	156.00	65.00	56.38
1	JARS-HYD	102.00	65.00	10.00
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
90	Drill Pipe	Stands		1733.70
1	Drill Pipe	Singles		9.65
	Kelly Down			2.56
	Total			2001.00
	Weight of DC			9.00
	Weight of String			66.00

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
1	SOP	D-3 run in the hole	00:00	
1	SOP	D-31 pipe spinner use	00:00	
1	SOP	C-10 level & load pipe rack for casing	00:00	
1	SOP	H-1 catching samples	00:00	
2	SOP	048-Mixing off shale with sawdust	08:00	2001
2	SOP	N10-Moving tubulars with loader	08:00	2001

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130215_1A	Pason	2013	02	15

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Cody Hart & Shane Welles	

Pason

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
2	SOP	C40-Level and load pipe racks with casing	08:00	2001
2	SOP	C3-Drifting casing	08:00	2001
3	SOP	D-2 tripping out of the hole	20:00	
3	SOP	D-14 blow out top drive	20:00	
3	SOP	D-18 dog collar use	20:00	
3	SOP	D-43 rig up wireline loggers	20:00	

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130216_1A	Pason	2013	02	16

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Cody Hart & Shane Welles	

DAILY CHECKS	OP	RM
1) Daily Walk Around Inspection	JD	C&S
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted	JD	C&S
5) Flare Lines Staked	JD	C&S
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines	JD	C&S
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		C&S
5) Motor Kills Checked		

Pason

CODE	1 Rig Up	2 Drill Actual	3 Reaming	4 Coring	5 Cond Mud & Circ	6 Trips	7 Rig Service	8 Repair Rig	9 Cut Off Drilg Line	10 Dev Survey	11 Wireline Logs	12 Run Csg & Cement	13 Wait On Cement	14 Nipple Up BOP	15 Test BOP	16 Drillstem Test	17 Plug Back	18 Squeeze Cement	19 Fishing	20 Dir Work	21 Safety Meeting	22 Tear Down	23 Waiting On	24 Rig Watch	25 Other	TOTAL
HOURS Tour 1							0.25				7.50										0.25					8.00
Tour 2						2.25	0.25		1.00		8.25										0.25					12.00
Tour 3			1.50			2.25	0.25																			4.00
Total			1.50			4.50	0.75		1.00		15.75										0.50					24.00

Kelly Bushing | Op Fuel 4500.00

FUEL @ 08:00 HOURS

Rig 25740.00 | Boiler 0.00

WEATHER: Time 08:00 | Temp -25.00 | Current Conditions CLEAR | Wind Direction W | Wind Strength UP TO 19 KM/H | Road Condition GOOD

TOUR 1

SIGNATURE OF DRILLER: Joel Doctor | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130216_1A	Pason	2013	02	16

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Cody Hart & Shane Welles	

DAILY CHECKS	OP	RM
1) Daily Walk Around Inspection		
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted		
5) Flare Lines Staked		
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines		
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		
5) Motor Kills Checked		

CAODC

pason

Pason

HOURS	CODE 1 Rig Up	2 Drill Actual	3 Reaming	4 Coring	5 Cond Mud & Circ	6 Trips	7 Rig Service	8 Repair Rig	9 Cut Off Drilg Line	10 Dev Survey	11 Wireline Logs	12 Run Csg & Cement	13 Wait On Cement	14 Nipple Up BOP	15 Test BOP	16 Drillstem Test	17 Plug Back	18 Squeeze Cement	19 Fishing	20 Dir Work	21 Safety Meeting	22 Tear Down	23 Waiting On	24 Rig Watch	25 Other	TOTAL
Tour 1							0.25				7.50										0.25					8.00
Tour 2						2.25	0.25		1.00		8.25										0.25					12.00
Tour 3			1.50			2.25	0.25																			4.00
Total			1.50			4.50	0.75		1.00		15.75										0.50					24.00

WEATHER	Kelly Bushing	Op Fuel
FUEL @ 08:00 HOURS	Rig	Boiler
	Time	Temp
	Current Conditions	
	Wind Direction	Wind Strength
	Road Condition	

TOUR 1

SIGNATURE OF DRILLER: Joel Doctor

START TIME: 00:00 END TIME: 08:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130216_1A	Pason	2013	02	16

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Cody Hart & Shane Welles	

DAILY CHECKS	OP	RM
1) Daily Walk Around Inspection		
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted		
5) Flare Lines Staked		
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines		
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		
5) Motor Kills Checked		

CAODC

pason

Pason

HOURS	CODE 1 Rig Up	2 Drill Actual	3 Reaming	4 Coring	5 Cond Mud & Circ	6 Trips	7 Rig Service	8 Repair Rig	9 Cut Off Drilg Line	10 Dev Survey	11 Wireline Logs	12 Run Csg & Cement	13 Wait On Cement	14 Nipple Up BOP	15 Test BOP	16 Drillstem Test	17 Plug Back	18 Squeeze Cement	19 Fishing	20 Dir Work	21 Safety Meeting	22 Tear Down	23 Waiting On	24 Rig Watch	25 Other	TOTAL
Tour 1							0.25				7.50										0.25					8.00
Tour 2						2.25	0.25		1.00		8.25										0.25					12.00
Tour 3			1.50			2.25	0.25																			4.00
Total			1.50			4.50	0.75		1.00		15.75										0.50					24.00

FUEL @ 08:00 HOURS

Kelly Bushing | Op Fuel | Rig | Boiler

WEATHER

Time | Temp | Current Conditions | Wind Direction | Wind Strength | Road Condition

TOUR 1

SIGNATURE OF DRILLER: Joel Doctor | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

Drill Pipe		Stands	
Drill Pipe		Singles	
Kelly Down			
Total			
Weight of DC			
Weight of String			

HOLE CONDITION

Hole Drag: Up | Down

Torque at Bottom

Fill on Bottom

MUD RECORD

Mud Type: Water ☐ Oil ☐

Other

Time		
Density		
Funnel Viscosity		
Fluid Loss		
pH		
Location of Sample		
Depth		
PVT		

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130216_1A	Pason	2013	02	16

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Cody Hart & Shane Welles	

Pason

DRILLING ASSEMBLY — TOUR 2

No	Component	OD	ID	Length
1	BIT	216	137.00	0.42
1	BIT SUB	102.00	65.00	0.94
6	DC (6.25 IN)	156.00	65.00	56.38
1	JARS-HYD	102.00	65.00	10.00
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
0	Drill Pipe	Stands		0.00
0	Drill Pipe	Singles		0.00
	Kelly Down			0.00
	Total			255.09
	Weight of DC			
	Weight of String			

DRILLING ASSEMBLY — TOUR 3

No	Component	OD	ID	Length
1	BIT	216	137.00	0.42
1	BIT SUB	102.00	65.00	0.94
6	DC (6.25 IN)	156.00	65.00	56.38
1	JARS-HYD	102.00	65.00	10.00
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
81	Drill Pipe	Stands		1560.67
1	Drill Pipe	Singles		9.50
	Kelly Down			4.74
	Total			1830.00
	Weight of DC			9.00
	Weight of String			66.00

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe	Stands		
	Drill Pipe	Singles		
	Kelly Down			
	Total			
	Weight of DC			
	Weight of String			

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
1	SOP	D-2 tripping out of the hole	00:00	
1	SOP	D-14 blow out top drive	00:00	
1	SOP	D-18 dog collar use	00:00	
1	SOP	D-43 rig up wireline loggers	00:00	
2	SOP	D42-Wire line logging	08:00	2001
2	SOP	A17-Rescue from mud tanks	08:00	2001

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130216_1A	Pason	2013	02	16

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Cody Hart & Shane Welles	

Pason

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
2	SOP	E4-Lock out permits	08:00	2001
2	SOP	G16-Maintaining parts and inventory	08:00	2001
3	SOP	D-37 Slip & cut	20:00	
3	SOP	D-3 run in the hole	20:00	
3	SOP	D-20 man rider use	20:00	
3	SOP	D-2 trip out of the hole	20:00	

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130217_1A	Pason	2013	02	17

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Cody Hart & Shane Welles	

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	JD	C&S
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted	JD	C&S
5) Flare Lines Staked	JD	C&S
6) BOP Drills Performed	JD	C&S
7) Visually Inspected BOPs - Flare Lines & Degasser Lines	JD	C&S
1) Rig Site Health & Safety Meeting (one/crew/month)		C&S
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		C&S
5) Motor Kills Checked		

Pason

CODE	1 Rig Up	2 Drill Actual	3 Reaming	4 Coring	5 Cond Mud & Circ	6 Trips	7 Rig Service	8 Repair Rig	9 Cut Off Drilg Line	10 Dev Survey	11 Wireline Logs	12 Run Csg & Cement	13 Wait On Cement	14 Nipple Up BOP	15 Test BOP	16 Drillstem Test	17 Plug Back	18 Squeeze Cement	19 Fishing	20 Dir Work	21 Safety Meeting	22 Tear Down	23 Waiting On	24 Rig Watch	25 Other	TOTAL
HOURS Tour 1			4.00		1.75	1.50	0.25														0.50					8.00
Tour 2						7.50	0.25				3.50										0.75					12.00
Tour 3							0.25				3.75															4.00
Total			4.00		1.75	9.00	0.75				7.25										1.25					24.00

Kelly Bushing | Op Fuel 5031.00

FUEL @ 08:00 HOURS

Rig 20709.00 | Boiler 0.00

WEATHER

Time 08:00 | Temp -25.00 | Current Conditions CLEAR | Wind Direction W | Wind Strength UP TO 19 KM/H | Road Condition GOOD

TOUR 1

SIGNATURE OF DRILLER: Joel Doctor | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	6
Size	216
IADC Code	
Manufacturer	Baker Hughes
Type	A841A9
Serial No	5196907
Jets	
Depth Out (m)	
Depth In (m)	2001
Total Drilled (m)	0
Hrs Run Today	4.00
Cumulative Hrs Run	5.00
Entry Date	2013/02/16

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB
1830m	2001m	REAM	108	6kdaN

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	216	137	0.42m
1	BIT SUB	102	65	0.94m
6	DC (6.25 IN)	156	70	56.38m
1	JARS-HYD	102	65	10.00m
1	X/O	102	65	1.10m
20	HWDP(4.0 IN)	102	65	186.25m
90	Drill Pipe	Stands		1733.70m
1	Drill Pipe	Singles		9.65m

Kelly Down	2.56m
Total	2001.00m
Weight of DC	9kdaN
Weight of String	66kdaN

HOLE CONDITION

Hole Drag Up 21 Down 10

Torque at Bottom	4052.00Nm
Fill on Bottom	9.00m

MUD RECORD

Mud Type Water [x] Oil [ ] Other

Time	02:00
Density	1120
Funnel Viscosity	90s/l
Fluid Loss	7cm3
pH	8
Location of Sample	shakers
Depth	2001m
PVT	34m3

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
2	SINGLE	152	114	9034	5

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
2	4414	@	64	@	1815
2	4940	@	63	@	2000
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type
BARITE	66	SX

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	8	10.5	220
A0124704	8	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	03:30	3.50	3A	Ream & clean 216mm rat hole from 1830m to 2001m, tight @ the funnel 1825m to
				1830m, bottom hole fill from 1992m to 2001m
03:30	04:15	0.75	5	Circulate & clean hole prior to trip out
04:15	04:30	0.25	7	Rig service, service loop sock maintence
04:30	05:45	1.25	6M	Wiper trip out/in of 216mm rat hole, flowcheck@2000m, pulled 21kDan over
05:45	06:00	0.25	21F	Derrick inspection
06:00	06:15	0.25	6M	Wiper trip out/in of 216mm rat hole, flowcheck@2000m
06:15	06:45	0.50	3A	Ream & clean 216mm rat hole from 1994m to 2001m
06:45	07:00	0.25	21	Safety meeting w/ rig crews & MGM rep.
07:00	08:00	1.00	5	Circulate & clean hole

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor
Functioned : upper pipe ram, flare igniter, crown saver, choke

SAFETY

Safety Topic	MEHL	MACP
Suspended loads	70.00kdaN	6321kPa

TOUR 2

SIGNATURE OF DRILLER: Blair Oleksyn | START TIME: 08:00 | END TIME: 20:00

BITS

Bit Number	6
Size	216
IADC Code	
Manufacturer	Baker Hughes
Type	A841A9
Serial No	5196907
Jets	
Depth Out (m)	2001
Depth In (m)	2001
Total Drilled (m)	0
Hrs Run Today	0.00
Cumulative Hrs Run	5.00
Entry Date	2013/02/16

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	0.00
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	216	137	0.42m
1	BIT SUB	102	65	0.94m
6	DC (6.25 IN)	156	70	56.38m
1	JARS-HYD	102	65	10.00m
1	X/O	102	65	1.10m
20	HWDP(4.0 IN)	102	65	186.25m
90	Drill Pipe	Stands		1733.70m
1	Drill Pipe	Singles		9.65m

Kelly Down	2.56m
Total	2001.00m
Weight of DC	9kdaN
Weight of String	66kdaN

HOLE CONDITION

Hole Drag Up Down

Torque at Bottom	
Fill on Bottom	

MUD RECORD

Mud Type Water [x] Oil [ ] Other

Time	08:00
Density	1125
Funnel Viscosity	95s/l
Fluid Loss	6cm3
pH	9
Location of Sample	
Depth	2001m
PVT	29m3

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
1		152	65	0	7

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density
cent 1	0	0	0	0
cent 2	0	0	0	0

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	12	10.5	220
A0124704	12	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	12:00	4.00	6B	Trip out of hole from 2001m to 1800m, pump pill, blow back top drive, cont
				tripping
12:00	12:15	0.25	21A	BOP Drill, 1 min 50 sec to shut in well
12:15	15:45	3.50	6B	Cont trip out of hole, lay out jars, FC @ 2000m, 1812m, 989m, 262m, and
				surface, Meas=8.19m3 Cal=7.03m3 Diff=1.16m3
15:45	16:00	0.25	7	Rig service, Function Blind rams 4 sec to close
16:00	16:15	0.25	21	Safety meeting with Baker Hughes and Akita crew
16:15	17:30	1.25	11	Rig up Baker Hughes wireline equipment
17:30	18:45	1.25	11	Baker Hughes wireline logging, logs to bottom 1999m at 18:10
18:45	19:00	0.25	21	Safety meeting with Akita crew and MGM rep
19:00	20:00	1.00	11	Baker Hughes wireline loggng

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor
Functioned : upper pipe ram, flare igniter, crown saver, choke

SAFETY

Safety Topic	MEHL	MACP
BOP DRILL	65.00kdaN	6321kPa

TOUR 3

SIGNATURE OF DRILLER: Joel Doctor | START TIME: 20:00 | END TIME: 24:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length
	Drill Pipe	Stands		
	Drill Pipe	Singles		

Kelly Down	
Total	
Weight of DC	
Weight of String	

HOLE CONDITION

Hole Drag Up Down

Torque at Bottom	
Fill on Bottom	

MUD RECORD

Mud Type Water [x] Oil [ ] Other

Time	20:00
Density	1120
Funnel Viscosity	90s/l
Fluid Loss	7cm3
pH	8
Location of Sample	Trip tank
Depth	2001m
PVT	22m3

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	4	10.5	220
A0124704	4	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
20:00	21:45	1.75	11A	Baker Hughes wireline logging run #2 tagged @ 1999m with XMAC/HDIL
21:45	23:45	2.00	11A	Baker Hughes wireline logging run #3 STAR/CBIL
23:45	24:00	0.25	7	Rig service, function pipe rams c/o 6 sec.

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor
Functioned : upper pipe ram, flare igniter, crown saver, choke
SLC - 3297mj ACCUM - 94709mj

SAFETY

Safety Topic	MEHL	MACP
Wireline logging hazards	17.00kdaN	6321kPa

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130217_1A	Pason	2013	02	17

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Cody Hart & Shane Welles	

Pason

DRILLING ASSEMBLY — TOUR 1

No	Component	OD	ID	Length
1	BIT	216	137.00	0.42
1	BIT SUB	102.00	65.00	0.94
6	DC (6.25 IN)	156.00	65.00	56.38
1	JARS-HYD	102.00	65.00	10.00
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
90	Drill Pipe		Stands	1733.70
1	Drill Pipe		Singles	9.65
	Kelly Down			2.56
	Total			2001.00
	Weight of DC			9.00
	Weight of String			66.00

DRILLING ASSEMBLY — TOUR 2

No	Component	OD	ID	Length
1	BIT	216	137.00	0.42
1	BIT SUB	102.00	65.00	0.94
6	DC (6.25 IN)	156.00	65.00	56.38
1	JARS-HYD	102.00	65.00	10.00
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
90	Drill Pipe		Stands	1733.70
1	Drill Pipe		Singles	9.65
	Kelly Down			2.56
	Total			2001.00
	Weight of DC			9.00
	Weight of String			66.00

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe		Stands	
	Drill Pipe		Singles	
	Kelly Down			
	Total			
	Weight of DC			
	Weight of String			

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
1	SOP	D-37 slip & cut	00:00	
1	SOP	D-3 run in the hole	00:00	
1	SOP	D-20 man rider use	00:00	
1	SOP	D-2 trip out of the hole	00:00	
3	SOP	G-10 general scrubbing	20:00	
3	SOP	B-2 adding ez-treat	20:00	

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130217_1A	Pason	2013	02	17

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Cody Hart & Shane Welles	

Pason

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
3	SOP	E-5 lock out permits	20:00	
3	SOP	Q-21 building hoses	20:00	

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130218_1C	Pason	2013	02	18

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Cody Hart & Shane Welles	

DAILY CHECKS	OP	RM
1) Daily Walk Around Inspection	JD	C&S
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted	JD	C&S
5) Flare Lines Staked	JD	C&S
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines	JD	C&S
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		C&S
5) Motor Kills Checked		

Pason

CODE	1 Rig Up	2 Drill Actual	3 Reaming	4 Coring	5 Cond Mud & Circ	6 Trips	7 Rig Service	8 Repair Rig	9 Cut Off Drilg Line	10 Dev Survey	11 Wireline Logs	12 Run Csg & Cement	13 Wait On Cement	14 Nipple Up BOP	15 Test BOP	16 Drillstem Test	17 Plug Back	18 Squeeze Cement	19 Fishing	20 Dir Work	21 Safety Meeting	22 Tear Down	23 Waiting On	24 Rig Watch	25 Other	TOTAL
HOURS Tour 1						2.50	0.25				5.00										0.25					8.00
Tour 2			2.00		2.00	7.50	0.25														0.25					12.00
Tour 3						2.00	0.25				1.75															4.00
Total			2.00		2.00	12.00	0.75				6.75										0.50					24.00

Kelly Bushing | Op Fuel 5031.00

FUEL @ 08:00 HOURS

Rig 15678.00 | Boiler 0.00

WEATHER

Time 08:00 | Temp -32.00 | Current Conditions CLEAR | Wind Direction W | Wind Strength UP TO 19 KM/H | Road Condition GOOD

TOUR 1

SIGNATURE OF DRILLER: Joel Doctor | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	6RR
Size	216
IADC Code	
Manufacturer	Baker Hughes
Type	A841A9
Serial No	5196907
Jets	
Depth Out (m)	
Depth In (m)	2001
Total Drilled (m)	0
Hrs Run Today	0.00
Cumulative Hrs Run	5.00
Entry Date	2013/02/18

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	214	137	0.44m
1	BIT SUB	102	65	0.94m
6	DC (6.25 IN)	156	70	56.38m
1	JARS-HYD	102	65	10.00m
1	X/O	102	65	1.10m
20	HWDP(4.0 IN)	102	65	186.25m
90	Drill Pipe	Stands		1733.70m
1	Drill Pipe	Singles		9.65m

Kelly Down	2.54m
Total	2001.00m
Weight of DC	9kdaN
Weight of String	66kdaN

HOLE CONDITION

Hole Drag Up 1 Down 1

Torque at Bottom

Fill on Bottom

MUD RECORD

Mud Type Water [x] Oil [ ] Other

Time	00:00
Density	1120
Funnel Viscosity	90s/l
Fluid Loss	7cm3
pH	8
Location of Sample	Trip tank
Depth	2001m
PVT	22m3

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	8	10.5	220
A0124704	8	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	05:00	5.00	11A	Baker Hughes wireline logging run #3 STAR/CBIL, tagged bottom @ 1981m,
				pulled tight @ 1822m
05:00	06:30	1.50	6A	Trip in the hole w/ slick assembly, wash through rathole & clean hole for
				logs
06:30	06:45	0.25	7	Rig service
06:45	07:00	0.25	21	Safety meeting w/ rig crews & MGM rep.
07:00	08:00	1.00	6A	Continue Trip in the hole w/ slick assembly, wash through rathole & clean
				hole for logs

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor

Functioned : upper pipe ram, flare igniter, crown saver, choke

SLC - 3297mj ACCUM - 94709mj

SAFETY

Safety Topic	MEHL	MACP
Forst bite	16.00kdaN	6321kPa

TOUR 2

SIGNATURE OF DRILLER: Blair Oleksyn | START TIME: 08:00 | END TIME: 20:00

BITS

Bit Number	6RR
Size	216
IADC Code	
Manufacturer	Baker Hughes
Type	A841A9
Serial No	5196907
Jets	
Depth Out (m)	
Depth In (m)	2001
Total Drilled (m)	0
Hrs Run Today	0.00
Cumulative Hrs Run	5.00
Entry Date	2013/02/18

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	214	137	0.44m
1	BIT SUB	102	65	0.94m
6	DC (6.25 IN)	156	70	56.38m
1	JARS-HYD	102	65	10.00m
1	X/O	102	65	1.10m
20	HWDP(4.0 IN)	102	65	186.25m
90	Drill Pipe	Stands		1733.70m
1	Drill Pipe	Singles		9.65m

Kelly Down	2.54m
Total	2001.00m
Weight of DC	9kdaN
Weight of String	66kdaN

HOLE CONDITION

Hole Drag Up Down

Torque at Bottom

Fill on Bottom

MUD RECORD

Mud Type Water [x] Oil [ ] Other

Time	14:00
Density	1130
Funnel Viscosity	100s/l
Fluid Loss	6cm3
pH	9
Location of Sample	
Depth	2001m
PVT	22m3

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density
cent 1	0	0	0	0
cent 2	0	0	0	0

MUD MATERIALS ADDED

Product	Amount	Type
BARITE	25	SX

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	12	10.5	220
A0124704	12	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	12:30	4.50	6A	Trip in hole , fill pipe @ 1000m and 1500m, work tight spots @1820m and
				1995m-2001m, wash in from 1820m to 2001m
12:30	13:30	1.00	5	Circulate and work pipe
13:30	15:30	2.00	3A	Begin tripping , pulled tight, pull out of rathole, tripped back to bottom
15:30	16:30	1.00	5	Circulate and work pipe
16:30	16:45	0.25	7	Rig service, function annuler ,55sec to close/open
16:45	18:45	2.00	6B	Trip out of hole, pump pill, blow out top drive
18:45	19:00	0.25	21	Safety meeting with MGM rep and Akita crew
19:00	20:00	1.00	6B	Cont trip out of hole

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor

Functioned : upper pipe ram, flare igniter, crown saver, choke

SAFETY

Safety Topic	MEHL	MACP
Tripping in thhe hole	75.00kdaN	6242kPa

TOUR 3

SIGNATURE OF DRILLER: Joel Doctor | START TIME: 20:00 | END TIME: 24:00

BITS

Bit Number	6RR
Size	216
IADC Code	
Manufacturer	Baker Hughes
Type	A841A9
Serial No	5196907
Jets	
Depth Out (m)	
Depth In (m)	2001
Total Drilled (m)	0
Hrs Run Today	0.00
Cumulative Hrs Run	5.00
Entry Date	2013/02/18

CUTTING STRUCTURE

TI	1	Gage	0
TO	1	ODC	NO
MDC	NO	Reason Pulled	LOG
LOC	A	Total Run (m/hr)	
BRG	0		

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	214	137	0.44m
1	BIT SUB	102	65	0.94m
6	DC (6.25 IN)	156	70	56.38m
1	JARS-HYD	102	65	10.00m
1	X/O	102	65	1.10m
20	HWDP(4.0 IN)	102	65	186.25m
90	Drill Pipe	Stands		1733.70m
1	Drill Pipe	Singles		9.65m

Kelly Down	2.54m
Total	2001.00m
Weight of DC	9kdaN
Weight of String	66kdaN

HOLE CONDITION

Hole Drag Up 1 Down 1

Torque at Bottom

Fill on Bottom

MUD RECORD

Mud Type Water [x] Oil [ ] Other

Time	23:15
Density	1155
Funnel Viscosity	98s/l
Fluid Loss	8cm3
pH	8
Location of Sample	shakers
Depth	2001m
PVT	17.8m3

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	4	10.5	220
A0124704	4	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
20:00	22:00	2.00	6B	Trip out of the hole for logs, flowcheck @ 2000m, 1795m, 999m, 262m, & every
				20 min while out of the hole
22:00	23:45	1.75	11A	Baker Hughes wireline logging run #4 FLEX/MREX/DSL
23:45	24:00	0.25	7	Rig service, functioned blind/shear ram c/o 6 sec. while out of hole

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor

Functioned : upper pipe ram, flare igniter, crown saver, choke

SLC - 6404mj ACCUM - 97814mj

SAFETY

Safety Topic	MEHL	MACP
Catwalk operations	66.00kdaN	6321kPa

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130218_1C	Pason	2013	02	18

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Cody Hart & Shane Welles	

Pason

DRILLING ASSEMBLY — TOUR 1

No	Component	OD	ID	Length
1	BIT	214.00	137.00	0.44
1	BIT SUB	102.00	65.00	0.94
6	DC (6.25 IN)	156.00	70.00	56.38
1	JARS-HYD	102.00	65.00	10.00
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
90	Drill Pipe		Stands	1733.70
1	Drill Pipe		Singles	9.65

Kelly Down	2.54
Total	2001.00
Weight of DC	9.00
Weight of String	66.00

DRILLING ASSEMBLY — TOUR 2

No	Component	OD	ID	Length
1	BIT	214.00	137.00	0.44
1	BIT SUB	102.00	65.00	0.94
6	DC (6.25 IN)	156.00	70.00	56.38
1	JARS-HYD	102.00	65.00	10.00
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
90	Drill Pipe		Stands	1733.70
1	Drill Pipe		Singles	9.65

Kelly Down	2.54
Total	2001.00
Weight of DC	9.00
Weight of String	66.00

DRILLING ASSEMBLY — TOUR 3

No	Component	OD	ID	Length
1	BIT	214.00	137.00	0.44
1	BIT SUB	102.00	65.00	0.94
6	DC (6.25 IN)	156.00	70.00	56.38
1	JARS-HYD	102.00	65.00	10.00
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
90	Drill Pipe		Stands	1733.70
1	Drill Pipe		Singles	9.65

Kelly Down	2.54
Total	2001.00
Weight of DC	9.00
Weight of String	66.00

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
1	SOP	G-10 general scrubbing	00:00	
1	SOP	B-2 adding ez-treat	00:00	
1	SOP	E-5 lock out permits	00:00	
1	SOP	Q-21 building hoses	00:00	
2	SOP	D3-Tripping in the hole	08:00	2001
2	SOP	N17-Operating the incinerator	08:00	2001

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130218_1C	Pason	2013	02	18

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Cody Hart & Shane Welles	

Pason

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
2	SOP	N4-Fueling the light towers	08:00	2001
2	SOP	M4-Daily check of manifold and bop valve alignment	08:00	2001
3	SOP	D-2 trip out of the hole	20:00	
3	SOP	D-43 rig up wireline loggers	20:00	
3	SOP	D-40 tugger operations	20:00	
3	SOP	K-6 adding methanol	20:00	

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130219_1A	Pason	2013	02	19

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Cody Hart & Shane Welles	

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	JD	C&S
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted	JD	C&S
5) Flare Lines Staked	JD	C&S
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines	JD	C&S
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		C&S
5) Motor Kills Checked		

Pason

CODE	1 Rig Up	2 Drill Actual	3 Reaming	4 Coring	5 Cond Mud & Circ	6 Trips	7 Rig Service	8 Repair Rig	9 Cut Off Drilg Line	10 Dev Survey	11 Wireline Logs	12 Run Csg & Cement	13 Wait On Cement	14 Nipple Up BOP	15 Test BOP	16 Drillstem Test	17 Plug Back	18 Squeeze Cement	19 Fishing	20 Dir Work	21 Safety Meeting	22 Tear Down	23 Waiting On	24 Rig Watch	25 Other	TOTAL
HOURS Tour 1						1.50	0.25				6.00										0.25					8.00
Tour 2					1.00	10.50	0.25														0.25					12.00
Tour 3					1.00	2.75															0.25					4.00
Total					2.00	14.75	0.50				6.00										0.75					24.00

Kelly Bushing | Op Fuel 5841.00

FUEL @ 08:00 HOURS

Rig 18837.00 | Boiler 0.00 | Time 08:00 | Temp -32.00

WEATHER

Current Conditions: CLEAR | Wind Direction: W | Wind Strength: UP TO 19 KM/H | Road Condition: GOOD

TOUR 1

SIGNATURE OF DRILLER: Joel Doctor | **START TIME:** 00:00 | **END TIME:** 08:00

BITS

Bit Number	6RR
Size	216
IADC Code	
Manufacturer	Baker Hughes
Type	A841A9
Serial No	5196907
Jets	
Depth Out (m)	
Depth In (m)	2001
Total Drilled (m)	0
Hrs Run Today	0.00
Cumulative Hrs Run	5.00
Entry Date	2013/02/19

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	214	137	0.44m
1	BIT SUB	102	65	0.94m
6	DC (6.25 IN)	156	70	56.38m
1	JARS-HYD	102	65	10.00m
1	X/O	102	65	1.10m
20	HWDP(4.0 IN)	102	65	186.25m
90	Drill Pipe	Stands		1733.70m
1	Drill Pipe	Singles		9.65m

Kelly Down	2.54m
Total	2001.00m
Weight of DC	9kdaN
Weight of String	66kdaN

HOLE CONDITION

Hole Drag: Up | Down

Torque at Bottom	
Fill on Bottom	

MUD RECORD

Mud Type: Water [x] Oil [ ] Other

Time	00:00
Density	1155
Funnel Viscosity	98s/l
Fluid Loss	8cm3
pH	8
Location of Sample	shakers
Depth	2001m
PVT	17.8m3

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	8	10.5	220
A0124704	8	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	06:00	6.00	11A	Baker Hughes wireline logging run #4 FLEX/MREX/DSL
06:00	06:15	0.25	7	Rig service, functioned blind/shear ram c/o 6 sec. while out of hole
06:15	06:45	0.50	6A	Trip in the hole w/ slick assembly
06:45	07:00	0.25	21	Safety meeting w/ rig crews & MGM. rep
07:00	08:00	1.00	6A	Trip in the hole w/ slick assembly

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor

Functioned : upper pipe ram, flare igniter, crown saver, choke

SLC - 6404mj ACCUM - 97814mj

Transfered 9000 litres from storage tank to rig tank.

SAFETY

Safety Topic	MEHL	MACP
Catwalk operations	16.00kdaN	6164kPa

TOUR 2

SIGNATURE OF DRILLER: Blair Oleksyn | **START TIME:** 08:00 | **END TIME:** 20:00

BITS

Bit Number	6RR
Size	216
IADC Code	
Manufacturer	Baker Hughes
Type	A841A9
Serial No	5196907
Jets	
Depth Out (m)	
Depth In (m)	2001
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	5.00
Entry Date	2013/02/19

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	214	137	0.44m
1	BIT SUB	102	65	0.94m
6	DC (6.25 IN)	156	70	56.38m
1	JARS-HYD	102	65	10.00m
1	X/O	102	65	1.10m
20	HWDP(4.0 IN)	102	65	186.25m
90	Drill Pipe	Stands		1733.70m
1	Drill Pipe	Singles		9.65m

Kelly Down	2.54m
Total	2001.00m
Weight of DC	9kdaN
Weight of String	66kdaN

HOLE CONDITION

Hole Drag: Up | Down

Torque at Bottom	
Fill on Bottom	

MUD RECORD

Mud Type: Water [x] Oil [ ] Other

Time	18:00
Density	1130
Funnel Viscosity	95s/l
Fluid Loss	6cm3
pH	9
Location of Sample	
Depth	
PVT	

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type
CAUSTIC	1	SX
BARITE	25	SX

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	12	10	220
A0124704	12	10	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	09:30	1.50	6A	Trip in hole
09:30	11:15	1.75	6B	Trip out of hole to install jars
11:15	11:30	0.25	7	Rig service, Function test Annular 55 sec to close/open
11:30	16:00	4.50	6A	Trip in hole, fill pipe and blow out top drive @ at 650m, 1300m
16:00	16:15	0.25	21	Safety meeting w/ rig crews & MGM. rep
16:15	18:15	2.00	6A	Cont. tripping in hole wash last 5 stands down
18:15	19:15	1.00	5D	Circulate hole clean
19:15	20:00	0.75	6B	Trip out of rat hole

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor

Functioned : upper pipe ram, flare igniter, crown saver, choke

SAFETY

Safety Topic	MEHL	MACP
Reaming	60.00kdaN	6321kPa

TOUR 3

SIGNATURE OF DRILLER: Joel Doctor | **START TIME:** 20:00 | **END TIME:** 24:00

BITS

Bit Number	6RR
Size	216
IADC Code	
Manufacturer	Baker Hughes
Type	A841A9
Serial No	5196907
Jets	
Depth Out (m)	
Depth In (m)	2001
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	5.00
Entry Date	2013/02/19

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	214	137	0.44m
1	BIT SUB	102	65	0.94m
6	DC (6.25 IN)	156	70	56.38m
1	JARS-HYD	102	65	10.00m
1	X/O	102	65	1.10m
20	HWDP(4.0 IN)	102	65	186.25m
90	Drill Pipe	Stands		1733.70m
1	Drill Pipe	Singles		9.65m

Kelly Down	2.54m
Total	2001.00m
Weight of DC	9kdaN
Weight of String	66kdaN

HOLE CONDITION

Hole Drag: Up 6 | Down 5

Torque at Bottom	4500.00Nm
Fill on Bottom	

MUD RECORD

Mud Type: Water [ ] Oil [ ] Other

Time	
Density	
Funnel Viscosity	
Fluid Loss	
pH	
Location of Sample	
Depth	
PVT	

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
2	SINGLE	152	113	8690	3

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	4	10.5	220
A0124704	4	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
20:00	20:45	0.75	6B	Cont. tripping out of rat hole
20:45	21:45	1.00	6A	Trip in hole and wash last three stands down
21:45	22:45	1.00	5	Circulate bottoms up
22:45	23:00	0.25	21	Safety meeting w/ rig crews & MGM. rep
23:00	24:00	1.00	6B	Trip out of hole (rack back 10 stands & come out side ways)

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor

Functioned : upper pipe ram, flare igniter, crown saver, choke

SAFETY

Safety Topic	MEHL	MACP
Laying down drill pipe	70.00kdaN	6321kPa

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130219_1A	Pason	2013	02	19

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Cody Hart & Shane Welles	

Pason

DRILLING ASSEMBLY — TOUR 1

No	Component	OD	ID	Length
1	BIT	214.00	137.00	0.44
1	BIT SUB	102.00	65.00	0.94
6	DC (6.25 IN)	156.00	70.00	56.38
1	JARS-HYD	102.00	65.00	10.00
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
90	Drill Pipe		Stands	1733.70
1	Drill Pipe		Singles	9.65

Kelly Down	2.54
Total	2001.00
Weight of DC	9.00
Weight of String	66.00

DRILLING ASSEMBLY — TOUR 2

No	Component	OD	ID	Length
1	BIT	214.00	137.00	0.44
1	BIT SUB	102.00	65.00	0.94
6	DC (6.25 IN)	156.00	70.00	56.38
1	JARS-HYD	102.00	65.00	10.00
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
90	Drill Pipe		Stands	1733.70
1	Drill Pipe		Singles	9.65

Kelly Down	2.54
Total	2001.00
Weight of DC	9.00
Weight of String	66.00

DRILLING ASSEMBLY — TOUR 3

No	Component	OD	ID	Length
1	BIT	214.00	137.00	0.44
1	BIT SUB	102.00	65.00	0.94
6	DC (6.25 IN)	156.00	70.00	56.38
1	JARS-HYD	102.00	65.00	10.00
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
90	Drill Pipe		Stands	1733.70
1	Drill Pipe		Singles	9.65

Kelly Down	2.54
Total	2001.00
Weight of DC	9.00
Weight of String	66.00

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
1	SOP	D-2 trip out of the hole	00:00	
1	SOP	D-43 rig up wireline loggers	00:00	
1	SOP	D-40 tugger operations	00:00	
1	SOP	K-6 adding methanol	00:00	
2	SOP	Pre trip floor inspection-d13	08:00	2001
2	SOP	Using pipe spinner-d31	08:00	2001

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130219_1A	Pason	2013	02	19

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Cody Hart & Shane Welles	

Pason

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
2	SOP	Inspecting slips and elevators	08:00	2001
2	SOP	Spooling tuggers	08:00	2001

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130220_1A	Pason	2013	02	20

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	JD	C&S
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted	JD	C&S
5) Flare Lines Staked	JD	C&S
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines	JD	C&S
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		C&S
5) Motor Kills Checked		

Pason

HOURS

CODE	1 Rig Up	2 Drill Actual	3 Reaming	4 Coring	5 Cond Mud & Circ	6 Trips	7 Rig Service	8 Repair Rig	9 Cut Off Drilg Line	10 Dev Survey	11 Wireline Logs	12 Run Csg & Cement	13 Wait On Cement	14 Nipple Up BOP	15 Test BOP	16 Drillstem Test	17 Plug Back	18 Squeeze Cement	19 Fishing	20 Dir Work	21 Safety Meeting	22 Tear Down	23 Waiting On	24 Rig Watch	25 Other	TOTAL
Tour 1						7.25	0.25														0.50					8.00
Tour 2						6.25	0.25		0.75			4.00									0.75					12.00
Tour 3							0.25					3.75														4.00
Total						13.50	0.75		0.75			7.75									1.25					24.00

Kelly Bushing | Op Fuel 5616.00

FUEL @ 08:00 HOURS

Rig 13221.00 | Boiler 0.00

WEATHER

Time 08:00 | Temp -35.00 | Current Conditions CLEAR | Wind Direction W | Wind Strength UP TO 19 KM/H | Road Condition GOOD

TOUR 1

SIGNATURE OF DRILLER: Blair Oleksyn | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	6RR
Size	216
IADC Code	
Manufacturer	Baker Hughes
Type	A841A9
Serial No	5196907
Jets	
Depth Out (m)	
Depth In (m)	2001
Total Drilled (m)	0
Hrs Run Today	
Cumulative Hrs Run	5.00
Entry Date	2013/02/19

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	214	137	0.44m
1	BIT SUB	102	65	0.94m
6	DC (6.25 IN)	156	70	56.38m
1	JARS-HYD	102	65	10.00m
1	X/O	102	65	1.10m
20	HWDP(4.0 IN)	102	65	186.25m
90	Drill Pipe	Stands		1733.70m
1	Drill Pipe	Singles		9.65m

Kelly Down	2.54m
Total	2001.00m
Weight of DC	9kdaN
Weight of String	66kdaN

HOLE CONDITION

Hole Drag: Up | Down

Torque at Bottom	
Fill on Bottom	

MUD RECORD

Mud Type: Water [x] Oil [ ] Other

Time	06:30
Density	1125
Funnel Viscosity	95s/l
Fluid Loss	6cm3
pH	9
Location of Sample	shaker
Depth	
PVT	

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
2		152	65	0	4

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density
CENT 1	0	0	0	0
CENT 2	0	0	0	0

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	8	10.5	220
A0124704	8	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	01:15	1.25	6B	Trip out of hole from 2001m to 1800m , pump pill, blow out top drive
01:15	01:30	0.25	21D	Jsa review of laying down drill pipe
01:30	06:30	5.00	6F	Lay down drill pipe singles from 1800m to 650m
06:30	06:45	0.25	7	Rig service, function annular 55 sec to close/open
06:45	07:00	0.25	21	Safety meeting with MGM rep and Akita crew
07:00	08:00	1.00	6F	Lay down drill string

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor

Functioned : upper pipe ram, flare igniter, crown saver, choke

SAFETY

Safety Topic	MEHL	MACP
laying down drill pipe	69.00kdaN	6321kPa

TOUR 2

SIGNATURE OF DRILLER: Travis Davson | START TIME: 08:00 | END TIME: 20:00

BITS

Bit Number	6RR
Size	216
IADC Code	
Manufacturer	Baker Hughes
Type	A841A9
Serial No	5196907
Jets	
Depth Out (m)	2001
Depth In (m)	2001
Total Drilled (m)	0
Hrs Run Today	
Cumulative Hrs Run	5.00
Entry Date	2013/02/19

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	0.00
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length
1	BIT	214	137	0.44m
1	BIT SUB	102	65	0.94m
6	DC (6.25 IN)	156	70	56.38m
1	JARS-HYD	102	65	10.00m
1	X/O	102	65	1.10m
20	HWDP(4.0 IN)	102	65	186.25m
90	Drill Pipe	Stands		1733.70m
1	Drill Pipe	Singles		9.65m

Kelly Down	2.54m
Total	2001.00m
Weight of DC	9kdaN
Weight of String	66kdaN

HOLE CONDITION

Hole Drag: Up | Down

Torque at Bottom	
Fill on Bottom	

MUD RECORD

Mud Type: Water [x] Oil [ ] Other

Time	
Density	
Funnel Viscosity	
Fluid Loss	
pH	
Location of Sample	
Depth	
PVT	

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
2		152	63	0	12

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	12	10.5	220
A0124704	12	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	08:15	0.25	21B	safety meeting with crew on slip & cut
08:15	09:00	0.75	9A	Slip & Cut drill line 15m
09:00	09:15	0.25	7	Rig service, function annular 55 sec to close/open, greased top drive
09:15	14:30	5.25	6B	Cont. laying out drill string(dp,hwdp,jars,collars)
14:30	15:30	1.00	6H	removed wear bushing and layed out
15:30	16:30	1.00	12A	prepare rig floor for running casing, gathered all third party tools to
				floor and rig up
16:30	16:45	0.25	21	Safety meeting with tong hand and akita crew & MGM rep
16:45	18:45	2.00	12B	Test run cameron landing equipment, run single joint of casing and test
				tongs readings for torque.
18:45	19:00	0.25	21	Safety meeting with MGM rep and Akita crew
19:00	20:00	1.00	12B	,Running 177.8mm casing

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor

Functioned : upper pipe ram, flare igniter, crown saver, choke

functioned blind rams on bank o/c 11 secs

meas=7.92, Cal=7.03, Diff=.89

SAFETY

Safety Topic	MEHL	MACP
Laying out pipe	35.00kdaN	6321kPa

TOUR 3

SIGNATURE OF DRILLER: Blair Oleksyn | START TIME: 20:00 | END TIME: 24:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length
	Drill Pipe	Stands		
	Drill Pipe	Singles		

Kelly Down	
Total	
Weight of DC	
Weight of String	

HOLE CONDITION

Hole Drag: Up | Down

Torque at Bottom	
Fill on Bottom	

MUD RECORD

Mud Type: Water [ ] Oil [ ] Other

Time	
Density	
Funnel Viscosity	
Fluid Loss	
pH	
Location of Sample	
Depth	
PVT	

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run
2		152	0	0	0

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	4	10.5	220
A0124704	4	10.5	240

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
20:00	23:45	3.75	12B	Run 48 joints of 177.8mm 53.59kg/m L-80 tenaris blue casing
23:45	24:00	0.25	7	Rig service,Catwalk , function test crown saver

Remarks: Checked : brake linkage, deadman clamp, fast line clamp, escape pod anchor

Functioned : upper pipe ram, flare igniter, crown saver, choke

Elevator certification 7" SLX-150 Ton BJ Side door elevators,Serial # 44922,Visually confirmed,Load test # EDM-0505 8596 69459LT,W.O.-69459 Load tested 225 ton Inspection# H-16335

SAFETY

Safety Topic	MEHL	MACP
Running casing	35.00kdaN	6321kPa

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130220_1A	Pason	2013	02	20

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

DRILLING ASSEMBLY — TOUR 1

No	Component	OD	ID	Length
1	BIT	214.00	137.00	0.44
1	BIT SUB	102.00	65.00	0.94
6	DC (6.25 IN)	156.00	70.00	56.38
1	JARS-HYD	102.00	65.00	10.00
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
90	Drill Pipe	Stands		1733.70
1	Drill Pipe	Singles		9.65
	Kelly Down			2.54
	Total			2001.00
	Weight of DC			9.00
	Weight of String			66.00

DRILLING ASSEMBLY — TOUR 2

No	Component	OD	ID	Length
1	BIT	214.00	137.00	0.44
1	BIT SUB	102.00	65.00	0.94
6	DC (6.25 IN)	156.00	70.00	56.38
1	JARS-HYD	102.00	65.00	10.00
1	X/O	102.00	65.00	1.10
20	HWDP(4.0 IN)	102.00	65.00	186.25
90	Drill Pipe	Stands		1733.70
1	Drill Pipe	Singles		9.65
	Kelly Down			2.54
	Total			2001.00
	Weight of DC			9.00
	Weight of String			66.00

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe	Stands		
	Drill Pipe	Singles		
	Kelly Down			
	Total			
	Weight of DC			
	Weight of String			

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
1	SOP	C6-LOWERING TUBULARS WITH CATWALK	00:00	2001
1	SOP	C2-ROLLING DRILL PIPE AND COLLARS	00:00	2001
1	SOP	N10-MOVING TUBULARS WITH LOADER	00:00	2001
1	SOP	D15-LAY OUT DRILL COLLARS	00:00	2001
2	SOP	Lay out drill collars	08:00	
2	SOP	slip & cut	09:00	

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130220_1A	Pason	2013	02	20

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
2	SOP	Run casing	10:00	
2	SOP	Power tong operation	13:00	
3	elevator certs	ELEVATOR CERTIFICATION-7" BJ SLX-150 TON SIDE DOOR ELEVATORS SERIAL# 44922 LOAD TEST# EDM 0505 8596 69459LT W.O.-69459 LOAD TESTED-225 TON INSPECTION #H-16335	20:00	2001

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130221_1B	Pason	2013	02	21

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	JD	G&C
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted	JD	G&C
5) Flare Lines Staked	JD	G&C
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines	JD	G&C
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		G&C
5) Motor Kills Checked		

Pason

HOURS

CODE	1 Rig Up	2 Drill Actual	3 Reaming	4 Coring	5 Cond Mud & Circ	6 Trips	7 Rig Service	8 Repair Rig	9 Cut Off Drilg Line	10 Dev Survey	11 Wireline Logs	12 Run Csg & Cement	13 Wait On Cement	14 Nipple Up BOP	15 Test BOP	16 Drillstem Test	17 Plug Back	18 Squeeze Cement	19 Fishing	20 Dir Work	21 Safety Meeting	22 Tear Down	23 Waiting On	24 Rig Watch	25 Other	TOTAL
Tour 1							0.25					7.50									0.25					8.00
Tour 2					5.00							6.50									0.50					12.00
Tour 3						1.75	0.25					2.00														4.00
Total					5.00	1.75	0.50					16.00									0.75					24.00

Kelly Bushing | Op Fuel: 5200.00

FUEL @ 08:00 HOURS

Rig: 18369.00 | Boiler: 0.00

WEATHER

Time: 08:00 | Temp: -33.00

Current Conditions: PARTLY CLOUDY

Wind Direction: W | Wind Strength: UP TO 19 KM/H

Road Condition: GOOD

TOUR 1

SIGNATURE OF DRILLER: Blair Oleksyn | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130221_1B	Pason	2013	02	21

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
1	SOP	C6-HOIST TUBULARS WITH CATWALK	00:00	2001
1	SOP	D16-USING SIDE DOOR ELEVATORS	00:00	2001
1	SOP	D24-POWER TONG OPERATION	00:00	2001
1	SOP	D32-USING ROPE TO CATCH TUBULARS	00:00	2001
2	SOP	Run casing	09:00	
2	SOP	Power tong operation	10:00	

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130221_1B	Pason	2013	02	21

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
2	SOP	Cementing	11:00	
2	SOP	Tugger operation	12:00	

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130222_1A	Pason	2013	02	22

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	JD	G&C
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted	JD	G&C
5) Flare Lines Staked	JD	G&C
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines	JD	G&C
1) Rig Site Health & Safety Meeting (one/crew/month)		G&C
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		G&C
5) Motor Kills Checked		

CAODC

Pason

HOURS

CODE	1 Rig Up	2 Drill Actual	3 Reaming	4 Coring	5 Cond Mud & Circ	6 Trips	7 Rig Service	8 Repair Rig	9 Cut Off Drilg Line	10 Dev Survey	11 Wireline Logs	12 Run Csg & Cement	13 Wait On Cement	14 Nipple Up BOP	15 Test BOP	16 Drillstem Test	17 Plug Back	18 Squeeze Cement	19 Fishing	20 Dir Work	21 Safety Meeting	22 Tear Down	23 Waiting On	24 Rig Watch	25 Other	TOTAL
Tour 1							0.25							1.00	6.00						0.75					8.00
Tour 2											6.00	1.50		4.00							0.50					12.00
Tour 3	0.75					0.50	0.25				2.50															4.00
Total	0.75					0.50	0.50				8.50	1.50		5.00	6.00						1.25					24.00

Kelly Bushing | Op Fuel 5031.00

FUEL @ 08:00 HOURS

Rig 13338.00 | Boiler 0.00

WEATHER

Time 08:00 | Temp -25.00

Current Conditions: PARTLY CLOUDY

Wind Direction W | Wind Strength UP TO 19 KM/H

Road Condition GOOD

TOUR 1

SIGNATURE OF DRILLER: Blair Oleksyn

START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130222_1A	Pason	2013	02	22

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
1	SOP	D23-CEMENTING	00:00	2001
1	SOP	O18-MIXING OFF IN SHALE TANK	00:00	2001
1	SOP	E4-LOCK OUT PERMITS	00:00	2001
1	SOP	A11-RESCUE WORKER FROM CONFINED SPACE	00:00	2001
2	SOP	Working in heights	08:00	
2	SOP	Installing/removing flow line	09:00	

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130222_1A	Pason	2013	02	22

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
2	SOP	Pressure test bop	10:00	
2	SOP	Filling 400 BBL	11:00	
3	SOP	D40- TUGGER OPERATION	20:00	2000
3	SOP	D42-LOGGING	20:00	2000
3	SOP	N5-WORKING IN ICY CONDITIONS	20:00	2000
3	SOP	B2-ADDING EZ TREAT	20:00	2000

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130223_1A	Pason	2013	02	23

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	JD	G&C
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted	JD	G&C
5) Flare Lines Staked	JD	G&C
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines	JD	G&C
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		G&C
5) Motor Kills Checked		

CAODC

Pason

HOURS

CODE	1 Rig Up	2 Drill Actual	3 Reaming	4 Coring	5 Cond Mud & Circ	6 Trips	7 Rig Service	8 Repair Rig	9 Cut Off Drilg Line	10 Dev Survey	11 Wireline Logs	12 Run Csg & Cement	13 Wait On Cement	14 Nipple Up BOP	15 Test BOP	16 Drillstem Test	17 Plug Back	18 Squeeze Cement	19 Fishing	20 Dir Work	21 Safety Meeting	22 Tear Down	23 Waiting On	24 Rig Watch	25 Other	TOTAL
Tour 1					2.00		0.25												4.75		1.00					8.00
Tour 2							0.25													1.00	0.25				10.50	12.00
Tour 3						2.00	0.25					1.50									0.25					4.00
Total					2.00	2.00	0.75					1.50							4.75	1.00	1.50				10.50	24.00

Kelly Bushing | Op Fuel 6206.00

FUEL @ 08:00 HOURS

Rig 17082.00 | Boiler 0.00

WEATHER

Time 08:00 | Temp -25.00

Current Conditions: PARTLY CLOUDY

Wind Direction W | Wind Strength UP TO 19 KM/H

Road Condition GOOD

TOUR 1

SIGNATURE OF DRILLER: Blair Oleksyn | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130223_1A	Pason	2013	02	23

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
1	SOP	F1-HANDLING OIL DRUMS	00:00	2001
1	SOP	M5-USING HAMMER WRENCH	00:00	2001
1	SOP	O3-LOADER OPERATION	00:00	2001
1	SOP	K4-REMOVING ENGINE FROM BUILDING	00:00	2001
2	SOP	Rig up wireline loggers	08:00	
2	SOP	Run casing	09:00	

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130223_1A	Pason	2013	02	23

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
2	SOP	Working in extreme weather condition	10:00	
2	SOP	Working at heights	11:00	
3	SOP	D21-RUNNING CASING	20:00	2001
3	SOP	D40-TUGGER OPERATION	20:00	2001
3	SOP	K6-ADDING METHANOL	20:00	2001

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130224_1A	Pason	2013	02	24

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	JD	G&C
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted	JD	G&C
5) Flare Lines Staked	JD	G&C
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines	JD	G&C
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		G&C
5) Motor Kills Checked		

CAODC

Pason

HOURS

CODE	1 Rig Up	2 Drill Actual	3 Reaming	4 Coring	5 Cond Mud & Circ	6 Trips	7 Rig Service	8 Repair Rig	9 Cut Off Drilg Line	10 Dev Survey	11 Wireline Logs	12 Run Csg & Cement	13 Wait On Cement	14 Nipple Up BOP	15 Test BOP	16 Drillstem Test	17 Plug Back	18 Squeeze Cement	19 Fishing	20 Dir Work	21 Safety Meeting	22 Tear Down	23 Waiting On	24 Rig Watch	25 Other	TOTAL
Tour 1							0.25					7.50									0.25					8.00
Tour 2												5.50							2.75		1.00	2.75				12.00
Tour 3					2.00	1.50	0.25														0.25					4.00
Total					2.00	1.50	0.50					13.00							2.75		1.50	2.75				24.00

Kelly Bushing | Op Fuel 4446.00

FUEL @ 08:00 HOURS

Rig 12636.00 | Boiler 0.00

WEATHER

Time 05:30 | Temp -25.00

Current Conditions: PARTLY CLOUDY

Wind Direction W | Wind Strength UP TO 19 KMH

Road Condition GOOD

TOUR 1

SIGNATURE OF DRILLER: Blair Oleksyn | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130224_1A	Pason	2013	02	24

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
1	SOP	RM,-WORKING AT HEIGHTS	00:00	2001
1	SOP	C6-HOIST TUBULARS WITH CATWALK	00:00	2001
1	SOP	N5-WORKING IN ICY CONDITIONS	00:00	2001
1	SOP	D21-RUNNING CASING	00:00	2001
2	SOP	Rig up wireline loggers	08:00	
2	SOP	Run casing	09:00	

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130224_1A	Pason	2013	02	24

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
2	SOP	Working in extreme weather condition	10:00	
2	SOP	working at heights	11:00	
3	SOP	D40-TUGGER OPERATION	20:00	2001
3	SOP	M5-USING HAMMER WRENCHS	20:00	2001
3	SOP	L9-NIPPLE UP AND DOWN	20:00	2001

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130225_1A	Pason	2013	02	25

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

DAILY CHECKS	OP	RM
1) Daily Walk Around Inspection		G&C
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted		G&C
5) Flare Lines Staked		
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines		
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		G&C
5) Motor Kills Checked		

Pason

CODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
HOURS	Rig Up	Drill Actual	Reaming	Coring	Cond Mud & Circ	Trips	Rig Service	Repair Rig	Cut Off Drilg Line	Dev Survey	Wireline Logs	Run Csg & Cement	Wait On Cement	Nipple Up BOP	Test BOP	Drillstem Test	Plug Back	Squeeze Cement	Fishing	Dir Work	Safety Meeting	Tear Down	Waiting On	Rig Watch	Other	TOTAL
Tour 1					3.00	0.25	0.25							2.75		1.50					0.25					8.00
Tour 2														5.50	0.50						1.00	5.00				12.00
Tour 3																						4.00				4.00
Total					3.00	0.25	0.25							8.25	0.50	1.50					1.25	9.00				24.00

Kelly Bushing | Op Fuel 3978.00

FUEL @ 08:00 HOURS

Rig 8658.00 | Boiler 0.00

WEATHER

Time 05:30 | Temp -34.00

Current Conditions: PARTLY CLOUDY

Wind Direction W | Wind Strength UP TO 19 KM/H

Road Condition GOOD

TOUR 1

SIGNATURE OF DRILLER: Blair Oleksyn | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130225_1A	Pason	2013	02	25

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
2	SOP	Nipple up and down	08:00	
2	SOP	Pressure test BOP's	09:00	
2	SOP	Working in icy conditions	10:00	
2	SOP	Securing loads for rig moves	11:00	
3	SOP	Install top drive into carrier	20:00	
3	SOP	work at heights	20:00	

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130225_1A	Pason	2013	02	25

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	

Pason

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
3	SOP	operate catwalk	20:00	

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130226_1A	Pason	2013	02	26

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	2013/02/25 16:00

DAILY CHECKS	OP	RM
1) Daily Walk Around Inspection	TM	G&C
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted	TM	G&C
5) Flare Lines Staked		
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines		
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		G&C
4) Crown Saver Checked		
5) Motor Kills Checked		

Pason

HOURS

CODE	1 Rig Up	2 Drill Actual	3 Reaming	4 Coring	5 Cond Mud & Circ	6 Trips	7 Rig Service	8 Repair Rig	9 Cut Off Drilg Line	10 Dev Survey	11 Wireline Logs	12 Run Csg & Cement	13 Wait On Cement	14 Nipple Up BOP	15 Test BOP	16 Drillstem Test	17 Plug Back	18 Squeeze Cement	19 Fishing	20 Dir Work	21 Safety Meeting	22 Tear Down	23 Waiting On	24 Rig Watch	25 Other	TOTAL
Tour 1																					0.25	7.75				8.00
Tour 2	4.75																				0.75	3.00	3.50			12.00
Tour 3																							4.00			4.00
Total	4.75																				1.00	10.75	7.50			24.00

Kelly Bushing | Op Fuel 2668.00

FUEL @ 08:00 HOURS

Rig 5967.00 | Boiler 0.00 | Time 05:30 | Temp -31.00

WEATHER

Current Conditions: PARTLY CLOUDY | Wind Direction W | Wind Strength UP TO 19 KM/H | Road Condition GOOD

TOUR 1

SIGNATURE OF DRILLER: Blair Oleksyn | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130226_1A	Pason	2013	02	26

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	Guy Cusitar / Cody Hart	2013/02/25 16:00

Pason

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR ☐

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
1	SOP	Work at heights	03:00	
1	SOP	Bridle up	03:00	
1	RIG RELEASE	Lay over derrick	03:00	
2	SOP	Remove Carrier from sub	17:30	
2	SOP	Skid sub with ponys	17:30	

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130227_1B	Pason	2013	02	27

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	GUY CUSITAR	2013/02/25 16:00

DAILY CHECKS	OP	RM
1) Daily Walk Around Inspection	TM	G&C
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted	TM	G&C
5) Flare Lines Staked		
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines		
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		
5) Motor Kills Checked		

Pason

CODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
HOURS	Rig Up	Drill Actual	Reaming	Coring	Cond Mud & Circ	Trips	Rig Service	Repair Rig	Cut Off Drlg Line	Dev Survey	Wireline Logs	Run Csg & Cement	Wait On Cement	Nipple Up BOP	Test BOP	Drillstem Test	Plug Back	Squeeze Cement	Fishing	Dir Work	Safety Meeting	Tear Down	Waiting On	Rig Watch	Other	TOTAL
Tour 1																							8.00			8.00
Tour 2	11.25																				0.75					12.00
Tour 3		4.00																								4.00
Total	11.25	4.00																			0.75		8.00			24.00

Kelly Bushing | Op Fuel 4467.00

FUEL @ 08:00 HOURS

Rig 1500.00 | Boiler 0.00

WEATHER

Time 05:30 | Temp -27.00

Current Conditions: CLEAR

Wind Direction: W | Wind Strength: UP TO 19 KM/H

Road Condition: GOOD

TOUR 1

SIGNATURE OF DRILLER: GUY CUSITAR | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

DRILL ASSEMBLY & SPECIAL EVENTS - ADDITIONAL DATA

Tour Sheet Serial No	Vendor Software Version	Year	Month	Day
0Y5537_20130227_1B	Pason	2013	02	27

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	☐

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	GUY CUSITAR	2013/02/25 16:00

Pason

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

DRILLING ASSEMBLY — TOUR

No	Component	OD	ID	Length
	Drill Pipe — Stands			
	Drill Pipe — Singles			

Kelly Down	
Total	
Weight of DC	
Weight of String	

SPECIAL EVENTS

Tour No.	Event No.	Description	Time	Depth
2	SOP	Remve dog house with pickers	11:00	
2	SOP	Remove Derrick from carrier	12:00	

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DY5537_20130228_1A	Pason	2013	02	28

License No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id
1202	MGM-Shell East Mackay I-78	64:47:42.10N/125:43:19.10W	NT	LAT-LONG	

Operator	Contractor	Rig No	Well Type	Re-Entry
MGM ENERGY CORP.	AKITA DRILLING LTD.	37	VERT	

Operator's AFE	Contractor's Job No	Spud Date Time
12D0006	3702132198	2013/01/27 14:00

Signature of Operator Representative	Signature of Contractor's Rig Manager	Rig Release Date Time
JASON DUCKWORTH	GUY CUSITAR	2013/02/25 16:00

DAILY CHECKS	OP	RM
1) Daily Walk Around Inspection	JD	GC
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted	JD	GC
5) Flare Lines Staked		
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines		
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		
5) Motor Kills Checked		

Pason

CODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
HOURS	Rig Up	Drill Actual	Reaming	Coring	Cond Mud & Circ	Trips	Rig Service	Repair Rig	Cut Off Drilg Line	Dev Survey	Wireline Logs	Run Csg & Cement	Wait On Cement	Nipple Up BOP	Test BOP	Drillstem Test	Plug Back	Squeeze Cement	Fishing	Dir Work	Safety Meeting	Tear Down	Waiting On	Rig Watch	Other	TOTAL
Tour 1																									8.00	8.00
Tour 2	11.75																				0.25					12.00
Tour 3																										
Total	11.75																				0.25				8.00	20.00

Kelly Bushing | Op Fuel 500.00

FUEL @ 08:00 HOURS

Rig 1000.00 | Boiler 0.00 | Time 05:30 | Temp -27.00

WEATHER

Current Conditions: CLEAR | Wind Direction W | Wind Strength UP TO 19 KM/H | Road Condition GOOD

TOUR 1

SIGNATURE OF DRILLER: GUY CUSITAR | START TIME: 00:00 | END TIME: 08:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

Drill Pipe		Stands	
Drill Pipe		Singles	
Kelly Down			
Total			
Weight of DC			
Weight of String			

HOLE CONDITION

Hole Drag: Up | Down

Torque at Bottom

Fill on Bottom

MUD RECORD

Mud Type: Water ☐ Oil ☐

Other

Time			
Density			
Funnel Viscosity			
Fluid Loss			
pH			
Location of Sample			
Depth			
PVT			

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	8	10.5	240
A0124704	0	1	0

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	08:00	8.00	25	Boilers operating 1 /

Remarks:

SAFETY

Safety Topic	MEHL	MACP

TOUR 2

SIGNATURE OF DRILLER: Joel Doctor | START TIME: 08:00 | END TIME: 20:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

Drill Pipe		Stands	
Drill Pipe		Singles	
Kelly Down			
Total			
Weight of DC			
Weight of String			

HOLE CONDITION

Hole Drag: Up | Down

Torque at Bottom

Fill on Bottom

MUD RECORD

Mud Type: Water ☐ Oil ☐

Other

Time			
Density			
Funnel Viscosity			
Fluid Loss			
pH			
Location of Sample			
Depth			
PVT			

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp
A0093289	12	10.5	260
A0124704	0	1	0

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	08:15	0.25	21	Safety meeting ,Rack rig loads in Norman Wells Akita Yard with Mullen
08:15	20:00	11.75	1A	Off load rig loads ,Rack rig Norman Wells Akita Yard Rig shut down Racked

Remarks:

SAFETY

Safety Topic	MEHL	MACP
Rack rig		

TOUR 3

SIGNATURE OF DRILLER: GUY CUSITAR | START TIME: 20:00 | END TIME: 24:00

BITS

Bit Number	
Size	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

CUTTING STRUCTURE

TI		Gage	
TO		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

METRES DRILLED

From	To	D-R-C	RPM	WOB

DRILLING ASSEMBLY

No	Component	OD	ID	Length

Drill Pipe		Stands	
Drill Pipe		Singles	
Kelly Down			
Total			
Weight of DC			
Weight of String			

HOLE CONDITION

Hole Drag: Up | Down

Torque at Bottom

Fill on Bottom

MUD RECORD

Mud Type: Water ☐ Oil ☐

Other

Time			
Density			
Funnel Viscosity			
Fluid Loss			
pH			
Location of Sample			
Depth			
PVT			

CIRCULATION

Pump#	Type	Liner Size	SPM	Pressure	Hours Run

Remarks:

REDUCED PUMP SPEED

Pump No.	Pressure		Strokes/min		Depth
		@		@	
		@		@	
		@		@	

DEVIATION SURVEYS

Time	Depth	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density	Over Flow Density	Under Flow Density

MUD MATERIALS ADDED

Product	Amount	Type

Boiler

Boiler #	Hours Run	pH	Stack Temp

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks

Remarks:

SAFETY

Safety Topic	MEHL	MACP

Appendix A12 Formation Integrity Test (Leak-off Test)

LEAKOFF DATA WORKSHEET SHEET

COMPANY MGM Energy **WELL** I-78 **RIG** Akita 37 **HOLE SECTION** 222mm Production **DATE** Feb.02, 2013

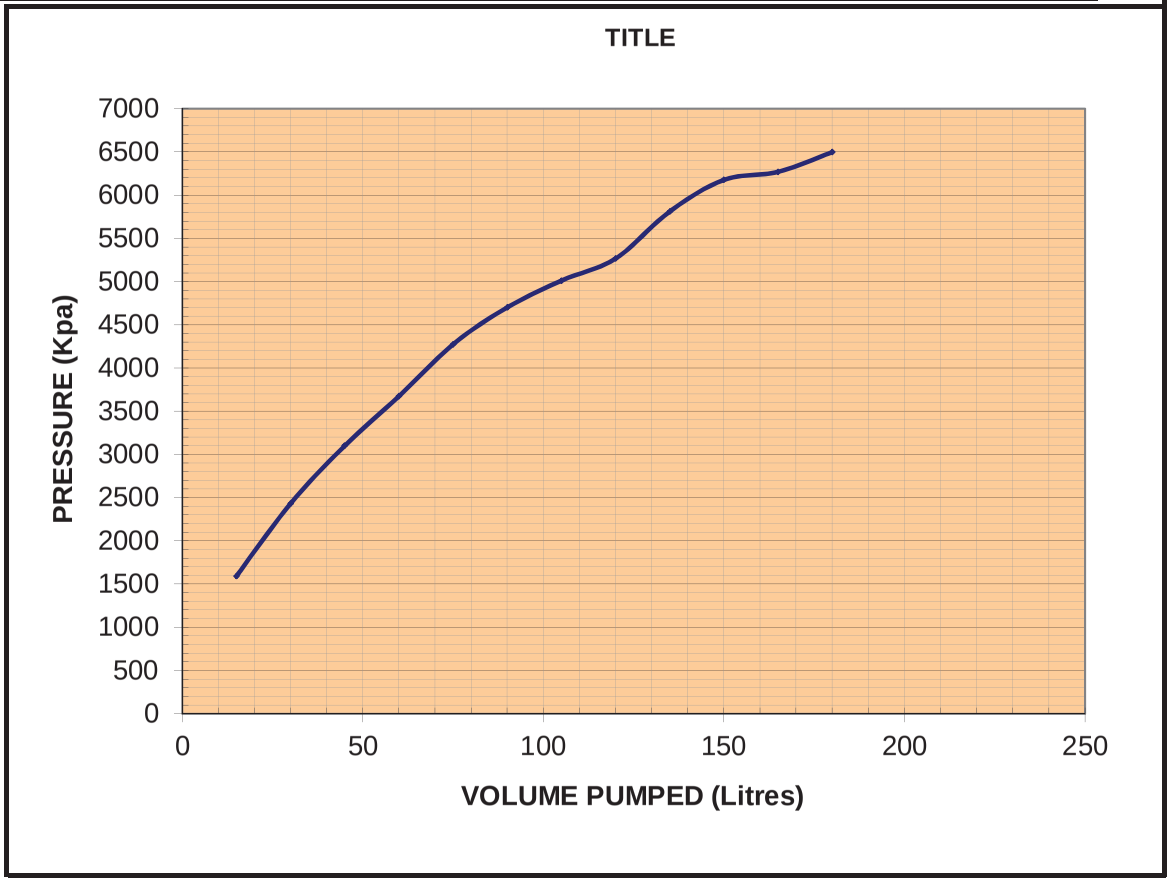
Notes: No Leak off @ 6500kPa SAP = 25.76kPa/m gradient

Note: Shaded Areas auto calculated.

Test No.	CASING DATA														OPEN HOLE DATA				Drill Pipe (mm)				Total Cap m3
	Set(m) From	To	Size mm	Grade	WT kg/m	ID mm	Burst kPa	Safe Fact%	Burst with SF	Tested To(kPa)	Casing L.(m)	Cap m3	Shoe Depth(m) TVD	TMD	RT to WH	ID mm	Hole TMD(m)	Length m	Cap m3	OD mm	ID mm	Len m	Cap m3	
	0	401.79	244.5	L-80	59.53	224.41	39600	80%	31680	21000	401.8	11.6	401.79	401.79		222.0	410	8	0.3	102	84.5	410	1	13
	0	0				0.00		80%	0		0.0	0.0						0	0.0	0	0	0	0	0
	0	0				0.00		80%	0		0.0	0.0		0		0.0	0	0	0.0	0	0	0	0	0.0
									0		0.0	0.00						0	0.0				0	0
									0		0.0	0.00						0	0.0				0	0

TEST NO.	PRERECORDED DATA Test Type	Fluid Used For Test	Empirical Compress	Wt (kg/m)	MAX Allow Press(kPa)	Req'd Frac MD(kg/m3)	TVD of Test(m)	Equip Test Req'd (kPa)	CALCULATED TEST DATA m3 To Compress	Press Req'd	m3 To Pump	ACTUAL TEST DATA Vol liters	Rate l / min	TEST TVD(m)	Test Press(kPa)	EMW kg/m3	Mud Grad kPa / m	BLEED BACK liters	in Min
1	FIT	Water	0.00000070	1010	21,000	1845	410	3,358	13	3358	0.03	180	5	410	6500	2626	25.76		
2				0		0	0		0	0	#VALUE!				0	######	#VALUE!		
									0							#DIV/0!	#DIV/0!		

NO 1(FIT) TIME min	VOL Litres	PRESS kPa	NO 2 (Other) TIME min	VOL Liters	PRESS kPa	NO 3(Other) TIME min	VOL Liters	PRESS mPa
0	0		0					
3	15	1592	1					
6	30	2434	2					
9	45	3102	3					
12	60	3675	4					
15	75	4275	5					
18	90	4702	6					
21	105	5012	7					
24	120	5268	8					
27	135	5812	9					
30	150	6178	10					
33	165	6270	11					
36	180	6500	12					
39	195		13					
42	210		14					
			15					
			16					
			17					
			18					
			19					
			20					



Appendix A13 Hydraulic Fracturing Reports

Bluefish

Canol

CUSTOMER:	MGM ENERGY CORP	Service Order	S231410072
Address:		Job Type	NITRIFIED SUPER RHEO-GEL 6 FRAC
		UWI:	5I-78-64-50-125-30
	4100-350 7 AVE SW	Well Name	MGM - SHELL EAST MACKAY I - 78
	CALGARY	Formation	BLUEFISH
	AB	Reservoir Fluid	Oil
Representative:	CLINT MURRAY MS2	BH Representative	Bursey, Jamie T.

Job Date	28-Feb-2013		
Proposal	P306205-4		
BHST (°C)	57		
Frac Zone			
Well Type	New Well Development		

Item	OD (mm)	Weight (kg/m)	Grade	Bottom Depth (m)	Burst (MPa)	Volume (m3)
Liner	114.3	20.09	P-110	1946.00	85.6	15.15
Casing	177.8	38.69	L-80	2020.00	49.9	

Total Volume (m3): 15.15

Treatment Mode:	CASING	Wellhead Pressure (MPa)	0.3
Packer Depth (m)		Annular / Relief Valve (MPa)	0 / 0
PBTD (m)	1974	Pressure Test (MPa)	69

TREATING FLUID	MINIFRAC (ISIP)	
Frac Oil 200	5.0	M3

TREATING FLUID	PAD	
Super Rheo-Gel 6 Fracturing System	59.5	M3
GO-64 Oil Gellant	6.0	L / M3
XLO-5 Crosslinker	6.0	L / M3
RG-35 SLR Breaker (Blend)	30.0	L / M3
Water	1.0	M3 / M3

Perforation Intervals	Depth (m) Top	Bottom	SPM
Perforations	1946.0	1948.0	17

	Min	Max	Avg.
Pumping Pressure (MPa)	29.1	33.1	31.1
Pumping Rate (m3/min)	3.5	3.5	3.5
Kilowatts	1697.5	1930.8	1814.2

TREATING FLUID	PROPPANT	
Super Rheo-Gel 6 Fracturing System	82.6	M3
GO-64 Oil Gellant	6.0	L / M3
XLO-5 Crosslinker	6.0	L / M3
RG-35 SLR Breaker (Blend)	30.0	L / M3
Water	1.0	M3 / M3

TREATING FLUID	FLUSH	
Frac Oil 200	11.7	M3

MSDS Fracture Fluid Density (kg/m3)	795
MSDS Fracture Fluid Temperature (oC)	10.0
Fracture Fluid Base Component:	Frac Oil
Estimated Sand Top (m)	
Hole Fill (m3)	
Breakdown Pressure (Mpa)	36.7
Instantaneous Shut In Pressure (MPa)	29.0
One Minute Shut In Pressue (MPa)	
15 Shut In Pressure (MPa)	

Proppant Agents	Concentration (kg/m3) Start	End	at Perfs	In Formation (Tonnes)	Total Pumped (Tonnes)
FRAC SAND, 50/140 WHITE (OTTAWA TYPE)	30	140	100	4.90	4.90
HEXION PR 6000 30/50	140	590	400	28.04	28.04
Total Proppant:				32.94	32.94

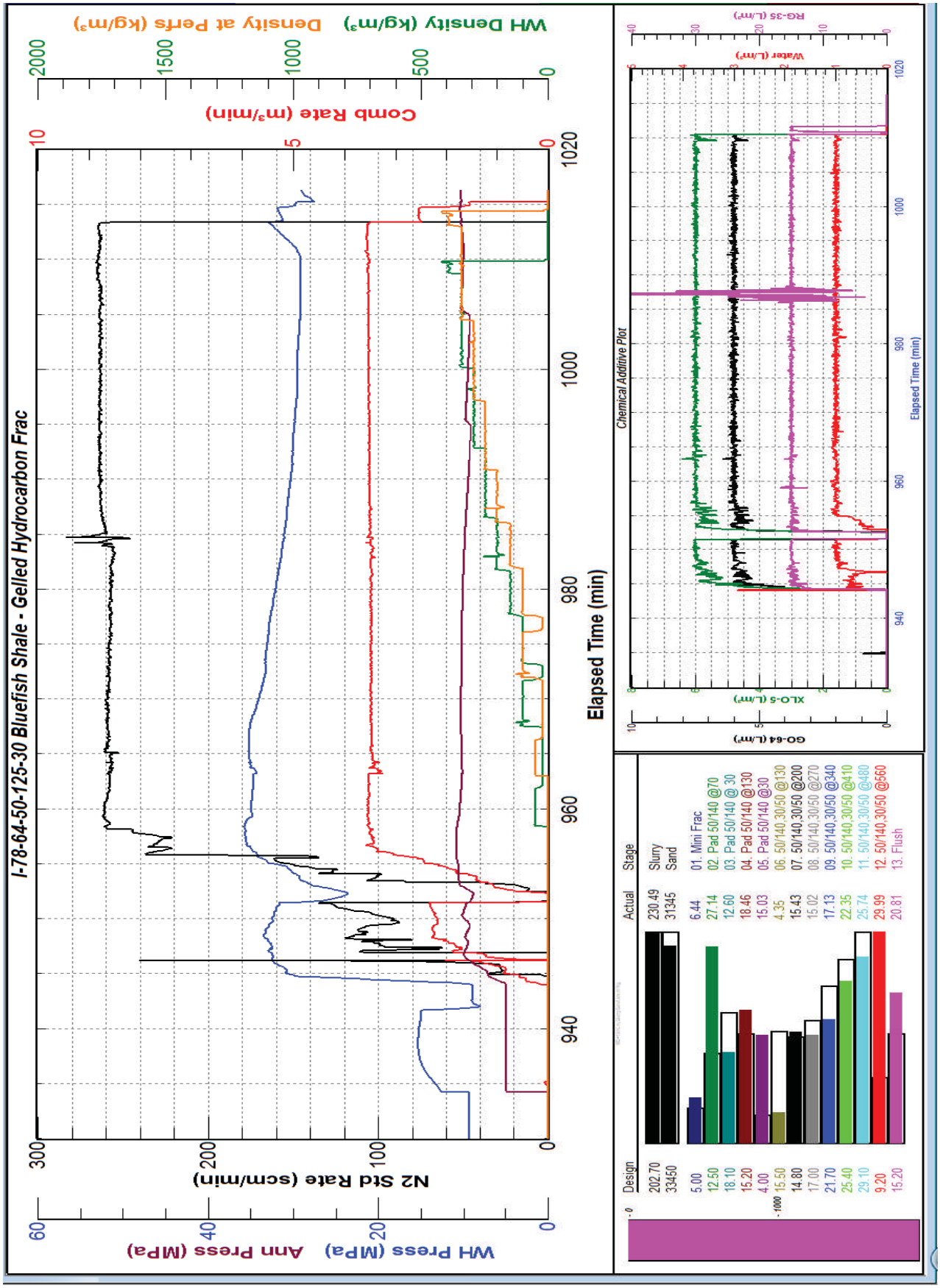
		Job	Cool Down	Total
Energizing Fluid:	Nitrogen (sm3)	15842.0	11050.0	26892.0

	Blender Fluids (m3)			Energizing Fluid		Down Hole Fluids (m3)		
Total Pumped (m3)	158.8	171.3		15842.0		233.0		
Total In Formation (m3)						217.8		

Arrived location:	2013-02-28 11:00 Hours
Left location:	2013-03-02 12:25 Hours

Time	Pressure (Mpa) Casing	Tubing	Clean Volume	Slurry Volume	Slurry Rate	Slurry Conc.	Volume (sm3)	Rate (sm3/min)	Slurry Volume	Sand Conc.	Slurry Rate	Comments
19:30	0.3		5.0	5.0	1.00				5.0		1.00	Minifrac (Isip) with Frac Oil
11:20	8.9		24.5	24.5	2.53		1496.00	250.00	30.3		3.50	Pad
11:33	34.9		8.9	9.1	2.53	70	926.00	250.00	12.7	50	3.50	50/140 Sand @ 67
11:37	34.7		12.9	13.0	2.53	30	1368.00	250.00	18.4	22	3.50	50/140 Sand @ 33
11:42	34.4		10.4	10.9	2.53	140	1126.00	250.00	15.3	100	3.50	50/140 Sand @ 134
11:46	33.3		3.0	3.0	2.53	33	312.00	250.00	4.3	24	3.50	50/140 Sand @ 33
												50/140 Sand @ 25
11:47	33.3		10.4	11.0	2.53	140	1150.00	250.00	15.4	100	3.50	30/50 Hexion PR 6000 @ 134
												50/140 Sand @ 25
11:51	32.7		9.9	10.7	2.53	210	1106.00	250.00	15.0	148	3.50	30/50 Hexion PR 6000 @ 203
												50/140 Sand @ 25
11:55	31.7		11.0	12.2	2.53	290	1275.00	250.00	17.2	203	3.50	30/50 Hexion PR 6000 @ 272
												50/140 Sand @ 25
12:00	30.8		13.9	15.8	2.53	360	1678.00	250.00	22.4	250	3.50	30/50 Hexion PR 6000 @ 342
												50/140 Sand @ 25
12:06	30.1		15.7	18.3	2.53	430	1944.00	250.00	25.9	297	3.50	30/50 Hexion PR 6000 @ 413

												50/140 Sand @ 25
12:14	29.5		17.6	21.1	2.53	510	2229.00	250.00	29.8	349	3.50	30/50 Hexion PR 6000 @ 485
												50/140 Sand @ 25
12:22	29.2		3.9	4.8	2.53	590	456.00	250.00	6.6	401	3.50	30/50 Hexion PR 6000 @ 558
12:24	29.4		11.7	11.7	2.53		776.00	250.00	14.7		3.50	Flush with Frac Oil


I-78-64-50-125-30 Bluefish Shale - Gelled Hydrocarbon Frac
WH Press (MPa)
Ann Press (MPa)
N2 Std Rate (scm/min)
Comb Rate (m³/min)
WH Density (kg/m³)
Density at Perfs (kg/m³)
Elapsed Time (min)
Chemical Additive Plot
GO-64 (L/m³)
XLO-5 (L/m³)
Water (L/m³)
RG-35 (L/m³)
Design
Actual
Stage
Slurry
Sand
01. Mini Frac
02. Pad 50/140 @70
03. Pad 50/140 @ 30
04. Pad 50/140 @130
05. Pad 50/140 @30
06. 50/140,30/50 @130
07. 50/140,30/50 @200
08. 50/140,30/50 @270
09. 50/140,30/50 @340
10. 50/140,30/50 @410
11. 50/140,30/50 @480
12. 50/140,30/50 @560
13. Flush

Advancing Reservoir Performance

POST FRACTURE STIMULATION REPORT
NET PRESSURE MATCHED GEOMETRY
THIGHTHOLE



MGM ENERGY CORP.
MGM Shell East MacKay 1-78
1-78-64°50' 125°30'
Bluefish (Oil)



Prepared For:	Hal Anderson
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Report Date:	July 29, 2013
Report #:	2013-00594



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Objective

The objective of this report is to perform a net pressure match to determine the post fracture treatment geometry for the Bluefish formation.

Introduction

On March 01, 2013, a 5.0 m^3 Frac Oil was pumped down 114.3 mm liner and tie back string for the Diagnostic Fracture Injectivity Test (DFIT) to analysis the Bluefish formation at 1-78-64° 50' 125° 30'. If the test is conducted properly, the following data listed in Table 1 can be achieved from the analysis. Also see Appendix B for the results from the DFIT analysis. The zone of interest was perforated at 1946.0 m – 1948.0 m.

On March 02, 2013, a 32.94 tonnes of Nitrified Super Rheo-Gel 6, which is a gelled hydrocarbon based fluid system, was pumped at a rate of 3.5 m^3/min into the Bluefish formation for the stimulation treatment. The treatment included 28.04 tonnes of 30/50 Hexion PR 6000 and 4.9 tonnes of 50/140 mesh sand throughout the pads and other sand stages. The fracture program, P306205-4, was modified during the fracture treatment to include 50/140 mesh sand in all the sand stages to control fluid leakoff.

Summary

On February 20, 2013, Baker Hughes reviewed the logs for the well located at 1-78-64° 50' 125° 30' using Powerlog software to update critical petrophysical rock properties and reservoir characteristics. Based on the DFIT, fracture gradient was measured and used to evaluate the petrophysical model. However, the fracture gradient estimated was the same as the measured value so the logs did not need to be recalibrated.

The Fracture geometries were generated using Grid Oriented Hydraulic Fracture Extension Replicator (GOHFER™) 8.1.5.1 based on incorporation of the petrophysical model. GOHFER 3D is a planar, grid-based 3D fracture geometry simulator fully coupled with fluid/solid transport capabilities. GOHFER 3D also has a comprehensive log analysis package used for the direct integration of digital log data into a planar 3D grid reservoir.

Simulations were designed to pump down 114.3 mm liner and tie back string utilizing the actual pumped sand schedule. See Table 3 for propped fracture simulation parameters.

The reservoir parameters (logs) are illustrated in Table 2 and Appendix A. The fracture results from the pre-fracture model geometry, post fracture treatment net pressure matched geometry, and the net pressure matched plot are denoted in Tables 4 and 5, and Figures 1, 2 and 3 respectively.

Table 1: Diagnostic Fracture Injectivity Test (DFIT) Data

Formation	Bluefish
Fluid Pumped	Frac Oil
Volume Pumped (m^3)	5.0
Pumped Rate (m^3/min)	1.0
Measured ISIP (MPa)	19.8
Frac Gradient (kPa/m)	20.0
Estimated Breakdown Pressure (MPa)	38.9
Estimated Closure Pressure (MPa)	33.1
Reservoir Pressure (MPa)	Not available from results
Permeability (mD)	Not available from results
Secondary Leakoff Mechanism (PDL, etc.)	Not available from results

Table 2: Reservoir Parameters

Formation	Bluefish	
Target Top (m, MD)	1935.5	Logs
Target Bottom (m, MD)	1957.5	Logs
Perforations (m, MD)	1946.0 - 1948.0	Customer
Reservoir Fluid	Oil	Customer
Reservoir Temperature (°C)	54.8	Logs
Porosity (%)	10.8	Logs
In-Situ Permeability (mD)	0.17	Logs
Reservoir Pressure (MPa)	26.0	Estimated
Water Saturation (%)	31.8	Logs
Net Pay (m)	14.5	Logs
Avg. Poisson's Ratio	0.28	Logs
Avg. Static Young's Modulus (GPa)	12.7	Logs
Estimated Closure Stress (MPa)	33.1	Petrophysical Model
Estimated Closure Gradient (kPa/m)	17.0	Petrophysical Model
Measured ISIP (MPa)	19.8	DFIT
Frac Gradient (kPa/m)	20.0	Measured

Table 3: Propped Fracture Simulation Inputs (Actual Pumped Sand Schedule)

Formation	Bluefish
Fluid Pumped	Nitrified Super Rheo-Gel 6
Tonnage Pumped (T)	~4.9 T 50/140 Sand & 28.04 T 30/50 Hexion PR 6000
Max. Ramped DH Conc. (kg/m^3)	~400
Pumped Rate (m^3/min)	3.5
Pad Volume (%)	27.2

Table 4: Initial Model Fracture Dimensions from GOHFER™

Hydraulic Fracture Half Length (m)	679
Effective Propped Fracture Half Length (m) *	219
Top of Fracture (m)	1934
Bottom of Propped Fracture (m)	1958
Fracture Height (m)	24
Net Pay Height (m)	14.5
Average Fracture Width (mm)	6.9
Net Proppant Concentration (kg/m^2)	2.7

Note: *Effective Propped Fracture Half Length (m) = > 1.0 kg/m^2

Table 5: Net Pressure Matched Model Fracture Dimensions from GOHFER™

Hydraulic Fracture Half Length (m)	747
Effective Propped Fracture Half Length (m) *	223
Top of Fracture (m)	1934
Bottom of Propped Fracture (m)	1958
Fracture Height (m)	24
Net Pay Height (m)	14.5
Average Fracture Width (mm)	6.5
Net Proppant Concentration (kg/m²)	2.5

Note: *Effective Propped Fracture Half Length (m) = > 1.0 kg/m^2

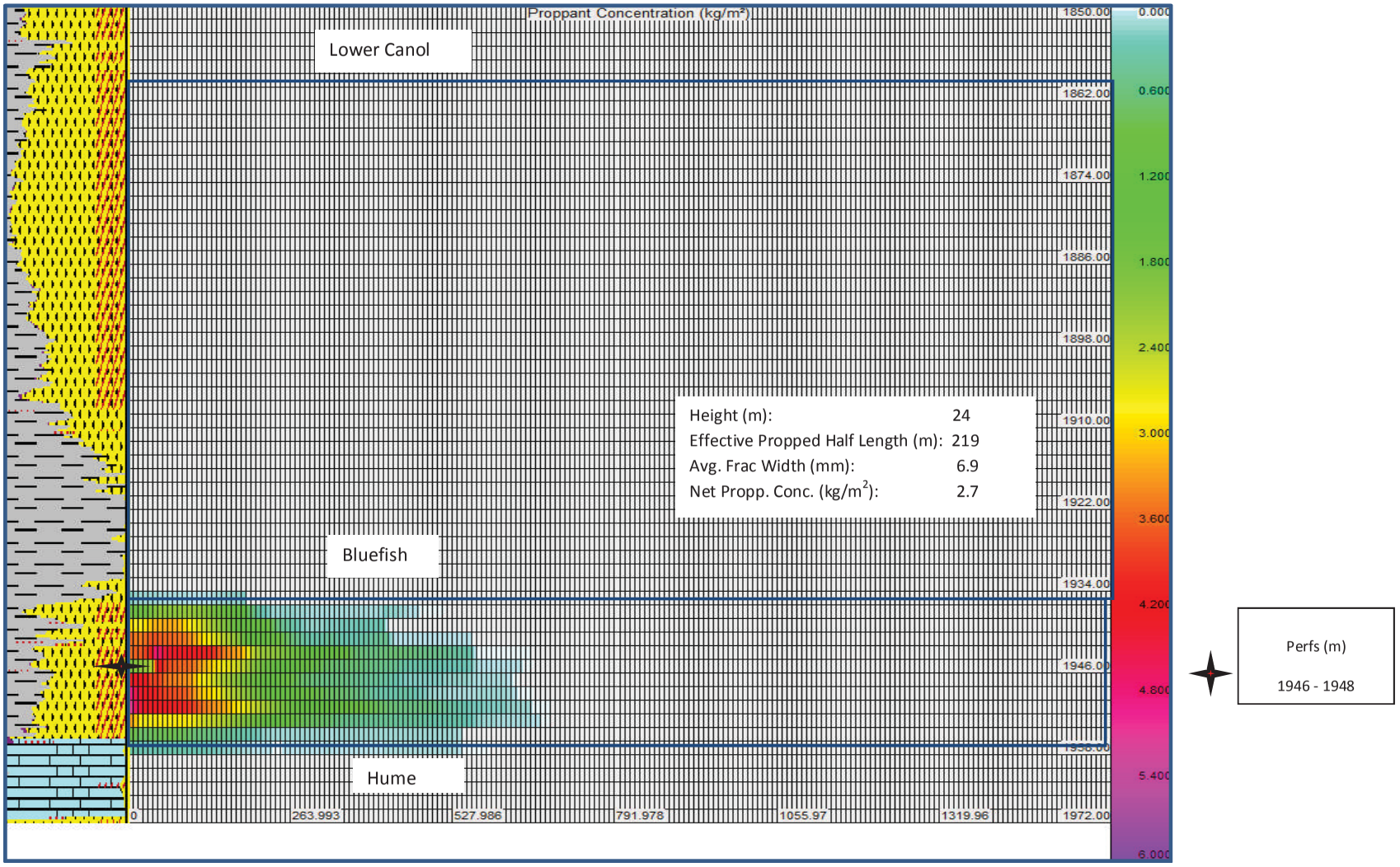
Discussion

The simulations were conducted in GOHFER down 114.3 mm liner using the actual pumped sand schedule (See Table 2). As illustrated in Table 3, and 4, the effective propped fracture half length outputs utilize a minimum proppant concentration cutoff of 1.0 kg/m^2. This is the minimum proppant concentration cutoff required to conduct flow while taking into consideration embedment, spalling, and non-Darcy flow, etc.

The upper height growth is contained within the Bluefish formation by the shale in the Lower Canol formation which was predicted in the pre-fracture model (See Table 4 and 5). The lower height growth is bounded within the Bluefish formation by the limestone in the Hume formation. The effective propped half length is greater in the post-fracture results than the pre-fracture.

.

Figure 1: Initial Model Fracture Geometry – Proppant Concentration (kg/m²)



440

Figure 2: Net Pressure Matched Fracture Geometry – Proppant Concentration (kg/m²)

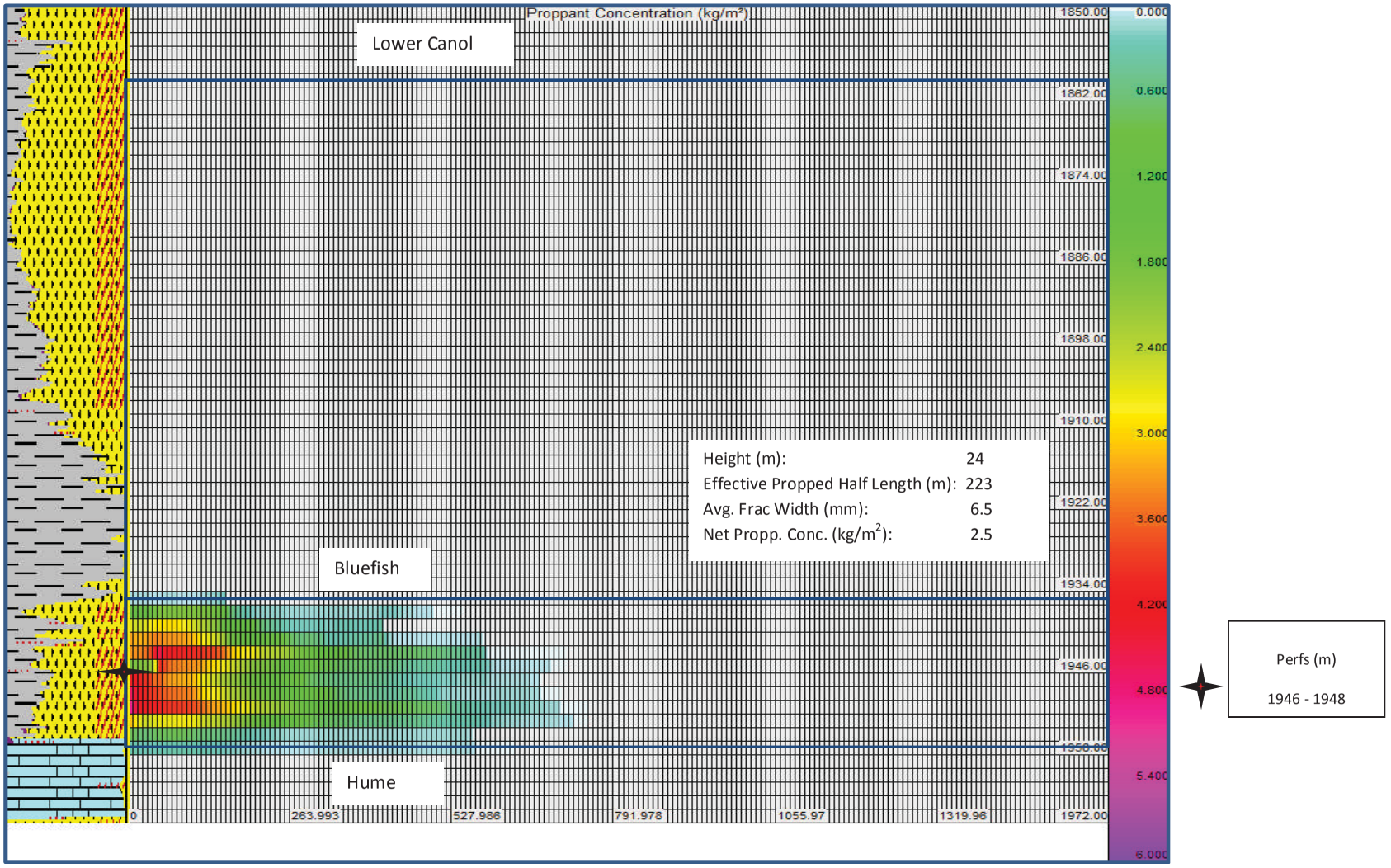
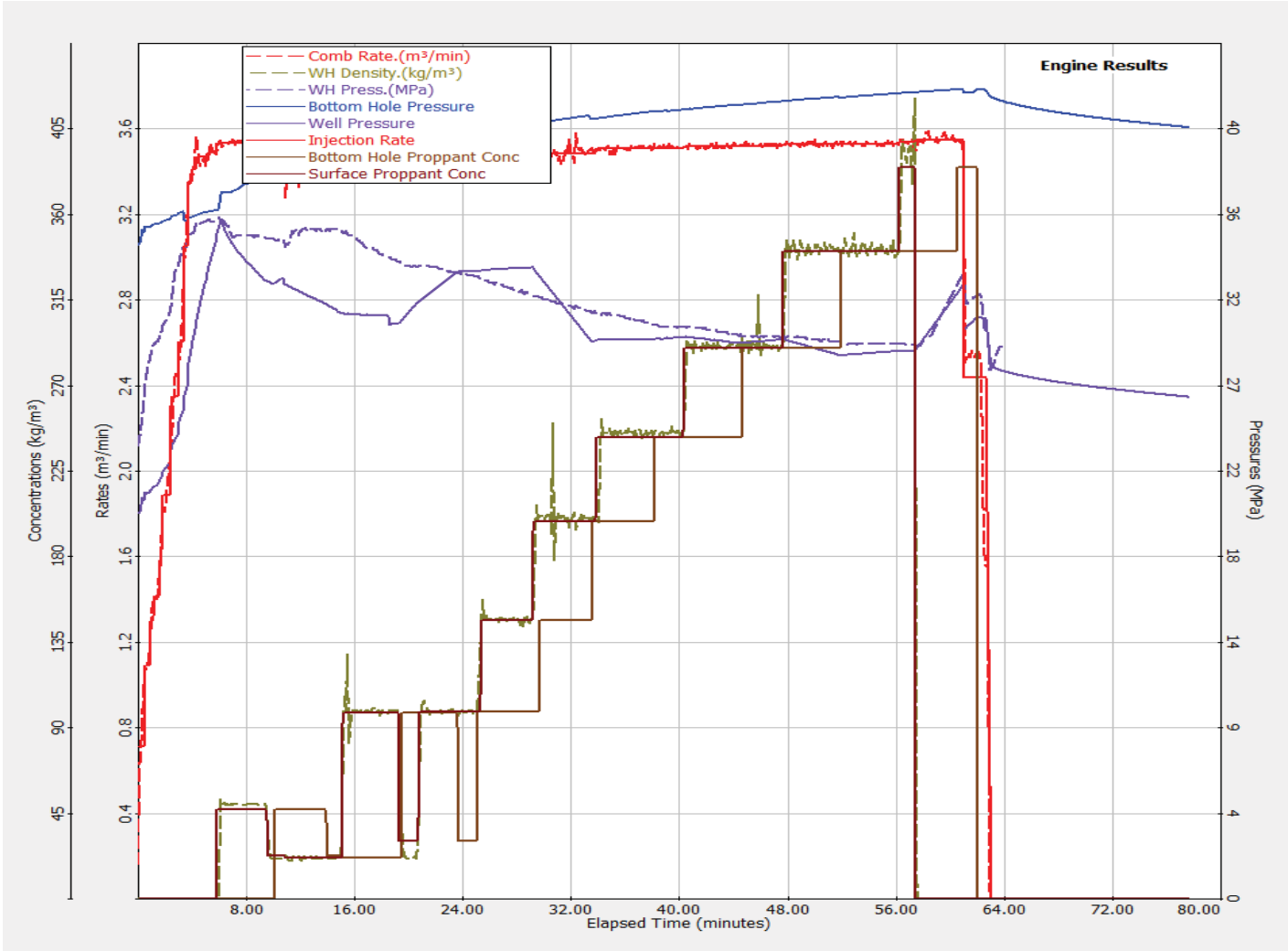
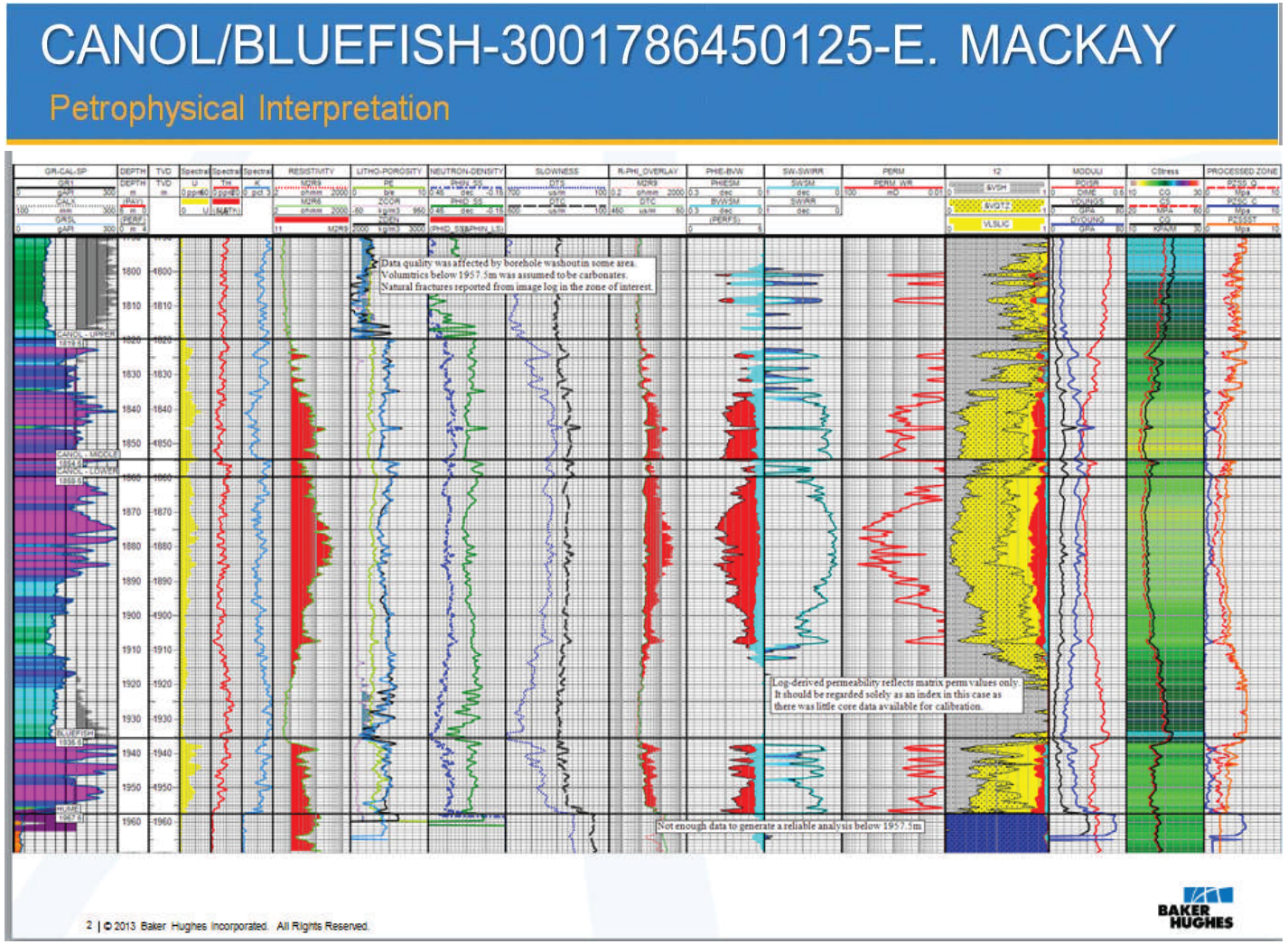


Figure 3: Net Pressure Matched Plot



Appendix A: Petrophysical Report



CANOL/BLUEFISH-3001786450125-E. MACKAY

Curve Summary

SWSM <= 0.5

Company	MGM ENERGY CORP
UWI	3001786450125
Field	EAST MACKAY
Province	NORTHWEST TERRITORIES

Well Log	Log Units	Interval Log Top	Interval Log Bottom	Net Interval	Arithmeti Mean	Standard Deviation	Minimum Value	Maximum Value	Geometric Mean	Harmonic Mean
Upper CANOL										
CS	MPA	1823.9	1854	19.3	27.983	1.236	26.287	31.917	27.957	27.932
CG	KPA/M	1823.9	1854	19.3	15.183	0.718	14.203	17.424	15.167	15.151
PORE	MPA	1823.9	1854	19.3	18.874	0.07	18.656	19.079	18.874	18.874
PHIESM	dec	1823.9	1854	19.3	0.132	0.021	0.041	0.165	0.13	0.127
SWSM	dec	1823.9	1854	19.3	0.247	0.083	0.13	0.498	0.235	0.225
PERM_WR	mD	1823.9	1854	19.3	0.546	0.521	0	2.885	0.307	0.039
SWIRR	DEC	1823.9	1854	19.3	0.253	0.081	0.134	0.493	0.241	0.231
DYOUNG	GPA	1823.9	1854	19.3	31.805	3.158	23.039	46.33	31.649	31.491
YOUNGS	GPA	1823.9	1854	19.3	14.959	2.097	9.933	26.991	14.823	14.69
POISR	DIME	1823.9	1854	19.3	0.228	0.022	0.194	0.292	0.227	0.226
BIOV		1823.9	1854	19.3	0.747	0.02	0.659	0.779	0.747	0.747
PZST	Mpa	1823.9	1854	19.3	2.376	0.241	1.921	3.134	2.365	2.354
LOWER CANOL										
CS	MPA	1859.4	1908.2	44.1	29.406	1.149	27.45	32.384	29.384	29.362
CG	KPA/M	1859.4	1908.2	44.1	15.621	0.542	14.679	17.05	15.611	15.602
PORE	MPA	1859.4	1908.2	44.1	19.241	0.208	19.014	19.765	19.24	19.239
PHIESM	dec	1859.4	1908.2	44.1	0.126	0.034	0.049	0.196	0.121	0.116
SWSM	dec	1859.4	1908.2	44.1	0.223	0.116	0.063	0.499	0.193	0.166
PERM_WR	mD	1859.4	1908.2	44.1	2.064	3.834	0.001	25.424	0.348	0.042
SWIRR	DEC	1859.4	1908.2	44.1	0.231	0.122	0.064	0.521	0.199	0.171
DYOUNG	GPA	1859.4	1908.2	44.1	29.654	2.052	25.072	37.324	29.584	29.516
YOUNGS	GPA	1859.4	1908.2	44.1	13.664	1.417	10.837	19.49	13.593	13.525
POISR	DIME	1859.4	1908.2	44.1	0.243	0.015	0.213	0.28	0.243	0.242
BIOV		1859.4	1908.2	44.1	0.742	0.033	0.667	0.809	0.741	0.74
PZST	Mpa	1859.4	1908.2	44.1	2.28	0.296	1.693	3.043	2.261	2.242
BLUEFISH										
CS	MPA	1937.7	1957.4	14.5	33.222	1.106	31.328	35.802	33.203	33.185
CG	KPA/M	1937.7	1957.4	14.5	17.049	0.57	16.043	18.304	17.04	17.03
PORE	MPA	1937.7	1957.4	14.5	20.049	0.101	19.779	20.23	20.049	20.048
PHIESM	dec	1937.7	1957.4	14.5	0.108	0.02	0.066	0.173	0.106	0.104
SWSM	dec	1937.7	1957.4	14.5	0.318	0.07	0.184	0.492	0.31	0.303
PERM_WR	mD	1937.7	1957.4	14.5	0.171	0.274	0.004	2.015	0.082	0.04
SWIRR	DEC	1937.7	1957.4	14.5	0.329	0.074	0.19	0.514	0.32	0.312
DYOUNG	GPA	1937.7	1957.4	14.5	28.3	5.859	20.055	59.793	27.819	27.421
YOUNGS	GPA	1937.7	1957.4	14.5	12.651	3.642	7.72	33.693	12.263	11.954
POISR	DIME	1937.7	1957.4	14.5	0.285	0.017	0.255	0.324	0.285	0.284
BIOV		1937.7	1957.4	14.5	0.724	0.02	0.683	0.787	0.724	0.723
PZST	Mpa	1937.7	1957.4	14.5	2.419	0.224	1.784	3.28	2.408	2.398

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CANOL/BLUEFISH-300178645O125-E. MACKAY

ANALYSIS CONSTANT & VALUES

Pore Pressure Gradient	10.1	kPa/m (Supplied by customer)
Overburden Gradient	24.36	kPa/m (Estimated from RHOB)
BSTR	0	
TSTS	0	

Notes:
-Log-derived permeability reflects matrix perm values only. It should be regarded solely as an index in this case as there was little core data available for calibration.

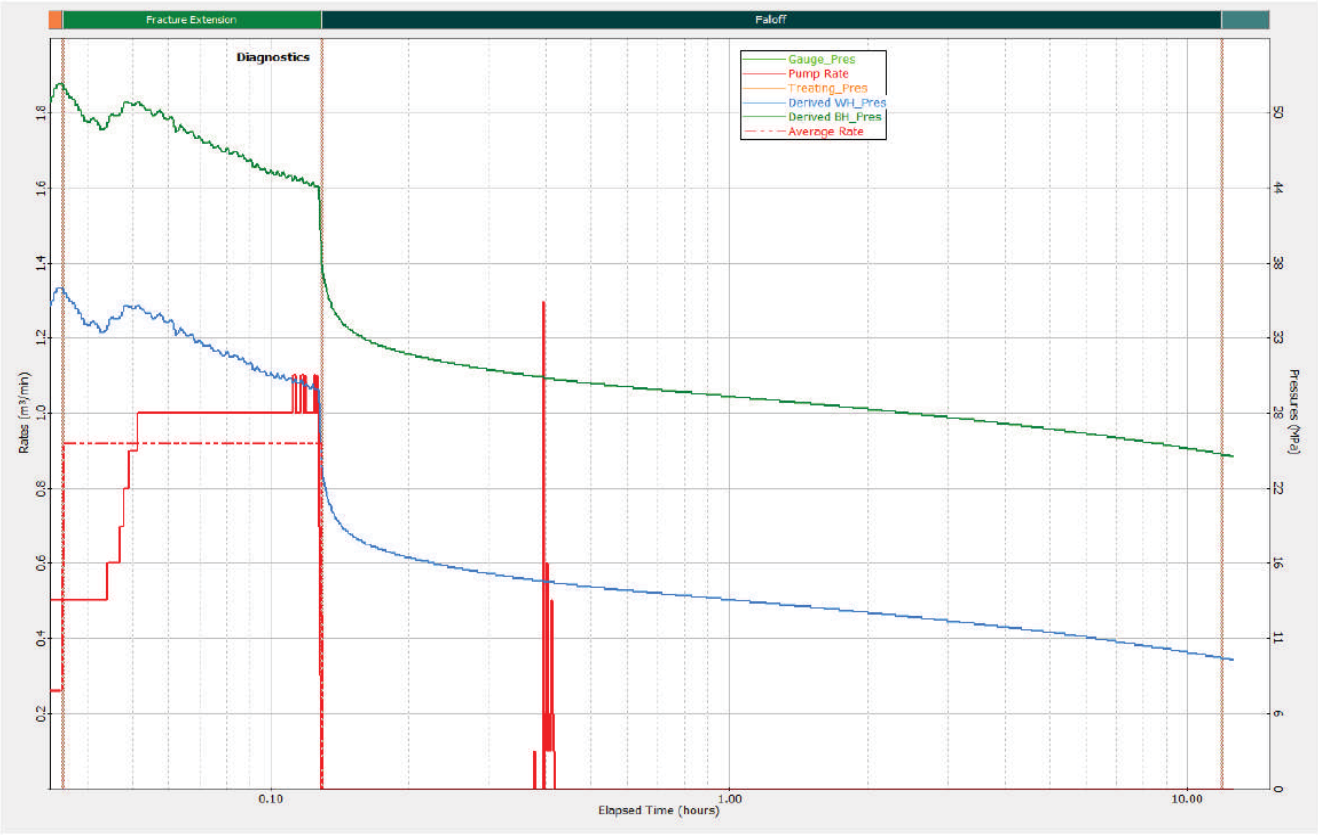
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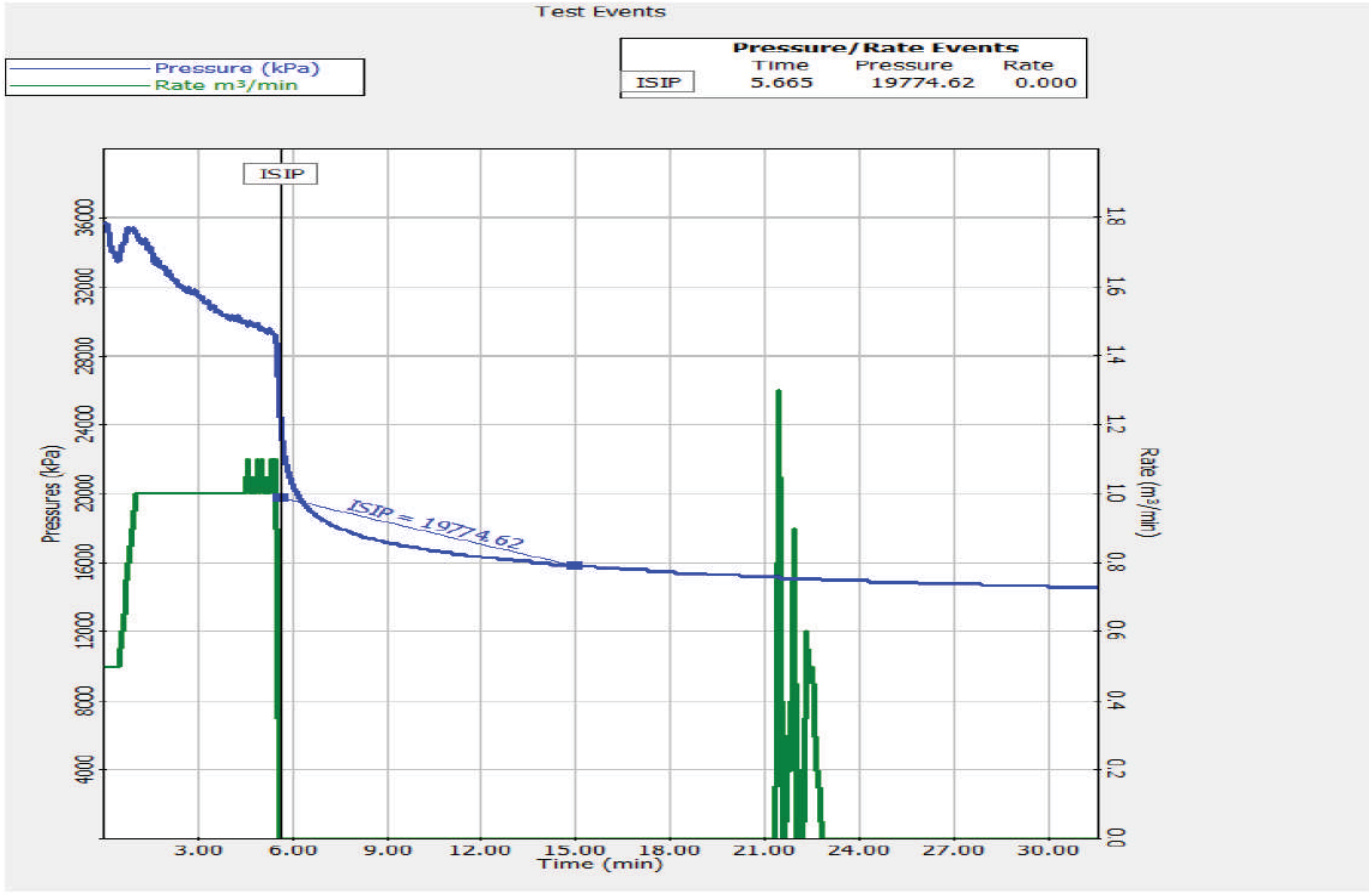
Appendix B: Diagnostic Injectivity Test (DFIT) Report

MGM: I-78-64-50-125-30: DFIT Analysis

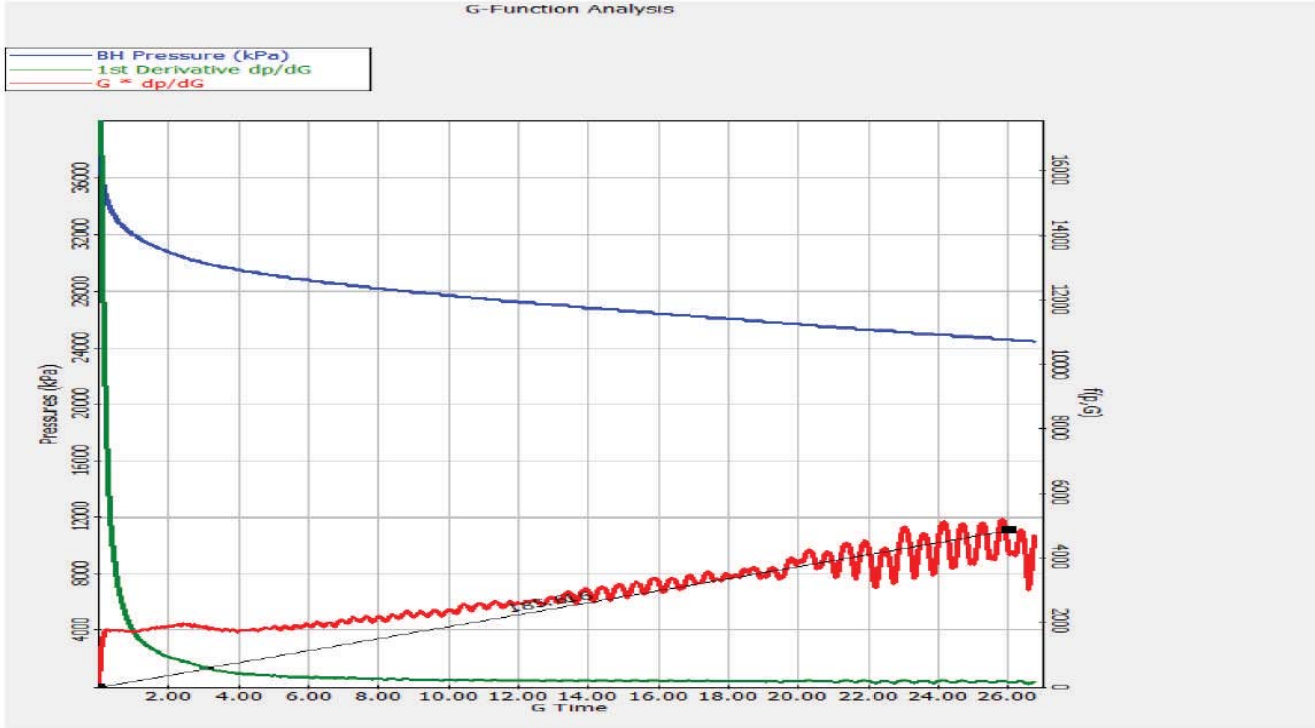
Falloff Data



ISIP


Test Events
Pressure (kPa)
Rate m³/min
Pressure/Rate Events
Time Pressure Rate
ISIP 5.665 19774.62 0.000
ISIP
ISIP = 19774.62
Pressures (kPa)
Rate (m³/min)
Time (min)
4000
8000
12000
16000
20000
24000
28000
32000
36000
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
3.00
6.00
9.00
12.00
15.00
18.00
21.00
24.00
27.00
30.00

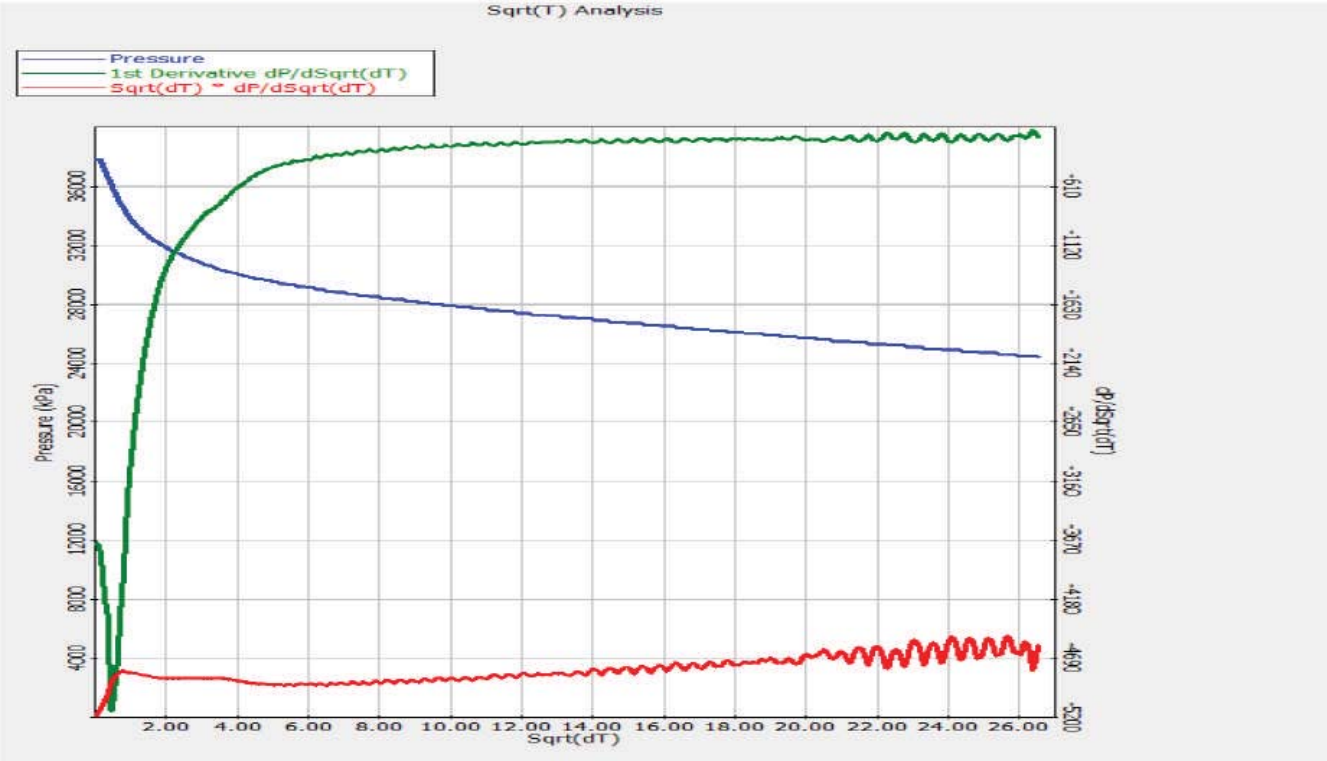
G-Function



- **Closure cannot be confirmed to have occurred on the G-Function graph. Falloff data does not demonstrate after-closure flow, therefore it cannot be confirmed that closure has or will occur (on the G-Function analysis). The slope of the G*dP/dG is consistent with the characteristics of Tip Extension that can exist in low permeability wells. G-Function analysis requires a consistent frac geometry for its analysis and will not identify closure stress for a mini-frac injection characterized by Tip Extension.**

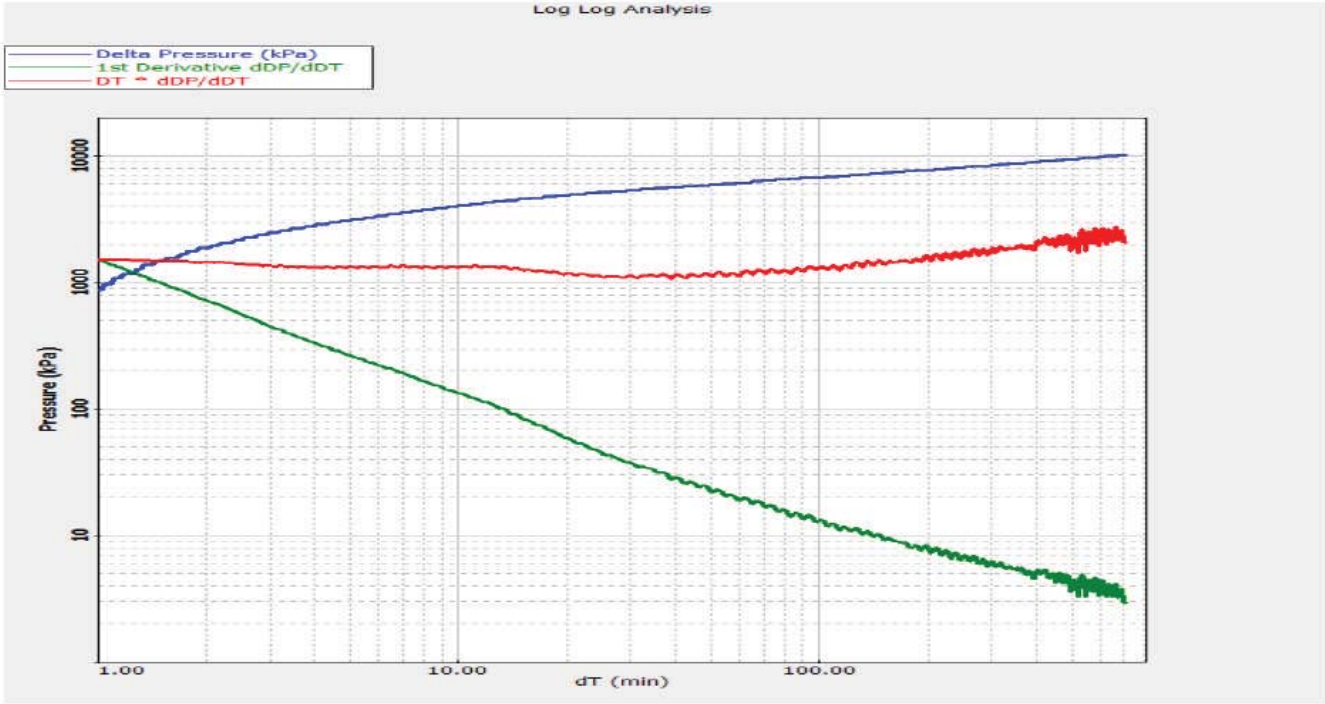
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Square Root Analysis



- **Square root analysis confirms G-Function in absence of identifiable closure stress**

Log Log Analysis



- **Delta pressure and DT*dDP/dDT both have ¼ slopes indicating bilinear flow which characterizes Tip Extension. Fractures initiated in low permeability formations can extend after shut down. As long as a positive slope continues, no closure has occurred and no after closure analysis can be undertaken (no negative slopes exist in this analysis).**

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Multi Stage Fracture Summary

CUSTOMER:	MGM ENERGY CORP	Service Order	S231410074	Job Date	4-Mar-2013
Address:		Job Type	NITRIFIED SUPER RHEO-GEL 6 FRAC	Proposal	P315296-4
		UWI:	5I-78-64-50-125-30		
	4100-350 7 AVE SW	Well Name	MGM - SHELL EAST MACKAY I-78	BHST (°C)	57
	CALGARY				
	AB	Reservoir Fluid	Oil	Well Type	New Well Development
Representative:	BoB Carnduff	BH Representative	Bursey, Jamie T.		

WELL TREATMENT SUMMARY

WELL DATA

Item	OD (mm)	Weight (kg/m)	Grade	Bottom Depth (m)	Burst (MPa)	Volume (m3)
Liner	114.3	20.09	P-110	1840.00	85.6	14.65
Casing	177.8	38.69	L-80	2020.00	49.9	
			Total Volume (m3):			14.65

Treatment Mode:	CASING	Wellhead Pressure (MPa)	5.2
Packer Depth (m)		Annular Pressure (MPa)	10.0
PBTD (m)	1943	Relief Valve Pressure (MPa)	14.0
		Pressure Test (MPa)	69.0

WELL TREATMENT TOTALS

Number of Zones Fractured:	3	
Total Proppant Pumped :	82.8	Tonnes
Total Clean Fluid Pumped :	389.0	m3
Total Energizing Fluid Pumped:	28757.00	sm3
Total Energizing Fluid Cool Down/Losses:	19030.00	sm3
Total Spearhead Fluid Pumped:	0.0	m3
Total Ball Launch Fluid Pumped:	0.0	m3
MSDS Fracture Fluid Density:	795.0	kg/m3
MSDS Fracture Fluid Temperature:	10.0	oC
Fracture Fluid Base Component :	Frac Oil	

TREATMENT FLUID

Super Rheo-Gel 6 Fracturing System

GO-64 Oil Gellant	6.00	L	/ m3
XLO-5 Crosslinker	6.00	L	/ m3
RG-35 SLR Breaker (Blend)	30.00	L	/ m3
Water	1.00	M3	/ m3

Pad	Super Rheo-Gel 6 Fracturing Syste
Proppant	Super Rheo-Gel 6 Fracturing Syste
Energizing Fluid	Nitrogen

Special Treatment Instructions and Additional Information: 0

WELL TREATMENT ZONE DETAILS

Formation : Canol #1

Zone A: This Interval (Zone) Programmed for :

Perforation Interval Depth (m)	Top	Bottom	SPM
	1882.0	1884.0	17

HEXION PR 6000 30/50 23.5 TO

	Min	Max	Avg
Pumping Pressure (MPa)	23.8	27.4	25.6
Pumping Rate (m3/min)	3.5	3.5	3.5

Concentration (kg/m3) Start	End	at Perfs	Proppant In Formation (Tonnes)
70	560	400	23.50

Hole Fill (m3):	5.5
Ball Seat Pressure (Mpa)	21.5
Breakdown Pressure (Mpa)	29.3
One Minute Shut In Pressue (MPa)	N/A
Zone Communication	No
Sand Off	No

Total Proppant Pumped	23.5	Tonnes
Nitrogen Rate	204	sm3/min
Pump Start Time	2013-Mar-04	20:45
Pump Stop Time	2013-Mar-05	13:11

FLUID VOLUMES

Treatment Fluid	PAD		
Super Rheo-Gel 6 Fracturing System		45.3	m3
Treatment Fluid	PROPPANT		
Super Rheo-Gel 6 Fracturing System		62.8	m3
Treatment Fluid	FLUSH		
Frac Oil		14.7	m3
Total Clean Fluid Pumped			
Super Rheo-Gel 6 Fracturing System		122.8	m3
Total Ball Launch Fluid Pumped:			
Frac Oil		0.0	m3
Nitrogen Pumped		10695.0	sm3

Zone Comments and Additional Information: Pumped 14.2m3 for DFIT and shut down to monitor pressure overnight

Formation : Canol #2

Zone B: This Interval (Zone) Programmed for :

Perforation Interval Depth (m)	Top	Bottom	SPM
	1869.0	1871.0	17

HEXION PR 6000 30/50 34.8 TO

	Min	Max	Avg
Pumping Pressure (MPa)	23.2	27.0	25.1
Pumping Rate (m3/min)	3.5	3.5	3.5

Concentration (kg/m3) Start	End	at Perfs	Proppant In Formation (Tonnes)
70	560	400	34.80

Wellhead Pressure (Mpa)	17.2
Ball Seat Pressure (Mpa)	37.3
Breakdown Pressure (Mpa)	26.3
One Minute Shut In Pressue (MPa)	N/A
Zone Communication	No
Sand Off	No

Total Proppant Pumped	34.8	Tonnes
Nitrogen Rate	204	sm3/min
Pump Start Time	2013-Mar-05	14:02
Pump Stop Time	2013-Mar-05	15:12

FLUID VOLUMES

Treatment Fluid	PAD		
Super Rheo-Gel 6 Fracturing System		52.5	m3
Treatment Fluid	PROPPANT		
Super Rheo-Gel 6 Fracturing System		95.2	m3
Treatment Fluid	FLUSH		
Frac Oil		14.6	m3
Total Clean Fluid Pumped			
Super Rheo-Gel 6 Fracturing System		162.3	m3
Total Ball Launch Fluid Pumped:			
Frac Oil		0.0	m3
Nitrogen Pumped		11109.0	sm3

Zone Comments and Additional Information: 0

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Multi Stage Fracture Summary

Formation :	Canol	#3
Perforation Interval Depth (m)	Top	Bottom	SPM
	1840.0	1849.0	17

	Min	Max	Avg
Pumping Pressure (MPa)	22.4	26.8	24.6
Pumping Rate (m3/min)	3.5	3.5	3.5

Wellhead Pressure (Mpa)	18.4
Ball Seat Pressure (Mpa)	38.3
Breakdown Pressure (Mpa)	29.6
15 Minute Shut In Pressue (MPa)	21.3
Zone Communication	No
Sand Off	No

Zone Comments and Additional Information:

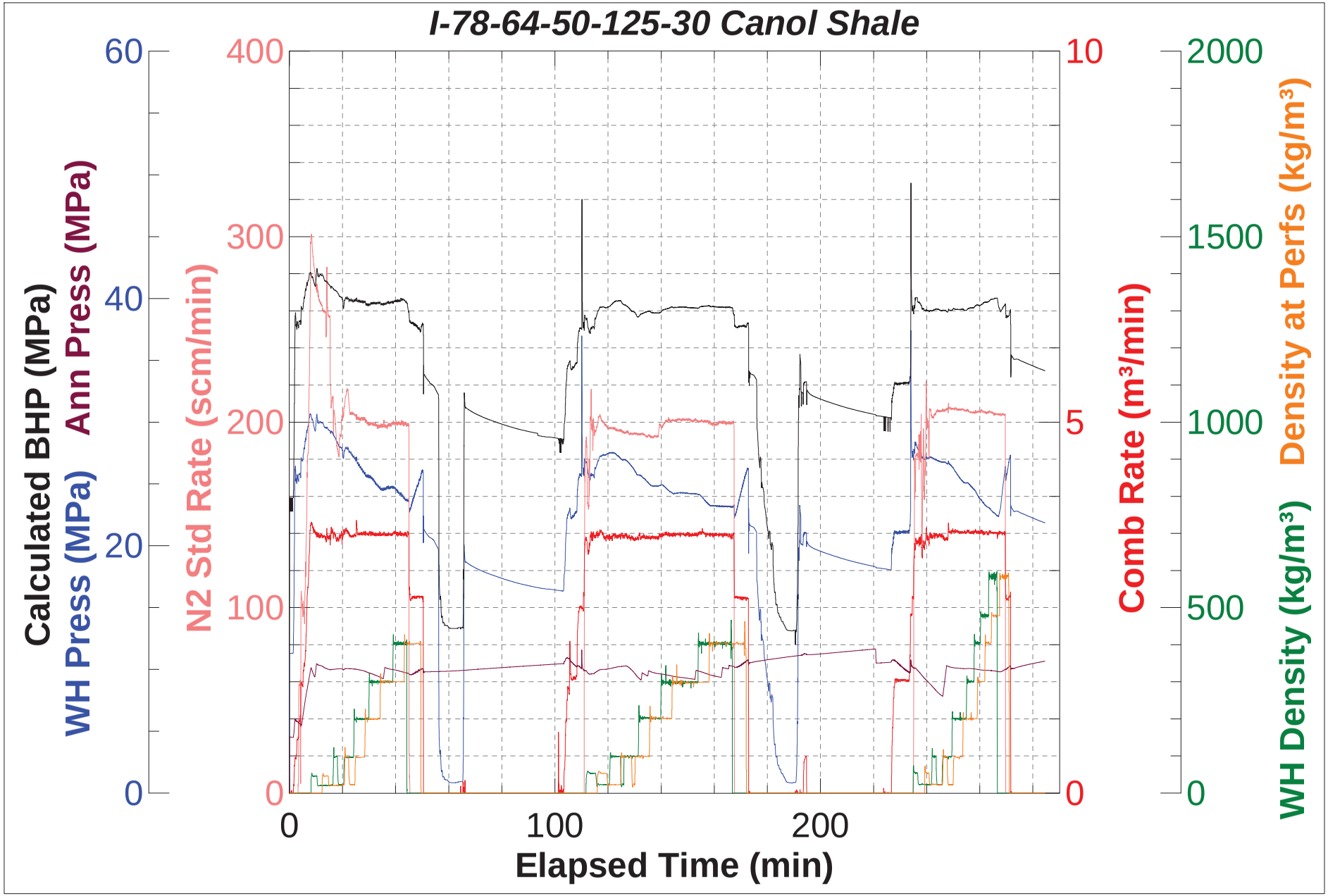
Zone C: This Interval (Zone) Programmed for :		
HEXION PR 6000 30/50	24.5	TO

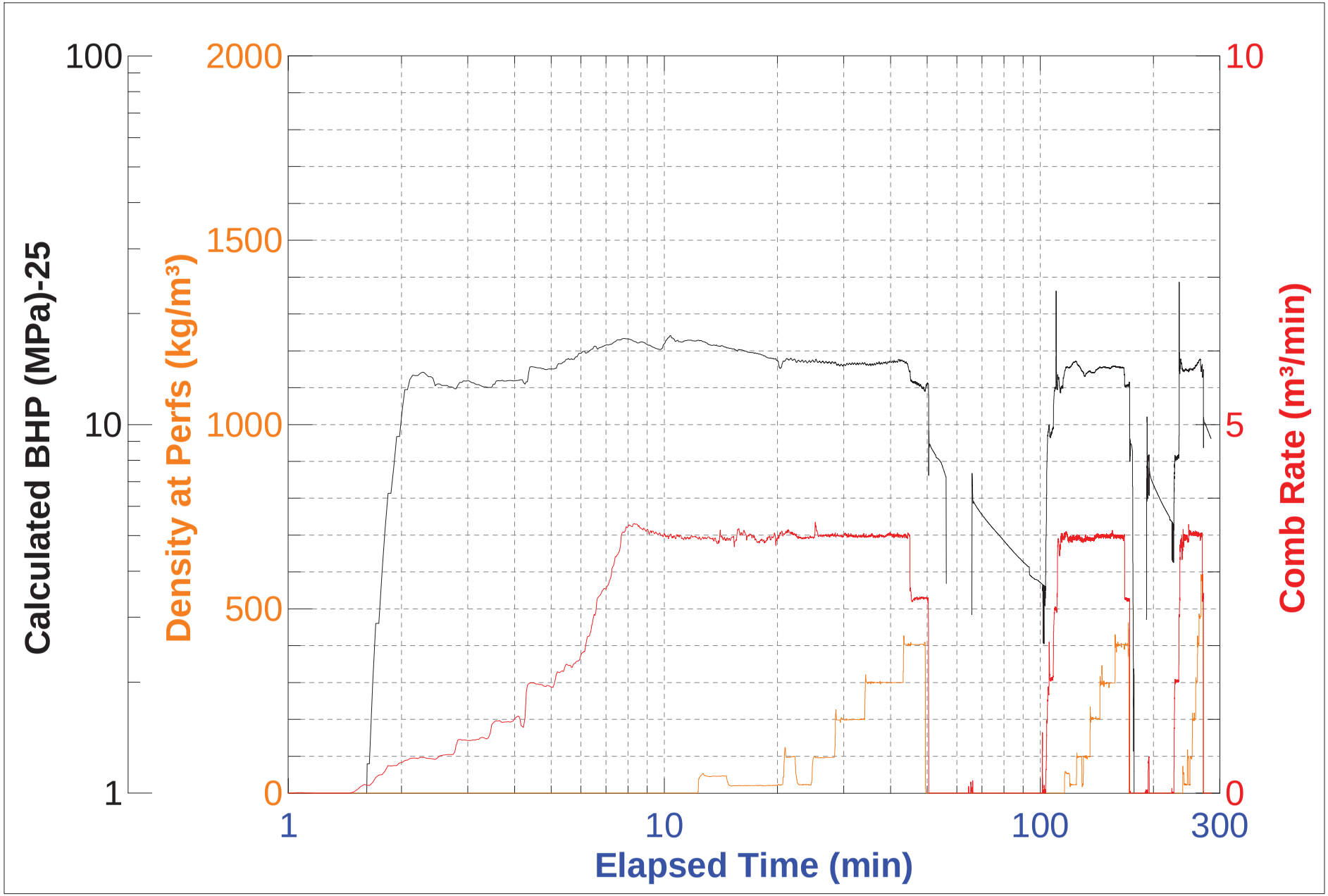
Concentration (kg/m3)			Proppant In Formation (Tonnes)
Start	End	at Perfs	
70	830	600	24.50

Total Proppant Pumped	24.5	Tonnes
Nitrogen Rate	204	sm3/min
Pump Start Time	2013-Mar-05	16:02
Pump Stop Time	2013-Mar-05	17:00

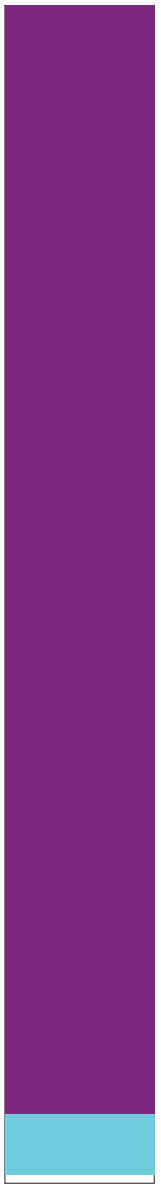
0

FLUID VOLUMES		
Treatment Fluid PAD		
Super Rheo-Gel 6 Fracturing System	42.0	m3
Treatment Fluid PROPPANT		
Super Rheo-Gel 6 Fracturing System	50.0	m3
Treatment Fluid FLUSH		
Frac Oil	11.9	m3
Total Clean Fluid Pumped		
Super Rheo-Gel 6 Fracturing System	103.9	m3
Total Ball Launch Fluid Pumped:		
Frac Oil	0.0	m3
Nitrogen Pumped	6953.0	sm3


I-78-64-50-125-30 Canol Shale
Calculated BHP (MPa)
WH Press (MPa)
Ann Press (MPa)
N2 Std Rate (scm/min)
Comb Rate (m³/min)
WH Density (kg/m³)
Density at Perfs (kg/m³)
Elapsed Time (min)
0
20
40
60
0
100
200
300
400
0
5
10
0
500
1000
1500
2000
0
100
200


Calculated BHP (MPa)-25
Density at Perfs (kg/m³)
Comb Rate (m³/min)
Elapsed Time (min)
100
10
1
2000
1500
1000
500
0
10
5
0
1
10
100
300

MD=1883 m, Slurry/Sand are m³/kg



Design		Actual	Stage
174.60		516.53	Slurry
24015		81608	Sand
25.00		40.71	01. Pad
6.10		24.95	02. Pad 50/140 @70
18.10		56.37	03. Pad 50/140 @30
6.30		26.97	04. 50/140 @130
8.10		33.96	05. 50/140 @30
12.90		44.48	06. 50/140,30/50 @130
10.60		69.23	07. 50/140,30/50 @200
12.10		90.49	08. 50/140,30/50 @270
15.10		75.54	09. 50/140,30/50 @340
19.00		41.19	10. 50/140,30/50 @410
20.90		12.63	11. 50/140,30/50 @480
6.70		0.00	12. 50/140,30/50 @560
3.00		0.00	13. Ball Spacer
10.70		0.00	14. Flush

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Advancing Reservoir Performance

BAKER HUGHES

TIGHTHOLE

POST FRACTURE STIMULATION REPORT
NET PRESSURE MATCHED GEOMETRY



MGM ENERGY CORP.
MGM Shell East MacKay 1-78
1-78-64°50' 125°30'
Canol (Oil)



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Report Date:	June 17, 2013
Report #:	2013-00594



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Upper Canol Shale (1,840.0 m -1,842.0 m and 1,847.0 m -1,849.0 m) Zone 3 ... 3

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History

The Upper and Lower Canol Shale formations at 1-78-64° 50' 125° 30' were divided into three intervals (zones). The intervals were perforated and treated with Nitrified Super Rheo-Gel 6 fracture fluid on March 04, 2013. The perforation intervals and treatment data are illustrated in Table 1. The treatment sand schedules proposed in the proposal P315296-4 were changed for each zone during pumping because leak off was less severe than expected. All zones were completed successfully and the reservoir parameters are showed in Table 1.

After the fracture treatments were completed, a Spinner survey was conducted by Pure Energy Services on March 14, 2013 to March 22, 2013. During this period, estimated oil and gas production was collected for zone 1, 2 and 3. The contributions by phase flowrate are listed in Table 4.

Objective

The purposes of this report are to perform a net pressure match on each zone to determine the post fracture treatment geometries and to match the Spinner estimated oil production for zone 2.

Since limited cumulative production data was provided for zone 2, which accounted for 78% of the total production, a ninety days' estimated oil production match was conducted using the Predict-K production simulator (See Figure 4). Predict-K used the effective fracture length and conductivity from GOHFER™ to estimate the production that can be achieved from the zone of interest. A solution GOR of 100 M^3/M^3 and an average API gravity of 46.3 were also used to match the oil production in Predict-K. Due to low cumulative production from zone 1 and 3, their production matched analysis were excluded from this report.

Summary

Fracture treatments were conducted down a 114.3 mm tubing/liner and perforated at different intervals (see Table 1). A Diagnostic Fracture Injectivity Test (DFIT) was performed on the Lower-Lower Canol Shale (zone 1) at perforation interval 1,882.0 m -1,884.0 m. A 14.3 m^3 Frac Oil was pumped at 1.0 m3/min. Based on the DFIT ISIP, fracture closure gradient was estimated and the petrophysical model was reviewed by the reservoir team to be suitable for this report until the pending core data is received. Fracture geometries were generated using GOHFER™ 8.1.3.0 based on incorporation of the interpreted log analysis.

Lower-Lower Canol Shale -Zone 1

This interval was perforated at 1,882.0 m -1,884.0 m. It was treated with 23.5 tonnes of 30/50 Hexion PR 6000 & 50/140 sand at a combined rate of 3.5 m3/min of Nitrified Super Rheo-Gel 6 fluid with a N_2 rate of 265 $sm3/m^3$. The fracture results from the post fracture treatment net pressure matched geometry and net pressure matched plot for this zone are denoted in Table 3, Figure 1 and 5 respectively.

Upper-Lower Canol Shale-Zone 2

This interval was perforated at 1,869.0 m -1,871.0 m. It was treated with 34.8 tonnes 30/50 Hexion PR 6000 & 50/140 sand at a combined rate of 3.5 m3/min of Nitrified Super Rheo-Gel 6 fluid with a N2 rate of 265 sm3/m^3. The fracture results from the post fracture treatment net pressure matched geometry and net pressure matched plot for this zone are denoted in Table 3, Figure 2 and 6 respectively. The production results for this scenario are showed in Table 5 and Figure 4.

Upper-Canol Shale-Zone 3

This interval was perforated at 1,840.0 m -1,842.0 m and 1,847.0 m -1,849.0 m. It was treated with 24.5 tonnes 30/50 Hexion PR 6000 & 50/140 sand at a combined rate of 3.5 m3/min of Nitrified Super Rheo-Gel 6 fluid with a N2 rate of 265 sm3/m^3. The fracture results from the post fracture treatment net pressure matched geometry and net pressure matched plot for this zone are denoted in Table 3, Figure 3 and 7 respectively.

Table 1: Reservoir Parameters

Formation	Zone 1 (Lower –Lower Canol)	Zone 2 (Upper –Lower Canol)	Zone 3 (Upper –Canol)	Source
Target Perforations (m)	1,882.0-1,884.0	1,869.0-1,871.0	1,840.0-1,842.0 1,847.0-1,849.0	Customer
Target MD Top (m)	1,859.4	1,859.4	1,823.9	Logs
Target MD Bottom (m)	1,908.2	1,908.2	1,854.0	Logs
Reservoir Fluid	Oil	Oil & Gas	Oil & Gas	Customer
Reservoir Temperature (°C)	50	50	50	Log
Porosity (%)	10.8	12.6	13.2	Logs
In-Situ Permeability (mD)	2.064	2.064	0.546	Logs
Reservoir Pressure (MPa)	26	26	26	Customer/Offset
Water Saturation (%)	22.3	22.3	24.7	Logs
Drainage Area (acres)	158	158	158	Assumed
Net Pay –over intervals (m)	~44.1	~44.1	~19.3	Logs
Avg. Poisson's Ratio	0.243	0.243	0.228	Logs
Avg. Young's Modulus (GPa)	29.6	29.6	31.8	Logs
Estimated Closure Stress (MPa)	25.6	30.8	29.6	GOHFER™ (Matched)
Estimated Closure Gradient	13.6	16.5	16.1	GOHFER™ (Matched)
ISIP (MPa)	17.6			DFIT
Frac Gradient (kPa/m)	15.97			DFIT

Table 2: Initial Model Parameters and GOHFER™ Fracture Dimensions

Formation	Zone 1 (Lower –Lower Canol)	Zone 2 (Upper –Lower Canol)	Zone 3 (Upper –Canol)
Perforations (m)	1,882.0-1,884.0	1,869.0-1,871.0	1,840.0-1,842.0 1,847.0-1,849.0
Fluid	N_2 Super Rheo-Gel 6	N_2 Super Rheo-Gel 6	N_2 Super Rheo-Gel 6
Tonnage (T) (30/50 PR 6000 / 50/140 Sand)	23.6	35.7	23.6
Combine Rate (m^3/min)	3.5	3.5	3.5
Maximum DH Concentration (kg/m^3)	400	400	600
Hydraulic Fracture Half Length (m)	284	318	517
Effective Propped Fracture Half Length*	185	245	245
Fracture Height (m)	38	41	20
Average Fracture Width (mm)	2.9	3.1	4.8
Estimated Net Proppant Concentration	1.9	2.1	3.4

Note: The above fracture geometry information used 15 minute shut-in.

*Note: Effective Propped Fracture Half Length (m) =.> 1.0 kg/m^2

Table 3: Model Parameters and Net Pressure Matched GOHFER™ Fracture Dimensions

Formation	Zone 1 (Lower –Lower Canol)	Zone 2 (Upper –Lower Canol)	Zone 3 (Upper –Canol)
Perforations (m)	1,882.0-1,884.0	1,869.0-1,871.0	1,840.0-1,842.0 1,847.0-1,849.0
Fluid	N_2 Super Rheo-Gel 6	N_2 Super Rheo-Gel 6	N_2 Super Rheo-Gel 6
Tonnage (T) (30/50 PR 6000 / 50/140 Sand)	23.5	34.8	24.5
Combine Rate (m^3/min)	3.5	3.5	3.5
Maximum DH Concentration (kg/m^3)	400	400	600
Hydraulic Fracture Half Length (m)	286	476	530
Effective Propped Fracture Half Length*	163	313	221
Top of Fracture (m)	1860	1861	1837
Bottom of Propped Fracture (m)	1897	1897	1855
Fracture Height (m)	37	36	18
Hydraulic Height (m)	38	37	20
Average Fracture Width (mm)	4.5	3.2	5.4
Estimated Net Proppant Concentration	1.9	2.1	3.4

Note: The above fracture geometry information used 15 minute shut-in.

*Note: Effective Propped Fracture Half Length (m) =.> 1.0 kg/m^2

Table 4: Spinner Results of Oil and Gas Contributions

Zones (m)	Qo res.* (m^3/D)	Qg res.* (m^3/D)	Production (%)
Inflow 1 (1845.6-1846.3)	0.49	1.97	20.59
Inflow 2 (1869.0-1871.0)	7.77	1.57	78.07
Inflow 3 (1882.0-1883.5)	0.16	0.00	1.34

*Note: Qo is oil flowrate and Qg is gas flowrate.

Table 5: Matched and Resulting Production

Zone 2	34.8 T	Spinner (m^3/Day)
1 Day Production Rate of Oil (m^3/Day)	7.7	7.7
90 Day Cumulative Oil Production (m^3/Day)	4.4	

Note: Using the assumptions listed above, production is simulated in an integrated, finite-difference, single-well, single-phase, 2D model.

Discussion / Recommendation

The effective propped fracture half length was determined with a 1.0 kg/m^2 cutoff proppant concentration. Zone 1 at perforation depth 1,882.0 m -1,884.0 m has similar fracture height growth which is consisted with the pre-fracture model.

The effective propped fracture half length is 68 m greater in the post-fracture results for zone 2 at perforation depth 1,882.0 m - 1,884.0 m compared to the initial model results. The increased fracture length from the net pressure matched geometry in zone 2 may suggest that the thin laminated sandstone layers between the two zones did not provide sufficient containment to isolation the two fractures and thus may contribute to the extra effective propped half length (See Figure 2). The production data also shown that zone 2 contributes 78% of the Spinner survey production compared to the other zones (See Table 4).

Zone 3 at perforation depths 1,840.0 m -1,842.0 m and 1,847.0 m -1,849.0 m has a similar fracture height growth which is consisted with the initial model. The low porosity and permeability from the log in this zone may suggest why the Spinner survey production is lower compared to zone 2 (See Table 4

According to the net pressure matched fracture geometry and Spinner production data supplied, zone 2 will be the primary zone that will contribute to production due to the effective propped fracture half length (See Figure 2 and Table 4 respectively).

Based on the data presented in this report, it is recommended to pump larger tonnage in zone 2 to give more conductive path for fluid to flow out the reservoir. Also as different phase fluids are produced in the proppant pack, such as solution gas, a large proppant pack will be more conductive and favorable to this environment.

Figure 1: Net Pressure Matched Fracture Geometry – Proppant Concentration (kg/m²) Zone 1

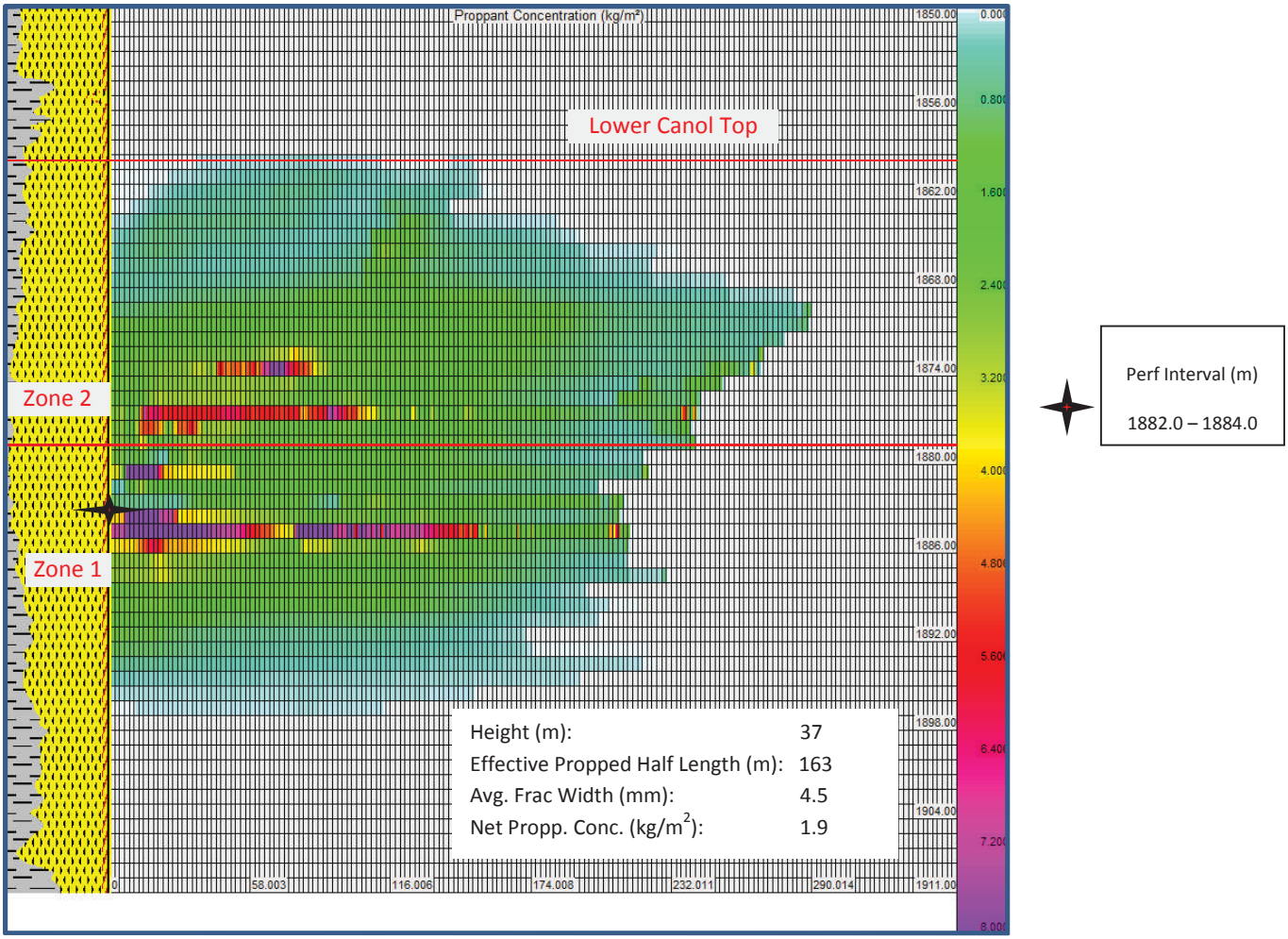


Figure 2: Net Pressure Matched Fracture Geometry – Proppant Concentration (kg/m²) Zone 2

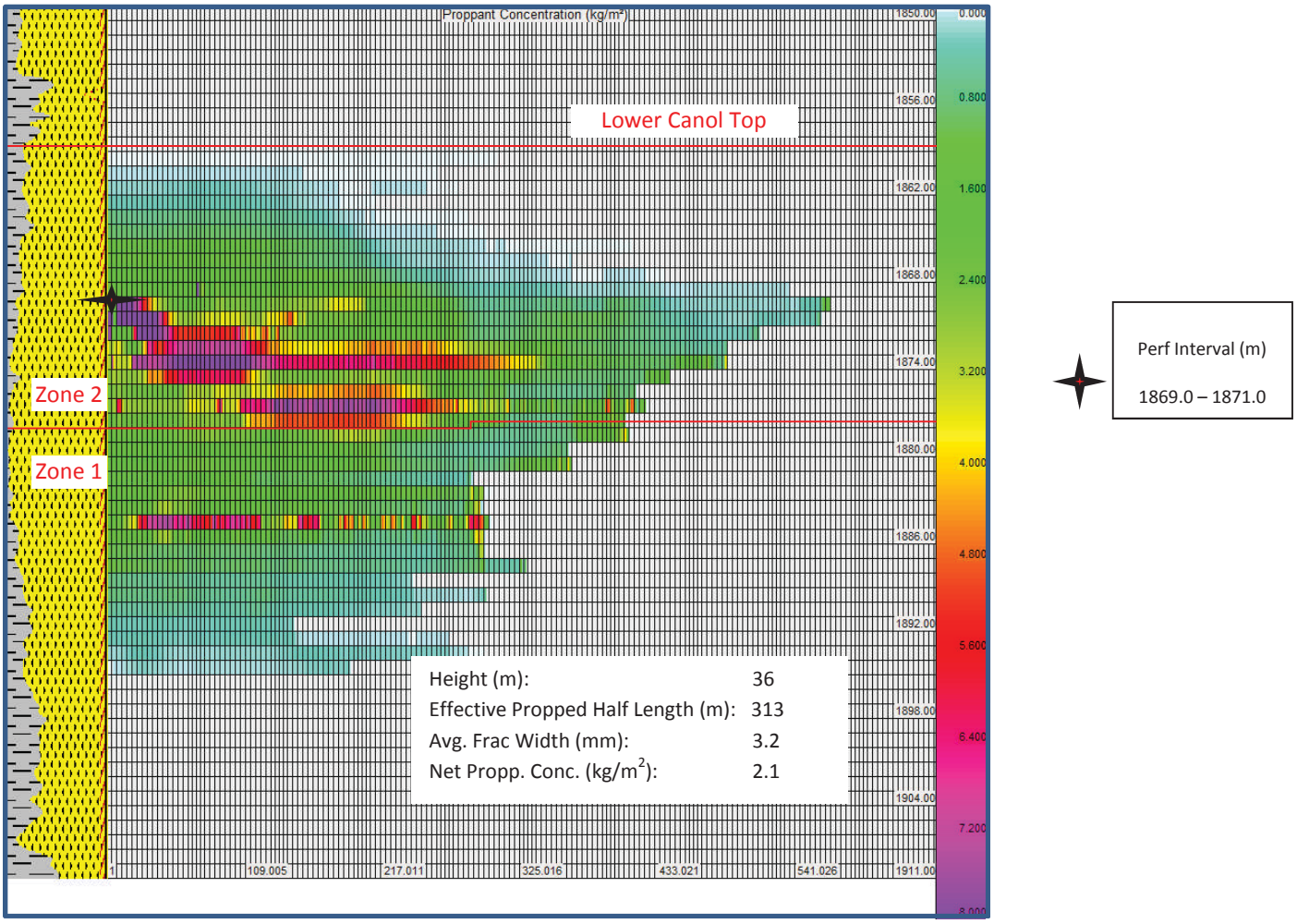


Figure 3: Net Pressure Matched Fracture Geometry – Proppant Concentration (kg/m²) Zone 3

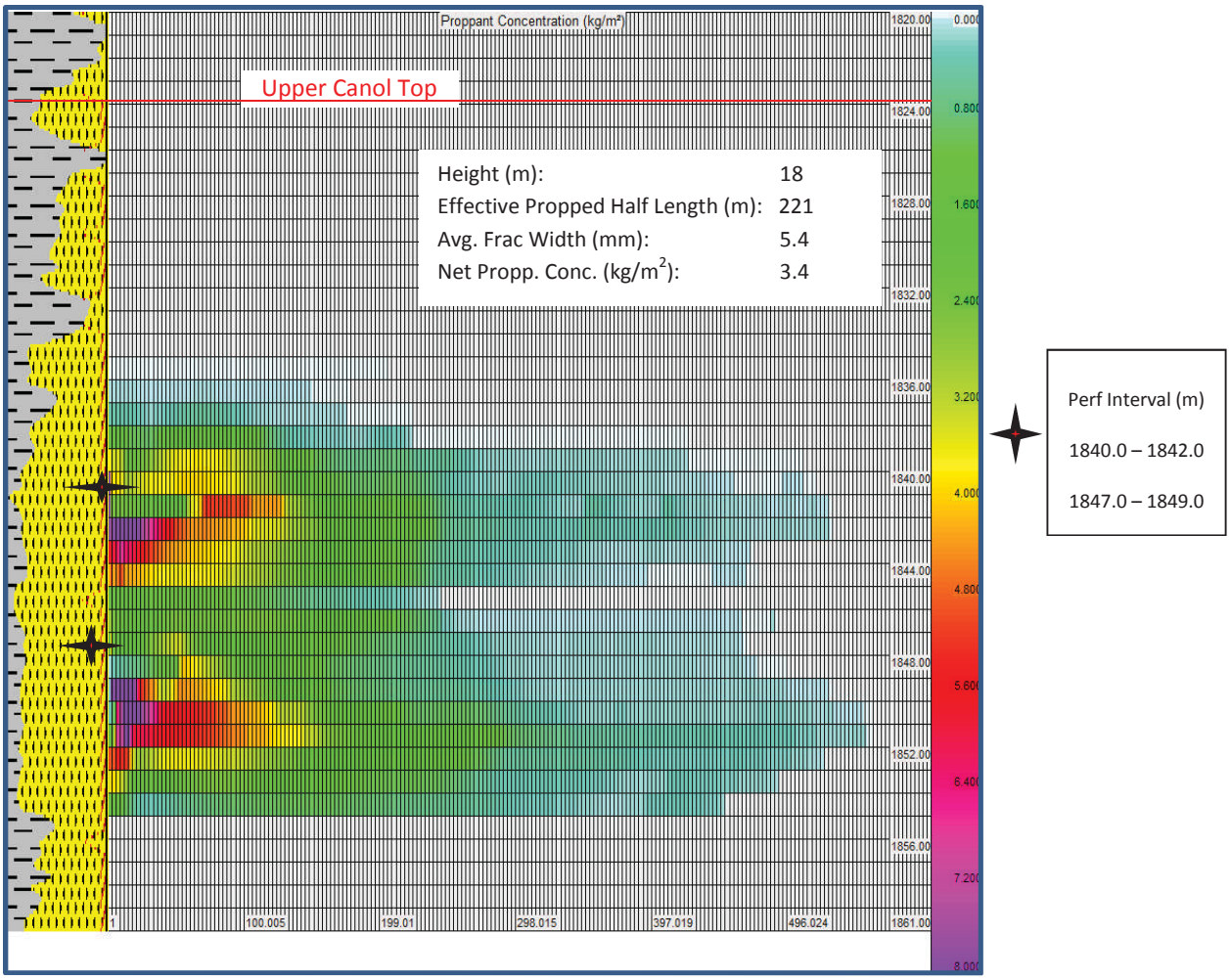


Figure 4: Resulting Production Zone 2

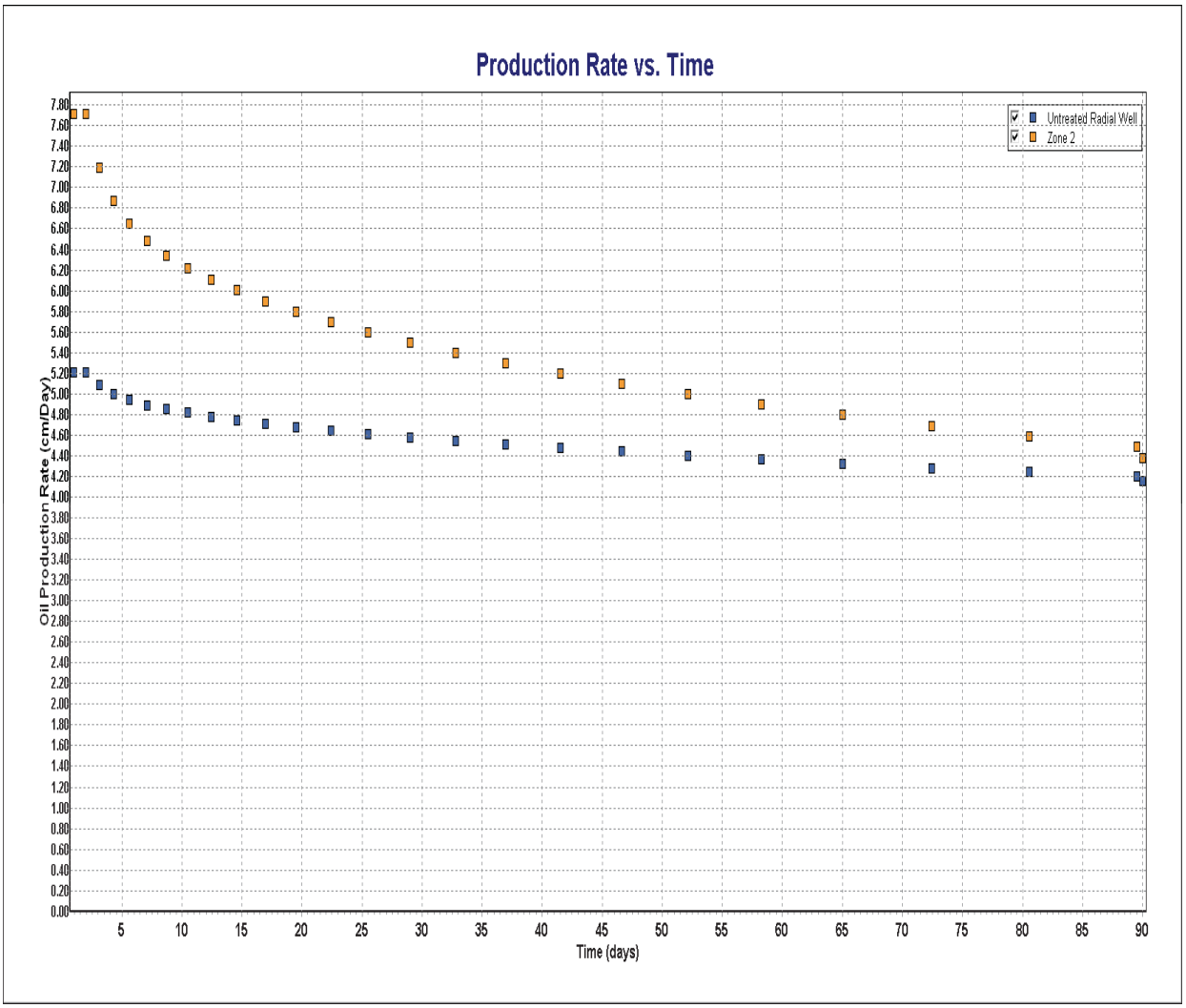


Figure 5: Net Pressure Match Plot Zone 1

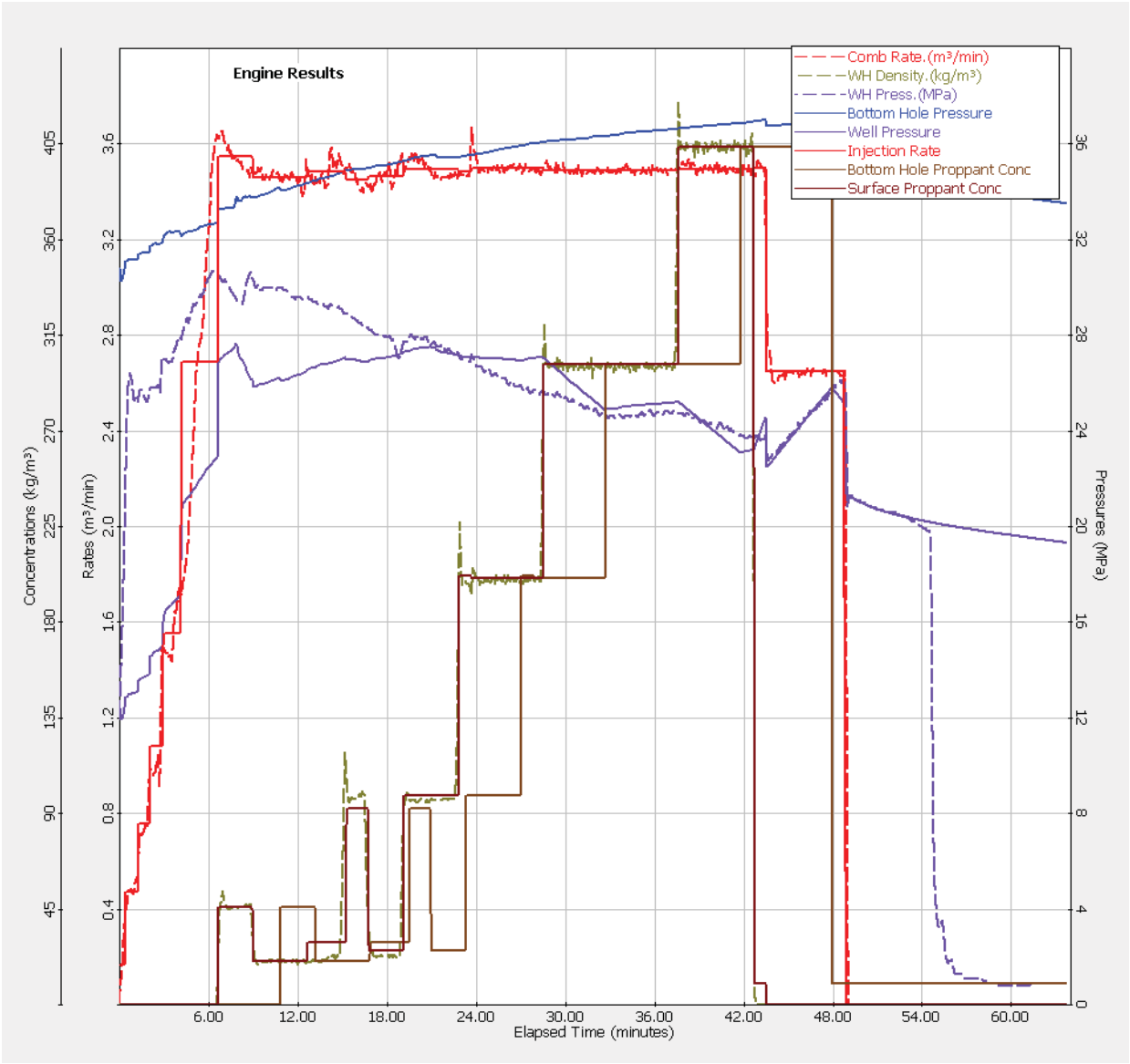


Figure 6: Net Pressure Match Plot Zone 2

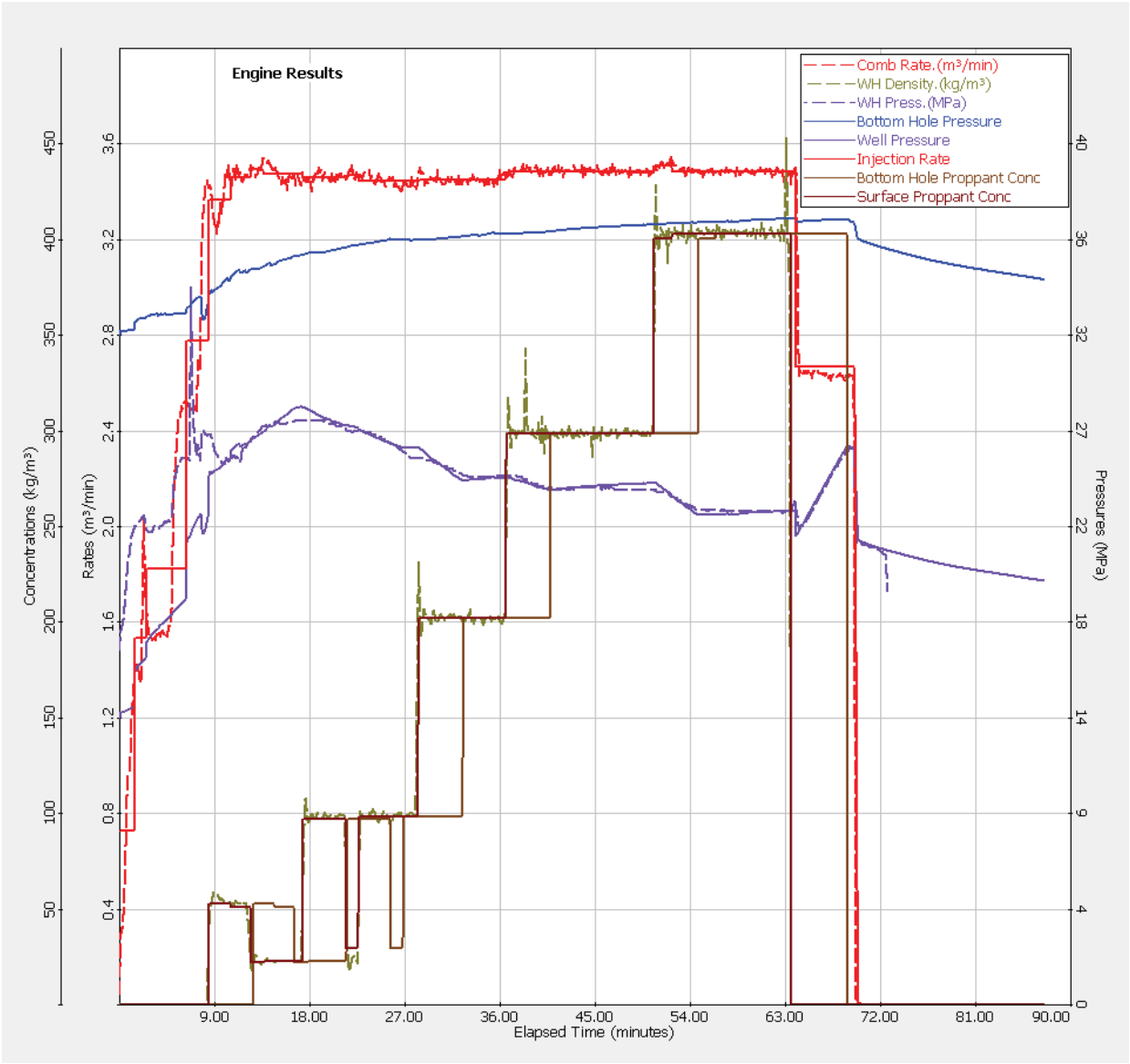
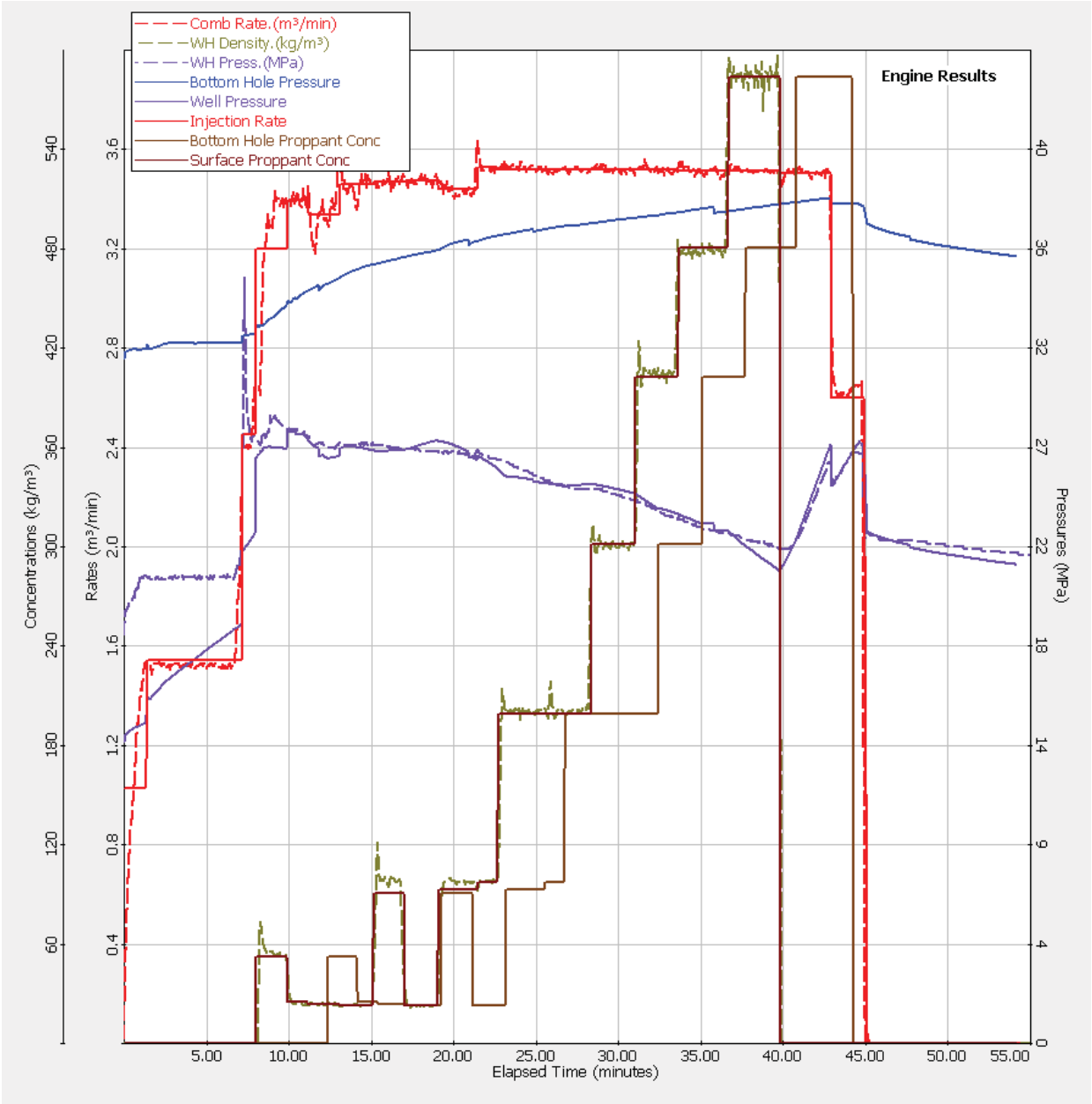
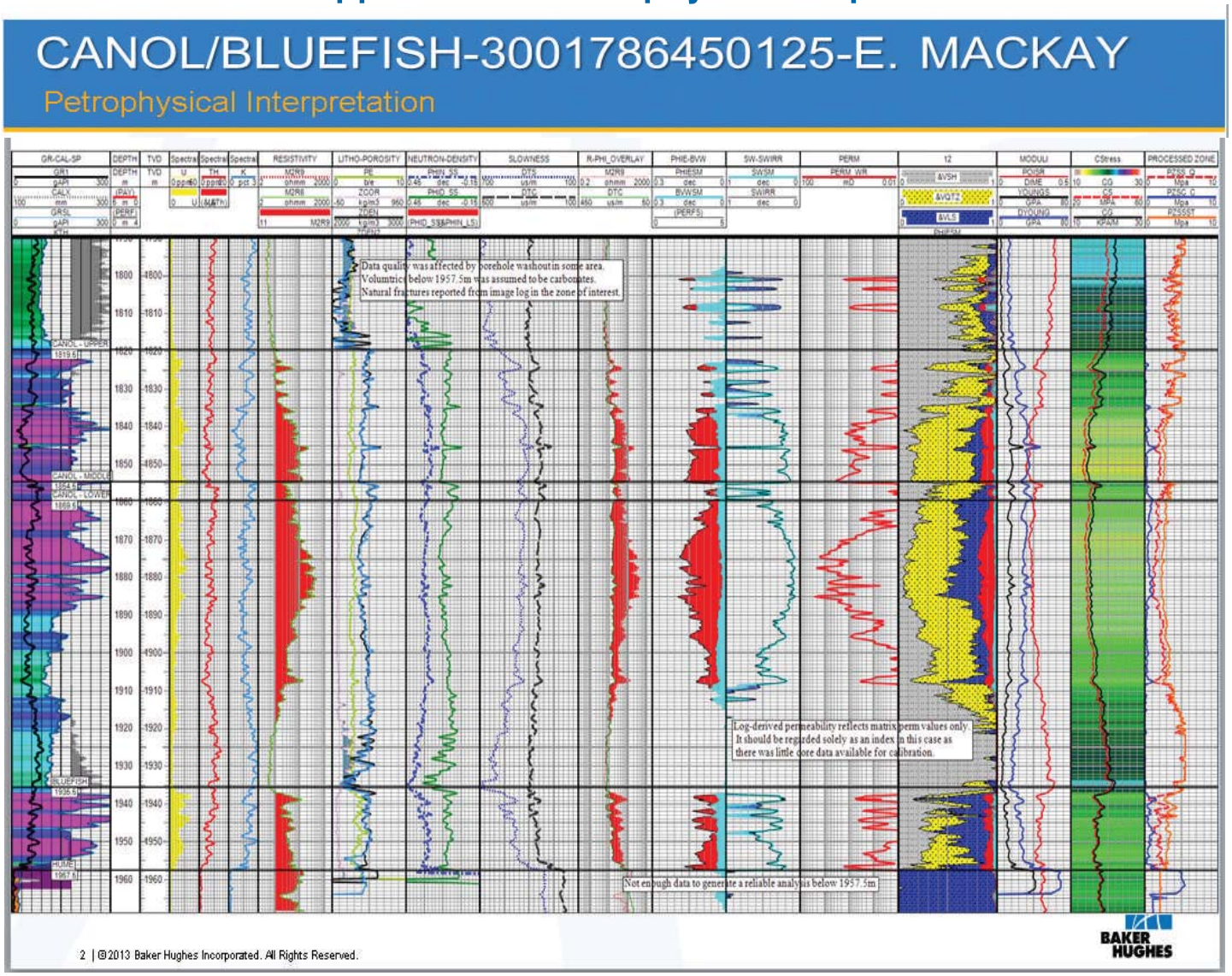


Figure 7: Net Pressure Match Plot Zone 3



Appendix A: Petrophysical Report



CANOL/BLUEFISH-300178645012S-E. MACKAY

Curve Summary

SWSM <= 0.5

Company	MGM ENERGY CORP
UWI	300178645012S
Field	EAST MACKAY
Province	NORTHWEST TERRITORIES

Well Log	Log Units	Interval Log Top	Interval Log Bottom	Net Interval	Arithmeti Mean	Standard Deviation	Minimum Value	Maximum Value	Geometric Mean	Harmonic Mean
Upper CANOL										
CS	MPA	1823.9	1854	19.3	27.983	1.236	26.287	31.917	27.957	27.932
CG	KPA/M	1823.9	1854	19.3	15.183	0.718	14.203	17.424	15.167	15.151
PORE	MPA	1823.9	1854	19.3	18.874	0.07	18.656	19.079	18.874	18.874
PHIESM	dec	1823.9	1854	19.3	0.132	0.021	0.041	0.165	0.13	0.127
SWSM	dec	1823.9	1854	19.3	0.247	0.083	0.13	0.498	0.235	0.225
PERM_WP	mD	1823.9	1854	19.3	0.546	0.521	0	2.885	0.307	0.039
SWIRR	DEC	1823.9	1854	19.3	0.253	0.081	0.134	0.493	0.241	0.231
DYOUNG	GPA	1823.9	1854	19.3	31.805	3.158	23.039	46.33	31.649	31.491
YOUNGS	GPA	1823.9	1854	19.3	14.959	2.097	9.933	26.991	14.823	14.69
POISR	DIME	1823.9	1854	19.3	0.228	0.022	0.194	0.292	0.227	0.226
BIOV		1823.9	1854	19.3	0.747	0.02	0.659	0.779	0.747	0.747
PZST	Mpa	1823.9	1854	19.3	2.376	0.241	1.921	3.134	2.365	2.354
LOWER CANOL										
CS	MPA	1859.4	1908.2	44.1	29.406	1.149	27.45	32.384	29.384	29.362
CG	KPA/M	1859.4	1908.2	44.1	15.621	0.542	14.679	17.05	15.611	15.602
PORE	MPA	1859.4	1908.2	44.1	19.241	0.208	19.014	19.765	19.24	19.239
PHIESM	dec	1859.4	1908.2	44.1	0.126	0.034	0.049	0.196	0.121	0.116
SWSM	dec	1859.4	1908.2	44.1	0.223	0.116	0.063	0.499	0.193	0.166
PERM_WP	mD	1859.4	1908.2	44.1	2.064	3.834	0.001	25.424	0.348	0.042
SWIRR	DEC	1859.4	1908.2	44.1	0.231	0.122	0.064	0.521	0.199	0.171
DYOUNG	GPA	1859.4	1908.2	44.1	29.654	2.052	25.072	37.324	29.584	29.516
YOUNGS	GPA	1859.4	1908.2	44.1	13.664	1.417	10.837	19.49	13.593	13.525
POISR	DIME	1859.4	1908.2	44.1	0.243	0.015	0.213	0.28	0.243	0.242
BIOV		1859.4	1908.2	44.1	0.742	0.033	0.667	0.809	0.741	0.74
PZST	Mpa	1859.4	1908.2	44.1	2.28	0.296	1.693	3.043	2.261	2.242
BLUEFISH										
CS	MPA	1937.7	1957.4	14.5	33.222	1.106	31.328	35.802	33.203	33.185
CG	KPA/M	1937.7	1957.4	14.5	17.049	0.57	16.043	18.304	17.04	17.03
PORE	MPA	1937.7	1957.4	14.5	20.049	0.101	19.779	20.23	20.049	20.048
PHIESM	dec	1937.7	1957.4	14.5	0.108	0.02	0.066	0.173	0.106	0.104
SWSM	dec	1937.7	1957.4	14.5	0.318	0.07	0.184	0.492	0.31	0.303
PERM_WP	mD	1937.7	1957.4	14.5	0.171	0.274	0.004	2.015	0.082	0.04
SWIRR	DEC	1937.7	1957.4	14.5	0.329	0.074	0.19	0.514	0.32	0.312
DYOUNG	GPA	1937.7	1957.4	14.5	28.3	5.859	20.055	59.793	27.819	27.421
YOUNGS	GPA	1937.7	1957.4	14.5	12.651	3.642	7.72	33.693	12.263	11.954
POISR	DIME	1937.7	1957.4	14.5	0.285	0.017	0.255	0.324	0.285	0.284
BIOV		1937.7	1957.4	14.5	0.724	0.02	0.683	0.787	0.724	0.723
PZST	Mpa	1937.7	1957.4	14.5	2.419	0.224	1.784	3.28	2.408	2.398

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CANOL/BLUEFISH-300178645012 5-E. MACKAY

ANALYSIS CONSTANT & VALUES

Pore Pressure Gradient	10.1 kPa/m (Supplied by customer)
Overburden Gradient	24.36 kPa/m (Estimated from RHOB)

Notes:

-Log-derived permeability reflects matrix perm values only. It should be regarded solely as an index in this case as there was little core data available for calibration.

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Appendix A14 MSDS Sheets for Hydraulic Fracturing Chemicals

Hydraulic Fracturing Fluid Product Component Information Disclosure

Fracture Date	**3/4/2013**
Province:	**NWT**
Region:	**Tulita District**
Well Number:	
Operator Name:	**MGM Energy Corp**
Well Name:	**MGM - SHELL EAST MACKAY I-78**
Longitude:	**-125.723528**
Latitude:	**64.795111**
Long/Lat Projection:	**NAD83**
Production Type:	
True Vertical Depth (TVD):	**2,001**
Total Water Volume (m3)*:	**1**

Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Gibson Ultra	Gibson Energy ULC	Base/Carrier Fluid					
			Distillates (petroleum), hydrotreated li	64742-47-8	100.00%	65.80014%	
Nitrogen	Baker Hughes	Energizing Fluid					
			Nitrogen	7727-37-9	100.00%	13.35266%	
PR6000 30/50	Baker Hughes	Proppant					
			Crystalline Silica (Quartz)	14808-60-7	100.00%	15.19368%	
FRAC SAND 50/140 CANA	Baker Hughes	Proppant					
			Crystalline Silica (Quartz)	14808-60-7	100.00%	2.32529%	
NOWSTA-L	Baker Hughes	Clay control					Not injected
			Potassium hydroxide	1310-58-3	60.00%	0.00526%	Surface only
Water		Breaker Aid					
			Water	7732-18-5	100.00%	0.07402%	
GO-64	Baker Hughes	Gelling agent					
			Phosphoric acid, mixed diesters with C6-12 alcs.,ET alc. and polyethylene glycol mono phenyl ether	Not Available	100.00%	0.44091%	
XLO-5	Baker Hughes	Crosslinker					
			2-Dibutylaminoethanol	102-81-8	30.00%	0.17006%	
			Ethoxylated oleyl amine	13127-82-7	10.00%	0.05669%	
			Ferric sulphate	10028-22-5	60.00%	0.34013%	
RG-35SLR	Baker Hughes	Breaker					
			Distillates (petroleum), hydrotreated light	64742-47-8	90.00%	2.08052%	
			Magnesium oxide	1309-48-4	40.00%	0.92468%	
Tracerco 163a		Tracer			100.00%	0.00044%	

* Total Water Volume sources may include fresh water, produced water, and/or recycled water

** Information is based on the maximum potential for concentration and thus the total may be over 100%

Information provided in this form, with respect to ingredients in the fracturing fluid is consistent with the Material Safety Data Sheet (MSDS) information.

Section 1: PRODUCT AND COMPANY IDENTIFICATION

Product Name:	Gibson Ultra
Synonyms:	Not available.
Product Use:	Drilling muds, oil-based.
Manufacturer/Supplier:	Gibson Energy ULC 1700, 440 – 2nd Ave. SW Calgary, Alberta T2P 5E9
Phone Number:	(403) 206-4000
Emergency Phone:	Canutec (613) 993-6666 or Cellular *666
Date of Preparation:	December 17, 2012

Section 2: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

DANGER
COMBUSTIBLE LIQUID AND VAPOR. HARMFUL OR FATAL IF SWALLOWED. CAN ENTER LUNGS AND CAUSE DAMAGE. MAY IRRITATE EYES AND SKIN.

Colour: Colourless.
Physical State: Liquid.
Odour: Mild Petroleum/Solvent.

WHMIS	Personal Protection Equipment	TDG (Ground)
		Not regulated.

Potential Health Effects: See Section 11 for more information.

Likely Routes of Exposure: Eye contact. Skin contact. Inhalation. Ingestion.

Inhalation: May cause respiratory irritation. Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain. Excessive inhalation may cause headache, dizziness, confusion, loss of appetite and/or loss of consciousness.

Eye: May cause eye irritation. Signs/symptoms may include redness, swelling, pain, tearing, and blurred or hazy vision.

Skin: May cause skin irritation. Signs/symptoms may include localized redness, swelling, and itching.

Ingestion: May be fatal if swallowed and enters airways. May cause gastrointestinal irritation. Signs/symptoms may include abdominal pain, stomach upset, nausea, vomiting and diarrhea.

Medical Conditions Aggravated By Exposure: Not available.

Target Organs: Skin. Eyes. Gastrointestinal tract. Respiratory system. Nervous system.

Potential Environmental Effects: See Section 12 for more information.

Section 3: COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous Ingredient(s)	CAS No.	% wt./wt.
Distillates (petroleum), hydrotreated light	64742-47-8	100

Section 4: FIRST AID MEASURES

Inhalation: If inhaled: Call a poison center or doctor/physician if you feel unwell. If breathing or the heart stops, trained personnel should immediately begin artificial respiration (AR) or cardiopulmonary resuscitation (CPR) respectively. Get medical attention immediately.

Eye Contact: If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a poison center or doctor if you feel unwell.

Skin Contact: If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. Call a poison center or doctor if you feel unwell. Wash skin with soap and water for at least 15 minutes.

Ingestion: If swallowed: Immediately call a poison center or doctor. If vomiting occurs naturally, have victim lean forward to reduce the risk of aspiration. Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If breathing or the heart stops, trained personnel should immediately begin artificial respiration (AR) or cardiopulmonary resuscitation (CPR) respectively. Get medical attention immediately.

General Advice: In case of accident or if you feel unwell, seek medical advice immediately (show the label or MSDS where possible).

Note to Physicians: Symptoms may not appear immediately.

Section 5: FIRE FIGHTING MEASURES

Flammability: Combustible liquid by WHMIS criteria.

Means of Extinction
Suitable Extinguishing Media: Small Fire: Dry chemical, CO_2, water spray or regular foam.

Large Fire: Water spray, fog or regular foam. Move containers from fire area if you can do it without risk.

Unsuitable Extinguishing Media: Not available.

Products of Combustion: Oxides of carbon.

Protection of Firefighters: Fire may produce irritating, corrosive and/or toxic gases. Runoff from fire control or dilution water may cause pollution.

Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters' protective clothing will only provide limited protection.

Explosion Data

Sensitivity to Mechanical Impact: This material is not sensitive to mechanical impact.

Sensitivity to Static Discharge: This material is sensitive to static discharge.

Section 6: ACCIDENTAL RELEASE MEASURES

Emergency Procedures: Keep unauthorized personnel away. Stay upwind. Keep out of low areas. Ventilate closed spaces before entering. ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).

If engineering controls and ventilation are not sufficient to control exposure to below the allowable limits then an appropriate NIOSH/MSHA approved air-purifying respirator with organic vapor cartridge, or self-contained breathing apparatus must be used. Supplied air breathing apparatus must be used when oxygen concentrations are low or if airborne concentrations exceed the limits of the air-purifying respirators.

Personal Precautions: Do not touch or walk through spilled material. Use personal protection recommended in Section 8.

Environmental Precautions: Keep out of drains, sewers, ditches, and waterways.

Methods for Containment: Stop leak if without risk. Contain spill and absorb with inert absorbent. Large pools may be covered with foam to prevent vapour evolution. Do not flush to sewer or allow to enter waterways.

Methods for Clean-Up: Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Use clean non-sparking tools to collect absorbed material. Large spills should be removed with explosion proof vacuum equipment.

Other Information: Dispose of in accordance with all Federal, Provincial and local regulations. Comply with Federal, Provincial, and local requirements for spill and/or release notification.

Section 7: HANDLING AND STORAGE

Handling:

Do not swallow. Keep away from heat, sparks, open flames, and hot surfaces. No smoking. Keep container tightly closed. Ground/bond container and receiving equipment. Use only non-sparking tools. Take precautionary measures against static discharge. See Section 8 for information on Personal Protective Equipment.

Storage:
Store in a well-ventilated place. Keep cool. Store locked up. Store away from incompatible Materials. See Section 10 for information on Incompatible Materials. Keep out of the reach of children.

Section 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines
Component

Distillates (petroleum), hydrotreated light [CAS No. 64742-47-8]

ACGIH: 100 ppm (TWA); (1980); For Stoddard solvent
OSHA: 500 ppm (TWA), 2900 mg/m³ (TWA);
100 ppm (TWA) [Vacated]; For Stoddard solvent.

TWA: Time-Weighted Average

Engineering Controls:	Use ventilation adequate to keep exposures (airborne levels of dust, fume, vapour, gas, etc.) below recommended exposure limits. Use explosion-proof electrical, ventilating, and lighting equipment.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Eye/Face Protection:	Safety glasses are recommended.
Hand Protection:	Wear protective gloves. Consult manufacturer specifications for further information.
Skin and Body Protection:	Wear protective clothing. Flame resistant clothing that meets the NFPA 2112 and CAN/CGSB 155.20 standards is recommended in areas where material is stored or handled.
Respiratory Protection:	If engineering controls and ventilation are not sufficient to control exposure to below the allowable limits then an appropriate NIOSH/MSHA approved air-purifying respirator with organic vapor cartridge, or self-contained breathing apparatus must be used. Supplied air breathing apparatus must be used when oxygen concentrations are low or if airborne concentrations exceed the limits of the air-purifying respirators.
General Hygiene Considerations:	Handle according to established industrial hygiene and safety practices.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Clear liquid.
Colour:	Colourless.
Odour:	Mild Petroleum/Solvent.

Odour Threshold:	Not available.
Physical State:	Liquid.
pH:	Not available.
Viscosity:	1.5 to 1.75 cSt at 40 °C (104 °F)
Melting Point:	Not available.
Boiling Point:	192 to 250 °C (377.6 to 482 °F)
Flash Point:	Min. 70 °C (158 °F) (PMCC)
Evaporation Rate:	0.1 (n-BuAc = 1)
Lower Flammability Limit:	0.6 %
Upper Flammability Limit:	5 %
Vapor Pressure:	0.023 kPa at 20 °C (68 °F)
Vapor Density:	6.2 (Air = 1) at 101 kPa
Specific Gravity:	0.790 to 0.810 (Water = 1) at 15.6 °C (60.1 °F)
Density:	Not available.
Solubility in Water:	Negligible.
Coefficient of Water/Oil Distribution:	Not available.
Auto-ignition Temperature:	251 °C (483.8 °F) (approximate)
Percent Volatile, wt. %:	Not available.
VOC content, wt. %:	Not available.

Section 10: STABILITY AND REACTIVITY

Stability:	Stable under normal storage conditions.
Conditions of Reactivity:	Contact with incompatible materials. Exposure to heat.
Incompatible Materials:	Strong oxidizers.
Hazardous Decomposition Products:	Not available.
Possibility of Hazardous Reactions:	None known.

Section 11: TOXICOLOGICAL INFORMATION

EFFECTS OF ACUTE EXPOSURE

Component Toxicity

Component	CAS No.	LD_{50} oral	LD_{50} dermal	LC_{50}
Distillates (petroleum), hydrotreated light	64742-47-8	> 15000 mg/kg	> 3160 mg/kg	Not available.

Inhalation: May cause respiratory irritation. Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain. Excessive inhalation may cause headache, dizziness, confusion, loss of appetite and/or loss of consciousness.

Eye: May cause eye irritation. Signs/symptoms may include redness, swelling, pain, tearing, and blurred or hazy vision.

Skin: May cause skin irritation. Signs/symptoms may include localized redness, swelling, and itching.

Ingestion: May be fatal if swallowed and enters airways. May cause gastrointestinal irritation. Signs/symptoms may include abdominal pain, stomach upset, nausea, vomiting and diarrhea.

Skin Sensitization: Not available.

Respiratory Sensitization: Not available.

EFFECTS OF CHRONIC EXPOSURE

Target Organs: Skin. Eyes. Gastrointestinal tract. Respiratory system. Nervous system.

Chronic Effects: Prolonged or repeated contact may dry skin and cause irritation.

Carcinogenicity: This product does not contain any carcinogens or potential carcinogens as listed by ACGIH, IARC, OSHA, or NTP.

Mutagenicity: Not available.

Reproductive Effects: Not available.

Developmental Effects

Teratogenicity: Not available.

Embryotoxicity: Not available.

Toxicologically Synergistic Materials: Not available.

Section 12: ECOLOGICAL INFORMATION

Ecotoxicity: Lepomis macrochirus: LC50 = 2.2 mg/L, 96 hr static; Oncorhynchus mykiss: LC50 = 2.4 mg/L, 96 hr static; Pimephales promelas: LC50 = 45 mg/L, 96 hr flow-through.

Persistence / Degradability: Not available.

Bioaccumulation / Accumulation: Not available.

Mobility in Environment: Not available.

Section 13: DISPOSAL CONSIDERATIONS

Disposal Instructions: Disposal should be in accordance with applicable Federal, Provincial and local laws and regulations. Local regulations may be more stringent than Provincial or Federal requirements.

Section 14: TRANSPORT INFORMATION

Canada Transportation of Dangerous Goods (TDG)

Proper Shipping Name: Not regulated.

Class: Not applicable.

UN Number: Not applicable.

Packing Group: Not applicable.

Label Code: Not applicable.

Section 15: REGULATORY INFORMATION

Chemical Inventories

Canada (DSL)

The components of this product are in compliance with the chemical notification requirements of the NSN Regulations under CEPA, 1999.

Federal Regulations

Canada

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

WHMIS Classification: Class B3 - Combustible Liquids.

Hazard Symbols:



Section 16: OTHER INFORMATION

Disclaimer: The information contained in this document applies to this specific material as supplied. It may not be valid for this material if it is used in combination with any other materials. It is the user's responsibility to satisfy oneself as to the suitability and completeness of this information for his own particular use.

MSDS Expiry Date (Canada): December 16, 2015

Version: 1.0

MSDS Prepared by: **Deerfoot Consulting Inc.**

Phone: (403) 720-3700

Schlumberger

SAFETY DATA SHEET

(Canada)

Version: 4 *Revision date:* 27 April 2012

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product Code: **N002**
Product Name: **NITROGEN N2**

Company identification:
Schlumberger Canada, Ltd.
525 - 3rd Avenue S.W.
Calgary, Alberta T2P 0G4, Canada

Corporate address and telephone number:
Schlumberger Technology Corporation
110 Schlumberger Drive
Sugar Land, Texas 77478, USA
Telephone: 1-281-285-7873

Emergency telephone number: **USA: 1-281-595-3518**

Product use: Foaming agent in oilfield applications.
PIN: UN 1977

SECTION 2. HAZARDS IDENTIFICATION

Form: Liquid **Color:** Colorless **Odor:** None
Main physical hazards: Cryogenic liquid.
Main health hazards: Causes severe eye burns. Causes severe skin burns. Causes burns to mouth, throat and stomach. May cause asphyxiation in high concentrations.
Precautions: Vapors are heavier than air and can cause suffocation by reducing oxygen available for breathing.

Principle routes of exposure:
Eye contact. Skin contact. Inhalation.



WHMIS Hazard Class:
A (Compressed Gases)

SECTION 3. COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS-No	Weight %- Range
Nitrogen, liquid form	7727-37-9	60-100

SECTION 4. FIRST AID MEASURES

Eye contact: Immediately flush eye(s) with plenty of water. Call a physician immediately.
Skin contact: Frozen tissue should be bathed continuously with water until thawed. Treat as a burn. Seek medical attention..
Ingestion: Call a physician immediately. If breathing has stopped or heart has stopped, trained personnel should immediately administer artificial respiration or CPR, as required.

SECTION 4. FIRST AID MEASURES

Inhalation: Move to fresh air. If breathing has stopped or heart has stopped, trained personnel should immediately administer artificial respiration or CPR, as required.

SECTION 5. FIRE FIGHTING MEASURES

Flash point: Not combustible
Autoignition temperature: Not applicable.
Flammability limits in air:
Lower: Not applicable
Upper: Not applicable
Oxidizing properties: None.

Hazardous combustion products:
None

Explosive properties:
Explosion data - sensitivity to mechanical impact:
Not applicable.
Explosion data - sensitivity to static discharge:
Not applicable.
Suitable extinguishing media:
None needed. Use extinguishing media appropriate for surrounding material.

Extinguishing media which must not be used for safety reasons:
Not applicable.

Special exposure hazards arising from the substance or preparation itself, its combustion products, or released gases:
Take precaution for cryogenic liquid. Vapors are heavier than air and can cause suffocation by reducing oxygen available for breathing.

Special protective equipment for firefighters:
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Use self-contained breathing apparatus in closed areas.

NFPA:

Health:	**3**
Flammability:	**0**
Instability:	**0**
Special:	**None**

SECTION 6. ACCIDENTAL RELEASE MEASURES

Main physical hazards: Cryogenic liquid.
Personal precautions: Evacuate personnel to safe areas. Ensure adequate ventilation. Wear suitable protective equipment.
Methods for cleaning up: Evacuate and ventilate the area.
Environmental precautions: None known.

SECTION 7. HANDLING AND STORAGE

Handling:
Precautions: Vapors are heavier than air and can cause suffocation by reducing oxygen available for breathing.

SECTION 7. HANDLING AND STORAGE

Safe handling advice: Avoid contact with skin and eyes. Ensure adequate ventilation. Wear suitable protective equipment.

Technical measures/ storage conditions: Keep at temperature not exceeding 50 °C (122 °F).

Packaging requirements: Use specially constructed containers only.

Incompatible products: Carbon steel.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

Engineering measures to reduce exposure: Control the source.

Hygiene measures: Avoid contact with the skin and the eyes. Wear suitable protective equipment.

Respiratory protection: In case of insufficient ventilation, wear suitable respiratory equipment. Use SCBA (self contained breathing apparatus) in confined areas and for emergencies.

Eye protection: Tightly fitting safety goggles. Face-shield.

Hand protection: Impervious gauntlet gloves designed for use with cryogenics.

Skin and body protection: Clean, body-covering clothing.

Occupational Exposure Limits

	ACGIH - TLVs			OSHA - PELs		
Component	**TWA / C**	**STEL**	**Skin Notation**	**TWA / C**	**STEL**	**Final PELs - Skin**
Nitrogen, liquid form	-	Simple asphyxiant	-	-	-	-

Additional notes:
- General notes concerning "Particles Not Otherwise Specified" [PNOS] (insoluble or poorly soluble): ACGIH PNOS Recommendations: airborne concentrations should be kept below 3 mg/m³, respirable particulate, and 10 mg/m³, inhalable particles.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Form: Liquid

Color: Colorless

Odor: None

Odor threshold: Not applicable.

pH: Not applicable.

Boiling point/range: -196 °C / -321 °F

Bulk density: Not applicable.

Flash point: Not combustible

Melting point/range: -210 °C / -346 °F

Decomposition temperature: No data available.

Solubility:

Water solubility: 15 g/l (@ 20°C)

Fat solubility: Insoluble.

Partition coefficient (n-octanol/water): Not applicable.

Relative density: 0.808 (@ 20°C)

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Vapor pressure: No data available.
Vapor density: 0.97
Viscosity: No data available.
Evaporation rate: 100
% Volatile (VOC): None.

SECTION 10. STABILITY AND REACTIVITY

Stability:
Stable.

Conditions to avoid:
Storage temperature not to exceed 50 °C (122 °F).

Incompatibility with other substances:
Carbon steel.

Hazardous decomposition products:
None.

Hazardous polymerization:
None.

SECTION 11. TOXICOLOGICAL INFORMATION

Principle routes of exposure:
Eye contact. Skin contact. Inhalation.

PRODUCT TOXICOLOGICAL INFORMATION

Acute Health Hazard

Eye contact: Causes eye burns. Rapidly causes pain, burns, corneal injury. May cause permanent damage and blindness.
Skin contact: Rapidly causes pain, burns, redness, swelling and damage to tissue.
Ingestion: Causes pain and severe burns to mouth, throat and stomach.
Inhalation: Will not support life. Reduces oxygen available for breathing. Can cause dizziness, headache, loss of consciousness, death.
Sensitization - lung: Not known to cause allergic reaction.
Sensitization - skin: Not known to cause allergic reaction.

Chronic Health Hazard

Carcinogenic effects: None known.
Mutagenic effects: Not known to cause heritable genetic damage.
Teratogenic effects: Not known to cause birth defects or have a deleterious effect on a developing fetus.
Reproductive toxicity: Not known to adversely affect reproductive functions and organs.
Target organ effects: None known.

COMPONENT TOXICOLOGICAL INFORMATION

Component	Target Organ Effects	LD50 / LC50
Nitrogen, liquid form	-	-

Component	IARC Group 1 or 2	ACGIH - Carcinogens	OSHA Listed Carcinogens	NTP
Nitrogen, liquid form	-	-	-	-

SECTION 12. ECOLOGICAL INFORMATION

PRODUCT INFORMATION

COMPONENT INFORMATION

Nitrogen, liquid form

Persistence / degradability: Not applicable.
Bioaccumulation: Not applicable

SECTION 13. DISPOSAL CONSIDERATIONS

Waste from residues / unused products:
Refer to manufacturer/supplier for information on recovery/recycling.

Contaminated packaging:
Empty pressure vessels should be returned to the supplier.

SECTION 14. TRANSPORT INFORMATION

TDG (Canada):

Shipping name: NITROGEN, REFRIGERATED LIQUID, 2.2, UN 1977
Label(s): Non-Flammable Gas 2.2
PIN: UN 1977
Class: 2.2

DOT:

CERCLA RQ: Not established
Hazard class: 2.2
Proper shipping name: Nitrogen, refrigerated liquid cryogenic liquid, 2.2, UN 1977
Label(s): Non-Flammable Gas 2.2

IMDG/IMO

Shipping name: NITROGEN, REFRIGERATED LIQUID
Label(s): Non-Flammable Gas 2.2
Class or Div.: 2.2
UN number: UN 1977
EMS: F-C, S-V

ICAO/IATA

Shipping name: Nitrogen, refrigerated liquid
Label(s) Non-Flammable Gas 2.2

SECTION 14. TRANSPORT INFORMATION

Class or Div.: 2.2

UN number: UN 1977

Note 1:
For the applicable placard selection refer to the appropriate transport regulations; the selection may vary depending on the cargo size and categories of other hazardous materials in the cargo.

SECTION 15. REGULATORY INFORMATION

National Chemical Inventories

Canada, Domestic Substance List (DSL): This product complies with DSL requirements.

USA, Toxic Substances Control Act inventory (TSCA): This product complies with TSCA requirements.

Workplace Hazardous Materials Information System (WHMIS)

This product has been classified according to the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by the Controlled Products Regulations.

SECTION 16. OTHER INFORMATION

Current references:

1. Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices. *American Conference of Governmental Industrial Hygienists, Cincinnati OH.*
2. IARC Monograms on the Evaluation of the Carcinogenic Risk of Chemicals to Man. *World Health Organization, International Agency for Research on Cancer. Geneva, Switzerland.*
3. Annual Report on Carcinogens. National Toxicology Program. *U.S. Department of Heath and Human Services, Public Health Service.*
4. NIOSH Registry of Toxic Effects of Chemical Substances (RTECS). *National Institute for Occupational safety and Health. Cincinnati, OH.*
5. LOLI Database.

Explanation of terms:
ACGIH: American Conference of Governmental Industrial Hygienist
ACGIH-TL: Threshold Limit Value
DSL: Domestic Substance List
HMIRC: Hazardous Materials Information Review Commission
IARC: International Agency for Research on Cancer
NFPA: National Fire Protection Association
NTP: National Toxicology Program
NIOSH: National Institute of Occupational Safety & Health
NIOSH-REL: Recommended Exposure Limit
OSHA: Occupational Safety & Health Administration
OSHA-PEL: Permissible Exposure Limit
TSCA: Toxic Substance Control Act (Inventory)

Occupational Exposure Limits indicators: TWA - Time Weighted Average; STEL - Short Term Limit; C - Ceiling Limit;units: [mg/m^3]

ACGIH Notations:
"Skin" refers to the potential significant contribution to the overall exposure by the cutaneous route, including mucous membranes and the eyes, either by contact with vapors or by direct skin contact with the substance.
"A" notation indicates carcinogenicity as follows:
ACGIH classification: A1 - Confirmed Human Carcinogen; A2 - Suspected Human Carcinogen; A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans; A4 - Not Classifiable as a Human Carcinogen; A5 - Not suspected as a Human Carcinogen.
"SEN" refers to the potential for an agent to product sensitization as confirmed by human and animal data.

Section(s) revised: 3, 8, 16

Prepared by: Global Chemical Regulatory Compliance (GCRC). Bethicia Prasek, Tel. 1-281-285-3690.

Revision date: 27 April 2012

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End of the Material Safety Data Sheet

ATLAS RESIN PROPPANTS SAFETY DATA SHEET

ATLAS PRC, ATLAS PRC Premium

Section 1. Chemical Product and Company Identification

Product Type: Oil and Gas Well Resin Coated Proppant – Sand Substrate
Application: Hydraulic Fracturing
Manufacturer/Supplier Information: ATLAS RESIN PROPPANTS LLC
N 7532 County Road P
Taylor, WI 54659
715-662-2200

Restriction on use: **This product is not to be used for abrasive blasting. This Safety Data Sheet (SDS) and the information contained herein were not developed for abrasive blasting. Do not pneumatically unload at a pressure exceeding 5 psi so as to avoid abrading the product.**

For additional health, safety or regulatory information, call 715-662-2400.

Section 2. Hazards Identification

GHS Classification:

Health:
Category 1A Carcinogen
Category 1 Specific Target Organ Toxicity (STOT) following repeated exposures
Category 2B Eye Irritation

Signal Word DANGER



***Hazard Statements*:**
May cause cancer by inhalation.
Causes damage to lungs, kidneys and autoimmune system through prolonged or repeated exposure by inhalation.
Causes eye irritation.

Precautionary Statements:
Do not handle until the safety information presented in this SDS has been read and understood. **DO NOT BREATHE DUST**.
Do not eat, drink or smoke while handling this product.
Wash skin thoroughly after handling.
If exposed or concerned: Get medical attention.

Section 2. Hazards Identification (continued)

If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do, and continue rinsing.
If eye irritation persists: Get medical advice/attention.
Avoid creating dust when handling, using or storing. Use with adequate ventilation to keep exposure below recommended exposure limits.
Wear eye protection, protective gloves and respiratory protection following this SDS and NIOSH guidelines.
Dispose of contents/container in accordance with local, regional, national or international regulations.

Please refer to Section 11 for details of specific health effects of crystalline silica and phenolic resin dust.

Section 3. Composition/Information on Ingredients

Hazardous Ingredients:

	CAS #	Percent
Quartz (SiO_2) (Crystalline Silica)	14808-60-7	95% to 98%
Phenolic Resin	9003-35-4	2% to 5%

Section 4. First Aid Measures

Inhalation: If gross inhalation of product occurs, remove the person to fresh air, perform artificial respiration as needed and obtain medical attention as needed. Use with adequate ventilation.

Eye: Immediately wash the eye with plenty of water for at least 15 minutes, while holding eyelid(s) open. If irritation persists, seek medical attention.

Skin: If abrasion occurs, wash with soap and water, and seek medical attention if irritation persists or develops later.

Ingestion: If gastrointestinal discomfort occurs, give a large quantity of water. Never attempt to make an unconscious person drink or vomit. Seek medical attention.

Section 4. First Aid Measures (continued)

Signs and Symptoms of Exposure:

Crystalline Silica: There are generally no signs or symptoms of exposure to crystalline silica (quartz). Often, chronic silicosis has no symptoms. The symptoms of chronic silicosis, if present, are shortness of breath, wheezing, cough and sputum production. The symptoms of acute silicosis which can occur with exposures to very high concentrations of respirable crystalline silica over a very short time period, sometimes as short as 6 months, are the same as those associated with chronic silicosis; additionally, weight loss and fever may also occur. The symptoms of scleroderma, an autoimmune disease, include thickening and stiffness of the skin, particularly in the fingers, shortness of breath, difficulty swallowing and joint problems.

Phenolic Resin Dust: Phenolic resin dust can be generated from abusive handling of this product including, but not limited to, excessive mixing, handling at a pressure greater than 5 psi, etc. and the dust may cause eye, nose, and throat and lung irritation if allowed to become airborne.

Section 5. Fire Fighting Measures

Extinguishing Media: Use water spray, alcohol foam, CO_2 or dry chemical.

Unusual Fire and Explosion Habits: Caution - This product is coated with phenolic resin which may abrade during handling or mechanical conveyance generating organic dust. Abraded phenolic resin dust can be combustible and may present a fire or explosive hazard when dispersed and ignited in air. Handle or convey as instructed in NFPA Pamphlet 654, UK HSE Guidance HSG 103. 100% Phenolic resin dust lower explosive limit (LEL) – 25,000 mg/m^3 (0.025 oz/ft^3).

Special Fire Fighting Procedures: Fire fighters should wear self-contained breathing apparatus.

Hazardous Combustion Products: See Hazardous Decomposition Products in Section 10. Reactivity and Stability.

Section 6. Accidental Release Measures

Wear appropriate personal protective equipment. Ensure appropriate respirators are worn during and following clean up or whenever airborne dust is present, to ensure worker exposures remain below occupational exposure limits (Refer to Section 8).

Section 6. Accidental Release Measures (continued)

Follow respiratory protection selection guidelines as described in Section 8 of this document.

Surface may be slippery due to roundness of the material. Collect the material using a method that does not produce dust such as a High-Efficiency Particulate Air (HEPA) vacuum or thoroughly wetting down the silica-containing dust before cleaning up. Place the silica-containing dust in a covered container appropriate for disposal. Dispose of the silica-containing dust according to federal, state and local regulations.

This product is not subject to the reporting requirements of Title III of SARA, 1986, and 40 CFR 372.

Section 7. General Handling and Storage

This product is **not** to be used for abrasive blasting. Do not abrade or crush this material. Do not breathe dust, which may be created during the handling of this product. Do not rely on vision to determine whether respirable silica is present in the air, as it may be present without a visible cloud. Use good housekeeping procedures to prevent the accumulation of silica dust in the workplace. Avoid the creation of respirable dust. Avoid standing on piles of materials as they may be unstable.

Use adequate ventilation and dust collection equipment. Ensure that the dust collection system is adequate to reduce airborne dust levels to below the appropriate occupational exposure limit. If the airborne dust levels are above the appropriate occupational exposure limits, use respiratory protection during the establishment of engineering controls. Refer to Section 8 - Exposure Controls/Personal Protection for further information. Avoid conditions that will generate dust when handling this product.

In accordance with OSHA's Hazard Communication Standards (29 CFR 1910.1200, 1915.99, 1917.28, 1918.90, 1926.59, 1928.21), state and/or local right to know laws and regulations, familiarize your employees with this SDS and the information herein. Warn employees, your customers and other third parties (in the case of resale or distribution to others), of the potential health risks associated with the use of this product and train them in the appropriate use of PPE and engineering controls which will reduce their risks of exposure. It is a requirement of law that training, testing and appropriate handling is used.

Store in a cool dry place. Do not cut, grind, weld, or drill on or near this product. See Section 5. Fire Fighting Measures as it relates to handling and storage of this material.

Section 7. General Handling and Storage (continued)

Spills: Surface may be slippery due to roundness of material. Collect the material using a method that does not produce dust such as a HEPA vacuum or thoroughly wetting down the silica-containing dust before cleaning up. Place the silica-containing dust in a covered container appropriate for disposal. Dispose of the silica-containing dust according to federal, state and local regulations.

See also ASTM standard practice E 1132-06, "Standard Practice for Health Requirements Relating to Occupational Exposure to Respirable Crystalline Silica."

For safe handling and use of this product for Hydraulic Fracturing, please see the OSHA/NIOSH Hazard Alert Worker Exposure to Silica during Hydraulic Fracturing DHHS (NIOSH) Publication No. 2012-166 (2012): http://www.osha.gov/dts/hazardalerts/hydraulic_frac_hazard_alert.pdf

Section 8. Exposure Controls/Personal Protection

Occupational Exposure Limits (respirable fraction) in air for dust containing crystalline silica (quartz):

Standard	Exposure Limits
MSHA/OSHA PEL* (8-Hour Time-Weighted Average)	$\frac{10 \text{ mg/m}^3}{\% \text{ SiO}_2+2}$
ACGIH TLV** (8-Hour Time-Weighted Average)	0.025 mg/m^3
NIOSH REL** (10-Hour Time-Weighted Average, 40-hour work week)	0.05 mg/m^3

* The OSHA/MSHA PEL for dust containing crystalline silica (quartz) is based on the silica content of the respirable dust sample. The OSHA/MSHA PEL for crystalline silica as tridymite and cristobalite is one-half the PEL for crystalline silica (quartz).
** The ACGIH and NIOSH limits are for crystalline silica (quartz), independent of the dust concentration. The ACGIH TLV for crystalline silica as cristobalite is equal to the TLV for crystalline silica as quartz. In 2005, ACGIH withdrew the TLV for crystalline silica as tridymite. Refer to Section 10 for thermal stability information for crystalline silica (quartz).

Section 8. Exposure Controls/Personal Protection (continued)

Occupational Exposure Limits in air for inert/nuisance dust:

Standard	Respirable Dust	Total Dust
MSHA/OSHA PEL (as Inert or Nuisance Dust)	5 mg/m^3	15 mg/m^3
ACGIH TLV (as Particles Not Otherwise Specified)	3 mg/m^3	*10 mg/m^3

The limits for Inert Dust are provided as guidelines. Nuisance dust is limited to particulates not known to cause systemic injury or illness. * The TLV provided is for inhalable particles not otherwise specified.

California Inhalation Reference Exposure Limit (REL)**:** The California chronic REL for respirable crystalline silica (quartz, cristobalite, tridymite) is 3 ug/m^3. [Dated December 18, 2008]. A chronic REL is an airborne level of a chemical at or below which no adverse health effects are anticipated in individuals indefinitely exposed to that level. [Dated 2/10/05].

Canadian OEL for crystalline silica**:**
Canada Labor Code: 0.025 mg/m^3 (respirable).
Alberta, British Columbia: 0.025 mg/m^3 (respirable quartz and cristobalite).
Saskatchewen: 2 mg/m^3 (respirable, amorphous: silica fume); 0.1 mg/m^3 (respirable, amorphous: silica fused); 0.05 mg/m^3 (respirable, cristobalite); 0.05 mg/m^3 (respirable tridymite); 0.1 mg/m^3 (respirable, quartz); 0.1 mg/m^3 (respirable, tripoli).
Manitoba, Newfoundland, Prince Edward Island: 0.025 mg/m^3 (respirable).
Ontario: 0.05 mg/m^3 (respirable cristobalite, tridymite); 0.1 mg/m^3 (quartz, tripoli); 0.1 mg/m^3 (silica fused); 2 mg/m^3 (silica fume).
Quebec: 0.05 mg/m^3 (respirable, cristobalite, tridymite); 0.1 mg/m^3 (quartz, tripoli).
New Brunswick: 0.1 mg/m^3 (quartz); 0.05 mg/m^3 (cristobalite).
Nova Scotia: 0.025 mg/m^3 (quartz, cristobalite).
Yukon: 2 mg/m^3 (respirable, amorphous); 300 particles/ml measured with a konimeter (quartz, and tripoli); 150 particles/ML measured with a konimeter (cristobalite and tridymite).
Northwest Territories, Nunavut: 2 mg/m^3 (respirable, amorphous); 0.05 mg/m^3 (respirable, cristobalite, tridymite, silica flour); 0.1 mg/m^3 (respirable, fused silica, quartz, tripoli).

Section 8. Exposure Controls/Personal Protection (continued)

OEL for crystalline silica (Mexico):
0.1 mg/m^3 (quartz, inhalable)
0.05 mg/m^3 (cristobalite, inhalable)
0.05 mg/m^3 (tridymite, inhalable)
0.1 mg/m^3 (tripoli containing respirable quartz powder, inhalable)
(Also refer to ACGIH)

OEL for crystalline silica (Argentina):
0.05 mg/m^3 (quartz, respirable)
0.05 mg/m^3 (cristobalite, respirable)
0.05 mg/m^3 (tridymite, respirable)
0.1 mg/m^3 (tripoli, respirable)

Exposure limits for Phenolic Resin are not listed.

Minimize creation of dust. Do not abrade or crush this material. It is not to be used for abrasive blasting.

Engineering Controls:
Ventilation: Use local exhaust, general ventilation or natural ventilation adequate to maintain exposures below appropriate exposure limits.

Other control measures: Respirable dust and quartz levels should be monitored regularly. Dust and quartz levels in excess of appropriate exposure limits should be reduced by all feasible engineering controls, including (but not limited to) dust suppression (wetting), ventilation, process enclosure, and enclosed employee work stations.

Respiratory Protection: Consult with OSHA regulations, Canadian CCOHS, NIOSH recommendations and other applicable regulatory agencies to determine the appropriate respiratory protection to be worn during use of this product, and use only such recommended respiratory protection equipment. Avoid breathing dust produced during the use and handling of this product. If the workplace airborne crystalline silica concentration is unknown for a given task, conduct air monitoring to determine the appropriate level of respiratory protection to be worn. Consult with a certified industrial hygienist, your insurance risk manager or the OSHA Consultative Services group for detailed information. Ensure appropriate respirators are worn during and following the task, including clean up or whenever airborne dust is present, to ensure worker exposures remain below occupational exposure limits.

Section 8. Exposure Controls/Personal Protection (continued)

Provisions should be made for a respiratory protection training program (see 29 CFR 1910.134 – Respiratory Protection for minimum program requirements). See also ANSI standard Z88.2 (latest revision) "American National Standard for Respiratory Protection," 29 CFR 1910.134 and 1926.103, and 42 CFR 84.

Respirator Recommendations: For respirable quartz levels that exceed, or are likely to exceed, ten times the applicable limit, which NIOSH designates as an 8 hour-TWA of 0.5 mg/m^3, a NIOSH-approved 100 series particulate filter respirator must be worn.

NIOSH recommendations for respiratory protection include:

Up to 0.5 mg/m^3: (APF = 10) Any particulate respirator equipped with an N95, R95, or P95 filter (including N95, R95, and P95 filtering facepieces) except quarter-mask respirators. The following filters may also be used: N99, R99, P99, N100, R100, P100.
Up to 1.25 mg/m^3: (APF = 25) Any powered, air-purifying respirator with a high-efficiency particulate filter.
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode
Up to 2.5 mg/m^3: (APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter.
(APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter
Up to 25 mg/m^3: (APF = 1000) Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode

Respirator use must comply with applicable MSHA or OSHA standards, which include provisions for a user training program, respirator maintenance and cleaning, respirator fit testing, and other requirements. For additional information contact NIOSH at 1-800-35-NIOSH or visit website: http://www.cdc.gov/niosh/npg (search for crystalline silica).

Emergency or planned entry into unknown concentrations or IDLH conditions (50 mg/m^3 for crystalline silica-quartz): Any self-contained breathing apparatus that has a full-face piece and is operated in a pressure-demand or other positive-pressure mode or any supplied-air respirator that has a full-face piece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus.

Escape from unknown or IDLH conditions (50 mg/m^3 for crystalline silica-quartz): Any air-purifying, full-face piece respirator with a high-efficiency particulate filter or any appropriate escape-type, self-contained breathing apparatus.

Section 8. Exposure Controls/Personal Protection (continued)

Protective Clothing: Long sleeved shirt, full length pants and safety shoes.

Gloves: Recommended in situations where abrasion from sand may occur.

Eye/Face: Safety glasses with side shields should be worn as minimum protection. Dust goggles should be worn when excessively (visible) dusty conditions are present or are anticipated. There is a potential for severe eye irritation for those wearing contact lenses.

General Hygiene Considerations: There are no known hazards associated with this material when used as recommended. Following the guidelines in this SDS is recognized as good industrial hygiene practice. Avoid breathing dust. Wash dust-exposed skin with soap and water before eating, drinking, smoking and using toilet facilities. PPE should be selected based on OSHA standards or guidelines, and ANSI standards as they relate to selection, training and testing, and use.

Section 9. Physical and Chemical Properties

Appearance:	Amber, free flowing granules
Odor:	Mild phenolic resin odor
Color:	Light tan/yellow to amber
Boiling Point:	N/A
Evaporation Rate:	None
Specific Gravity:	2.43 - 2.60
Melting point:	N/A
Flash Point:	Not readily combustible (Fire Train Test, 49 CFR 173, Appendix E)
Flammable Limits in Air:	None, except dusty conditions
Lower Explosive Limit:	N/K
Upper Explosive Limit:	N/K
Solubility in Water:	Insoluble
Vapor Density:	N/A
pH (slurry in Distilled Water):	6.5 - 7.5

Section 10. Stability and Reactivity

Reactivity: Reactive with strong oxidizing agents

Chemical Stability: Stable

Thermal Stability: If crystalline silica (quartz) is heated to more than 870°C (1598°F), it can change to a form of crystalline silica known as tridymite, and if crystalline silica (quartz) is heated to more than 1470°C (2678°F), it can change to a form of crystalline silica known as cristobalite.

Hazardous Polymerization: Not expected to occur. (NFPA 704-12 (4-3.1)).

Incompatible Materials: Strong oxidizing agents, such as fluorine, chlorine trifluoride, hydrogen fluoride, oxygen difluoride, hydrogen peroxide, etc.; acetylene and ammonia.

Hazardous Decomposition Products: Small amounts of phenol, formaldehyde, carbon monoxide, carbon dioxide and water vapor may be evolved if the product polymerizes or decomposes.

Section 11. Toxicological Information

CAUTION: Crystalline silica exists in several forms, the most common of which is quartz. Crystalline silica as tridymite and cristobalite are more fibrogenic than crystalline silica as quartz.

Potential Health Effects

Primary routes(s) of exposure: ■ Inhalation □ Skin □ Ingestion

Inhalation:
Acute Effects: One form of silicosis, Acute Silicosis, can occur with exposures to very high concentrations of respirable crystalline silica over a very short time period, sometimes as short as 6 months. The symptoms of acute silicosis include (but are not limited to) progressive shortness of breath, fever, cough and weight loss. Acute silicosis is fatal.

Chronic Effects: The adverse health effects, lung disease, silicosis, cancer, autoimmune disease, tuberculosis and nephrotoxicity, are chronic effects.

Eye Contact: Crystalline silica (quartz) may cause abrasion of the cornea.

Section 11. Toxicological Information (continued)

Skin Contact: May cause abrasion to skin.

Ingestion: No adverse effects expected for incidental ingestion. Ingestion of large amounts may cause gastrointestinal tract irritation.

Medical Conditions Generally Aggravated by Exposure: The condition of individuals with lung disease (e.g., bronchitis, emphysema, chronic obstructive pulmonary disease) can be aggravated by exposure.

A. SILICOSIS

The major concern is silicosis (lung disease), caused by the inhalation and retention of respirable crystalline silica dust. Silicosis can exist in several forms, chronic (or ordinary), accelerated or acute.

Chronic or Ordinary Silicosis is the most common form of silicosis and can occur after many years of exposure to levels above the occupational exposure limits for airborne respirable crystalline silica dust. It is further defined as either simple or complicated silicosis.

Simple Silicosis is characterized by lung lesions (shown as radiographic opacities) less than 1 centimeter in diameter, primarily in the upper lung zones. Often, simple silicosis is not associated with symptoms, detectable changes in lung function or disability. Simple silicosis may be progressive and may develop into complicated silicosis or progressive massive fibrosis (PMF).

Complicated Silicosis or PMF is characterized by lung lesions (shown as radiographic opacities) greater than 1 centimeter in diameter. Although there may be no symptoms associated with complicated silicosis or PMF, the symptoms, if present, are shortness of breath, wheezing, cough and sputum production. Complicated silicosis or PMF may be associated with decreased lung function and may be disabling. Advanced complicated silicosis or PMF may lead to death. Advanced complicated silicosis or PMF can result in heart disease (cor pumonale) secondary to the lung disease.

Accelerated Silicosis can occur with exposure to high concentrations of respirable crystalline silica over a relatively short period; the lung lesions can appear within five (5) years of the initial exposure. The progression can be rapid. Accelerated silicosis is similar to chronic or ordinary silicosis, except that the lung lesions appear earlier and the progression is more rapid.

Section 11. Toxicological Information (continued)

Acute Silicosis can occur with exposures to very high concentrations of respirable crystalline silica over a very short time period, sometimes as short as a few months. The symptoms of acute silicosis include progressive shortness of breath, fever, cough and weight loss. Acute silicosis is fatal.

B. CANCER

IARC: The International Agency for Research on Cancer concluded that there is "*sufficient evidence* in humans for the carcinogenicity of crystalline silica in the form of quartz or cristobalite"; there is "*sufficient evidence* in experimental animals for the carcinogenicity of quartz dust" and that there is "*limited evidence* in experimental animals for the carcinogenicity of tridymite dust and cristobalite dust." The overall IARC evaluation was that "crystalline silica inhaled in the form of quartz or cristobalite dust is *carcinogenic to humans* (*Group 1*)." The IARC evaluation noted that not all industrial circumstances studied evidenced carcinogenicity. The monograph also stated that "Carcinogenicity may be dependent on inherent characteristics of the crystalline silica or on external factors affecting its biological activity or distribution of its polymorphs." For further information on the IARC evaluation, see IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Volume 100C, "Silica Dust, Crystalline, in the Form of Quartz or Cristobalite" (2012).

NTP: In its Eleventh Annual Report on Carcinogens, concluded that respirable crystalline silica is known to be a human carcinogen, based on sufficient evidence of carcinogenicity from studies in humans indicating a causal relationship between exposure to respirable crystalline silica and increased lung cancer rates in workers exposed to crystalline silica dust.

OSHA: Crystalline silica is not on the OSHA carcinogen list.

There have been many articles published on the carcinogenicity of crystalline silica, which the reader should consult for additional information; the following are examples of recently published articles: (1) "Dose-Response Meta-Analysis of Silica and Lung Cancer", *Cancer Causes Control*, (20):925-33 (2009); (2) "Occupational Silica Exposure and Lung Cancer Risk: A Review of Epidemiological Studies 1996-2005', *Ann Oncol*, (17) 1039-50 (2006); (3) "Lung Cancer Among Industrial Sand Workers Exposed to Crystalline Silica", *Am J Epidemiol*, (153) 695-703 (2001); (4) "Crystalline Silica and the Risk of Lung Cancer in the Potteries", *Occup Environ Med*, (55) 779-785 (1998); (5) "Is Silicosis Required for Silica-Associated Lung Cancer?", *American Journal of Industrial Medicine*, (37) 252- 259 (2000); (6) " Silica, Silicosis, and Lung Cancer: A Risk Assessment", *American Journal of Industrial Medicine*, (38) 8-18 (2000) and (7) "Silica,

Section 11. Toxicological Information (continued)

Silicosis, and Lung Cancer: A Response to a Recent Working Group Report", *Journal of Occupational and Environmental Medicine*, (42) 704-720 (2000).

C. AUTOIMMUNE DISEASES

There is evidence that exposure to respirable crystalline silica (without silicosis) or that the disease silicosis may be associated with the increased incidence of several autoimmune disorders -- scleroderma, systemic lupus erythematosus, rheumatoid arthritis and diseases affecting the kidneys. For a review of the subject, the following may be consulted: (1) “Antinuclear Antibody and Rheumatoid Factor in Silica-Exposed Workers”, *Arh Hig Rada Toksikol*, (60) 185-90 (2009); (2) "Occupational Exposure to Crystalline Silica and Autoimmune Disease", *Environmental Health Perspectives*, (107) Supplement 5, 793-802 (1999); (3) "Occupational Scleroderma", *Current Opinion in Rheumatology*, (11) 490-494 (1999) and (4) “Connective Tissue Disease and Silicosis”, *Am J Ind Med*, (35), 375-381 (1999).

D. TUBERCULOSIS

Individuals with silicosis are at increased risk to develop pulmonary tuberculosis, if exposed to persons with tuberculosis. The following may be consulted for further information: (1) “Tuberculosis and Silicosis: Epidemiology, Diagnosis and Chemoprophylaxis”, *J Bras Pneumol*, (34) 959-66 (2008); (2) *Occupational Lung Disorders*, Third Edition, Chapter 12, entitled "Silicosis and Related Diseases", Parkes, W. Raymond (1994); (3) "Risk of Pulmonary Tuberculosis Relative to Silicosis and Exposure to Silica Dust in South African Gold Miners," *Occup Environ Med*, (55) 496-502 (1998) and (4) “Occupational Risk Factors for Developing Tuberculosis”, *Am J Ind Med*, (30) 148-154 (1996).

E. KIDNEY DISEASE

There is evidence that exposure to respirable crystalline silica (without silicosis) or that the disease silicosis is associated with the increased incidence of kidney diseases, including end stage renal disease. For additional information on the subject, the following may be consulted: (1) “Mortality from Lung and Kidney Disease in a Cohort of North American Industrial Sand Workers: An Update”, *Ann Occup Hyg*, (49) 367-73 (2005); (2) "Kidney Disease and Silicosis", *Nephron*, (85) 14-19 (2000); (3) “End Stage Renal Disease Among Ceramic Workers Exposed to Silica”, *Occup Environ Med*, (56) 559-561 (1999) and (4) “Kidney Disease and Arthritis in a Cohort Study of Workers Exposed to Silica”, *Epidemiology*, (12) 405-412 (2001).

Section 11. Toxicological Information (continued)

F. NON-MALIGNANT RESPIRATORY DISEASES
NIOSH has cited the results of studies that report an association between dusts found in various mining operations and non-malignant respiratory disease, particularly among smokers, including bronchitis, emphysema, and small airways disease. See *NIOSH Hazard Review – Health Effects of Occupational Exposure to Respirable Crystalline Silica*, published in April 2002, available from NIOSH, 4676 Columbia Parkway, Cincinnati, OH 45226, or at http://www.cdc.gov/niosh/02-129A.html.

Potential Health Effects from Phenolic Resin Dust:
Phenolic resin dust can be generated from abrasive handling of this product and the dust may cause eye, nose, throat and lung irritation if allowed to become airborne.

Section 12. Ecological Information

Crystalline silica is not known to be toxic to the ecology. See sections 3, 8, and 10 for additional information.

Section 13. Disposal Considerations

General: Dispose of according to local, state / provincial and federal requirements. Additional information concerning disposal can be obtained by contacting ATLAS Resin Proppants, LLC.

Recycling the material: SDS and disposal profile available on request.

This material may qualify to be landfilled based on the class of landfill and whether this material has been contaminated. ATLAS Resin Proppants, LLC will supply disposal company information and information related to the material and recycling.

Section 14. Transportation Information

U.S. Department of Transportation: Non-regulated.
Canadian Transportation of Dangerous Goods (TDG): Non-regulated.
Consult other applicable international, national, state, provincial or local laws, as needed.

Section 15. Regulatory Information

As determined by review according to the requirements of OSHA Hazardous Communication Standard 29CFR1910.1200, this material presents possible health hazards. The OSHA Hazardous Communication Standard 29 CFR 1910.1200 and state and local worker or community "Right to Know" laws and regulations should be strictly followed. Provide training about the OSHA precautions. It is the user's responsibility to make available this SDS to employees and others who may handle or be exposed to this product. Instruct your employees to handle this product properly.

SARA Title III: Section 311 and 312: Immediate health hazard and delayed health hazard.

SARA Title III: Section 313 Supplier Notification: This product contains the following toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right – To – Know Act of 1986 and 40 CFR 372:

CAS# - None Chemical Name – None

RCRA: Crystalline silica (quartz) is not classified as a hazardous waste under the Resource Conservation and Recovery Act, or its regulations, 40 CFR §261 et seq.

CERCLA: Crystalline silica (quartz) is not classified as a hazardous substance under regulations of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 40 CFR §302.4

EPCRA: Crystalline Silica is not listed on Emergency Planning and Community Right to Know Act Section 302 and 313 as a chemical subject to reporting.

Clean Air Act: Resin coated sand was not processed with or does not contain any Class I or Class II ozone depleting substances.

FDA: Silica is included in the list of substances that may be included in coatings used in food contact surfaces, 21 CFR §175.300(b)(3).(The FDA standard primarily applies to products containing silica used in the coatings of food contact surfaces).

TSCA: Crystalline Silica – quartz, appears on the EPA TSCA inventory under the CAS No. 14808- 60-7.

National Pollutant Release Inventory (NPRI), CEPA subsection 16(1): None required.

Section 15. Regulatory Information (continued)

NTP: Respirable crystalline silica is classified as a known carcinogen.

OSHA Carcinogen: Crystalline Silica is not listed.

IARC: Crystalline silica inhaled in the form of quartz or cristobalite dust is carcinogenic to humans (Group 1).

California Proposition 65: Crystalline Silica is classified as a substance known to the state of California to be a carcinogen.

Massachusetts Toxic Use Reduction Act: Respirable crystalline silica is considered toxic per the Massachusetts Toxic Use Reduction Act.

Pennsylvania Worker and Community Right to Know Act: Quartz is considered hazardous for purposes of the Act, but it is not a special hazardous substance or an environmental hazardous substance.

Canadian Environmental Protection Agency (CEPA): All chemical substances listed on Domestic Substance List (DSL) or otherwise in compliance with CEPA new substance notification requirements.

Canadian Regulations: All information required by Controlled Products Regulation (CPR) is contained in the SDS. Product classified according to the hazard criteria of CPR.

WHMIS: CLASS D 2A and CLASS D 2B

Local, county, state/provincial or national emergency planning, right to know, or other laws, regulations or ordinances may apply. **CONSULT APPLICABLE LAWS, REGULATIONS ORORDINANCES.**

Section 16. Other Information

Definitions of Acronyms:

ACGIH: American Conference of Governmental Industrial Hygienists
ANSI: American National Standards Institute
APF: Assigned Protection Factor
California REL: California Inhalation Reference Exposure Limit

Section 16. Other Information (continued)

CAS: Chemical Abstracts Service
CCOHS: Canadian Centre for Occupational Health and Safety
CEPA: Canadian Environmental Protection Agency
CERCLA: Comprehensive Environmental Response, Compensation and Liability Act
CFR: US Code of Federal Regulations
CPR: Controlled Products Regulation
DHHS: Department of Health and Human Services
DOT: US Department of Transportation
DSL: Domestic Substances List
EPA: Environmental Protection Agency
EPCRA: Emergency Planning and Community Right to Know Act
FDA: Food and Drug Administration
GHS: Globally Harmonized System
HEPA: High-Efficiency Particulate Air
HSG: Health & Safety Guidance
IARC: International Agency for Research on Cancer
IDLH: Immediately Dangerous to Life and Health
LEL: Lower Explosive Limit
MSHA: Mine Safety and Health Administration
NFPA: National Fire Protection Association
NIOSH: National Institute for Occupational Safety and Health, US Department of Health and Human Services
NPRI: National Pollutant Release Inventory
NTP: National Toxicology Program
OEL: Occupational Exposure Limit
OSHA: Occupational Safety and Health Administration, US Department of Labor
PEL: Permissible Exposure Limit
PMF: Progressive Massive Fibrosis
PPE: Personal Protective Equipment
RCRA: Resource Conservation and Recovery Act
SARA Title III: Title III of the Superfund Amendments and Reauthorization Act, 1986
SDS: Safety Data Sheet
STOT: Specific Target Organ Toxicity
TDG: Transportation of Dangerous Goods
TLV: Threshold Limit Value
TSCA: Toxic Substance Control Act
TWA: Time-Weighted Average
UK HSE: United Kingdom Health and Safety Executive
WHMIS: Workplace Hazardous Materials Information System

Section 16. Other Information (continued)

Date of Preparation: January 29, 2013, Revision B

ATLAS RESIN PROPPANTS, LLC MAKES NO WARRANTIES EXPRESSED OR IMPLIED, CONCERNING THESE PRODUCTS OR THE MERCHANTABILITY OR FITNESS THEREOF FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE PRODUCT OR INFORMATION PROVIDED HEREIN.

All information herein is based on data obtained from recognized technical sources and while the information is believed to be accurate, the supplier makes no commitment or guarantee to its accuracy or sufficiency. The uses of these products are beyond the control of ATLAS RESIN PROPPANTS, LLC. The user assumes all risk, and liability of use of these products, and the reliance upon whether or not the product is suitable for any application. The user accepts all responsibility to educate and train individuals using these products in a safe and correct manner in accordance to all regulations and laws applicable to education, training, exposure, handling, application and disposal of products.

User's Responsibility: The OSHA Hazard Communication Standard 29 CFR 1910.1200 requires that this SDS be made available to your employees who handle or may be exposed to this product. Educate and train your employees regarding applicable precautions. Instruct your employees to handle this product properly.

Disclaimer: The information contained in this document applies to this specific material as supplied. It may not be valid for this material if it is used in combination with other materials. It is the user's responsibility to satisfy oneself as to the suitability and completeness of this information for one's own particular use. Since the actual use of the product described herein is beyond our control, ATLAS RESIN PROPPANTS, LLC, assumes no liability arising out of the use of the product by others. Appropriate warnings and safe handling procedures should be provided to handlers and users.

An electronic version of this SDS is available at www.atlasresinproppants.com . More information on the effects of crystalline silica exposure may be obtained from OSHA (phone number: 1-800-321-OSHA; website: http://www.osha.gov) or from NIOSH (phone number: 1-800-35-NIOSH; website: http://www.cdc.gov/niosh).

BAKER HUGHES	**Baker Hughes Canada Company** **MATERIAL SAFETY DATA SHEET**	Region Canada

1 PRODUCT AND COMPANY IDENTIFICATION

Product Name: **Frac Sand (All Meshes)**
Product Use: Proppant for fracturing applications
Chemical Family: Silicon dioxide

Supplier:
Baker Hughes Canada Company
1000, 401 - 9th Avenue SW
Calgary, Alberta, Canada T2P 3C5
Phone: (403) 531-5151

IN CASE OF EMERGENCY CALL: (403) 531-5151 (24 hrs)

2 COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient CAS#	%	ACGIH TWA	ACGIH STEL
Crystalline silica quartz 014808-60-7	> 98	0.025 mg/m3 (respirable fraction)	NA

3 HAZARDS IDENTIFICATION

PRIMARY ROUTES OF EXPOSURE: Inhalation. Eye contact.

ACUTE OVEREXPOSURE EFFECTS:

INHALATION: Inhalation of dust may cause respiratory tract irritation.

INGESTION: None known.

EYE CONTACT: Dust may cause irritation.

SKIN CONTACT: None known.

4 FIRST AID MEASURES

INHALATION:
If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult give oxygen. Only trained personnel should administer oxygen. Get medical attention.

INGESTION:
Rinse mouth out with water. Drink plenty of water. If large quantities were ingested, seek medical advice.

EYES:
Flush eyes with plenty of water and get medical attention if irritation persists.

SKIN:
Flush skin with water. Remove contaminated clothing and launder before reuse. Get medical attention if irritation persists.

5 FIRE FIGHTING MEASURES

FLASHPOINT (METHOD): None
LOWER EXPLOSION LIMIT (% v/v): Not applicable
UPPER EXPLOSION LIMIT (% v/v): Not applicable

AUTO-IGNITION TEMPERATURE: Not applicable

SPECIAL HAZARDS:
None.
EXTINGUISHING MEDIA:
Use appropriate media for surrounding fire.
SPECIAL FIREFIGHTING PROCEDURES:
Fire-fighters should wear self-contained breathing apparatus and full protective clothing when fighting chemical fires.
HAZARDOUS COMBUSTION PRODUCTS:
None.

SENSITIVITY TO STATIC DISCHARGE: No
SENSITIVITY TO MECHANICAL IMPACT: No

6 ACCIDENTAL RELEASE MEASURES

Wear specified protective equipment. Sweep, scoop, or vacuum up spill, while taking care not to disperse dust in the air. Place in suitable container(s) for reuse or disposal. Flush remaining traces of material with copious quantities of water.

7 HANDLING AND STORAGE

HANDLING:
Wear specified protective equipment. Use only in a well ventilated area. Avoid creating dust.

STORAGE REQUIREMENTS:
Keep container in a well ventilated area. Keep away from incompatible materials.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

SPECIFIC ENGINEERING CONTROLS:
Use only in a well ventilated area. Adequate ventilation should be provided to keep dust concentrations below acceptable exposure limits.

PERSONAL PROTECTIVE EQUIPMENT:
Dust respirator (NIOSH/MSHA air purifying respirator with high efficiency particulate filter). Safety glasses. Use gloves as a standard industrial handling procedure. Coveralls.

9 PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE:	Solid
COLOR:	Tan
ODOR:	None
ODOR THRESHOLD:	Not applicable
SPECIFIC GRAVITY:	2.65
VAPOR PRESSURE:	Not applicable
VAPOR DENSITY (air = 1):	Not applicable
EVAPORATION RATE:	Not applicable
BOILING POINT:	Not available
FREEZING POINT:	Not applicable
pH:	Not applicable
VISCOSITY (C):	Not applicable
SOLUBILITY IN WATER:	Insoluble
COEFFICIENT OF WATER/OIL DISTRIBUTION:	Not applicable

10 STABILITY AND REACTIVITY

STABILITY:
Stable.
INCOMPATIBILITY/CONDITIONS OF REACTIVITY:
Hydrofluoric acid will dissolve sand releasing corrosive silicon tetrafluoride gas. Contact with strong oxidizers such as

fluorine and chlorine trifluoride may cause fire.
HAZARDOUS THERMAL DECOMPOSITION PRODUCTS:
None known.
HAZARDOUS POLYMERIZATION:
Will not occur.

11 TOXICOLOGICAL PROPERTIES

CHRONIC EFFECTS:
Chronic inhalation of respirable crystalline silica may result in shortness of breath, dyspnea (difficult breathing) and dry cough. These symptoms are generally a first sign of a pulmonary disease called Silicosis. The development of Silicosis generally occurs over many years of exposure. The occurrence of Silicosis is most common in persons who have received prolonged and repeated exposure to the silica dust (e.g. sandblasting and quartz mining operations). In mild cases of Silicosis there is little or no signs of disease; however, the disease may progress after exposure has stopped.

SENSITIZATION:
Not known.
CARCINOGENICITY:
Free crystalline silica is listed as a Group 1 carcinogen (carcinogenic to humans) by IARC. This classification applies to the inhalation of respirable crystalline silica. (IARC - International Agency for Research on Cancer)
MUTAGENICITY:
Not known.
REPRODUCTIVE TOXICITY:
Not known.

12 ECOLOGICAL INFORMATION

No specific information available.

13 DISPOSAL CONSIDERATIONS

WASTE DISPOSAL:
Disposal should be made in accordance with national and local regulations. Consult local waste authorities for direction and/or approvals prior to disposal.

14 TRANSPORT INFORMATION

TDG

Proper Shipping Name:	NOT RESTRICTED
UN No.:	NA
Hazard Class - Primary:	
Hazard Class - Secondary:	
Packing Group:	

AIR TRANSPORT (ICAO/IATA)

Proper Shipping Name:	NOT RESTRICTED
UN No.:	NA
Hazard Class - Primary:	
Hazard Class - Secondary:	
Packing Group:	

MARINE TRANSPORT (IMDG/IMO)

Proper Shipping Name:	NOT RESTRICTED
UN No.:	NA
Hazard Class - Primary:	
Hazard Class - Secondary:	
Packing Group:	
EmS:	

15 REGULATORY INFORMATION

WHMIS:
D-2A (See Section 11)

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

16 OTHER INFORMATION

ISSUE DATE: 09/12/2009
REVISIONS: Review
PREPARED BY: Chemical Technology Centre

The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof. Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in his use of the material.

Material Safety Data Sheet

1 . Product and company identification

Product name : GO-64

Supplier : Baker Hughes Canada Company
1000, 401 - 9th Avenue SW
Calgary, Alberta, T2P 3C5
Canada
For Product Information: 403-531-5151

Material Uses : Special: Oil gelling agent

Code : 488159

Validation date : 4/24/2012.

Print date : 4/24/2012.

Version : 1

Responsible name : Global Regulatory Affairs - Telephone 281-276-5400 or 800-231-3606

In case of emergency : CANUTEC 613-996-6666 (Canada 24 hours)
(001)281-276-5400
CHEMTREC 800-424-9300 (U.S. 24 hour)
CHEMTREC Int'l 01-703-527-3887 (International 24 hours)

Canada

WHMIS (Canada) : Class D-2B: Material causing other toxic effects (Toxic).
Class E: Corrosive material

WHMIS (Pictograms) :



2 . Hazards identification

Physical state : Liquid.

Odor : Musty. [Slight]

Color : Water-white./Light yellow

Emergency overview : DANGER!

CAUSES EYE AND SKIN BURNS. MAY CAUSE ALLERGIC SKIN REACTION.

Do not breathe vapor or mist. Do not get in eyes or on skin or clothing. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling.

Routes of entry : Dermal contact. Eye contact. Ingestion.

Potential acute health effects

Inhalation : May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system.

Ingestion : May cause burns to mouth, throat and stomach.

Skin : Corrosive to the skin. Causes burns. May cause sensitization by skin contact.

Eyes : Corrosive to eyes. Causes burns.

Potential chronic health effects

Chronic effects : Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Over-exposure signs/symptoms

Inhalation : None known.

Ingestion : stomach pains

Skin : pain or irritation, redness, blistering may occur

Eyes : pain, watering, redness

2 . Hazards identification

Medical conditions aggravated by over-exposure : Pre-existing skin disorders may be aggravated by over-exposure to this product.

See toxicological information (Section 11)

3 . Composition/information on ingredients

Name	CAS number	Wt. %
Phosphoric acid, mixed diesters with C6-12 alcs., Et alc. and polyethylene glycol mono phenyl ether	Not Available	100

Additional information

This product is a mixture.

4 . First aid measures

Eye contact : Get medical attention immediately. Immediately flush the eye(s) continuously with lukewarm, gently flowing water for at least 20-60 minutes while holding the eyelid(s) open.

Skin contact : Wash affected area with soap and mild detergent for at least 20 - 60 minutes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.

Inhalation : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Ingestion : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wear suitable protective clothing and gloves. Remove contaminated clothing and shoes.

5 . Fire-fighting measures

Flammability of the product : In a fire or if heated, a pressure increase will occur and the container may burst.

Extinguishing media

Suitable : Use an extinguishing agent suitable for the surrounding fire.

Not suitable : None known.

Special exposure hazards : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Hazardous thermal decomposition products : carbon dioxide,carbon monoxide,phosphorus oxides

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6 . Accidental release measures

Personal precautions : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Methods for cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Absorb with an inert material. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

Additional information

This product contains a substance subject to a Ministerial Order. In the event of an accidental release (e.g. spill or leak), immediately notify a member of Baker Hughes Canada Company HSE department.

7 . Handling and storage

Handling : Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Empty containers retain product residue and can be hazardous. Do not reuse container.

Storage : Store in accordance with local regulations. Store in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

8 . Exposure controls/personal protection

Occupational exposure limits		TWA (8 hours)			STEL (15 mins)			Ceiling			
Ingredients:	List name	ppm	mg/m³	Other	ppm	mg/m³	Other	ppm	mg/m³	Other	Notations
No exposure limit value known.											

If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures : If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Ensure that eyewash stations and safety showers are close to the workstation location. Take off contaminated clothing and wash before reuse.

8 . Exposure controls/personal protection

Personal protection

Respiratory : If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Hands : Chemical-resistant gloves.

Eyes : Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles.

Skin : Wear long sleeves and chemical resistant apron to prevent repeated or prolonged skin contact.

9 . Physical and chemical properties

Physical state : Liquid.

Flash point : Closed cup: 165.56°C (330°F)

Auto-ignition temperature : Not available.

Flammable limits : Not available.

Color : Water-white./Light yellow

Odor : Musty. [Slight]

pH : 2.4

: 1% Aqueous Solution

Boiling/condensation point : Not available.

Initial Boiling Point : Not available.

Melting/freezing point : <4°C (<39.2°F)

Relative density : 1.04

Density : 8.66 (lbs/gal)

Vapor density : Not available.

Odor threshold : Not available.

Evaporation rate : Not available.

VOC : Not available.

Viscosity : Not available.

Solubility (Water) : Insoluble

Vapor pressure : <0.017 kPa (<0.13 mm Hg) at 25°C

Pour Point : Not available.

Partition coefficient (LogKow) : Not available.

10 . Stability and Reactivity

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

Conditions to avoid : No specific data.

Materials to avoid : Reactive or incompatible with the following materials: oxidizing materials,alkalis, and strong bases.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Conditions of reactivity : Slightly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.

11 . Toxicological information

No additional information.

Chronic toxicity Remarks

1) Phosphate ester

Not available.

12 . Ecological information

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Biodegradability

Conclusion/Summary : Not available.

13. Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14 . Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label	Additional information
DOT Classification	UN3265	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Contains: Phosphate ester)	8	III		-
TDG Classification	UN3265	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Contains: Phosphate ester)	8	III		-
IMDG Class	UN3265	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Contains: Phosphate ester)	8	III		**Emergency schedules (EmS)** F-A; S-B
IATA-DGR Class	UN3265	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Contains: Phosphate ester)	8	III		-

PG* : Packing group

DOT Reportable Quantity Not applicable.

Marine pollutant Not applicable.

North-America NAERG : 153

15 . Regulatory information

Canada

WHMIS (Canada) : Class D-2B: Material causing other toxic effects (Toxic).
Class E: Corrosive material

Canada (CEPA DSL): : At least one component is not listed.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

Canadian NPRI : None of the components are listed.

U.S. Federal regulations : **United States inventory (TSCA 8b)**: All components are listed or exempted.

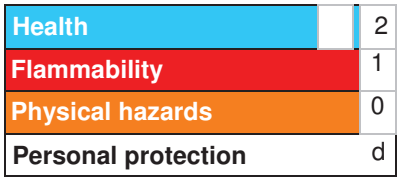
Additional information

This product contains a substance subject to a Ministerial Order. In the event of an accidental release (e.g. spill or leak), immediately notify a member of Baker Hughes Canada Company HSE department.

16 . Other information

Label requirements : CAUSES EYE AND SKIN BURNS. MAY CAUSE ALLERGIC SKIN REACTION.

Hazardous Material Information System (U.S.A.) :



Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.) :



Date of printing : **4/24/2012.**

Indicates information that has changed from previously issued version.

Notice to reader

NOTE: The information on this MSDS is based on data which is considered to be accurate. Baker Hughes, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.

This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Material Safety Data Sheet

1 . Product and company identification

Product name : RG-35

Supplier : Baker Hughes Canada Company
1000, 401 - 9th Avenue SW
Calgary, Alberta, T2P 3C5
Canada
For Product Information: 403-531-5151

Material Uses : Special: oil Breaker

Code : 411125

Validation date : 5/14/2012.

Print date : 5/14/2012.

Version : 1.01

Responsible name : Global Regulatory Affairs - Telephone 281-276-5400 or 800-231-3606

In case of emergency : CANUTEC 613-996-6666 (Canada 24 hours)
(001)281-276-5400
CHEMTREC 800-424-9300 (U.S. 24 hour)
CHEMTREC Int'l 01-703-527-3887 (International 24 hours)

Canada

WHMIS (Canada) : Not controlled under WHMIS (Canada).

WHMIS (Pictograms) :

2 . Hazards identification

Physical state : Solid. [Powder. to Granular solid.]

Odor : Odorless.

Color : White.

Emergency overview : MAY CAUSE RESPIRATORY TRACT, EYE AND SKIN IRRITATION.

Fine dust clouds may form explosive mixtures with air. Handling and/or processing of this material may generate a dust which can cause mechanical irritation of the eyes, skin, nose and throat. Keep away from heat, sparks and flame. Prevent dust accumulation. Avoid breathing dust. Avoid contact with eyes. Avoid prolonged or repeated contact with skin. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling.

Routes of entry : Dermal contact. Inhalation.

Potential acute health effects

Inhalation : Slightly irritating to the respiratory system.

Ingestion : Ingestion may cause gastrointestinal irritation and diarrhea.

Skin : Slightly irritating to the skin.

Eyes : Slightly irritating to the eyes. No significant irritation expected other than possible mechanical irritation.

Potential chronic health effects

Chronic effects : Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation.

Over-exposure signs/symptoms

Inhalation : respiratory tract irritation, coughing

Ingestion : None known.

Skin : irritation, redness

Eyes : irritation, watering, redness

See toxicological information (Section 11)

3 . Composition/information on ingredients

Name	CAS number	Wt. %
Magnesium oxide	1309-48-4	60 - 100

4 . First aid measures

Eye contact : Get medical attention immediately. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids.

Skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.

Inhalation : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Ingestion : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

5 . Fire-fighting measures

Flammability of the product : Fine dust clouds may form explosive mixtures with air.

Extinguishing media

Suitable : Use dry chemical powder.

Not suitable : Do not use water jet.

Special exposure hazards : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Hazardous thermal decomposition products : metal oxide/oxides

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6 . Accidental release measures

Personal precautions : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing dust. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Methods for cleaning up

Small spill : Move containers from spill area. Vacuum or sweep up material and place in a designated, labeled waste container. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor.

6 . Accidental release measures

Large spill : Move containers from spill area. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Vacuum or sweep up material and place in a designated, labeled waste container. Avoid creating dusty conditions and prevent wind dispersal. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor. Note: see section 1 for emergency contact information and section 13 for waste disposal.

7 . Handling and storage

Handling : Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing dust. Avoid the creation of dust when handling and avoid all possible sources of ignition (spark or flame). Prevent dust accumulation. Use only with adequate ventilation. Electrical equipment and lighting should be protected to appropriate standards to prevent dust coming into contact with hot surfaces, sparks or other ignition sources. Empty containers retain product residue and can be hazardous. Do not reuse container.

Storage : Store in accordance with local regulations. Store in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

8 . Exposure controls/personal protection

Occupational exposure limits		TWA (8 hours)			STEL (15 mins)			Ceiling			
Ingredients:	List name	ppm	mg/m³	Other	ppm	mg/m³	Other	ppm	mg/m³	Other	Notations
Magnesium oxide	US ACGIH	-	10	-	-	-	-	-	-	-	[a]
	OSHA PEL	-	15	-	-	-	-	-	-	-	[b]
	OSHA PEL 1989	-	10	-	-	-	-	-	-	-	[b]

Form: [a]Inhalable fraction. See Appendix C, paragraph A. Inhalable Particulate Mass TLVs (IPM–TLVs) for those materials that are hazardous when deposited anywhere in the respiratory tract. [b]Total particulates

Consult local authorities for acceptable exposure limits.

Only components of this product with established exposure limits appear in the box above.

If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures : Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. Use explosion-proof ventilation equipment.

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Ensure that eyewash stations and safety showers are close to the workstation location. Take off contaminated clothing and wash before reuse.

Personal protection

Respiratory : Approved/certified disposable particulate dust mask. Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

8 . Exposure controls/personal protection

Hands	:	Chemical-resistant gloves.
Eyes	:	Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles.
Skin	:	Wear long sleeves and other protective clothing to prevent repeated or prolonged skin contact.

9 . Physical and chemical properties

Physical state	:	Solid. [Powder. to Granular solid.]
Flash point	:	[Product does not sustain combustion.]
Auto-ignition temperature	:	Not available.
Flammable limits	:	Not available.
Color	:	White.
Odor	:	Odorless.
pH	:	10
	:	Saturated aqueous solution.
Boiling/condensation point	:	5072.2°C (9162°F)
Initial Boiling Point	:	Not available.
Melting/freezing point	:	2800°C (5072°F)
Relative density	:	3.6
Density	:	Not available.
Vapor density	:	Not available.
Odor threshold	:	Not available.
Evaporation rate	:	Not available.
VOC	:	Not available.
Viscosity	:	Not available.
Solubility (Water)	:	Slight
Vapor pressure	:	0 kPa (0 mm Hg)
Pour Point	:	Not available.
Partition coefficient (LogKow)	:	Not available.

10 . Stability and Reactivity

Chemical stability	:	The product is stable.
Possibility of hazardous reactions	:	Under normal conditions of storage and use, hazardous reactions will not occur.
Hazardous polymerization	:	Under normal conditions of storage and use, hazardous polymerization will not occur.
Conditions to avoid	:	Avoid the creation of dust when handling and avoid all possible sources of ignition (spark or flame). Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Prevent dust accumulation.
Materials to avoid	:	Reactive or incompatible with the following materials: acids and moisture. Chlorine , Phosphorus pentachloride , Trifluoride
Hazardous decomposition products	:	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
Conditions of reactivity	:	Non-flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.

11 . Toxicological information

Carcinogenicity

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
Magnesium oxide	A4	-	-	-	-	-

Chronic toxicity Remarks

1) Magnesium oxide

Not available.

12 . Ecological information

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Biodegradability

Conclusion/Summary : Not available.

13. Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14 . Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label	Additional information
DOT Classification	Not regulated.	-	-	-		-
TDG Classification	Not regulated.	-	-	-		-
IMDG Class	Not regulated.	-	-	-		-
IATA-DGR Class	Not regulated.	-	-	-		-

PG* : Packing group

DOT Reportable Quantity Not applicable.

Marine pollutant Not applicable.

North-America NAERG : Not available.

15 . Regulatory information

Canada

WHMIS (Canada) : Not controlled under WHMIS (Canada).

Canada (CEPA DSL): : All components are listed or exempted.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

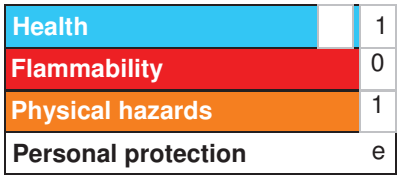
Canadian NPRI : None of the components are listed.

U.S. Federal regulations : **United States inventory (TSCA 8b)**: All components are listed or exempted.

16 . Other information

Label requirements : MAY CAUSE RESPIRATORY TRACT, EYE AND SKIN IRRITATION.

Hazardous Material Information System (U.S.A.) :



Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.) :



Date of printing : **5/14/2012.**

Indicates information that has changed from previously issued version.

Notice to reader

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The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.

This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Material Safety Data Sheet

1 . Product and company identification

Product name : XLO-5

Supplier : Baker Hughes Canada Company
1000, 401 - 9th Avenue SW
Calgary, Alberta, T2P 3C5
Canada
For Product Information: 403-531-5151

Material Uses : Special: Cross-linking agent.

Code : 488160

Validation date : 12/16/2011.

Print date : 12/16/2011.

Version : 2

Responsible name : Global Regulatory Affairs - Telephone 281-276-5400 or 800-231-3606

In case of emergency : CANUTEC 613-996-6666 (Canada 24 hours)
(001)281-276-5400
CHEMTREC 800-424-9300 (U.S. 24 hour)
CHEMTREC Int'l 01-703-527-3887 (International 24 hours)

Canada

WHMIS (Canada) : Class D-1B: Material causing immediate and serious toxic effects (Toxic).
Class E: Corrosive material

WHMIS (Pictograms) :



2 . Hazards identification

Physical state : Liquid.

Odor : Characteristic. [Slight]

Color : Brown. [Light]

Emergency overview : DANGER!

CAUSES RESPIRATORY TRACT, EYE AND SKIN BURNS. MAY BE HARMFUL IF SWALLOWED. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.

Do not breathe vapor or mist. Do not ingest. Do not get in eyes or on skin or clothing. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling.

Routes of entry : Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects

Inhalation : Corrosive to the respiratory system.

Ingestion : Harmful if swallowed. May cause burns to mouth, throat and stomach.

Skin : Corrosive to the skin. Causes burns.

Eyes : Corrosive to eyes. Causes burns.

Potential chronic health effects

Chronic effects : Contains material that may cause target organ damage, based on animal data.

Target organs : Contains material which may cause damage to the following organs: upper respiratory tract, skin, eyes.

Over-exposure signs/symptoms

Inhalation : respiratory tract irritation, coughing

2 . Hazards identification

Ingestion : stomach pains

Skin : pain or irritation, redness, blistering may occur

Eyes : pain, watering, redness

Medical conditions aggravated by over-exposure : Pre-existing disorders involving any target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

See toxicological information (Section 11)

3 . Composition/information on ingredients

Name	CAS number	Wt. %
Ferric sulfate	10028-22-5	30 - 60
2-Dibutylaminoethanol	102-81-8	10 - 30
Ethoxylated oleyl amine	13127-82-7	5 - 10

4 . First aid measures

Eye contact : Get medical attention immediately. Immediately flush the eye(s) continuously with lukewarm, gently flowing water for at least 20-60 minutes while holding the eyelid(s) open.

Skin contact : Wash affected area with soap and mild detergent for at least 20 - 60 minutes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.

Inhalation : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Ingestion : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wear suitable protective clothing and gloves. Remove contaminated clothing and shoes.

5 . Fire-fighting measures

Flammability of the product : In a fire or if heated, a pressure increase will occur and the container may burst.

Extinguishing media

Suitable : Use an extinguishing agent suitable for the surrounding fire.

Not suitable : None known.

Special exposure hazards : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Hazardous thermal decomposition products : carbon dioxide,carbon monoxide,nitrogen oxides,sulfur oxides,metal oxide/oxides

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6 . Accidental release measures

Personal precautions : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Methods for cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Absorb with an inert material. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

7 . Handling and storage

Handling : Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Empty containers retain product residue and can be hazardous. Do not reuse container.

Storage : Store in accordance with local regulations. Store in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

8 . Exposure controls/personal protection

Occupational exposure limits		TWA (8 hours)			STEL (15 mins)			Ceiling			
Ingredients:	List name	ppm	mg/m³	Other	ppm	mg/m³	Other	ppm	mg/m³	Other	Notations
Ferric sulfate, as Fe	US ACGIH	-	1	-	-	-	-	-	-	-	
	OSHA PEL 1989	-	1	-	-	-	-	-	-	-	[a]
2-Dibutylaminoethanol	US ACGIH	0.5	3.5	-	-	-	-	-	-	-	[1]
	OSHA PEL 1989	2	14	-	-	-	-	-	-	-	

[1]Absorbed through skin.
Form: [a]Soluble

Consult local authorities for acceptable exposure limits.

Only components of this product with established exposure limits appear in the box above.

If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

8 . Exposure controls/personal protection

Engineering measures : Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Ensure that eyewash stations and safety showers are close to the workstation location. Take off contaminated clothing and wash before reuse.

Personal protection

Respiratory : If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Hands : Chemical-resistant gloves.

Eyes : Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles.

Skin : Wear long sleeves and chemical resistant apron to prevent repeated or prolonged skin contact.

9 . Physical and chemical properties

Physical state : Liquid.

Flash point : Closed cup: >93.33°C (>200°F)

Auto-ignition temperature : Not available.

Flammable limits : Not available.

Color : Brown. [Light]

Odor : Characteristic. [Slight]

pH : Not available.

Boiling/condensation point : Not available.

Initial Boiling Point : Not available.

Melting/freezing point : <4°C (<39.2°F)

Relative density : 1.35

Density : 11.88 (lbs/gal)

Vapor density : Not available.

Odor threshold : Not available.

Evaporation rate : Not available.

VOC : Not available.

Viscosity : Not available.

Solubility (Water) : Dispersible

Vapor pressure : <0.13 kPa (<1 mm Hg) at 25°C

Pour Point : Not available.

Partition coefficient (LogKow) : Not available.

10 . Stability and Reactivity

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

Conditions to avoid : No specific data.

Materials to avoid :

10 . Stability and Reactivity

Reactive or incompatible with the following materials: oxidizing materials, metals and alkalis.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Conditions of reactivity : Slightly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.

11 . Toxicological information

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
2-Dibutylaminoethanol	LD50 Dermal	Rabbit	1680 uL/kg	-
	LD50 Oral	Rat	1070 mg/kg	-

Chronic toxicity Remarks

1) Ferric sulfate

Not available.

2) 2-Dibutylaminoethanol

Not available.

3) Ethoxylated oleyl amine

Not available.

12 . Ecological information

Aquatic ecotoxicity

Product/ingredient name	Result	Species	Exposure
Ferric sulfate	Acute LC50 28 mg/L Fresh water	Fish - Brown trout - Salmo trutta - Fingerling - 30 g	4 days
2-Dibutylaminoethanol	Acute EC50 73.7 mg/L Fresh water	Daphnia - Water flea - Daphnia magna - <24 hours	48 hours

Conclusion/Summary : Not available.

Biodegradability

Conclusion/Summary : Not available.

13. Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14 . Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label	Additional information
DOT Classification	UN2922	CORROSIVE LIQUID, TOXIC, N.O.S. (Contains: Ferric sulfate, 2-Dibutylaminoethanol)	8 (6.1)	III		-
TDG Classification	UN2922	CORROSIVE LIQUID, TOXIC, N.O.S. (Contains: Ferric sulfate, 2-Dibutylaminoethanol)	8 (6.1)	III		-
IMDG Class	UN2922	CORROSIVE LIQUID, TOXIC, N.O.S. (Contains: Ferric sulfate, 2-Dibutylaminoethanol)	8 (6.1)	III		**Emergency schedules (EmS)** F-A, S-B
IATA-DGR Class	UN2922	CORROSIVE LIQUID, TOXIC, N.O.S. (Contains: Ferric sulfate, 2-Dibutylaminoethanol)	8 (6.1)	III		-

PG* : Packing group

DOT Reportable Quantity Ferric sulfate, 168 gal of this product.

Marine pollutant Not applicable.

North-America NAERG : 154

15 . Regulatory information

Canada

WHMIS (Canada) : Class D-1B: Material causing immediate and serious toxic effects (Toxic).
Class E: Corrosive material

Canada (CEPA DSL): : All components are listed or exempted.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

Canadian NPRI : None of the components are listed.

U.S. Federal regulations : **United States inventory (TSCA 8b)**: All components are listed or exempted.

16 . Other information

Label requirements : CAUSES RESPIRATORY TRACT, EYE AND SKIN BURNS. MAY BE HARMFUL IF SWALLOWED. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.

Hazardous Material Information System (U.S.A.) :

Health	2
Flammability	1
Physical hazards	0
Personal protection	d

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.) :



Date of printing : **12/16/2011.**

Indicates information that has changed from previously issued version.

Notice to reader

NOTE: The information on this MSDS is based on data which is considered to be accurate. Baker Hughes, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.

This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Material Safety Data Sheet

According to OSHA and ANSI

Printing date 02/17/2012 Reviewed on 02/17/2012

1 Identification of the substance/mixture and of the company/undertaking

Product identifier

Product name: Tracerco 163a
Relevant identified uses of the substance or mixture and uses advised against.
Sector of Use SU24 Scientific research and development

Details of the supplier of the safety data sheet
Manufacturer/Supplier:
Alfa Aesar, A Johnson Matthey Company
Johnson Matthey Catalog Company, Inc.
30 Bond Street
Ward Hill, MA 01835-8099
Tel: 800-343-0660
Fax: 800-322-4757
Email: tech@alfa.com
www.alfa.com

Information Department: Health, Safety and Environmental Department
Emergency telephone number:
During normal hours the Health, Safety and Environmental Department at (800) 343-0660. After normal hours call Carechem 24 at (866) 928-0789.

2 Hazards identification

Classification of the substance or mixture



GHS07

H315 Causes skin irritation.
H319 Causes serious eye irritation.
H335 May cause respiratory irritation.

Classification according to Directive 67/548/EEC or Directive 1999/45/EC



Xi; Irritant

R36/37/38: Irritating to eyes, respiratory system and skin.
Information concerning particular hazards for human and environment: Not applicable

Label elements

Labelling according to EU guidelines:

Code letter and hazard designation of product:
Xi Irritant

Risk phrases:
36/37/38 Irritating to eyes, respiratory system and skin.

Safety phrases:
26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
37 Wear suitable gloves.
60 This material and its container must be disposed of as hazardous waste.
Hazard description:
WHMIS classification
D2B - Toxic material causing other toxic effects



Classification system
HMIS ratings (scale 0-4)
(Hazardous Materials Identification System)

HEALTH	1
FIRE	1
REACTIVITY	1

Health (acute effects) = 1
Flammability = 1
Reactivity = 1

Other hazards
Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.

(Contd. on page 2)

Material Safety Data Sheet

According to OSHA and ANSI

Printing date 02/17/2012 Reviewed on 02/17/2012

Product name: Tracerco 163a

(Contd. of page 1)

3 Composition/information on ingredients

Chemical characterization: Substances
CAS# Description:
CAS# Proprietary / Tracerco 163a

4 First aid measures

Description of first aid measures
After inhalation
Supply fresh air. If required, provide artificial respiration. Keep patient warm.
Seek immediate medical advice.
After skin contact
Immediately wash with water and soap and rinse thoroughly.
Seek immediate medical advice.
After eye contact
Rinse opened eye for several minutes under running water. Then consult a doctor.
After swallowing Seek medical treatment.
Information for doctor
Most important symptoms and effects, both acute and delayed
No further relevant information available.
Indication of any immediate medical attention and special treatment needed
No further relevant information available.

5 Firefighting measures

Extinguishing media
Suitable extinguishing agents
Use carbon dioxide, extinguishing powder or foam. Water may be ineffective but may be used for cooling exposed containers.
Special hazards arising from the substance or mixture
In case of fire, the following can be released:
Carbon monoxide and carbon dioxide
Hydrogen iodide (HI)
Advice for firefighters
Protective equipment:
Wear self-contained respirator.
Wear fully protective impervious suit.

6 Accidental release measures

Personal precautions, protective equipment and emergency procedures
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation
Environmental precautions:
Do not allow material to be released to the environment without proper governmental permits.
Methods and material for containment and cleaning up: Ensure adequate ventilation.
Reference to other sections
See Section 7 for information on safe handling
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

Handling
Precautions for safe handling
Keep container tightly sealed.
Store in cool, dry place in tightly closed containers.
Ensure good ventilation at the workplace.
Information about protection against explosions and fires: No information known.

Conditions for safe storage, including any incompatibilities
Storage
Requirements to be met by storerooms and receptacles: No special requirements.
Information about storage in one common storage facility: Store away from oxidizing agents.
Further information about storage conditions:
Keep container tightly sealed.
Store in cool, dry conditions in well sealed containers.
Specific end use(s) No further relevant information available.

(Contd. on page 3)

Material Safety Data Sheet
According to OSHA and ANSI

Printing date 02/17/2012 Reviewed on 02/17/2012

Product name: Tracerco 163a

(Contd. of page 2)

8 Exposure controls/personal protection

Additional information about design of technical systems:
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Control parameters
Components with limit values that require monitoring at the workplace:
Additional information: No data

Exposure controls
Personal protective equipment
General protective and hygienic measures
The usual precautionary measures for handling chemicals should be followed.
Keep away from foodstuffs, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Avoid contact with the eyes and skin.
Maintain an ergonomically appropriate working environment.
Breathing equipment: Use suitable respirator when high concentrations are present.
Protection of hands:
Impervious gloves
Check protective gloves prior to each use for their proper condition.
Material of gloves
The selection of suitable gloves not only depends on the material, but also on quality.
Quality will vary from manufacturer to manufacturer.
Eye protection: Safety glasses
Body protection: Protective work clothing.

9 Physical and chemical properties

Information on basic physical and chemical properties	
General Information	
Appearance:	
Form:	Crystalline powder
Color:	White
Odor:	Not determined
Odor threshold:	Not determined.
pH-value:	Not applicable.
Change in condition	
Melting point/Melting range:	131-133°C (268-271 °F)
Boiling point/Boiling range:	285°C (545 °F)
Sublimation temperature / start:	Not determined
Flash point:	Not applicable
Flammability (solid, gaseous)	Not determined.
Ignition temperature:	Not determined
Decomposition temperature:	Not determined
Auto igniting:	Not determined.
Danger of explosion:	Product does not present an explosion hazard.
Explosion limits:	
Lower:	Not determined
Upper:	Not determined
Vapor pressure:	Not applicable.
Density at 20°C (68 °F):	2.35 g/cm³ (19.611 lbs/gal)
Relative density	Not determined.
Vapor density	Not applicable.
Evaporation rate	Not applicable.
Segregation coefficient (n-octonol/water):	Not determined.
Viscosity:	
dynamic:	Not applicable.
kinematic:	Not applicable.
Other information	No further relevant information available.

USA

(Contd. on page 4)

Material Safety Data Sheet

According to OSHA and ANSI

Printing date 02/17/2012 Reviewed on 02/17/2012

Product name: Tracerco 163a

(Contd. of page 3)

10 Stability and reactivity

Reactivity
Chemical stability
Thermal decomposition / conditions to be avoided:
Decomposition will not occur if used and stored according to specifications.
Possibility of hazardous reactions No dangerous reactions known
Incompatible materials: Oxidizing agents
Hazardous decomposition products:
Carbon monoxide and carbon dioxide
Hydrogen iodide (HI)

11 Toxicological information

Information on toxicological effects
Acute toxicity:
Primary irritant effect:
on the skin: Irritating effect.
on the eye: Irritating effect.
Sensitization: No sensitizing effects known.
Other information (about experimental toxicology): Irritating to respiratory system
Subacute to chronic toxicity:
Other than potential irritation (see above), no information on illness or injury to humans from acute or chronic exposure to this product is available.
Additional toxicological information:
To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.
No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.

12 Ecological information

Toxicity
Aquatic toxicity: No further relevant information available.
Persistence and degradability No further relevant information available.
Behavior in environmental systems:
Bioaccumulative potential No further relevant information available.
Mobility in soil No further relevant information available.
Additional ecological information:
General notes:
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
Do not allow material to be released to the environment without proper governmental permits.
Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.
Other adverse effects No further relevant information available.

13 Disposal considerations

Waste treatment methods
Recommendation Consult state, local or national regulations to ensure proper disposal.

Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.

14 Transport information

UN-Number **DOT, ADR, ADN, IMDG, IATA**	Not applicable
UN proper shipping name **DOT, ADR, ADN, IMDG, IATA**	Not applicable
Transport hazard class(es) **DOT, ADR, ADN, IMDG, IATA** **Class**	Not applicable
Packing group **DOT, ADR, IMDG, IATA**	Not applicable

(Contd. on page 5)

Material Safety Data Sheet
According to OSHA and ANSI

Printing date 02/17/2012 Reviewed on 02/17/2012

Product name: Tracerco 163a

(Contd. of page 4)

Environmental hazards:	
Marine pollutant:	No
Special precautions for user	Not applicable.
Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code	Not applicable.
UN "Model Regulation":	–

15 Regulatory information

Safety, health and environmental regulations/legislation specific for the substance or mixture

Product related hazard informations:

Hazard symbols:
Xi Irritant

Risk phrases:
36/37/38 Irritating to eyes, respiratory system and skin.

Safety phrases:
26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
37 Wear suitable gloves.
60 This material and its container must be disposed of as hazardous waste.

National regulations
All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.
All components of this product are listed on the Canadian Non-Domestic Substances List (NDSL).

Information about limitation of use: For use only by technically qualified individuals.

Other regulations, limitations and prohibitive regulations
REACH – Pre-registered substances Substance is listed.
Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Department issuing MSDS: Health, Safety and Environmental Department.
Contact:
Zachariah C. Holt
Global EHS Manager
Abbreviations and acronyms:
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
ICAO: International Civil Aviation Organization
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
HMIS: Hazardous Materials Identification System (USA)
WHMIS: Workplace Hazardous Materials Information System (Canada)

Appendix A15 Production Test Summaries (Tester notes)

Bluefish

Canol

Fluid Calculations for the Canol

Fluid & Gas Analysis

General Information

Company:	MGM Energy Corp.	**Job Number:**	GP13-040
Well / Lease Name:	MGM Shell East MacKay I-78-64-50-125-30	**Formation:**	Blue Fish
Unique Well ID:	300/I-78-64-50-125-30/00	**Field:**	East MacKay
Test Type:	Completion	**Pool:**	N/A

Client Information

Company: MGM Energy Corp.
Contact: Sue Greggain
Phone:
Fax:
E-Mail:

Street Address: 4100, 350 - 7th Avenue SW, Calgary
Street Address:
City: Calgary
Province/State: Alberta
Postal/Zip Code: T2P 3N9
Country: Canada

Site Information

Contact: Clint Murry
Phone: 403-648-0847

Fax:
Email:

Well Information

Well / Lease Name: MGM Shell East MacKay I-78-64-50-125-30
Well License: 1202-002
Operator: MGM Energy Corp
Unique Well ID: 300/I-78-64-50-125-30/00
Field: East MacKay

Test Information

Company: PUREE Pure Energy Services Ltd.
Test Representative: Ryan Gaylard
Test Type: Completion
Start DateTime: 2013/02/18 08:00
End DateTime: 2013/04/03 11:45
Report By: FMC Technologies

Supervisor: Alex Alexopoulos
Test Unit: HS-13/ST-27
Job Number: GP13-040
Qualified By: AM Arcuri

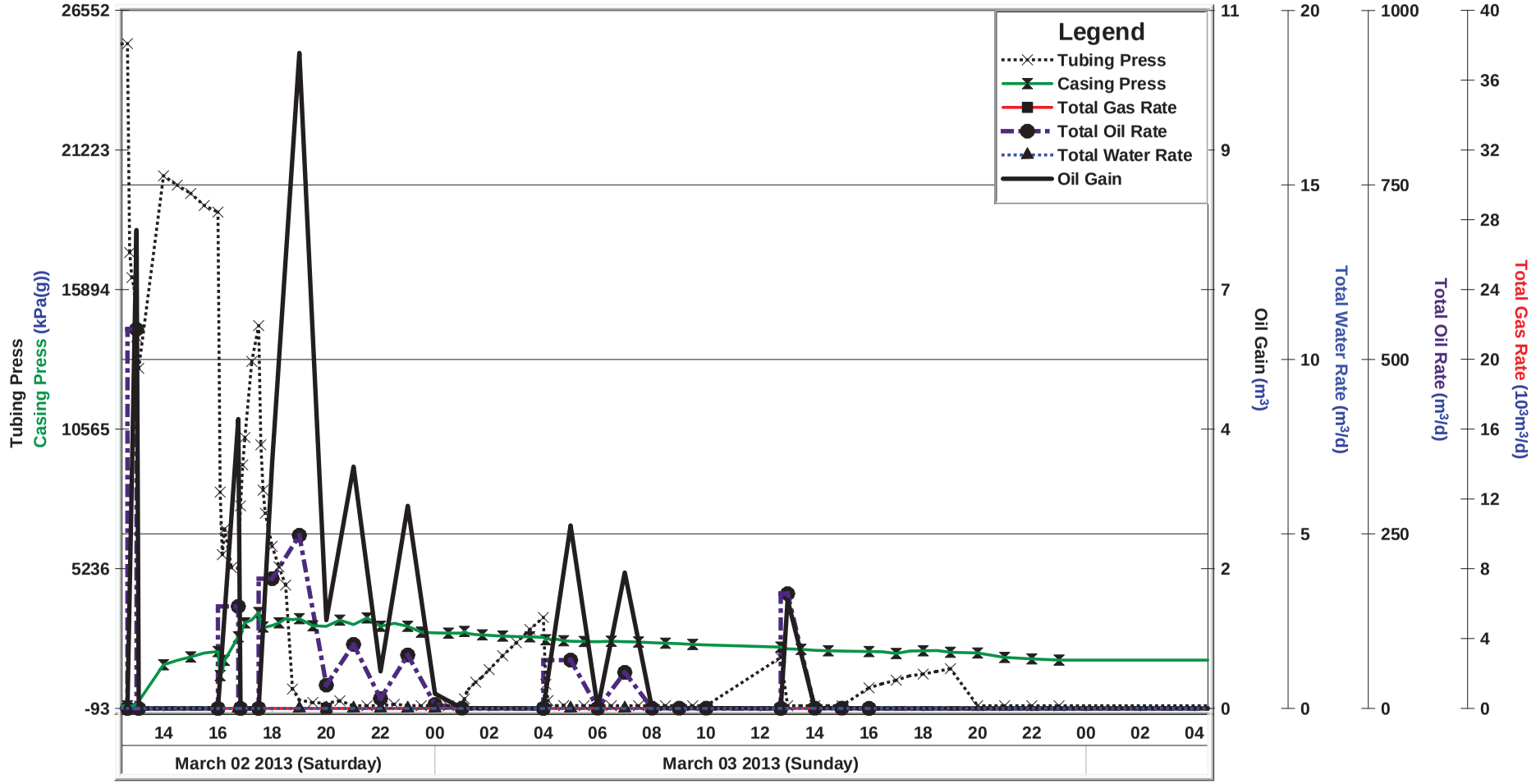
Remarks

Remarks: Final Test Summary
Cumm. Hours Flowed = 16Hrs, 83mins
Cumm. load fluid Recovered = 42.23 m3
Cumm. Oil produced = 0.00 m3
Cumm. Burnable Gas to Flare = 0.000 103m3
Initial load fluid to recover = 164.8 m3
Load fluid left to recover = 122.38 m3

Company:	MGM Energy Corp.	**Job Number:**	GP13-040
Well / Lease Name:	MGM Shell East MacKay I-78-64-50-125-30	**Formation:**	Blue Fish
Unique Well ID:	300/I-78-64-50-125-30/00	**Field:**	East MacKay
Test Type:	Completion	**Pool:**	N/A

PRESSURE & RATE VS TIME

BLUEFISH



541

FieldNotes32X™ Ver 6.1.1.350 131160
C:\PRD2013\I-78-64-50-125-30\GP13-040\East MacKay I-78 - Blue Fish.FLD 11-Apr-13

Field Measurements

Company:	MGM Energy Corp.	**Job Number:**	GP13-040
Well / Lease Name:	MGM Shell East MacKay I-78-64-50-125-30	**Formation:**	Blue Fish
Unique Well ID:	300/I-78-64-50-125-30/00	**Field:**	East MacKay
Test Type:	Completion	**Pool:**	N/A

			Wellhead					Gas VCone Meter 1					Oil Produced Volume Meter								
	Date	Time	Flow Time	Flow Temp	Tubing Press	Casing Press	Choke Size	Static Press	Diff Press	Meter Temp	Gas Rate	Cum Gas	Volume	BS&W Cut	Water Cum	Oil Gain	Oil Rate	Cum Oil	Water Salinity	pH	Sand
	YYYY/MM/DD	HH:mm	h	℃	kPa(g)	kPa(g)	mm	kPa(g)	kPa	℃	$10^3m^3/d$	10^3m^3	m^3	%	m^3	m^3	m^3/d	m^3	ppm		%
149	2013/04/03	02:00			2	1677	0.00							0							0.00
150		03:00			5	1647															
151		04:00			0	1635															
152		05:00			1	1616															
153		06:00	16.83		2	1594	0.00	0	0.00	0	0.000	0.000	0.00	0	0.00	0.00	0.00	42.23	0	0	0.00
154			***Daily production summary*** ((March 3rd @ 06:00hrs to March 4th @ 06:00hrs))																		
155			Daily Hours Flowed = 6Hrs, 15mins Cumm. Hours Flowed = 16Hrs, 83mins																		
156			Daily load fluid Recovered = 3.85 m^3 Cumm. load fluid Recovered = 42.23 m^3																		
157			Daily Oil produced = 0.00 m^3 Cumm. Oil produced = 0.00 m^3																		
158			Daily Burnable Gas Produced to Flare = 0.000 10^3m^3 Cumm. Burnable Gas to Flare = 0.000 10^3m^3																		
159			Initial load fluid to recover = 164.8 m^3 Load fluid left to recover = 122.38 m^3																		
160	2013/04/03	08:00	Shut in well, stand by for N^2 to pressure test plug.																		
161		11:30	Pressure test plug to 15 mPa.																		
162		11:45	Pressure test good. Bleed well down to 5 mPa. Shut in master.																		
163			4 Fluid Samples taken (2 @ 19:30, March 2/2013, 2 @ 21:00 March 2/2013) No gas samples taken.																		
164			End of File. Thank you for choosing FMC Technologies.																		

From	2013/04/02 06:00:00	**To**	2013/04/03 06:00:00
Gas Cum	0.000 10^3m^3	**Gas Cum**	0.000 10^3m^3
Oil Cum	0.000 m^3	**Oil Cum**	42.231 m^3
Water Cum	0.000 m^3	**Water Cum**	0.000 m^3
Cond Cum	m^3	**Cond Cum**	m^3

General Information

Company:	MGM Energy Corp.	**Job Number:**	GP13-040
Well / Lease Name:	MGM Shell East MacKay I-78-64-50-125-30	**Formation:**	Canol
Unique Well ID:	300/I-78-64-50-125-30/00	**Field:**	East MacKay
Test Type:	Completion	**Pool:**	1869.0 - 1884.0 mKB MD

Client Information

Company:	MGM Energy Corp.	**Street Address:**	Suite 4100, 350 - 7th Avenue SW
Contact:	Sue Greggain	**Street Address:**	Calgary
Phone:		**City:**	Calgary
Fax:		**Province/State:**	Alberta
E-Mail:		**Postal/Zip Code:**	T2P 3N9
		Country:	Canada

Site Information

Contact:	Clint Murry	**Fax:**	
Phone:	403-648-0847	**Email:**	

Well Information

Well / Lease Name:	MGM Shell East MacKay I-78-64-50-125-30
Well License:	1202-002
Operator:	MGM Energy Corp.
Unique Well ID:	300/I-78-64-50-125-30/00
Field:	East MacKay

Test Information

Company:	FMC Technologies	**Supervisor:**	Alex Alexopoulos
Test Representative:	Ryan Gaylard	**Test Unit:**	HS-13/ST-27
Test Type:	Completion	**Job Number:**	GP13-040
Start DateTime:	2012/02/18 00:00	**Qualified By:**	AM Arcuri
End DateTime:			
Report By:	FMC Technologies		

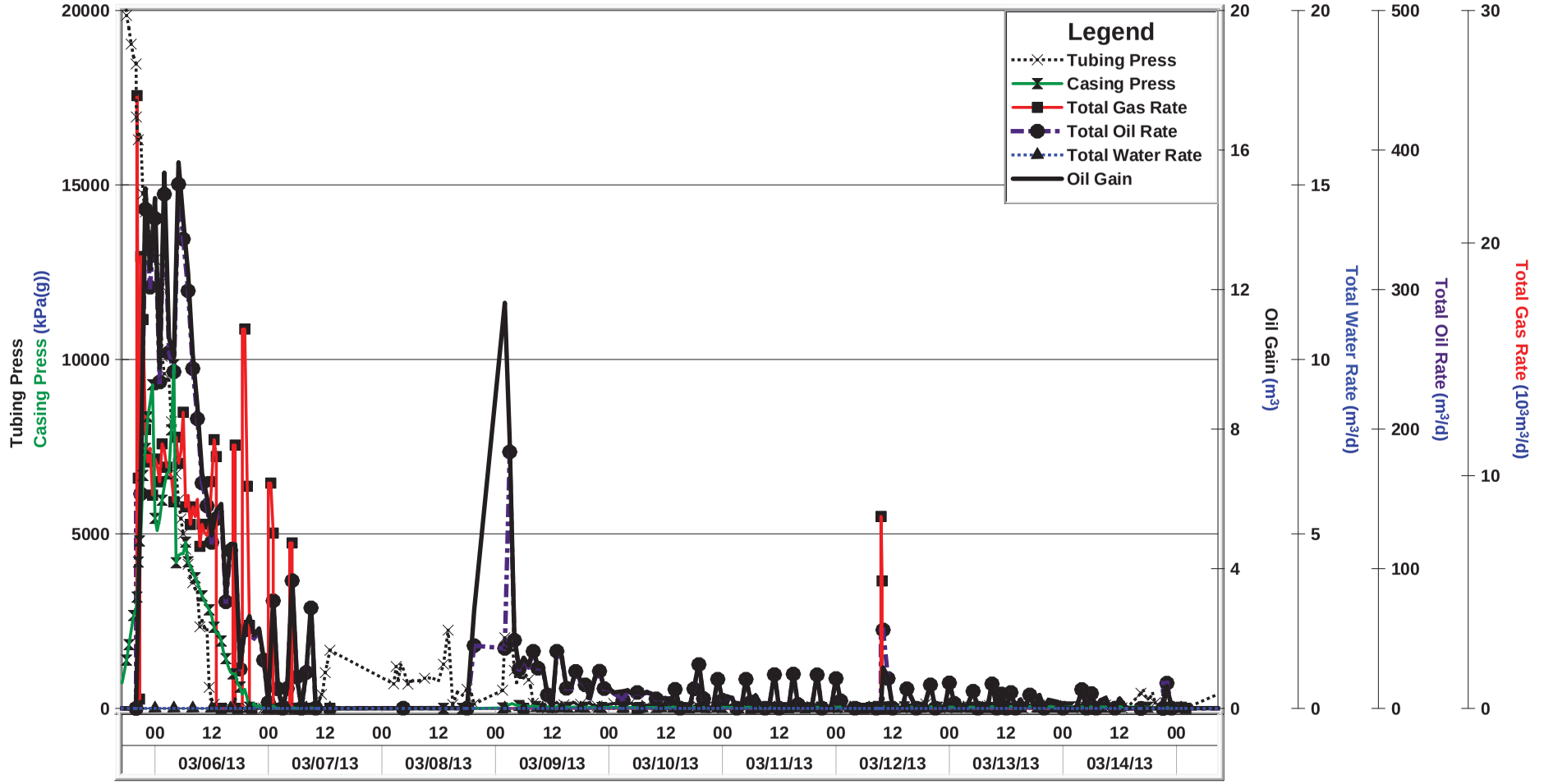
Remarks

Remarks: End of Job Summary
Cumm. Hours Flowed = 210.85
Cumm. load fluid Recovered = 291.43 m3
Cumm. Oil produced = 0.00 m3
Cumm. Burnable Gas to Flare = 1.677 103m3 flared for 20.58 hours
Initial load fluid to recover = 388.80 m3
Load fluid left to recover = 97.37 m3

Company:	MGM Energy Corp.	**Job Number:**	GP13-040
Well / Lease Name:	MGM Shell East MacKay I-78-64-50-125-30	**Formation:**	Canol
Unique Well ID:	300/I-78-64-50-125-30/00	**Field:**	East MacKay
Test Type:	Completion	**Pool:**	1869.0 - 1884.0 mKB MD

PRESSURE & RATE VS TIME

CANOL



FMC Technologies

Field Measurements

Company: MGM Energy Corp.
Well / Lease Name: MGM Shell East MacKay I-78-64-50-125-30
Unique Well ID: 300/I-78-64-50-125-30/00
Test Type: Completion

Job Number: GP13-040
Formation: Canol
Field: East MacKay
Pool: 1869.0 - 1884.0 mKB MD

			Wellhead						ST - 27 Orifice Meter									Oil Produced Volume Meter										
	Date	Time	Flow Time	Choke Size	Flow Temp	Tubing Press	Casing Press	Coil Press	Plate Size	Static Press	Diff Press	Meter Temp	Gas Rate	Burnable Gas Cum	Cum Flow Time	N2 Cum	N2	Gain	BSW	H2O Cum	Oil Rate	Oil Gain	Cum Oil	API	API Sample Temp	API @60F	pH	Sand
	YYYY/MM/DD	HH:mm	h	mm	℃	kPa(g)	kPa(g)	kPa(g)	mm	kPa(g)	kPa	℃	$10^3m^3/d$	10^3m^3	h	10^3m^3	%	m^3	%	m^3	m^3/d	m^3	m^3	°API	℉	°API		%
693	2013/03/14	22:00	Monitor showing 3% LEL's from meter run. Too small to measure.																									
694		22:30	207.35		-18	3	21																					
695		22:33	N_2 online.																									
696		23:00	207.85	50.80	-18	14	28	1690										0.00	0	0.00	0.00	0.00	291.43				0	0.0
697		23:30	208.35		-28	49	29																					
698	2013/03/15	00:00	208.85	50.80	-20	43	21	1760										0.00	0	0.00	0.00	0.00	291.43				0	0.0
699		00:10	N_2 offline.																									
700		00:30	209.35		-18	7	28																					
701		01:00	209.85	50.80	-20	0	31	0										0.00	0	0.00	0.00	0.00	291.43				0	0.0
702		01:30	210.35		-28	2	30																					
703		02:00	210.85	50.80	-34	1	28	0	0.00	0	0.00	0	0.000	1.677	20.5833	7.099		0.00	0	0.00	0.00	0.00	291.43				0	0.0
704		02:00	Coil at surface, shut in master valve and bleed off coil.																									
705		02:15	Coil begin to rig out, unable to monitor pressures.																									
706			Daily load fluid Recovered = 1.46 m^3											Cumm. load fluid Recovered = 291.43 m^3														
707			Initial load fluid to recover = 388.80 m^3											Load fluid left to recover = 97.37 m^3														
708			Rig in slickline.																									
709	2013/03/15	11:30	210.85	0.00		570		0	0.00	0	0.00	0	0.000	1.677	20.5833	7.099		0.00		0.00	0.00	0.00	291.43				0	0.0
710		12:00	Begin Slickline work, gauge ring, static gradient, recorders, plug and pressure tests.																									
711			End of Job Summary																									
712			Cumm. Hours Flowed = 210.85																									
713			Cumm. load fluid Recovered = 291.43 m^3																									
714			Cumm. Oil produced = 0.00 m^3																									
715			Cumm. Burnable Gas to Flare = 1.677 10^3m^3 flared for 20.58 hours																									

From	2013/03/14 06:00:00	To	2013/03/15 06:00:00
Gas Cum	0.000 10^3m^3	Gas Cum	8.776 10^3m^3
Oil Cum	1.451 m^3	Oil Cum	291.426 m^3
Water Cum	0.000 m^3	Water Cum	0.000 m^3
Cond Cum	m^3	Cond Cum	m^3

Field Measurements

Company:	MGM Energy Corp.	**Job Number:**	GP13-040
Well / Lease Name:	MGM Shell East MacKay I-78-64-50-125-30	**Formation:**	Canol
Unique Well ID:	300/I-78-64-50-125-30/00	**Field:**	East MacKay
Test Type:	Completion	**Pool:**	1869.0 - 1884.0 mKB MD

			Wellhead						ST - 27 Orifice Meter									Oil Produced Volume Meter										
	Date	Time	Flow Time	Choke Size	Flow Temp	Tubing Press	Casing Press	Coil Press	Plate Size	Static Press	Diff Press	Meter Temp	Gas Rate	Burnable Gas Cum	Cum Flow Time	N2 Cum	N2	Gain	BSW	H2O Cum	Oil Rate	Oil Gain	Cum Oil	API	API Sample Temp	API @60F	pH	Sand
	YYYY/MM/DD	HH:mm	h	mm	℃	kPa(g)	kPa(g)	kPa(g)	mm	kPa(g)	kPa	℃	$10^3m^3/d$	10^3m^3	h	10^3m^3	%	m^3	%	m^3	m^3/d	m^3	m^3	°API	°F	°API		%
716			Initial load fluid to recover = 388.80 m^3 Load fluid left to recover = 97.37 m^3																									
717			-TIN CONTAINER FLUID SAMPLES TO WEATHERFORD, GAS AND PLASTIC FLUID SAMPLES TO AGAT-																									
718			Gas cylinder #'s 11001069, 05004966, 05005398																									
719			End of job. Thank you for choosing FMC Technologies.																									

546

From		To	
Gas Cum	10^3m^3	Gas Cum	10^3m^3
Oil Cum	m^3	Oil Cum	m^3
Water Cum	m^3	Water Cum	m^3
Cond Cum	m^3	Cond Cum	m^3

Fluid Calculations for East MacKay I-78 – Canol – March 2013

Assumptions:

1. Fluid balance is “at the wing valve”.
2. Tubing is full at the start (don’t include volume to fill tubing after setting tubing plug above Bluefish).
3. Tubing is full at the end – included volume(s) to fill tubing at the end of the job.
4. Coil is empty at beginning. Do include volume to fill coil and well prior to milling
5. Coil is empty at the end of the job. All fluid in coil blown out & accounted for in the tester’s notes
6. Volumes used during milling of plugs not included. No record kept of volume into coiled tubing, but tester recorded zero gain during milling period.

Volumes pumped into the well (Canol)

Date	Volume (m3)	Remarks
March 4	5.8	Volume to fill tubing. Do not include per assumption 2 above
March 4	6.4	DFIT volume (21:30)
March 5	108.1	Lower Canol pad & treatment
	14.7	Lower Canol flush
	147.7	Middle Canol pad & treatment
	14.6	Middle Canol flush
	92.0	Upper Canol pad & treatment
	11.9	Upper Canol flush
March 7	4.0	Fill coil & well for milling (assumption 4 above)
March 8	0.0	No record kept of volume into coiled tubing, but tester recorded zero gain during milling period. (assumption 6 above)
March 9	0.0	Start N2 lifting
March 14	0.0	Discontinue N2 lifting – fluid from March 7 all included testers logs. Coil is dry – assumption 5 above
March 15	14.3	Fill tubing to set plugs. (should be 12 m3)
March 16	5.5	Refill tubing after setting plug (assumption 3)
TOTAL	**425.0**	**M3 of fluid pumped into I-78 Canol in March 2013**

Total fluid recovered from Canol according to tester’s notes is **291.43 m3.**

Although indications of new fluid were observed (colour and odour of returning fluid) and confirmed by laboratory analysis, there is still a **net 133.6 m3 of fluid left to recover** due to the short test time.

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TABLE 4
MGM ENERGY CORP. - EAST MACKAY
WELL 300/I-78-6450-12530/0 - SAMPLE IATA9456
SAMPLE VALIDATION
COMPOSITIONAL ANALYSIS OF FRAC OIL 1

Boiling Point (F)	Component Name	Chemical Symbol	Mole Fraction	Mass Fraction
-320.4	Nitrogen	N_2	0.0000	0.0000
-109.3	Carbon Dioxide	CO_2	0.0000	0.0000
-76.6	Hydrogen Sulphide	H_2S	0.0000	0.0000
-259.1	Methane	C_1	0.0000	0.0000
-128.0	Ethane	C_2	0.0000	0.0000
-44.0	Propane	C_3	0.0000	0.0000
10.9	i-Butane	i-C_4	0.0000	0.0000
30.9	n-Butane	n-C_4	0.0000	0.0000
82.0	i-Pentane	i-C_5	0.0000	0.0000
97.0	n-Pentane	n-C_5	0.0000	0.0000
97 - 156	Hexanes	C_6	0.0000	0.0000
156 - 208.9	Heptanes	C_7	0.0000	0.0000
208.9 - 258.1	Octanes	C_8	0.0000	0.0000
258.1 - 303.1	Nonanes	C_9	0.0005	0.0004
303.1 - 345	Decanes	C_{10}	0.0069	0.0058
345 - 385	Undecanes	C_{11}	0.1185	0.1028
385 - 419	Dodecanes	C_{12}	0.3332	0.3165
419 - 455	Tridecanes	C_{13}	0.3714	0.3835
455 - 486	Tetradecanes	C_{14}	0.1501	0.1682
486 - 519.1	Pentadecanes	C_{15}	0.0174	0.0211
519.1 - 550	Hexadecanes	C_{16}	0.0005	0.0007
550 - 557	Heptadecanes	C_{17}	0.0000	0.0000
557 - 603	Octadecanes	C_{18}	0.0000	0.0000
603 - 626	Nonadecanes	C_{19}	0.0000	0.0000
626 - 651.9	Eicosanes	C_{20}	0.0000	0.0000
651.9 - 675	Heneicosanes	C_{21}	0.0000	0.0000
675 - 696.9	Docosanes	C_{22}	0.0000	0.0000
696.9 - 716	Tricosanes	C_{23}	0.0000	0.0000
716 - 736	Tetracosanes	C_{24}	0.0000	0.0000
736 - 755.1	Pentacosanes	C_{25}	0.0000	0.0000
755.1 - 774	Hexacosanes	C_{26}	0.0000	0.0000
774.1 - 792	Heptacosanes	C_{27}	0.0000	0.0000
792.1 - 809.1	Octacosanes	C_{28}	0.0000	0.0000
809.1 - 826	Nonacosanes	C_{29}	0.0000	0.0000
Above 826	Tricontanes Plus	C_{30+}	0.0000	0.0000
	NAPHTHENES			
120.0	Cyclopentane	C_5H_{10}	0.0000	0.0000
162.0	Methylcyclopentane	C_6H_{12}	0.0000	0.0000
178.0	Cyclohexane	C_6H_{12}	0.0000	0.0000
214.0	Methylcyclohexane	C_7H_{14}	0.0000	0.0000
	AROMATICS			
176.0	Benzene	C_6H_6	0.0000	0.0000
231.1	Toluene	C_7H_8	0.0000	0.0000
277 - 282	Ethylbenzene & p,m-Xylene	C_8H_{10}	0.0001	0.0000
291.9	o-Xylene	C_8H_{10}	0.0000	0.0000
336.0	1, 2, 4-Trimethylbenzene	C_9H_{12}	0.0013	0.0009
Total			**1.0000**	**1.0000**

Total Sample

Molecular Weight	169.50
Density (g/cc)	0.8073

C_{6+} Fraction

Molecular Weight	169.50
Mole Fraction	1.0000
Density (g/cc)	0.8073

C_{7+} Fraction

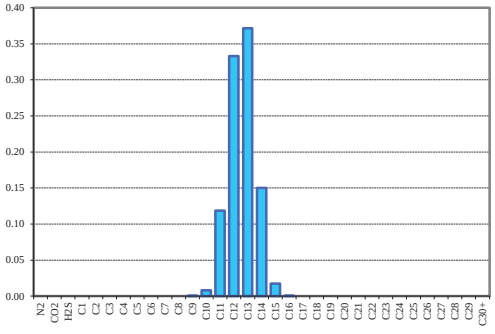
Molecular Weight	169.50
Mole Fraction	1.0000
Density (g/cc)	0.8073

C_{12+} Fraction

Molecular Weight	172.88
Mole Fraction	0.8726
Density (g/cc)	0.8096

C_{30+} Fraction

Molecular Weight	N/A
Mole Fraction	N/A
Density (g/cc)	N/A



Note: Physical properties are calculated based on GPA 2145-00 physical constants GC ID: 2120 ID: 15777-2383

TABLE 5
MGM ENERGY CORP. - EAST MACKAY
WELL 300/I-78-6450-12530/0 - SAMPLE IATA9458
SAMPLE VALIDATION
COMPOSITIONAL ANALYSIS OF FRAC OIL 2

Boiling Point (F)	Component Name	Chemical Symbol	Mole Fraction	Mass Fraction
-320.4	Nitrogen	N_2	0.0000	0.0000
-109.3	Carbon Dioxide	CO_2	0.0000	0.0000
-76.6	Hydrogen Sulphide	H_2S	0.0000	0.0000
-259.1	Methane	C_1	0.0000	0.0000
-128.0	Ethane	C_2	0.0000	0.0000
-44.0	Propane	C_3	0.0000	0.0000
10.9	i-Butane	i-C_4	0.0000	0.0000
30.9	n-Butane	n-C_4	0.0000	0.0000
82.0	i-Pentane	i-C_5	0.0000	0.0000
97.0	n-Pentane	n-C_5	0.0000	0.0000
97 - 156	Hexanes	C_6	0.0000	0.0000
156 - 208.9	Heptanes	C_7	0.0000	0.0000
208.9 - 258.1	Octanes	C_8	0.0000	0.0000
258.1 - 303.1	Nonanes	C_9	0.0005	0.0004
303.1 - 345	Decanes	C_{10}	0.0067	0.0056
345 - 385	Undecanes	C_{11}	0.1208	0.1051
385 - 419	Dodecanes	C_{12}	0.3422	0.3261
419 - 455	Tridecanes	C_{13}	0.3841	0.3979
455 - 486	Tetradecanes	C_{14}	0.1305	0.1468
486 - 519.1	Pentadecanes	C_{15}	0.0138	0.0168
519.1 - 550	Hexadecanes	C_{16}	0.0004	0.0005
550 - 557	Heptadecanes	C_{17}	0.0000	0.0000
557 - 603	Octadecanes	C_{18}	0.0000	0.0000
603 - 626	Nonadecanes	C_{19}	0.0000	0.0000
626 - 651.9	Eicosanes	C_{20}	0.0000	0.0000
651.9 - 675	Heneicosanes	C_{21}	0.0000	0.0000
675 - 696.9	Docosanes	C_{22}	0.0000	0.0000
696.9 - 716	Tricosanes	C_{23}	0.0000	0.0000
716 - 736	Tetracosanes	C_{24}	0.0000	0.0000
736 - 755.1	Pentacosanes	C_{25}	0.0000	0.0000
755.1 - 774	Hexacosanes	C_{26}	0.0000	0.0000
774.1 - 792	Heptacosanes	C_{27}	0.0000	0.0000
792.1 - 809.1	Octacosanes	C_{28}	0.0000	0.0000
809.1 - 826	Nonacosanes	C_{29}	0.0000	0.0000
Above 826	Tricontanes Plus	C_{30+}	0.0000	0.0000
	NAPHTHENES			
120.0	Cyclopentane	C_5H_{10}	0.0000	0.0000
162.0	Methylcyclopentane	C_6H_{12}	0.0000	0.0000
178.0	Cyclohexane	C_6H_{12}	0.0000	0.0000
214.0	Methylcyclohexane	C_7H_{14}	0.0000	0.0000
	AROMATICS			
176.0	Benzene	C_6H_6	0.0000	0.0000
231.1	Toluene	C_7H_8	0.0000	0.0000
277 - 282	Ethylbenzene & p,m-Xylene	C_8H_{10}	0.0001	0.0000
291.9	o-Xylene	C_8H_{10}	0.0000	0.0000
336.0	1, 2, 4-Trimethylbenzene	C_9H_{12}	0.0011	0.0008
Total			**1.0000**	**1.0000**

Total Sample

Molecular Weight	168.92
Density (g/cc)	0.8068

C_{6+} Fraction

Molecular Weight	168.92
Mole Fraction	1.0000
Density (g/cc)	0.8068

C_{7+} Fraction

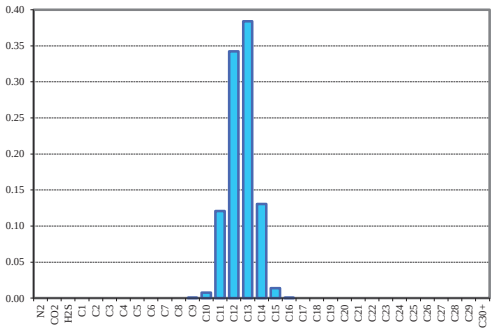
Molecular Weight	168.92
Mole Fraction	1.0000
Density (g/cc)	0.8068

C_{12+} Fraction

Molecular Weight	172.26
Mole Fraction	0.8709
Density (g/cc)	0.8091

C_{30+} Fraction

Molecular Weight	N/A
Mole Fraction	N/A
Density (g/cc)	N/A

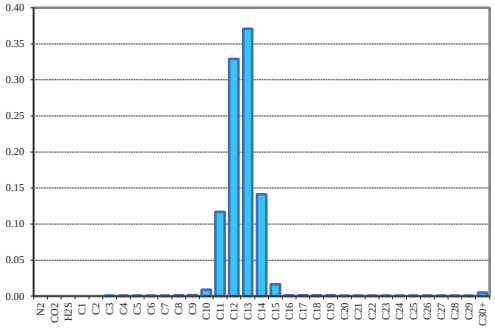


Note: Physical properties are calculated based on GPA 2145-00 physical constants GC ID: 2121 ID: 15778-2382

TABLE 6
MGM ENERGY CORP. - EAST MACKAY
WELL I-78-64-50-125-30 - NA - SAMPLE IATA9443
SAMPLE VALIDATION
COMPOSITIONAL ANALYSIS OFOIL (Bluefish, Mar.02 @19:30)

Boiling Point (F)	Component Name	Chemical Symbol	Mole Fraction	Mass Fraction
-320.4	Nitrogen	N_2	0.0000	0.0000
-109.3	Carbon Dioxide	CO_2	0.0000	0.0000
-76.6	Hydrogen Sulphide	H_2S	0.0000	0.0000
-259.1	Methane	C_1	0.0000	0.0000
-128.0	Ethane	C_2	0.0000	0.0000
-44.0	Propane	C_3	0.0004	0.0001
10.9	i-Butane	i-C_4	0.0001	0.0000
30.9	n-Butane	n-C_4	0.0003	0.0001
82.0	i-Pentane	i-C_5	0.0001	0.0001
97.0	n-Pentane	n-C_5	0.0002	0.0001
97 - 156	Hexanes	C_6	0.0007	0.0003
156 - 208.9	Heptanes	C_7	0.0005	0.0003
208.9 - 258.1	Octanes	C_8	0.0008	0.0005
258.1 - 303.1	Nonanes	C_9	0.0009	0.0007
303.1 - 345	Decanes	C_{10}	0.0077	0.0063
345 - 385	Undecanes	C_{11}	0.1168	0.0996
385 - 419	Dodecanes	C_{12}	0.3288	0.3073
419 - 455	Tridecanes	C_{13}	0.3707	0.3766
455 - 486	Tetradecanes	C_{14}	0.1414	0.1559
486 - 519.1	Pentadecanes	C_{15}	0.0164	0.0196
519.1 - 550	Hexadecanes	C_{16}	0.0012	0.0015
550 - 557	Heptadecanes	C_{17}	0.0009	0.0012
557 - 603	Octadecanes	C_{18}	0.0008	0.0011
603 - 626	Nonadecanes	C_{19}	0.0008	0.0012
626 - 651.9	Eicosanes	C_{20}	0.0006	0.0009
651.9 - 675	Heneicosanes	C_{21}	0.0005	0.0009
675 - 696.9	Docosanes	C_{22}	0.0005	0.0008
696.9 - 716	Tricosanes	C_{23}	0.0004	0.0007
716 - 736	Tetracosanes	C_{24}	0.0004	0.0008
736 - 755.1	Pentacosanes	C_{25}	0.0003	0.0007
755.1 - 774	Hexacosanes	C_{26}	0.0003	0.0007
774.1 - 792	Heptacosanes	C_{27}	0.0003	0.0006
792.1 - 809.1	Octacosanes	C_{28}	0.0003	0.0006
809.1 - 826	Nonacosanes	C_{29}	0.0002	0.0006
Above 826	Tricontanes Plus	C_{30+}	0.0048	0.0189
	NAPHTHENES			
120.0	Cyclopentane	C_5H_{10}	0.0001	0.0000
162.0	Methylcyclopentane	C_6H_{12}	0.0001	0.0000
178.0	Cyclohexane	C_6H_{12}	0.0001	0.0000
214.0	Methylcyclohexane	C_7H_{14}	0.0001	0.0001
	AROMATICS			
176.0	Benzene	C_6H_6	0.0000	0.0000
231.1	Toluene	C_7H_8	0.0001	0.0000
277 - 282	Ethylbenzene & p,m-Xylene	C_8H_{10}	0.0002	0.0001
291.9	o-Xylene	C_8H_{10}	0.0001	0.0001
336.0	1, 2, 4-Trimethylbenzene	C_9H_{12}	0.0013	0.0009
Total			**1.0000**	**1.0000**

Calculated Properties	
Total Sample	
Molecular Weight	172.29
Density (g/cc)	0.8104
C_{6+} Fraction	
Molecular Weight	172.42
Mole Fraction	0.9988
Density (g/cc)	0.8106
C_{7+} Fraction	
Molecular Weight	172.48
Mole Fraction	0.9981
Density (g/cc)	0.8106
C_{12+} Fraction	
Molecular Weight	176.46
Mole Fraction	0.8694
Density (g/cc)	0.8134
C_{30+} Fraction	
Molecular Weight	683.00
Mole Fraction	0.0048
Density (g/cc)	0.9947



Note: Physical properties are calculated based on GPA 2145-00 physical constants GC ID: 2136 ID: 15880-2398

TABLE 7
MGM ENERGY CORP. - EAST MACKAY
WELL I-78-64-50-125-30 - NA - SAMPLE IATA9445
SAMPLE VALIDATION
COMPOSITIONAL ANALYSIS OF OIL (Bluefish, Mar.02 @ 21:00)

Boiling Point (F)	Component Name	Chemical Symbol	Mole Fraction	Mass Fraction
-320.4	Nitrogen	N_2	0.0000	0.0000
-109.3	Carbon Dioxide	CO_2	0.0000	0.0000
-76.6	Hydrogen Sulphide	H_2S	0.0000	0.0000
-259.1	Methane	C_1	0.0000	0.0000
-128.0	Ethane	C_2	0.0000	0.0000
-44.0	Propane	C_3	0.0004	0.0001
10.9	i-Butane	i-C_4	0.0002	0.0001
30.9	n-Butane	n-C_4	0.0007	0.0002
82.0	i-Pentane	i-C_5	0.0004	0.0001
97.0	n-Pentane	n-C_5	0.0006	0.0003
97 - 156	Hexanes	C_6	0.0015	0.0007
156 - 208.9	Heptanes	C_7	0.0011	0.0006
208.9 - 258.1	Octanes	C_8	0.0015	0.0010
258.1 - 303.1	Nonanes	C_9	0.0016	0.0011
303.1 - 345	Decanes	C_{10}	0.0076	0.0062
345 - 385	Undecanes	C_{11}	0.1150	0.0960
385 - 419	Dodecanes	C_{12}	0.3202	0.2927
419 - 455	Tridecanes	C_{13}	0.3614	0.3591
455 - 486	Tetradecanes	C_{14}	0.1411	0.1522
486 - 519.1	Pentadecanes	C_{15}	0.0170	0.0199
519.1 - 550	Hexadecanes	C_{16}	0.0021	0.0026
550 - 557	Heptadecanes	C_{17}	0.0018	0.0025
557 - 603	Octadecanes	C_{18}	0.0017	0.0024
603 - 626	Nonadecanes	C_{19}	0.0017	0.0025
626 - 651.9	Eicosanes	C_{20}	0.0014	0.0021
651.9 - 675	Heneicosanes	C_{21}	0.0012	0.0020
675 - 696.9	Docosanes	C_{22}	0.0012	0.0020
696.9 - 716	Tricosanes	C_{23}	0.0009	0.0017
716 - 736	Tetracosanes	C_{24}	0.0010	0.0019
736 - 755.1	Pentacosanes	C_{25}	0.0009	0.0018
755.1 - 774	Hexacosanes	C_{26}	0.0009	0.0018
774.1 - 792	Heptacosanes	C_{27}	0.0008	0.0017
792.1 - 809.1	Octacosanes	C_{28}	0.0008	0.0017
809.1 - 826	Nonacosanes	C_{29}	0.0007	0.0017
Above 826	Tricontanes Plus	C_{30+}	0.0103	0.0399
	NAPHTHENES			
120.0	Cyclopentane	C_5H_{10}	0.0002	0.0001
162.0	Methylcyclopentane	C_6H_{12}	0.0001	0.0001
178.0	Cyclohexane	C_6H_{12}	0.0002	0.0001
214.0	Methylcyclohexane	C_7H_{14}	0.0002	0.0001
	AROMATICS			
176.0	Benzene	C_6H_6	0.0001	0.0000
231.1	Toluene	C_7H_8	0.0001	0.0001
277 - 282	Ethylbenzene & p,m-Xylene	C_8H_{10}	0.0003	0.0002
291.9	o-Xylene	C_8H_{10}	0.0002	0.0001
336.0	1, 2, 4-Trimethylbenzene	C_9H_{12}	0.0012	0.0008
Total			**1.0000**	**1.0000**

Calculated Properties

Total Sample

Molecular Weight	176.12
Density (g/cc)	0.8145

C_{6+} Fraction

Molecular Weight	176.38
Mole Fraction	0.9978
Density (g/cc)	0.8147

C_{7+} Fraction

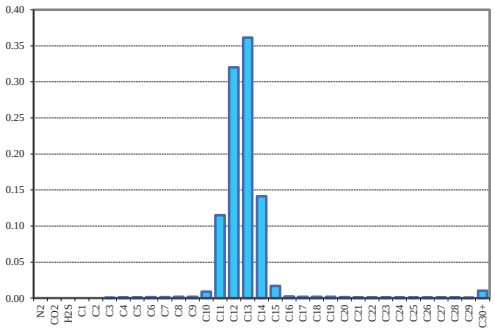
Molecular Weight	176.52
Mole Fraction	0.9962
Density (g/cc)	0.8148

C_{12+} Fraction

Molecular Weight	181.22
Mole Fraction	0.8670
Density (g/cc)	0.8181

C_{30+} Fraction

Molecular Weight	683.00
Mole Fraction	0.0103
Density (g/cc)	0.9947



Note: Physical properties are calculated based on GPA 2145-00 physical constants GC ID: 2137 ID: 15804-2399

TABLE 8
MGM ENERGY CORP. - EAST MACKAY
WELL I-78-64-50-125-30 - NA - SAMPLE IATA9473
SAMPLE VALIDATION
COMPOSITIONAL ANALYSIS OF OIL (Mar.09 @ 12:45)

Boiling Point (F)	Component Name	Chemical Symbol	Mole Fraction	Mass Fraction
-320.4	Nitrogen	N_2	0.0000	0.0000
-109.3	Carbon Dioxide	CO_2	0.0000	0.0000
-76.6	Hydrogen Sulphide	H_2S	0.0000	0.0000
-259.1	Methane	C_1	0.0000	0.0000
-128.0	Ethane	C_2	0.0000	0.0000
-44.0	Propane	C_3	0.0007	0.0002
10.9	i-Butane	i-C_4	0.0002	0.0001
30.9	n-Butane	n-C_4	0.0007	0.0002
82.0	i-Pentane	i-C_5	0.0003	0.0001
97.0	n-Pentane	n-C_5	0.0005	0.0002
97 - 156	Hexanes	C_6	0.0009	0.0004
156 - 208.9	Heptanes	C_7	0.0010	0.0006
208.9 - 258.1	Octanes	C_8	0.0014	0.0009
258.1 - 303.1	Nonanes	C_9	0.0015	0.0011
303.1 - 345	Decanes	C_{10}	0.0083	0.0068
345 - 385	Undecanes	C_{11}	0.1163	0.0978
385 - 419	Dodecanes	C_{12}	0.3254	0.2998
419 - 455	Tridecanes	C_{13}	0.3654	0.3660
455 - 486	Tetradecanes	C_{14}	0.1371	0.1491
486 - 519.1	Pentadecanes	C_{15}	0.0168	0.0198
519.1 - 550	Hexadecanes	C_{16}	0.0019	0.0024
550 - 557	Heptadecanes	C_{17}	0.0015	0.0020
557 - 603	Octadecanes	C_{18}	0.0012	0.0017
603 - 626	Nonadecanes	C_{19}	0.0012	0.0017
626 - 651.9	Eicosanes	C_{20}	0.0009	0.0014
651.9 - 675	Heneicosanes	C_{21}	0.0008	0.0013
675 - 696.9	Docosanes	C_{22}	0.0007	0.0012
696.9 - 716	Tricosanes	C_{23}	0.0006	0.0011
716 - 736	Tetracosanes	C_{24}	0.0006	0.0012
736 - 755.1	Pentacosanes	C_{25}	0.0006	0.0012
755.1 - 774	Hexacosanes	C_{26}	0.0005	0.0010
774.1 - 792	Heptacosanes	C_{27}	0.0005	0.0010
792.1 - 809.1	Octacosanes	C_{28}	0.0004	0.0009
809.1 - 826	Nonacosanes	C_{29}	0.0004	0.0009
Above 826	Tricontanes Plus	C_{30+}	0.0092	0.0361
	NAPHTHENES			
120.0	Cyclopentane	C_5H_{10}	0.0001	0.0000
162.0	Methylcyclopentane	C_6H_{12}	0.0001	0.0000
178.0	Cyclohexane	C_6H_{12}	0.0001	0.0001
214.0	Methylcyclohexane	C_7H_{14}	0.0002	0.0001
	AROMATICS			
176.0	Benzene	C_6H_6	0.0001	0.0000
231.1	Toluene	C_7H_8	0.0002	0.0001
277 - 282	Ethylbenzene & p,m-Xylene	C_8H_{10}	0.0002	0.0001
291.9	o-Xylene	C_8H_{10}	0.0002	0.0001
336.0	1, 2, 4-Trimethylbenzene	C_9H_{12}	0.0015	0.0010
Total			**1.0000**	**1.0000**

Calculated Properties

Total Sample

Molecular Weight	174.73
Density (g/cc)	0.8132

C_{6+} Fraction

Molecular Weight	175.00
Mole Fraction	0.9977
Density (g/cc)	0.8135

C_{7+} Fraction

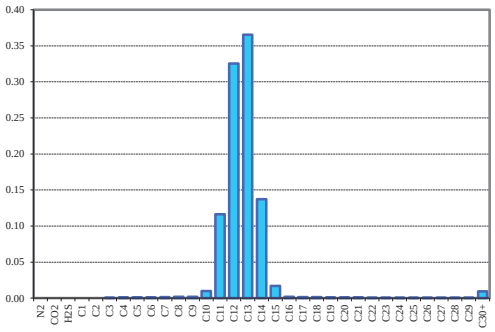
Molecular Weight	175.09
Mole Fraction	0.9967
Density (g/cc)	0.8135

C_{12+} Fraction

Molecular Weight	179.63
Mole Fraction	0.8657
Density (g/cc)	0.8168

C_{30+} Fraction

Molecular Weight	683.00
Mole Fraction	0.0092
Density (g/cc)	0.9947



Note: Physical properties are calculated based on GPA 2145-00 physical constants GC ID: 2152 ID: 15828-2409

TABLE 9
MGM ENERGY CORP. - EAST MACKAY
WELL I-78-64-50-125-30 - NA - SAMPLE IATA9460
SAMPLE VALIDATION
COMPOSITIONAL ANALYSIS OF OIL (Mar.10 @ 0:00)

Boiling Point (F)	Component Name	Chemical Symbol	Mole Fraction	Mass Fraction
-320.4	Nitrogen	N_2	0.0000	0.0000
-109.3	Carbon Dioxide	CO_2	0.0000	0.0000
-76.6	Hydrogen Sulphide	H_2S	0.0000	0.0000
-259.1	Methane	C_1	0.0000	0.0000
-128.0	Ethane	C_2	0.0000	0.0000
-44.0	Propane	C_3	0.0002	0.0001
10.9	i-Butane	i-C_4	0.0001	0.0000
30.9	n-Butane	n-C_4	0.0004	0.0001
82.0	i-Pentane	i-C_5	0.0004	0.0002
97.0	n-Pentane	n-C_5	0.0006	0.0003
97 - 156	Hexanes	C_6	0.0018	0.0009
156 - 208.9	Heptanes	C_7	0.0016	0.0009
208.9 - 258.1	Octanes	C_8	0.0019	0.0012
258.1 - 303.1	Nonanes	C_9	0.0019	0.0014
303.1 - 345	Decanes	C_{10}	0.0086	0.0070
345 - 385	Undecanes	C_{11}	0.1168	0.0975
385 - 419	Dodecanes	C_{12}	0.3214	0.2939
419 - 455	Tridecanes	C_{13}	0.3607	0.3585
455 - 486	Tetradecanes	C_{14}	0.1371	0.1479
486 - 519.1	Pentadecanes	C_{15}	0.0168	0.0196
519.1 - 550	Hexadecanes	C_{16}	0.0023	0.0029
550 - 557	Heptadecanes	C_{17}	0.0018	0.0024
557 - 603	Octadecanes	C_{18}	0.0016	0.0022
603 - 626	Nonadecanes	C_{19}	0.0015	0.0022
626 - 651.9	Eicosanes	C_{20}	0.0013	0.0020
651.9 - 675	Heneicosanes	C_{21}	0.0010	0.0017
675 - 696.9	Docosanes	C_{22}	0.0009	0.0016
696.9 - 716	Tricosanes	C_{23}	0.0008	0.0015
716 - 736	Tetracosanes	C_{24}	0.0008	0.0015
736 - 755.1	Pentacosanes	C_{25}	0.0007	0.0015
755.1 - 774	Hexacosanes	C_{26}	0.0007	0.0013
774.1 - 792	Heptacosanes	C_{27}	0.0006	0.0013
792.1 - 809.1	Octacosanes	C_{28}	0.0006	0.0012
809.1 - 826	Nonacosanes	C_{29}	0.0005	0.0012
Above 826	Tricontanes Plus	C_{30+}	0.0114	0.0442
	NAPHTHENES			
120.0	Cyclopentane	C_5H_{10}	0.0001	0.0001
162.0	Methylcyclopentane	C_6H_{12}	0.0002	0.0001
178.0	Cyclohexane	C_6H_{12}	0.0002	0.0001
214.0	Methylcyclohexane	C_7H_{14}	0.0001	0.0000
	AROMATICS			
176.0	Benzene	C_6H_6	0.0001	0.0000
231.1	Toluene	C_7H_8	0.0002	0.0001
277 - 282	Ethylbenzene & p,m-Xylene	C_8H_{10}	0.0003	0.0002
291.9	o-Xylene	C_8H_{10}	0.0002	0.0001
336.0	1, 2, 4-Trimethylbenzene	C_9H_{12}	0.0017	0.0011
Total			**1.0000**	**1.0000**

Total Sample

Molecular Weight	176.09
Density (g/cc)	0.8147

C_{6+} Fraction

Molecular Weight	176.29
Mole Fraction	0.9982
Density (g/cc)	0.8149

C_{7+} Fraction

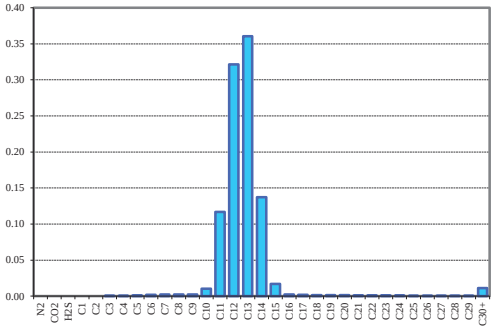
Molecular Weight	176.46
Mole Fraction	0.9963
Density (g/cc)	0.8151

C_{12+} Fraction

Molecular Weight	181.43
Mole Fraction	0.8624
Density (g/cc)	0.8185

C_{30+} Fraction

Molecular Weight	683.00
Mole Fraction	0.0114
Density (g/cc)	0.9947



Note: Physical properties are calculated based on GPA 2145-00 physical constants GC ID: 2139 ID: 15808-2400

TABLE 10
MGM ENERGY CORP. - EAST MACKAY
WELL I-78-64-50-125-30 - NA - SAMPLE IATA9461
SAMPLE VALIDATION
COMPOSITIONAL ANALYSIS OF OIL (Mar.10 @ 12:00)

Boiling Point (F)	Component Name	Chemical Symbol	Mole Fraction	Mass Fraction
-320.4	Nitrogen	N_2	0.0000	0.0000
-109.3	Carbon Dioxide	CO_2	0.0000	0.0000
-76.6	Hydrogen Sulphide	H_2S	0.0000	0.0000
-259.1	Methane	C_1	0.0000	0.0000
-128.0	Ethane	C_2	0.0000	0.0000
-44.0	Propane	C_3	0.0003	0.0001
10.9	i-Butane	i-C_4	0.0002	0.0001
30.9	n-Butane	n-C_4	0.0006	0.0002
82.0	i-Pentane	i-C_5	0.0004	0.0002
97.0	n-Pentane	n-C_5	0.0008	0.0003
97 - 156	Hexanes	C_6	0.0018	0.0009
156 - 208.9	Heptanes	C_7	0.0015	0.0009
208.9 - 258.1	Octanes	C_8	0.0019	0.0013
258.1 - 303.1	Nonanes	C_9	0.0018	0.0013
303.1 - 345	Decanes	C_{10}	0.0090	0.0074
345 - 385	Undecanes	C_{11}	0.1184	0.1001
385 - 419	Dodecanes	C_{12}	0.3273	0.3032
419 - 455	Tridecanes	C_{13}	0.3610	0.3634
455 - 486	Tetradecanes	C_{14}	0.1362	0.1489
486 - 519.1	Pentadecanes	C_{15}	0.0162	0.0192
519.1 - 550	Hexadecanes	C_{16}	0.0019	0.0024
550 - 557	Heptadecanes	C_{17}	0.0014	0.0019
557 - 603	Octadecanes	C_{18}	0.0012	0.0017
603 - 626	Nonadecanes	C_{19}	0.0012	0.0018
626 - 651.9	Eicosanes	C_{20}	0.0009	0.0014
651.9 - 675	Heneicosanes	C_{21}	0.0008	0.0014
675 - 696.9	Docosanes	C_{22}	0.0007	0.0012
696.9 - 716	Tricosanes	C_{23}	0.0006	0.0011
716 - 736	Tetracosanes	C_{24}	0.0006	0.0011
736 - 755.1	Pentacosanes	C_{25}	0.0005	0.0011
755.1 - 774	Hexacosanes	C_{26}	0.0005	0.0011
774.1 - 792	Heptacosanes	C_{27}	0.0004	0.0010
792.1 - 809.1	Octacosanes	C_{28}	0.0004	0.0009
809.1 - 826	Nonacosanes	C_{29}	0.0004	0.0009
Above 826	Tricontanes Plus	C_{30+}	0.0081	0.0319
	NAPHTHENES			
120.0	Cyclopentane	C_5H_{10}	0.0001	0.0001
162.0	Methylcyclopentane	C_6H_{12}	0.0002	0.0001
178.0	Cyclohexane	C_6H_{12}	0.0002	0.0001
214.0	Methylcyclohexane	C_7H_{14}	0.0003	0.0002
	AROMATICS			
176.0	Benzene	C_6H_6	0.0001	0.0001
231.1	Toluene	C_7H_8	0.0002	0.0001
277 - 282	Ethylbenzene & p,m-Xylene	C_8H_{10}	0.0003	0.0002
291.9	o-Xylene	C_8H_{10}	0.0002	0.0001
336.0	1, 2, 4-Trimethylbenzene	C_9H_{12}	0.0012	0.0008
Total			**1.0000**	**1.0000**

Calculated Properties

Total Sample

Molecular Weight	173.81
Density (g/cc)	0.8123

C_{6+} Fraction

Molecular Weight	174.07
Mole Fraction	0.9977
Density (g/cc)	0.8126

C_{7+} Fraction

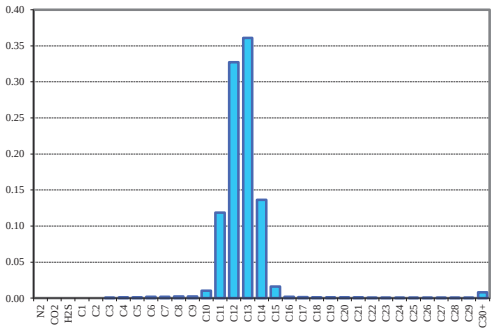
Molecular Weight	174.24
Mole Fraction	0.9958
Density (g/cc)	0.8127

C_{12+} Fraction

Molecular Weight	178.90
Mole Fraction	0.8604
Density (g/cc)	0.8160

C_{30+} Fraction

Molecular Weight	683.00
Mole Fraction	0.0081
Density (g/cc)	0.9947

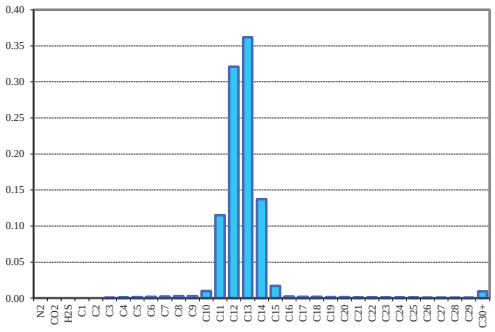


Note: Physical properties are calculated based on GPA 2145-00 physical constants GC ID: 2143 ID: 15814-2401

TABLE 11
MGM ENERGY CORP. - EAST MACKAY
WELL I-78-64-50-125-30 - NA - SAMPLE IATA9462
SAMPLE VALIDATION
COMPOSITIONAL ANALYSIS OF OIL (Mar.10 @ 23:00)

Boiling Point (F)	Component Name	Chemical Symbol	Mole Fraction	Mass Fraction
-320.4	Nitrogen	N_2	0.0000	0.0000
-109.3	Carbon Dioxide	CO_2	0.0000	0.0000
-76.6	Hydrogen Sulphide	H_2S	0.0000	0.0000
-259.1	Methane	C_1	0.0000	0.0000
-128.0	Ethane	C_2	0.0000	0.0000
-44.0	Propane	C_3	0.0002	0.0001
10.9	i-Butane	i-C_4	0.0002	0.0001
30.9	n-Butane	n-C_4	0.0009	0.0003
82.0	i-Pentane	i-C_5	0.0005	0.0002
97.0	n-Pentane	n-C_5	0.0009	0.0004
97 - 156	Hexanes	C_6	0.0018	0.0009
156 - 208.9	Heptanes	C_7	0.0017	0.0010
208.9 - 258.1	Octanes	C_8	0.0021	0.0014
258.1 - 303.1	Nonanes	C_9	0.0021	0.0015
303.1 - 345	Decanes	C_{10}	0.0086	0.0070
345 - 385	Undecanes	C_{11}	0.1151	0.0965
385 - 419	Dodecanes	C_{12}	0.3210	0.2948
419 - 455	Tridecanes	C_{13}	0.3617	0.3612
455 - 486	Tetradecanes	C_{14}	0.1372	0.1488
486 - 519.1	Pentadecanes	C_{15}	0.0168	0.0198
519.1 - 550	Hexadecanes	C_{16}	0.0025	0.0031
550 - 557	Heptadecanes	C_{17}	0.0019	0.0026
557 - 603	Octadecanes	C_{18}	0.0017	0.0024
603 - 626	Nonadecanes	C_{19}	0.0016	0.0024
626 - 651.9	Eicosanes	C_{20}	0.0013	0.0021
651.9 - 675	Heneicosanes	C_{21}	0.0012	0.0019
675 - 696.9	Docosanes	C_{22}	0.0010	0.0018
696.9 - 716	Tricosanes	C_{23}	0.0009	0.0016
716 - 736	Tetracosanes	C_{24}	0.0009	0.0017
736 - 755.1	Pentacosanes	C_{25}	0.0008	0.0015
755.1 - 774	Hexacosanes	C_{26}	0.0007	0.0015
774.1 - 792	Heptacosanes	C_{27}	0.0007	0.0015
792.1 - 809.1	Octacosanes	C_{28}	0.0006	0.0013
809.1 - 826	Nonacosanes	C_{29}	0.0006	0.0013
Above 826	Tricontanes Plus	C_{30+}	0.0096	0.0374
	NAPHTHENES			
120.0	Cyclopentane	C_5H_{10}	0.0001	0.0001
162.0	Methylcyclopentane	C_6H_{12}	0.0002	0.0001
178.0	Cyclohexane	C_6H_{12}	0.0003	0.0001
214.0	Methylcyclohexane	C_7H_{14}	0.0003	0.0002
	AROMATICS			
176.0	Benzene	C_6H_6	0.0001	0.0001
231.1	Toluene	C_7H_8	0.0002	0.0001
277 - 282	Ethylbenzene & p,m-Xylene	C_8H_{10}	0.0003	0.0002
291.9	o-Xylene	C_8H_{10}	0.0002	0.0001
336.0	1, 2, 4-Trimethylbenzene	C_9H_{12}	0.0014	0.0010
Total			**1.0000**	**1.0000**

Calculated Properties	
Total Sample	
Molecular Weight	175.27
Density (g/cc)	0.8137
C_{6+} Fraction	
Molecular Weight	175.57
Mole Fraction	0.9973
Density (g/cc)	0.8140
C_{7+} Fraction	
Molecular Weight	175.74
Mole Fraction	0.9954
Density (g/cc)	0.8141
C_{12+} Fraction	
Molecular Weight	180.57
Mole Fraction	0.8628
Density (g/cc)	0.8175
C_{30+} Fraction	
Molecular Weight	683.00
Mole Fraction	0.0096
Density (g/cc)	0.9947

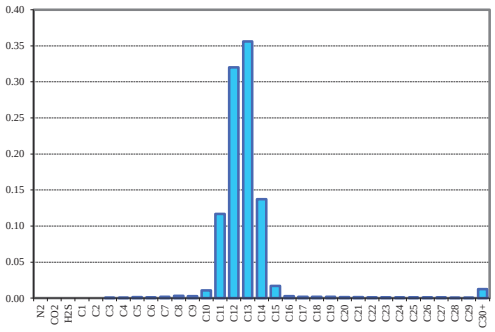


Note: Physical properties are calculated based on GPA 2145-00 physical constants GC ID: 2144 ID: 15818-2402

TABLE 12
MGM ENERGY CORP. - EAST MACKAY
WELL I-78-64-50-125-30 - NA - SAMPLE IATA9463
SAMPLE VALIDATION
COMPOSITIONAL ANALYSIS OF OIL (Mar.11 @ 11:00)

Boiling Point (F)	Component Name	Chemical Symbol	Mole Fraction	Mass Fraction
-320.4	Nitrogen	N_2	0.0000	0.0000
-109.3	Carbon Dioxide	CO_2	0.0000	0.0000
-76.6	Hydrogen Sulphide	H_2S	0.0000	0.0000
-259.1	Methane	C_1	0.0000	0.0000
-128.0	Ethane	C_2	0.0000	0.0000
-44.0	Propane	C_3	0.0003	0.0001
10.9	i-Butane	i-C_4	0.0001	0.0000
30.9	n-Butane	n-C_4	0.0004	0.0001
82.0	i-Pentane	i-C_5	0.0003	0.0001
97.0	n-Pentane	n-C_5	0.0009	0.0004
97 - 156	Hexanes	C_6	0.0011	0.0005
156 - 208.9	Heptanes	C_7	0.0017	0.0010
208.9 - 258.1	Octanes	C_8	0.0025	0.0016
258.1 - 303.1	Nonanes	C_9	0.0022	0.0016
303.1 - 345	Decanes	C_{10}	0.0090	0.0072
345 - 385	Undecanes	C_{11}	0.1169	0.0971
385 - 419	Dodecanes	C_{12}	0.3203	0.2912
419 - 455	Tridecanes	C_{13}	0.3560	0.3519
455 - 486	Tetradecanes	C_{14}	0.1373	0.1474
486 - 519.1	Pentadecanes	C_{15}	0.0172	0.0200
519.1 - 550	Hexadecanes	C_{16}	0.0026	0.0032
550 - 557	Heptadecanes	C_{17}	0.0020	0.0026
557 - 603	Octadecanes	C_{18}	0.0018	0.0025
603 - 626	Nonadecanes	C_{19}	0.0017	0.0025
626 - 651.9	Eicosanes	C_{20}	0.0014	0.0022
651.9 - 675	Heneicosanes	C_{21}	0.0012	0.0020
675 - 696.9	Docosanes	C_{22}	0.0011	0.0020
696.9 - 716	Tricosanes	C_{23}	0.0010	0.0018
716 - 736	Tetracosanes	C_{24}	0.0010	0.0018
736 - 755.1	Pentacosanes	C_{25}	0.0009	0.0017
755.1 - 774	Hexacosanes	C_{26}	0.0009	0.0017
774.1 - 792	Heptacosanes	C_{27}	0.0008	0.0017
792.1 - 809.1	Octacosanes	C_{28}	0.0007	0.0015
809.1 - 826	Nonacosanes	C_{29}	0.0006	0.0014
Above 826	Tricontanes Plus	C_{30+}	0.0127	0.0490
	NAPHTHENES			
120.0	Cyclopentane	C_5H_{10}	0.0001	0.0000
162.0	Methylcyclopentane	C_6H_{12}	0.0001	0.0001
178.0	Cyclohexane	C_6H_{12}	0.0001	0.0001
214.0	Methylcyclohexane	C_7H_{14}	0.0004	0.0002
	AROMATICS			
176.0	Benzene	C_6H_6	0.0001	0.0000
231.1	Toluene	C_7H_8	0.0003	0.0001
277 - 282	Ethylbenzene & p,m-Xylene	C_8H_{10}	0.0004	0.0002
291.9	o-Xylene	C_8H_{10}	0.0003	0.0002
336.0	1, 2, 4-Trimethylbenzene	C_9H_{12}	0.0018	0.0012
Total			**1.0000**	**1.0000**

Calculated Properties	
Total Sample	
Molecular Weight	177.06
Density (g/cc)	0.8157
C_{6+} Fraction	
Molecular Weight	177.30
Mole Fraction	0.9979
Density (g/cc)	0.8159
C_{7+} Fraction	
Molecular Weight	177.41
Mole Fraction	0.9967
Density (g/cc)	0.8160
C_{12+} Fraction	
Molecular Weight	182.63
Mole Fraction	0.8611
Density (g/cc)	0.8197
C_{30+} Fraction	
Molecular Weight	683.00
Mole Fraction	0.0127
Density (g/cc)	0.9947

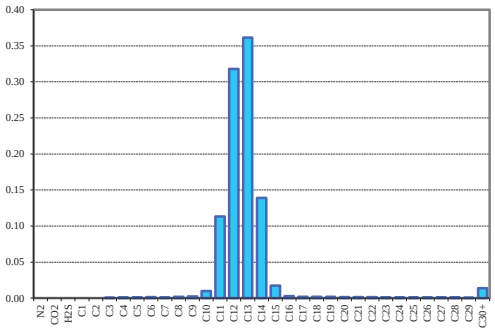


Note: Physical properties are calculated based on GPA 2145-00 physical constants GC ID: 2145 ID: 15819-2403

TABLE 13
MGM ENERGY CORP. - EAST MACKAY
WELL I-78-64-50-125-30 - NA - SAMPLE IATA9464
SAMPLE VALIDATION
COMPOSITIONAL ANALYSIS OF OIL (Mar.11 @ 23:00)

Boiling Point (F)	Component Name	Chemical Symbol	Mole Fraction	Mass Fraction
-320.4	Nitrogen	N_2	0.0000	0.0000
-109.3	Carbon Dioxide	CO_2	0.0000	0.0000
-76.6	Hydrogen Sulphide	H_2S	0.0000	0.0000
-259.1	Methane	C_1	0.0000	0.0000
-128.0	Ethane	C_2	0.0000	0.0000
-44.0	Propane	C_3	0.0001	0.0000
10.9	i-Butane	i-C_4	0.0002	0.0001
30.9	n-Butane	n-C_4	0.0009	0.0003
82.0	i-Pentane	i-C_5	0.0003	0.0001
97.0	n-Pentane	n-C_5	0.0006	0.0003
97 - 156	Hexanes	C_6	0.0012	0.0006
156 - 208.9	Heptanes	C_7	0.0008	0.0005
208.9 - 258.1	Octanes	C_8	0.0014	0.0009
258.1 - 303.1	Nonanes	C_9	0.0017	0.0012
303.1 - 345	Decanes	C_{10}	0.0082	0.0066
345 - 385	Undecanes	C_{11}	0.1134	0.0936
385 - 419	Dodecanes	C_{12}	0.3180	0.2874
419 - 455	Tridecanes	C_{13}	0.3614	0.3550
455 - 486	Tetradecanes	C_{14}	0.1392	0.1484
486 - 519.1	Pentadecanes	C_{15}	0.0176	0.0203
519.1 - 550	Hexadecanes	C_{16}	0.0025	0.0032
550 - 557	Heptadecanes	C_{17}	0.0021	0.0028
557 - 603	Octadecanes	C_{18}	0.0019	0.0026
603 - 626	Nonadecanes	C_{19}	0.0018	0.0026
626 - 651.9	Eicosanes	C_{20}	0.0015	0.0023
651.9 - 675	Heneicosanes	C_{21}	0.0013	0.0021
675 - 696.9	Docosanes	C_{22}	0.0012	0.0021
696.9 - 716	Tricosanes	C_{23}	0.0010	0.0018
716 - 736	Tetracosanes	C_{24}	0.0010	0.0019
736 - 755.1	Pentacosanes	C_{25}	0.0010	0.0019
755.1 - 774	Hexacosanes	C_{26}	0.0009	0.0018
774.1 - 792	Heptacosanes	C_{27}	0.0008	0.0017
792.1 - 809.1	Octacosanes	C_{28}	0.0008	0.0017
809.1 - 826	Nonacosanes	C_{29}	0.0007	0.0015
Above 826	Tricontanes Plus	C_{30+}	0.0138	0.0531
	NAPHTHENES			
120.0	Cyclopentane	C_5H_{10}	0.0001	0.0000
162.0	Methylcyclopentane	C_6H_{12}	0.0002	0.0001
178.0	Cyclohexane	C_6H_{12}	0.0001	0.0000
214.0	Methylcyclohexane	C_7H_{14}	0.0001	0.0001
	AROMATICS			
176.0	Benzene	C_6H_6	0.0001	0.0000
231.1	Toluene	C_7H_8	0.0001	0.0001
277 - 282	Ethylbenzene & p,m-Xylene	C_8H_{10}	0.0003	0.0002
291.9	o-Xylene	C_8H_{10}	0.0002	0.0001
336.0	1, 2, 4-Trimethylbenzene	C_9H_{12}	0.0017	0.0011
Total			**1.0000**	**1.0000**

Calculated Properties	
Total Sample	
Molecular Weight	178.13
Density (g/cc)	0.8167
C_{6+} Fraction	
Molecular Weight	178.37
Mole Fraction	0.9979
Density (g/cc)	0.8169
C_{7+} Fraction	
Molecular Weight	178.49
Mole Fraction	0.9966
Density (g/cc)	0.8170
C_{12+} Fraction	
Molecular Weight	183.44
Mole Fraction	0.8683
Density (g/cc)	0.8205
C_{30+} Fraction	
Molecular Weight	683.00
Mole Fraction	0.0138
Density (g/cc)	0.9947

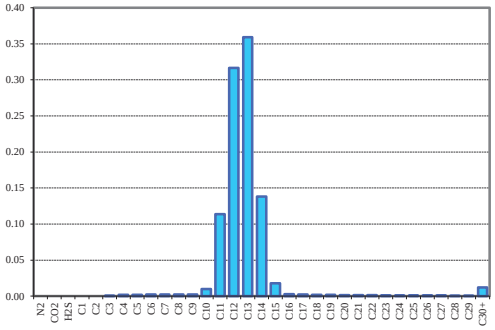


Note: Physical properties are calculated based on GPA 2145-00 physical constants GC ID: 2146 ID: 15820-2404

TABLE 14
MGM ENERGY CORP. - EAST MACKAY
WELL I-78-64-50-125-30 - NA - SAMPLE IATA9431
SAMPLE VALIDATION
COMPOSITIONAL ANALYSIS OF OIL (Mar.12 @ 11:00)

Boiling Point (F)	Component Name	Chemical Symbol	Mole Fraction	Mass Fraction
-320.4	Nitrogen	N_2	0.0000	0.0000
-109.3	Carbon Dioxide	CO_2	0.0000	0.0000
-76.6	Hydrogen Sulphide	H_2S	0.0000	0.0000
-259.1	Methane	C_1	0.0000	0.0000
-128.0	Ethane	C_2	0.0000	0.0000
-44.0	Propane	C_3	0.0003	0.0001
10.9	i-Butane	i-C_4	0.0002	0.0001
30.9	n-Butane	n-C_4	0.0015	0.0005
82.0	i-Pentane	i-C_5	0.0006	0.0003
97.0	n-Pentane	n-C_5	0.0013	0.0005
97 - 156	Hexanes	C_6	0.0020	0.0010
156 - 208.9	Heptanes	C_7	0.0016	0.0009
208.9 - 258.1	Octanes	C_8	0.0020	0.0013
258.1 - 303.1	Nonanes	C_9	0.0019	0.0014
303.1 - 345	Decanes	C_{10}	0.0086	0.0069
345 - 385	Undecanes	C_{11}	0.1138	0.0946
385 - 419	Dodecanes	C_{12}	0.3167	0.2883
419 - 455	Tridecanes	C_{13}	0.3592	0.3554
455 - 486	Tetradecanes	C_{14}	0.1380	0.1483
486 - 519.1	Pentadecanes	C_{15}	0.0178	0.0207
519.1 - 550	Hexadecanes	C_{16}	0.0027	0.0034
550 - 557	Heptadecanes	C_{17}	0.0021	0.0028
557 - 603	Octadecanes	C_{18}	0.0019	0.0027
603 - 626	Nonadecanes	C_{19}	0.0018	0.0027
626 - 651.9	Eicosanes	C_{20}	0.0015	0.0024
651.9 - 675	Heneicosanes	C_{21}	0.0014	0.0022
675 - 696.9	Docosanes	C_{22}	0.0013	0.0022
696.9 - 716	Tricosanes	C_{23}	0.0011	0.0019
716 - 736	Tetracosanes	C_{24}	0.0011	0.0020
736 - 755.1	Pentacosanes	C_{25}	0.0010	0.0019
755.1 - 774	Hexacosanes	C_{26}	0.0009	0.0018
774.1 - 792	Heptacosanes	C_{27}	0.0009	0.0018
792.1 - 809.1	Octacosanes	C_{28}	0.0007	0.0016
809.1 - 826	Nonacosanes	C_{29}	0.0007	0.0016
Above 826	Tricontanes Plus	C_{30+}	0.0121	0.0468
	NAPHTHENES			
120.0	Cyclopentane	C_5H_{10}	0.0002	0.0001
162.0	Methylcyclopentane	C_6H_{12}	0.0003	0.0001
178.0	Cyclohexane	C_6H_{12}	0.0002	0.0001
214.0	Methylcyclohexane	C_7H_{14}	0.0002	0.0001
	AROMATICS			
176.0	Benzene	C_6H_6	0.0001	0.0001
231.1	Toluene	C_7H_8	0.0002	0.0001
277 - 282	Ethylbenzene & p,m-Xylene	C_8H_{10}	0.0003	0.0002
291.9	o-Xylene	C_8H_{10}	0.0003	0.0002
336.0	1, 2, 4-Trimethylbenzene	C_9H_{12}	0.0015	0.0010
Total			**1.0000**	**1.0000**

Calculated Properties	
Total Sample	
Molecular Weight	176.87
Density (g/cc)	0.8154
C_{6+} Fraction	
Molecular Weight	177.31
Mole Fraction	0.9961
Density (g/cc)	0.8158
C_{7+} Fraction	
Molecular Weight	177.52
Mole Fraction	0.9938
Density (g/cc)	0.8160
C_{12+} Fraction	
Molecular Weight	182.55
Mole Fraction	0.8628
Density (g/cc)	0.8195
C_{30+} Fraction	
Molecular Weight	683.00
Mole Fraction	0.0121
Density (g/cc)	0.9947



Note: Physical properties are calculated based on GPA 2145-00 physical constants GC ID: 2154 ID: 15830-2405

TABLE 15
MGM ENERGY CORP. - EAST MACKAY
WELL I-78-64-50-125-30 - NA - SAMPLE IATA9466
SAMPLE VALIDATION
COMPOSITIONAL ANALYSIS OF OIL (Mar.13 @ 0:00)

Boiling Point (F)	Component Name	Chemical Symbol	Mole Fraction	Mass Fraction
-320.4	Nitrogen	N_2	0.0000	0.0000
-109.3	Carbon Dioxide	CO_2	0.0000	0.0000
-76.6	Hydrogen Sulphide	H_2S	0.0000	0.0000
-259.1	Methane	C_1	0.0000	0.0000
-128.0	Ethane	C_2	0.0000	0.0000
-44.0	Propane	C_3	0.0003	0.0001
10.9	i-Butane	i-C_4	0.0002	0.0001
30.9	n-Butane	n-C_4	0.0008	0.0003
82.0	i-Pentane	i-C_5	0.0003	0.0001
97.0	n-Pentane	n-C_5	0.0005	0.0002
97 - 156	Hexanes	C_6	0.0010	0.0005
156 - 208.9	Heptanes	C_7	0.0010	0.0006
208.9 - 258.1	Octanes	C_8	0.0019	0.0012
258.1 - 303.1	Nonanes	C_9	0.0020	0.0014
303.1 - 345	Decanes	C_{10}	0.0088	0.0070
345 - 385	Undecanes	C_{11}	0.1132	0.0930
385 - 419	Dodecanes	C_{12}	0.3131	0.2817
419 - 455	Tridecanes	C_{13}	0.3575	0.3496
455 - 486	Tetradecanes	C_{14}	0.1408	0.1495
486 - 519.1	Pentadecanes	C_{15}	0.0187	0.0215
519.1 - 550	Hexadecanes	C_{16}	0.0031	0.0038
550 - 557	Heptadecanes	C_{17}	0.0024	0.0032
557 - 603	Octadecanes	C_{18}	0.0023	0.0032
603 - 626	Nonadecanes	C_{19}	0.0021	0.0031
626 - 651.9	Eicosanes	C_{20}	0.0018	0.0028
651.9 - 675	Heneicosanes	C_{21}	0.0016	0.0026
675 - 696.9	Docosanes	C_{22}	0.0015	0.0026
696.9 - 716	Tricosanes	C_{23}	0.0013	0.0023
716 - 736	Tetracosanes	C_{24}	0.0013	0.0024
736 - 755.1	Pentacosanes	C_{25}	0.0012	0.0024
755.1 - 774	Hexacosanes	C_{26}	0.0011	0.0023
774.1 - 792	Heptacosanes	C_{27}	0.0010	0.0021
792.1 - 809.1	Octacosanes	C_{28}	0.0010	0.0022
809.1 - 826	Nonacosanes	C_{29}	0.0009	0.0020
Above 826	Tricontanes Plus	C_{30+}	0.0143	0.0546
	NAPHTHENES			
120.0	Cyclopentane	C_5H_{10}	0.0001	0.0000
162.0	Methylcyclopentane	C_6H_{12}	0.0001	0.0001
178.0	Cyclohexane	C_6H_{12}	0.0001	0.0001
214.0	Methylcyclohexane	C_7H_{14}	0.0002	0.0001
	AROMATICS			
176.0	Benzene	C_6H_6	0.0001	0.0000
231.1	Toluene	C_7H_8	0.0002	0.0001
277 - 282	Ethylbenzene & p,m-Xylene	C_8H_{10}	0.0003	0.0002
291.9	o-Xylene	C_8H_{10}	0.0003	0.0002
336.0	1, 2, 4-Trimethylbenzene	C_9H_{12}	0.0014	0.0010
Total			**1.0000**	**1.0000**

Calculated Properties

Total Sample

Molecular Weight	178.97
Density (g/cc)	0.8174

C_{6+} Fraction

Molecular Weight	179.22
Mole Fraction	0.9979
Density (g/cc)	0.8176

C_{7+} Fraction

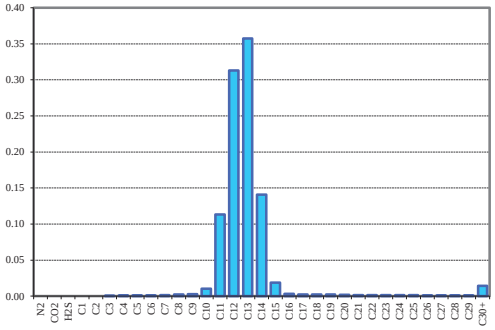
Molecular Weight	179.33
Mole Fraction	0.9967
Density (g/cc)	0.8177

C_{12+} Fraction

Molecular Weight	184.49
Mole Fraction	0.8672
Density (g/cc)	0.8213

C_{30+} Fraction

Molecular Weight	683.00
Mole Fraction	0.0143
Density (g/cc)	0.9947

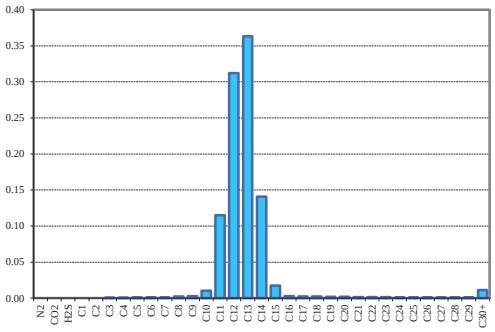


Note: Physical properties are calculated based on GPA 2145-00 physical constants GC ID: 2147 ID: 15822-2406

TABLE 16
MGM ENERGY CORP. - EAST MACKAY
WELL I-78-64-50-125-30 - NA - SAMPLE IATA9467
SAMPLE VALIDATION
COMPOSITIONAL ANALYSIS OF OIL (Mar.13 @ 12:00)

Boiling Point (F)	Component Name	Chemical Symbol	Mole Fraction	Mass Fraction
-320.4	Nitrogen	N_2	0.0000	0.0000
-109.3	Carbon Dioxide	CO_2	0.0000	0.0000
-76.6	Hydrogen Sulphide	H_2S	0.0000	0.0000
-259.1	Methane	C_1	0.0000	0.0000
-128.0	Ethane	C_2	0.0000	0.0000
-44.0	Propane	C_3	0.0001	0.0000
10.9	i-Butane	i-C_4	0.0001	0.0000
30.9	n-Butane	n-C_4	0.0003	0.0001
82.0	i-Pentane	i-C_5	0.0003	0.0001
97.0	n-Pentane	n-C_5	0.0007	0.0003
97 - 156	Hexanes	C_6	0.0009	0.0004
156 - 208.9	Heptanes	C_7	0.0008	0.0005
208.9 - 258.1	Octanes	C_8	0.0020	0.0013
258.1 - 303.1	Nonanes	C_9	0.0021	0.0015
303.1 - 345	Decanes	C_{10}	0.0092	0.0074
345 - 385	Undecanes	C_{11}	0.1148	0.0952
385 - 419	Dodecanes	C_{12}	0.3123	0.2836
419 - 455	Tridecanes	C_{13}	0.3631	0.3584
455 - 486	Tetradecanes	C_{14}	0.1408	0.1509
486 - 519.1	Pentadecanes	C_{15}	0.0174	0.0203
519.1 - 550	Hexadecanes	C_{16}	0.0028	0.0035
550 - 557	Heptadecanes	C_{17}	0.0023	0.0031
557 - 603	Octadecanes	C_{18}	0.0022	0.0031
603 - 626	Nonadecanes	C_{19}	0.0020	0.0030
626 - 651.9	Eicosanes	C_{20}	0.0017	0.0026
651.9 - 675	Heneicosanes	C_{21}	0.0015	0.0025
675 - 696.9	Docosanes	C_{22}	0.0014	0.0024
696.9 - 716	Tricosanes	C_{23}	0.0012	0.0022
716 - 736	Tetracosanes	C_{24}	0.0012	0.0022
736 - 755.1	Pentacosanes	C_{25}	0.0011	0.0021
755.1 - 774	Hexacosanes	C_{26}	0.0010	0.0021
774.1 - 792	Heptacosanes	C_{27}	0.0010	0.0020
792.1 - 809.1	Octacosanes	C_{28}	0.0009	0.0019
809.1 - 826	Nonacosanes	C_{29}	0.0008	0.0018
Above 826	Tricontanes Plus	C_{30+}	0.0114	0.0439
	NAPHTHENES			
120.0	Cyclopentane	C_5H_{10}	0.0001	0.0000
162.0	Methylcyclopentane	C_6H_{12}	0.0001	0.0001
178.0	Cyclohexane	C_6H_{12}	0.0001	0.0000
214.0	Methylcyclohexane	C_7H_{14}	0.0002	0.0001
	AROMATICS			
176.0	Benzene	C_6H_6	0.0000	0.0000
231.1	Toluene	C_7H_8	0.0002	0.0001
277 - 282	Ethylbenzene & p,m-Xylene	C_8H_{10}	0.0004	0.0002
291.9	o-Xylene	C_8H_{10}	0.0002	0.0001
336.0	1, 2, 4-Trimethylbenzene	C_9H_{12}	0.0013	0.0009
Total			**1.0000**	**1.0000**

Calculated Properties	
Total Sample	
Molecular Weight	177.29
Density (g/cc)	0.8156
C_{6+} Fraction	
Molecular Weight	177.46
Mole Fraction	0.9985
Density (g/cc)	0.8157
C_{7+} Fraction	
Molecular Weight	177.55
Mole Fraction	0.9975
Density (g/cc)	0.8158
C_{12+} Fraction	
Molecular Weight	182.51
Mole Fraction	0.8660
Density (g/cc)	0.8193
C_{30+} Fraction	
Molecular Weight	683.00
Mole Fraction	0.0114
Density (g/cc)	0.9947

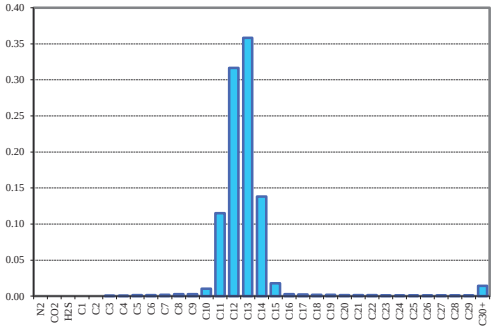


Note: Physical properties are calculated based on GPA 2145-00 physical constants GC ID: 2151 ID: 15826-2407

TABLE 17
MGM ENERGY CORP. - EAST MACKAY
WELL I-78-64-50-125-30 - NA - SAMPLE IATA9468
SAMPLE VALIDATION
COMPOSITIONAL ANALYSIS OF OIL (Mar.13 @ 23:00)

Boiling Point (F)	Component Name	Chemical Symbol	Mole Fraction	Mass Fraction
-320.4	Nitrogen	N_2	0.0000	0.0000
-109.3	Carbon Dioxide	CO_2	0.0000	0.0000
-76.6	Hydrogen Sulphide	H_2S	0.0000	0.0000
-259.1	Methane	C_1	0.0000	0.0000
-128.0	Ethane	C_2	0.0000	0.0000
-44.0	Propane	C_3	0.0001	0.0000
10.9	i-Butane	i-C_4	0.0000	0.0000
30.9	n-Butane	n-C_4	0.0002	0.0001
82.0	i-Pentane	i-C_5	0.0004	0.0001
97.0	n-Pentane	n-C_5	0.0010	0.0004
97 - 156	Hexanes	C_6	0.0011	0.0005
156 - 208.9	Heptanes	C_7	0.0014	0.0008
208.9 - 258.1	Octanes	C_8	0.0023	0.0015
258.1 - 303.1	Nonanes	C_9	0.0020	0.0014
303.1 - 345	Decanes	C_{10}	0.0089	0.0071
345 - 385	Undecanes	C_{11}	0.1150	0.0948
385 - 419	Dodecanes	C_{12}	0.3165	0.2857
419 - 455	Tridecanes	C_{13}	0.3582	0.3514
455 - 486	Tetradecanes	C_{14}	0.1381	0.1471
486 - 519.1	Pentadecanes	C_{15}	0.0179	0.0207
519.1 - 550	Hexadecanes	C_{16}	0.0026	0.0032
550 - 557	Heptadecanes	C_{17}	0.0022	0.0029
557 - 603	Octadecanes	C_{18}	0.0020	0.0029
603 - 626	Nonadecanes	C_{19}	0.0019	0.0028
626 - 651.9	Eicosanes	C_{20}	0.0016	0.0025
651.9 - 675	Heneicosanes	C_{21}	0.0015	0.0024
675 - 696.9	Docosanes	C_{22}	0.0013	0.0022
696.9 - 716	Tricosanes	C_{23}	0.0011	0.0020
716 - 736	Tetracosanes	C_{24}	0.0011	0.0021
736 - 755.1	Pentacosanes	C_{25}	0.0010	0.0020
755.1 - 774	Hexacosanes	C_{26}	0.0009	0.0018
774.1 - 792	Heptacosanes	C_{27}	0.0008	0.0017
792.1 - 809.1	Octacosanes	C_{28}	0.0008	0.0018
809.1 - 826	Nonacosanes	C_{29}	0.0008	0.0017
Above 826	Tricontanes Plus	C_{30+}	0.0143	0.0546
	NAPHTHENES			
120.0	Cyclopentane	C_5H_{10}	0.0001	0.0001
162.0	Methylcyclopentane	C_6H_{12}	0.0001	0.0001
178.0	Cyclohexane	C_6H_{12}	0.0001	0.0001
214.0	Methylcyclohexane	C_7H_{14}	0.0003	0.0002
	AROMATICS			
176.0	Benzene	C_6H_6	0.0001	0.0000
231.1	Toluene	C_7H_8	0.0002	0.0001
277 - 282	Ethylbenzene & p,m-Xylene	C_8H_{10}	0.0003	0.0002
291.9	o-Xylene	C_8H_{10}	0.0003	0.0002
336.0	1, 2, 4-Trimethylbenzene	C_9H_{12}	0.0014	0.0009
Total			**1.0000**	**1.0000**

Calculated Properties	
Total Sample	
Molecular Weight	178.37
Density (g/cc)	0.8169
C_{6+} Fraction	
Molecular Weight	178.56
Mole Fraction	0.9983
Density (g/cc)	0.8171
C_{7+} Fraction	
Molecular Weight	178.67
Mole Fraction	0.9971
Density (g/cc)	0.8172
C_{12+} Fraction	
Molecular Weight	183.90
Mole Fraction	0.8647
Density (g/cc)	0.8209
C_{30+} Fraction	
Molecular Weight	683.00
Mole Fraction	0.0143
Density (g/cc)	0.9947



Note: Physical properties are calculated based on GPA 2145-00 physical constants GC ID: 2153 ID: 15829-2408

TABLE 18
MGM ENERGY CORP. - EAST MACKAY
WELL I-78-64-50-125-30 - NA - SAMPLE IATA9469
SAMPLE VALIDATION
COMPOSITIONAL ANALYSIS OF OIL (Mar.14, 12:00)

Boiling Point (F)	Component Name	Chemical Symbol	Mole Fraction	Mass Fraction
-320.4	Nitrogen	N_2	0.0000	0.0000
-109.3	Carbon Dioxide	CO_2	0.0000	0.0000
-76.6	Hydrogen Sulphide	H_2S	0.0000	0.0000
-259.1	Methane	C_1	0.0000	0.0000
-128.0	Ethane	C_2	0.0000	0.0000
-44.0	Propane	C_3	0.0001	0.0000
10.9	i-Butane	i-C_4	0.0001	0.0000
30.9	n-Butane	n-C_4	0.0002	0.0001
82.0	i-Pentane	i-C_5	0.0003	0.0001
97.0	n-Pentane	n-C_5	0.0007	0.0003
97 - 156	Hexanes	C_6	0.0012	0.0006
156 - 208.9	Heptanes	C_7	0.0037	0.0021
208.9 - 258.1	Octanes	C_8	0.0022	0.0014
258.1 - 303.1	Nonanes	C_9	0.0019	0.0014
303.1 - 345	Decanes	C_{10}	0.0081	0.0065
345 - 385	Undecanes	C_{11}	0.1108	0.0913
385 - 419	Dodecanes	C_{12}	0.3154	0.2846
419 - 455	Tridecanes	C_{13}	0.3543	0.3475
455 - 486	Tetradecanes	C_{14}	0.1406	0.1498
486 - 519.1	Pentadecanes	C_{15}	0.0181	0.0209
519.1 - 550	Hexadecanes	C_{16}	0.0030	0.0037
550 - 557	Heptadecanes	C_{17}	0.0024	0.0032
557 - 603	Octadecanes	C_{18}	0.0022	0.0031
603 - 626	Nonadecanes	C_{19}	0.0021	0.0031
626 - 651.9	Eicosanes	C_{20}	0.0018	0.0027
651.9 - 675	Heneicosanes	C_{21}	0.0015	0.0025
675 - 696.9	Docosanes	C_{22}	0.0015	0.0025
696.9 - 716	Tricosanes	C_{23}	0.0013	0.0022
716 - 736	Tetracosanes	C_{24}	0.0012	0.0023
736 - 755.1	Pentacosanes	C_{25}	0.0011	0.0022
755.1 - 774	Hexacosanes	C_{26}	0.0011	0.0021
774.1 - 792	Heptacosanes	C_{27}	0.0010	0.0021
792.1 - 809.1	Octacosanes	C_{28}	0.0009	0.0020
809.1 - 826	Nonacosanes	C_{29}	0.0009	0.0019
Above 826	Tricontanes Plus	C_{30+}	0.0142	0.0545
	NAPHTHENES			
120.0	Cyclopentane	C_5H_{10}	0.0001	0.0000
162.0	Methylcyclopentane	C_6H_{12}	0.0002	0.0001
178.0	Cyclohexane	C_6H_{12}	0.0003	0.0001
214.0	Methylcyclohexane	C_7H_{14}	0.0003	0.0002
	AROMATICS			
176.0	Benzene	C_6H_6	0.0001	0.0000
231.1	Toluene	C_7H_8	0.0029	0.0015
277 - 282	Ethylbenzene & p,m-Xylene	C_8H_{10}	0.0003	0.0002
291.9	o-Xylene	C_8H_{10}	0.0002	0.0001
336.0	1, 2, 4-Trimethylbenzene	C_9H_{12}	0.0017	0.0012
Total			**1.0000**	**1.0000**

Calculated Properties

Total Sample

Molecular Weight	178.43
Density (g/cc)	0.8173

C_{6+} Fraction

Molecular Weight	178.58
Mole Fraction	0.9987
Density (g/cc)	0.8174

C_{7+} Fraction

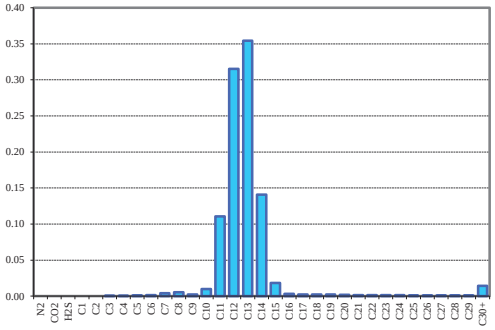
Molecular Weight	178.70
Mole Fraction	0.9974
Density (g/cc)	0.8175

C_{12+} Fraction

Molecular Weight	184.27
Mole Fraction	0.8645
Density (g/cc)	0.8211

C_{30+} Fraction

Molecular Weight	683.00
Mole Fraction	0.0142
Density (g/cc)	0.9947



Note: Physical properties are calculated based on GPA 2145-00 physical constants GC ID: 2122 ID: 15779-2385

TABLE 19
MGM ENERGY CORP. - EAST MACKAY
WELL 300/I-78-6450-12530/0 - SAMPLE IATA9470
SAMPLE VALIDATION
COMPOSITIONAL ANALYSIS OF OIL (Mar.14, 21:30)

Boiling Point (F)	Component Name	Chemical Symbol	Mole Fraction	Mass Fraction
-320.4	Nitrogen	N_2	0.0000	0.0000
-109.3	Carbon Dioxide	CO_2	0.0000	0.0000
-76.6	Hydrogen Sulphide	H_2S	0.0000	0.0000
-259.1	Methane	C_1	0.0000	0.0000
-128.0	Ethane	C_2	0.0000	0.0000
-44.0	Propane	C_3	0.0017	0.0004
10.9	i-Butane	i-C_4	0.0004	0.0001
30.9	n-Butane	n-C_4	0.0016	0.0005
82.0	i-Pentane	i-C_5	0.0005	0.0002
97.0	n-Pentane	n-C_5	0.0008	0.0003
97 - 156	Hexanes	C_6	0.0012	0.0006
156 - 208.9	Heptanes	C_7	0.0017	0.0009
208.9 - 258.1	Octanes	C_8	0.0021	0.0014
258.1 - 303.1	Nonanes	C_9	0.0020	0.0015
303.1 - 345	Decanes	C_{10}	0.0087	0.0070
345 - 385	Undecanes	C_{11}	0.1151	0.0956
385 - 419	Dodecanes	C_{12}	0.3171	0.2886
419 - 455	Tridecanes	C_{13}	0.3559	0.3521
455 - 486	Tetradecanes	C_{14}	0.1372	0.1473
486 - 519.1	Pentadecanes	C_{15}	0.0175	0.0204
519.1 - 550	Hexadecanes	C_{16}	0.0027	0.0034
550 - 557	Heptadecanes	C_{17}	0.0023	0.0031
557 - 603	Octadecanes	C_{18}	0.0021	0.0029
603 - 626	Nonadecanes	C_{19}	0.0020	0.0030
626 - 651.9	Eicosanes	C_{20}	0.0017	0.0027
651.9 - 675	Heneicosanes	C_{21}	0.0015	0.0024
675 - 696.9	Docosanes	C_{22}	0.0014	0.0024
696.9 - 716	Tricosanes	C_{23}	0.0012	0.0022
716 - 736	Tetracosanes	C_{24}	0.0012	0.0023
736 - 755.1	Pentacosanes	C_{25}	0.0012	0.0024
755.1 - 774	Hexacosanes	C_{26}	0.0011	0.0022
774.1 - 792	Heptacosanes	C_{27}	0.0010	0.0022
792.1 - 809.1	Octacosanes	C_{28}	0.0009	0.0020
809.1 - 826	Nonacosanes	C_{29}	0.0009	0.0019
Above 826	Tricontanes Plus	C_{30+}	0.0120	0.0460
	NAPHTHENES			
120.0	Cyclopentane	C_5H_{10}	0.0001	0.0001
162.0	Methylcyclopentane	C_6H_{12}	0.0002	0.0001
178.0	Cyclohexane	C_6H_{12}	0.0002	0.0001
214.0	Methylcyclohexane	C_7H_{14}	0.0003	0.0001
	AROMATICS			
176.0	Benzene	C_6H_6	0.0001	0.0000
231.1	Toluene	C_7H_8	0.0002	0.0001
277 - 282	Ethylbenzene & p,m-Xylene	C_8H_{10}	0.0003	0.0002
291.9	o-Xylene	C_8H_{10}	0.0003	0.0002
336.0	1, 2, 4-Trimethylbenzene	C_9H_{12}	0.0016	0.0011
Total			**1.0000**	**1.0000**

Total Sample

Molecular Weight	176.91
Density (g/cc)	0.8153

C_{6+} Fraction

Molecular Weight	177.51
Mole Fraction	0.9950
Density (g/cc)	0.8159

C_{7+} Fraction

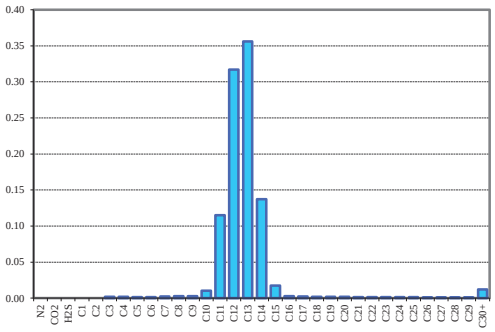
Molecular Weight	177.64
Mole Fraction	0.9936
Density (g/cc)	0.8160

C_{12+} Fraction

Molecular Weight	182.76
Mole Fraction	0.8609
Density (g/cc)	0.8196

C_{30+} Fraction

Molecular Weight	678.00
Mole Fraction	0.0120
Density (g/cc)	0.9942



Note: Physical properties are calculated based on GPA 2145-00 physical constants GC ID: 2123 ID: 15781-2386

AGAT® Laboratories

GAS ANALYSIS

No flag set.

Container Identification
4002158

Operator Name	Laboratory Number
MGM ENERGY CORP.	13G701983C

Unique Well Identifier	Well Name
300/I-78-64-50-125-30/0	MGM SHELL EAST MACKAY I-78-64-50-125-30

Field or Area	Pool or Zone	Sampler's Company
EAST MACKAY/ CANOL	CANOL	SAME

Well License	Elevation				Test Type	Test No.	Name of Sampler
1202-002	KB m	161.2	GRD m	155.0			PURE ENERGY

Test Interval or Perfs mKB		Sampling Point
1840-1842	1869-1871	WELLHEAD
1847-1849	1882-1884	

	Separator	Reservoir	Source	Sampled	Received
Pressure (kPa)			826	826	800
Temperature					21

Date Sampled	Date Received	Date Analyzed	Date Reported	Location - Approved By - Title
Mar 15, 2013	Apr 02, 2013	Apr 04, 2013	Apr 04, 2013	Calgary - Gerry Ecker - Reporter

Other Information
FORMATION: CANOL

** Results relate only to the items tested*

COMP	MOLE FRACTION		PETROLEUM LIQUID
	AIR FREE AS RECEIVED	AIR FREE ACID GAS FREE	mL / m³
H2	0.0001	0.0001	
He	0.0001	0.0001	
N2	0.8039	0.8045	
CO2	0.0007	0.0000	
H2S	0.0000	0.0000	
C1	0.1882	0.1883	
C2	0.0060	0.0060	
C3	0.0002	0.0002	0.7
IC4	0.0001	0.0001	0.4
NC4	0.0002	0.0002	0.8
IC5	0.0002	0.0002	1.0
NC5	0.0002	0.0002	1.0
C6	0.0001	0.0001	0.5
C7+	0.0000	0.0000	0.0
Total	1.0000	1.0000	4.4

Exceeds normal limits:
N2

GROSS HEATING VALUE MJ/m³
15° C AND 101.325 kPa

Air Free As Received	Moisture & Acid Gas Free
7.62	7.63

RELATIVE DENSITY (CALCULATED)

Moisture Free	Moisture & Acid Gas Free
0.891	0.891

Total Sample Density(kg/m3)
1.092

PSEUDO CRITICAL PROPERTIES (CALCULATED)

As Sampled		Acid Gas Free	
pPc (abs) kPa	pTc K	pPc (abs) kPa	pTc K
3633.7	139.8	3631.1	139.7

RELATIVE MOLECULAR MASS

Total Gas	C_7+
25.8	0.0

VAPOUR PRESSURE (Pentanes +)

106.18 kPa

H_2S g/m³

0.00

This analysis and calculations are based on GPA 2261, GPA 2145, and AGA#5

AGAT® Laboratories

GAS ANALYSIS

No flag set.

Container Identification
4002158

Operator Name	Laboratory Number
MGM ENERGY CORP.	13G701983CC

Unique Well Identifier	Well Name
300/I-78-64-50-125-30/0	MGM SHELL EAST MACKAY I-78-64-50-125-30

Field or Area	Pool or Zone	Sampler's Company
EAST MACKAY/ CANOL	CANOL	SAME

Well License	Elevation				Test Type	Test No.	Name of Sampler
1202-002	KB m	161.2	GRD m	155.0			PURE ENERGY

Test Interval or Perfs mKB		Sampling Point
1840-1842	1869-1871	WELLHEAD
1847-1849	1882-1884	

	Separator	Reservoir	Source	Sampled	Received
Pressure (kPa)			826	826	800
Temperature					21

Date Sampled	Date Received	Date Analyzed	Date Reported	Location - Approved By - Title
Mar 15, 2013	Apr 02, 2013	Apr 09, 2013	Apr 09, 2013	Calgary - Gerry Ecker - Reporter

Other Information
FORMATION: CANOL

** Results relate only to the items tested*

COMP	MOLE FRACTION		PETROLEUM LIQUID
	AIR FREE AS RECEIVED	AIR FREE ACID GAS FREE	mL / m³
H2	0.0001	0.0001	
He	0.0001	0.0001	
N2	0.0000	0.0000	
CO2	0.0040	0.0000	
H2S	0.0000	0.0000	
C1	0.9577	0.9616	
C2	0.0329	0.0330	
C3	0.0013	0.0013	4.8
IC4	0.0004	0.0004	1.7
NC4	0.0011	0.0011	4.6
IC5	0.0009	0.0009	4.4
NC5	0.0011	0.0011	5.3
C6	0.0004	0.0004	2.2
C7+	0.0000	0.0000	0.0
Total	1.0000	1.0000	23.0

GROSS HEATING VALUE MJ/m³
15° C AND 101.325 kPa

Air Free As Received	Moisture & Acid Gas Free
39.05	39.20

RELATIVE DENSITY (CALCULATED)

Moisture Free	Moisture & Acid Gas Free
0.582	0.578

Total Sample Density(kg/m3)
0.713

PSEUDO CRITICAL PROPERTIES (CALCULATED)

As Sampled		Acid Gas Free	
pPc (abs) kPa	pTc K	pPc (abs) kPa	pTc K
4613.5	196.0	4602.4	195.6

RELATIVE MOLECULAR MASS

Total Gas	C_7+
16.9	0.0

VAPOUR PRESSURE (Pentanes +)	H_2S g/m³
107.78 kPa	0.00

This analysis and calculations are based on GPA 2261, GPA 2145, and AGA#5

AGAT® Laboratories

GAS ANALYSIS

No flag set.

Container Identification
5004966

Operator Name	Laboratory Number
MGM ENERGY CORP.	13G701983B

Unique Well Identifier	Well Name
300/I-78-64-50-125-30/0	MGM SHELL EAST MACKAY I-78-64-50-125-30

Field or Area	Pool or Zone	Sampler's Company
EAST MCKAY/ CANOL	CANOL	SAME

Well License	Elevation				Test Type	Test No.	Name of Sampler
1202-002	KB m	161.2	GRD m	155.0			PURE ENERGY

Test Interval or Perfs mKB		Sampling Point
1840-1842	1869-1871	METER RUN
1847-1849	1882-1884	

	Separator	Reservoir	Source	Sampled	Received
Pressure (kPa)			110	110	60
Temperature			-18	-18	21

Date Sampled	Date Received	Date Analyzed	Date Reported	Location - Approved By - Title
Mar 14, 2013	Apr 02, 2013	Apr 04, 2013	Apr 04, 2013	Calgary - Gerry Ecker - Reporter

Other Information
FORMATION: CANOL

** Results relate only to the items tested*

COMP	MOLE FRACTION		PETROLEUM LIQUID
	AIR FREE AS RECEIVED	AIR FREE ACID GAS FREE	mL / m³
H2	0.0000	0.0000	
He	0.0001	0.0001	
N2	0.8769	0.8785	
CO2	0.0018	0.0000	
H2S	0.0000	0.0000	
C1	0.1080	0.1082	
C2	0.0083	0.0083	
C3	0.0038	0.0038	14.0
IC4	0.0002	0.0002	0.9
NC4	0.0006	0.0006	2.5
IC5	TRACE	TRACE	0.0
NC5	0.0001	0.0001	0.5
C6	0.0001	0.0001	0.5
C7+	0.0001	0.0001	0.6
Total	1.0000	1.0000	19.0

Exceeds normal limits:
N2

GROSS HEATING VALUE MJ/m³
15° C AND 101.325 kPa

Air Free As Received	Moisture & Acid Gas Free	C7+, Air Free As Received
5.13	5.13	0.02

RELATIVE DENSITY (CALCULATED) DENSITY

Moisture Free	Moisture & Acid Gas Free	C7+, Moisture Free	C7+, Portion Whole Density	C7+ Density (kg/m3)	Total Sample Density(kg/m3)
0.928	0.927	3.460	0.000	688.0	1.136

PSEUDO CRITICAL PROPERTIES (CALCULATED)

As Sampled		Acid Gas Free	
pPc (abs) kPa	pTc K	pPc (abs) kPa	pTc K
3548.5	136.2	3541.5	135.9

RELATIVE MOLECULAR MASS

Total Gas	C_7+
26.9	100.2

VAPOUR PRESSURE (Pentanes +)

50.92 kPa

H_2S g/m³

0.00

This analysis and calculations are based on GPA 2261, GPA 2145, and AGA#5

AGAT® Laboratories

GAS ANALYSIS

No flag set.

Container Identification
5004966

Operator Name	Laboratory Number
MGM ENERGY CORP.	13G701983BB

Unique Well Identifier	Well Name
300/I-78-64-50-125-30/0	MGM SHELL EAST MACKAY I-78-64-50-125-30

Field or Area	Pool or Zone	Sampler's Company
EAST MCKAY/ CANOL	CANOL	SAME

Well License	Elevation				Test Type	Test No.	Name of Sampler
1202-002	KB m	161.2	GRD m	155.0			PURE ENERGY

Test Interval or Perfs mKB		Sampling Point
1840-1842	1869-1871	METER RUN
1847-1849	1882-1884	

	Separator	Reservoir	Source	Sampled	Received
Pressure (kPa)			110	110	60
Temperature			-18	-18	21

Date Sampled	Date Received	Date Analyzed	Date Reported	Location - Approved By - Title
Mar 14, 2013	Apr 02, 2013	Apr 09, 2013	Apr 09, 2013	Calgary - Gerry Ecker - Reporter

Other Information
FORMATION: CANOL

** Results relate only to the items tested*

COMP	MOLE FRACTION		PETROLEUM LIQUID
	AIR FREE AS RECEIVED	AIR FREE ACID GAS FREE	mL / m³
H2	0.0000	0.0000	
He	0.0001	0.0001	
N2	0.0000	0.0000	
CO2	0.0143	0.0000	
H2S	0.0000	0.0000	
C1	0.8774	0.8901	
C2	0.0672	0.0682	
C3	0.0311	0.0316	114.3
IC4	0.0017	0.0017	7.4
NC4	0.0052	0.0053	21.9
IC5	0.0004	0.0004	2.0
NC5	0.0005	0.0005	2.4
C6	0.0010	0.0010	5.5
C7+	0.0011	0.0011	7.0
Total	1.0000	1.0000	160.5

GROSS HEATING VALUE MJ/m³
15° C AND 101.325 kPa

Air Free As Received	Moisture & Acid Gas Free	C7+, Air Free As Received
41.95	42.55	0.23

RELATIVE DENSITY (CALCULATED) DENSITY

Moisture Free	Moisture & Acid Gas Free	C7+, Moisture Free	C7+, Portion Whole Density	C7+ Density (kg/m3)	Total Sample Density(kg/m3)
0.648	0.635	3.592	0.004	693.5	0.793

PSEUDO CRITICAL PROPERTIES (CALCULATED)

As Sampled		Acid Gas Free	
pPc (abs) kPa	pTc K	pPc (abs) kPa	pTc K
4635.2	208.0	4595.5	206.6

RELATIVE MOLECULAR MASS

Total Gas	C_7+
18.8	104.0

VAPOUR PRESSURE (Pentanes +)	H_2S g/m³
51.44 kPa	0.00

This analysis and calculations are based on GPA 2261, GPA 2145, and AGA#5

AGAT® Laboratories

GAS ANALYSIS

No flag set.

Container Identification
5005398

Operator Name	Laboratory Number
MGM ENERGY CORP.	13G701983A

Unique Well Identifier	Well Name
300/I-78-64-50-125-30/0	MGM SHELL EAST MACKAY I-78-64-50-125-30

Field or Area	Pool or Zone	Sampler's Company
EAST MACKAY/ CANOL	CANOL	SAME

Well License	Elevation				Test Type	Test No.	Name of Sampler
1202-002	KB m	161.2	GRD m	155.0			PURE ENERGY

Test Interval or Perfs mKB		Sampling Point
1840-1842	1869-1871	MANIFOLD
1847-1849	1882-1884	

	Separator	Reservoir	Source	Sampled	Received
Pressure (kPa)			100	100	180
Temperature			-30	-30	21

Date Sampled	Date Received	Date Analyzed	Date Reported	Location - Approved By - Title
Mar 12, 2013	Apr 02, 2013	Apr 04, 2013	Apr 04, 2013	Calgary - Gerry Ecker - Reporter

Other Information
FORMATION: CANOL

** Results relate only to the items tested*

COMP	MOLE FRACTION		PETROLEUM LIQUID
	AIR FREE AS RECEIVED	AIR FREE ACID GAS FREE	mL / m³
H2	0.0001	0.0001	
He	0.0003	0.0003	
N2	0.6534	0.6561	
CO2	0.0041	0.0000	
H2S	0.0000	0.0000	
C1	0.3237	0.3250	
C2	0.0125	0.0126	
C3	0.0043	0.0043	15.8
IC4	0.0002	0.0002	0.9
NC4	0.0008	0.0008	3.4
IC5	0.0002	0.0002	1.0
NC5	0.0002	0.0002	1.0
C6	0.0001	0.0001	0.5
C7+	0.0001	0.0001	0.6
Total	1.0000	1.0000	23.2

Exceeds normal limits:
N2

GROSS HEATING VALUE MJ/m³
15° C AND 101.325 kPa

Air Free As Received	Moisture & Acid Gas Free	C7+, Air Free As Received
13.66	13.72	0.02

RELATIVE DENSITY (CALCULATED) DENSITY

Moisture Free	Moisture & Acid Gas Free	C7+, Moisture Free	C7+, Portion Whole Density	C7+ Density (kg/m3)	Total Sample Density(kg/m3)
0.841	0.838	3.460	0.000	688.0	1.030

PSEUDO CRITICAL PROPERTIES (CALCULATED)

As Sampled		Acid Gas Free	
pPc (abs) kPa	pTc K	pPc (abs) kPa	pTc K
3823.0	151.5	3808.3	150.9

RELATIVE MOLECULAR MASS

Total Gas	C_7+
24.3	100.2

VAPOUR PRESSURE (Pentanes +)

90.34 kPa

H_2S g/m³

0.00

This analysis and calculations are based on GPA 2261, GPA 2145, and AGA#5

AGAT® Laboratories

GAS ANALYSIS

No flag set.

Container Identification
5005398

Operator Name	Laboratory Number
MGM ENERGY CORP.	13G701983AA

Unique Well Identifier	Well Name
300/I-78-64-50-125-30/0	MGM SHELL EAST MACKAY I-78-64-50-125-30

Field or Area	Pool or Zone	Sampler's Company
EAST MACKAY/ CANOL	CANOL	SAME

Well License	Elevation				Test Type	Test No.	Name of Sampler
1202-002	KB m	161.2	GRD m	155.0			PURE ENERGY

Test Interval or Perfs mKB		Sampling Point
1840-1842	1869-1871	MANIFOLD
1847-1849	1882-1884	

	Separator	Reservoir	Source	Sampled	Received
Pressure (kPa)			100	100	180
Temperature			-30	-30	21

Date Sampled	Date Received	Date Analyzed	Date Reported	Location - Approved By - Title
Mar 12, 2013	Apr 02, 2013	Apr 09, 2013	Apr 09, 2013	Calgary - Gerry Ecker - Reporter

Other Information
FORMATION: CANOL

** Results relate only to the items tested*

COMP	MOLE FRACTION		PETROLEUM LIQUID
	AIR FREE AS RECEIVED	AIR FREE ACID GAS FREE	mL / m³
H2	0.0001	0.0001	
He	0.0003	0.0003	
N2	0.0000	0.0000	
CO2	0.0118	0.0000	
H2S	0.0000	0.0000	
C1	0.9342	0.9455	
C2	0.0362	0.0366	
C3	0.0125	0.0126	45.9
IC4	0.0007	0.0007	3.1
NC4	0.0024	0.0024	10.1
IC5	0.0004	0.0004	2.0
NC5	0.0006	0.0006	2.9
C6	0.0004	0.0004	2.2
C7+	0.0004	0.0004	2.5
Total	1.0000	1.0000	68.7

GROSS HEATING VALUE MJ/m³
15° C AND 101.325 kPa

Air Free As Received	Moisture & Acid Gas Free	C7+, Air Free As Received
39.57	40.03	0.08

RELATIVE DENSITY (CALCULATED) DENSITY

Moisture Free	Moisture & Acid Gas Free	C7+, Moisture Free	C7+, Portion Whole Density	C7+ Density (kg/m3)	Total Sample Density(kg/m3)
0.603	0.592	3.581	0.001	693.0	0.739

PSEUDO CRITICAL PROPERTIES (CALCULATED)

As Sampled		Acid Gas Free	
pPc (abs) kPa	pTc K	pPc (abs) kPa	pTc K
4630.4	199.5	4597.7	198.2

RELATIVE MOLECULAR MASS

Total Gas	C_7+
17.5	103.7

VAPOUR PRESSURE (Pentanes +)	H_2S g/m³
76.79 kPa	0.00

This analysis and calculations are based on GPA 2261, GPA 2145, and AGA#5

AGAT® Laboratories

WATER ANALYSIS

Container Identification
PB1A

Operator Name	Laboratory Number
MGM ENERGY CORP.	13WG766749A

Unique Well Identifier	Well Name
I-78-64-50-125-30	MGM SHELL EAST MACKAY I-78

Field or Area	Pool or Zone	Sampler's Company
NOT AVAILABLE	NOT AVAILABLE	FMC TECHNOLOGIES

Well License	Elevation				Test Type	Test No.	Name of Sampler
1202-002	KB m	160.70	GRD m	155.10			NOT AVAILABLE

Test Interval or Perfs mKB		Sampling Point
1840.00-1884.00		NOT AVAILABLE
mKB		

	Separator	Reservoir	Source	Sampled	Received
Pressure (kPa)					
Temperature					

Date Sampled	Date Received	Date Analyzed	Date Reported	Location - Approved By - Title
Sep 20, 2013	Oct 04, 2013	Oct 08, 2013	Oct 08, 2013	Calgary - Benita Cortez - Reporter

Other Information
POOL: UPPER CANOL/LOWER CANOL; SP: 1930mCF

* Results relate only to the items tested

Note: Sampling Point, Unique Well Identifier and/or Pool or Zone information was unavailable at time of reporting. This information is integral to AGAT's WebFLUIDs, a comparison, history and trending analysis system.

Cations

ION	mg/L	mmol/L	meq/L
Na	36600.0	1592.0	1592.0
K	3340.0	85.4	85.4
Ca	410.0	10.2	20.5
Mg	3560.0	146.5	292.9
Fe	TRACE	0.0	TRACE
Total Cations			1990.8

Anions

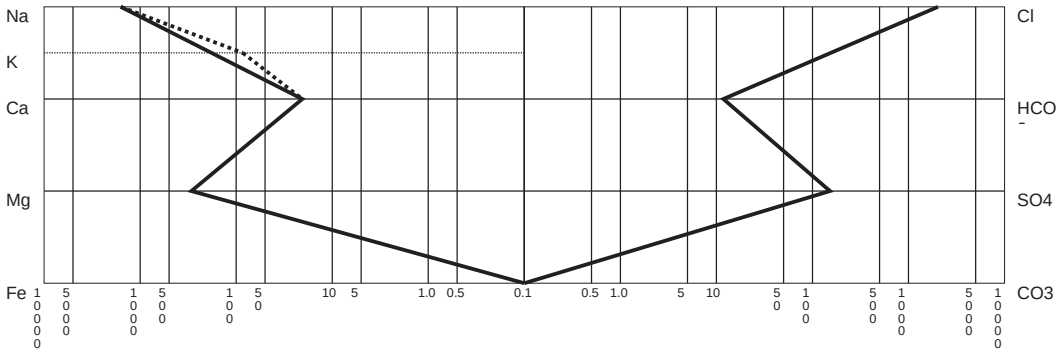
ION	mg/L	mmol/L	meq/L
Cl	71978.0	2030.3	2030.3
HCO3	721.8	11.8	11.8
SO4	7320.0	76.2	152.4
CO3	Nil	Nil	Nil
OH	Nil	Nil	Nil
Total Anions			2194.5

Other Measurements

Measurement	Value
Total Dissolved Solids (Calculated) mg/L	123563
Observed pH	7.90
H2S (25°C) mg/L	N/D
Relative Density (25°C)	1.095
Resistivity/OHM·m (25°C)	0.095
Salinity %	11.88
Total Alkalinity as CaCO3	591.67

This analysis and calculations are based on:
pH = SM 4500 H+
Alkalinity = SM 2320
Cations = EPA SW-846 7000B
Anions = SM 4110B
H2S = SM 4500 S^{-2}

Stiff Diagram (meq/L)



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Appendix A16 Production Data (Canol)

Production Log (Spinner etc.)

Static Gradient

Buildup

PureEnergy
Providing Superior Value

PRODUCTION PROFILE LOG

File No:	
LSD.	
SEC.	
TWP.	
RGE.	
WEST	

Company **MGM ENERGY CORP**

Well **MGM SHELL EAST MACKAY 1-78**

Field **EAST MACKAY**

Province **N.W.T.** Country **Canada**

Well License No. 1202 SURFACE LOCATION: 1-78-64-50-125-30

UWID.

LSD. SEC. TWP. RGE W.

Permanent Datum	Ground Level	**Elevation**	155.00	**Elev K.B.**	161.20
Log Meas. From	Kelly Bushing	**Meters Above Datum**	6.20	**Elev D.F.**	
Drilling Meas. From	Kelly Bushing			**Elev G.L.**	155.00

Date	MARCH 14, 2013	**Work Order No.**	SS352027
Run / Pass No.	ONE	**Unit No. / Location**	LD-4507 | RED DEER
Depth Driller	1944.0 M.	**Fluid Type**	OIL / N2
Depth Logger	NOT TAGGED	**Fluid Level**	DISPERSED
Bot. Logged Interval	1910.0 M.	**Bottom Hole Temp.**	68.60 C.
Top Logged Interval	1500.0 M.	**Well Head Pressure**	NONE
Logged Interval	410.0 M.	**Fluid Rate @ Surface**	NONE
Recorded By	F. KAPROWSKI	**Witnessed By**	B. CARNDIFF / B. IVANCHUK

Logging Passes

Pass Name	Start	Stop
P1SI	1500	1910
P2SI	1825	1910
P3OPEN	1825	1910
P4OPEN	1825	1910
P5PMPG	1825	1910

Existing Perforating Intervals

From	To	From	To

Casing Data

Size	Wgt (kg/m)	From	To
244.5	59.5	SURFACE	400.0
177.8	38.7	SURFACE	2020.0

Tubing Data

Size	Wgt (kg/m)	From	To
114.3	20.1	SURFACE	1965.0

Other Information

Service	Type	Size	Depth	Comment

ALL INTERPRETATIONS ARE OPINIONS BASED ON ELECTRICAL OR OTHER MEASUREMENTS AND WE CANNOT, AND DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATIONS, AND SHALL NOT, EXCEPT IN THE CASE OF GROSS OR WILLFUL NEGLIGENCE ON OUR PART, BE LIABLE FOR ANY LOSS, COST, DAMAGES OR EXPENSES INCURRED OR SUSTAINED BY ANYONE RESULTING FROM ANY INTERPRETATIONS MADE BY ANY OF OUR OFFICES, AGENTS, OR EMPLOYEES. THESE INTERPRETATIONS ARE ALSO SUBJECT TO CLAUSE 4 IN OUR GENERAL TERMS AND CONDITIONS AS SET OUT IN OUR PRICE SCHEDULE.

Correlated To :	BAKER HUGHES DIGITAL SPECTRAL LOG DATED 19-FEB- 2013
Remarks :	LOG INTERVALS AS PER PROGRAM
	GAMMA RAY 1512-003
TICKET #	GRADIO 1010-355
SS352027	HIRES PTF 0605-077

Tool String Configuration

-1.83 m Top of String

574

Max. Length: 5.75 m

Lee Specialties Knuckle Joint (1 3/8)

Length: 0.51 m Max Diameter: 34.90 mm

Lee Specialties Memory Tool

Lee Specialties Memory Tool
Length: 2.05 m Max Diameter: 34.90 mm

Lee Specialties Gamma Ray
Length: 0.90 m Max Diameter: 34.90 mm

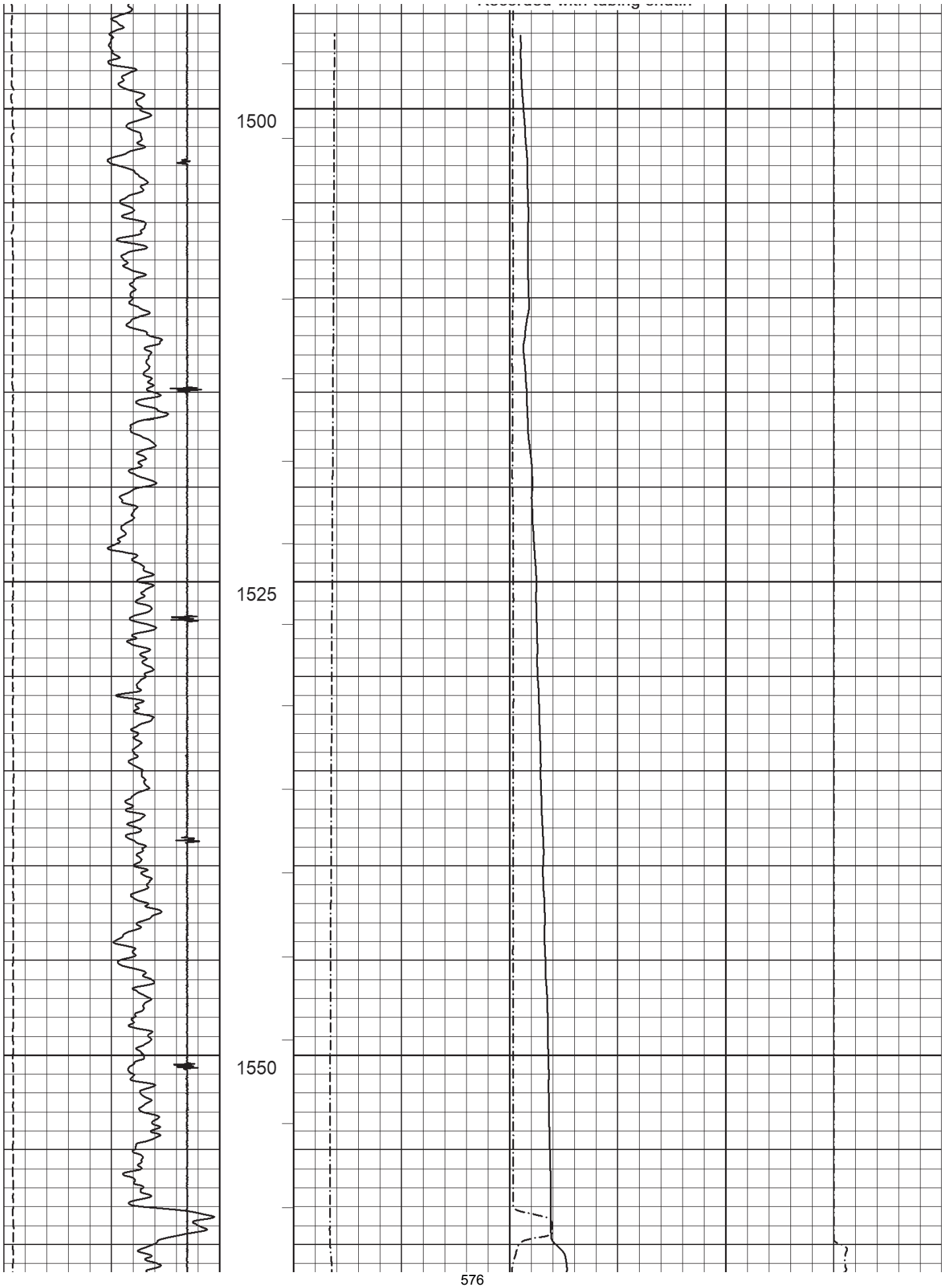
Lee Specialties Gradio
Length: 1.31 m Max Diameter: 34.93 mm

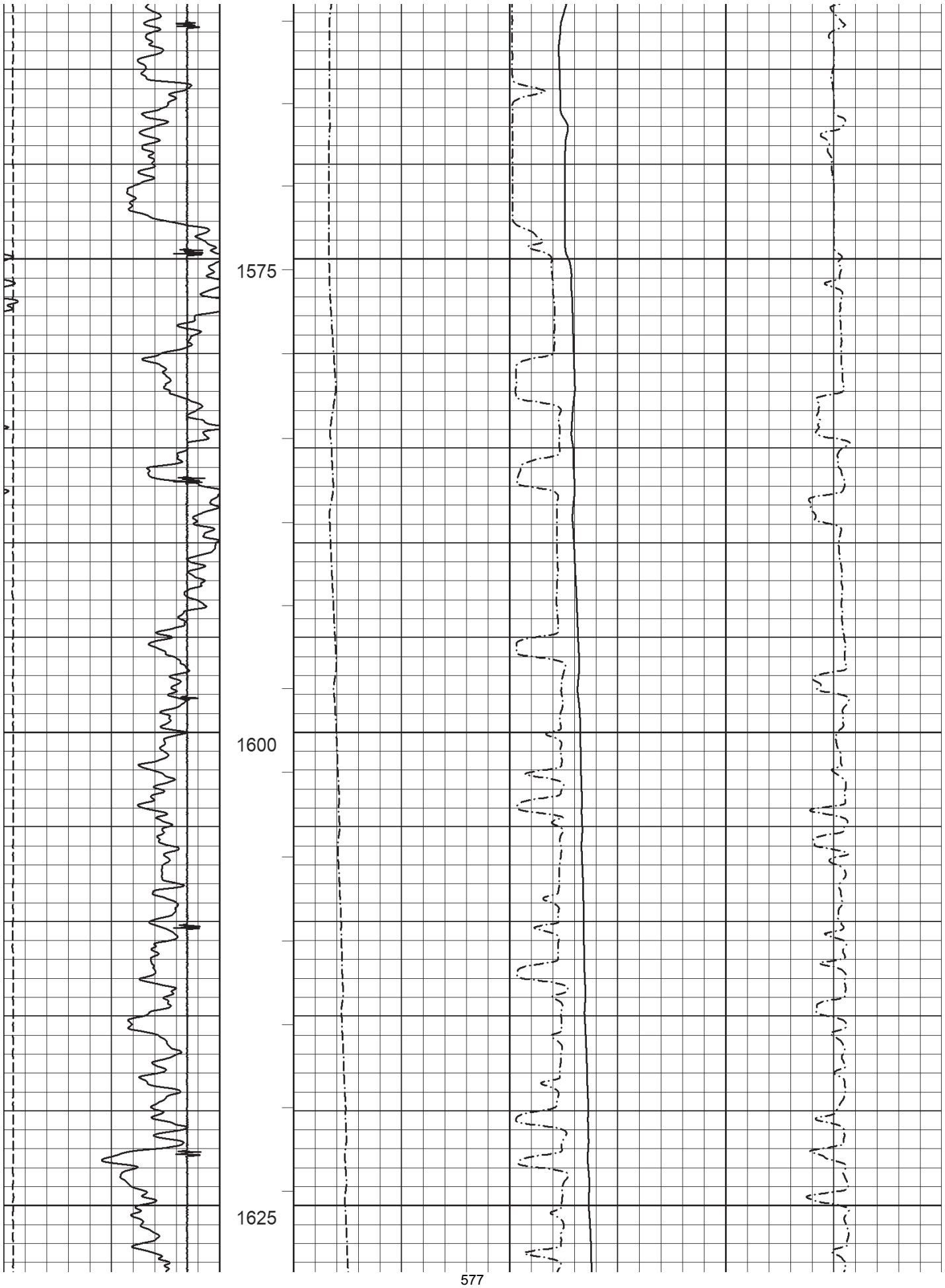
Lee Specialties PTF 1-11/16 Continuous Spinner
Length: 0.98 m Max Diameter: 42.88 mm



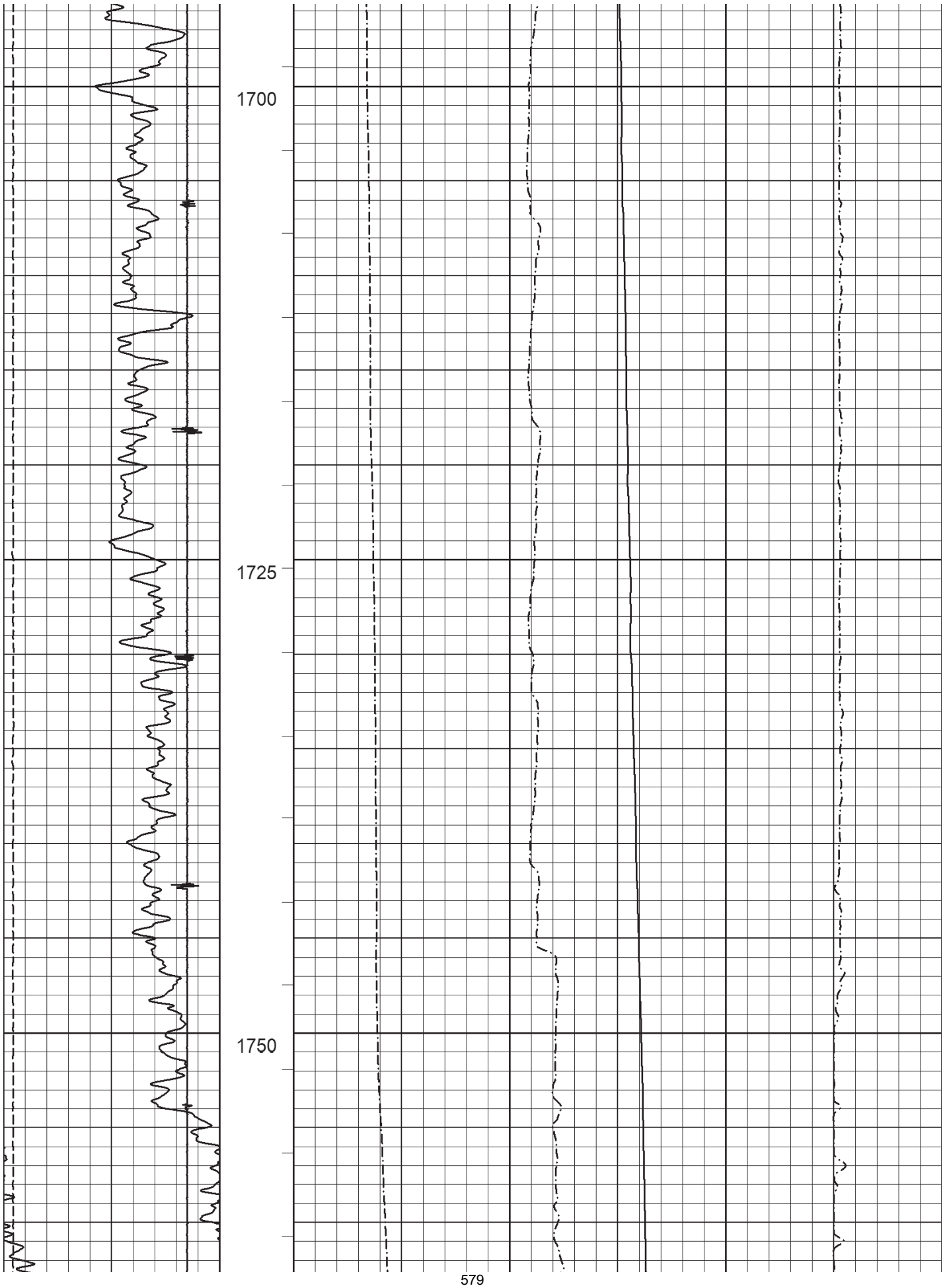
2013-03-14 18:24	METERS	Pressure (kPa)	Raw Gradio (kg/m³)	Spinner (RPS)
Speed (m/min)	1:240	0.0 2000.0	0.00 2000.00	-10.00 10.00
0.00 100.00			Temperature (°C)	
CCL			50.00 70.00	
0.00 100.00		Logging Down	File P1SI.pre	
Gamma Ray		Shutin		
0.00 120.00				
Pass No. 1	1492.84			111207N

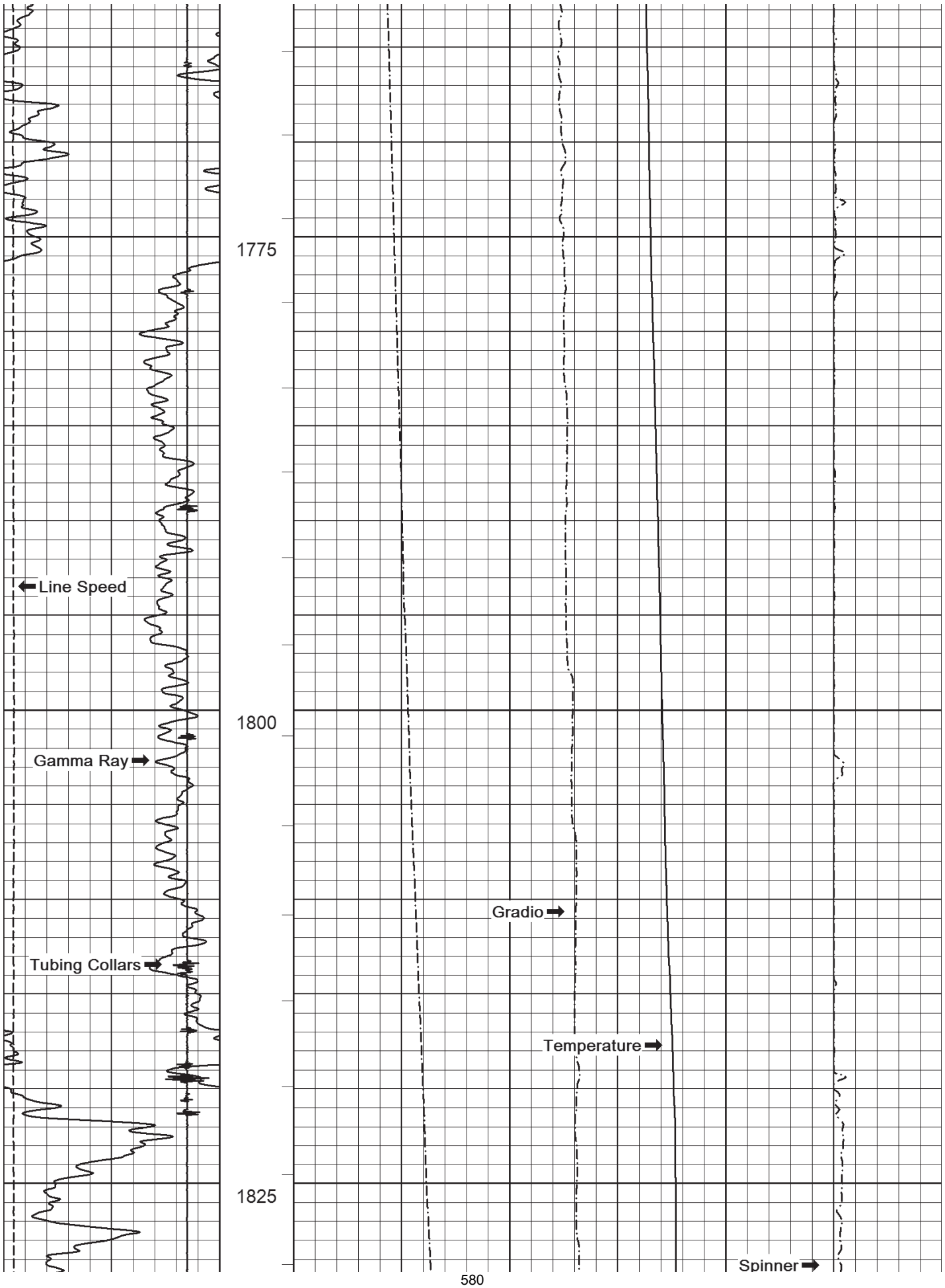
Recorded with tubing shutin

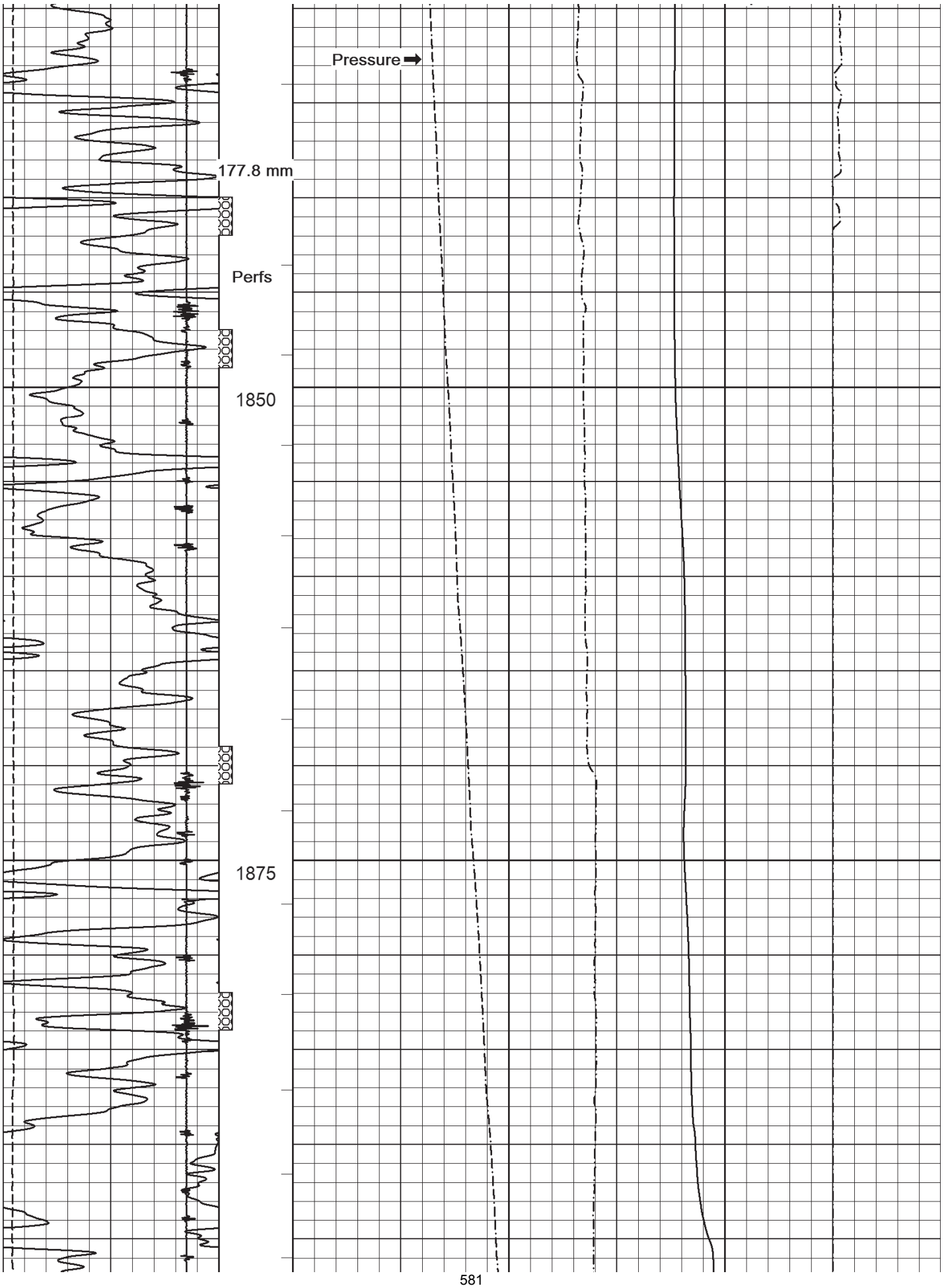

1500
1525
1550

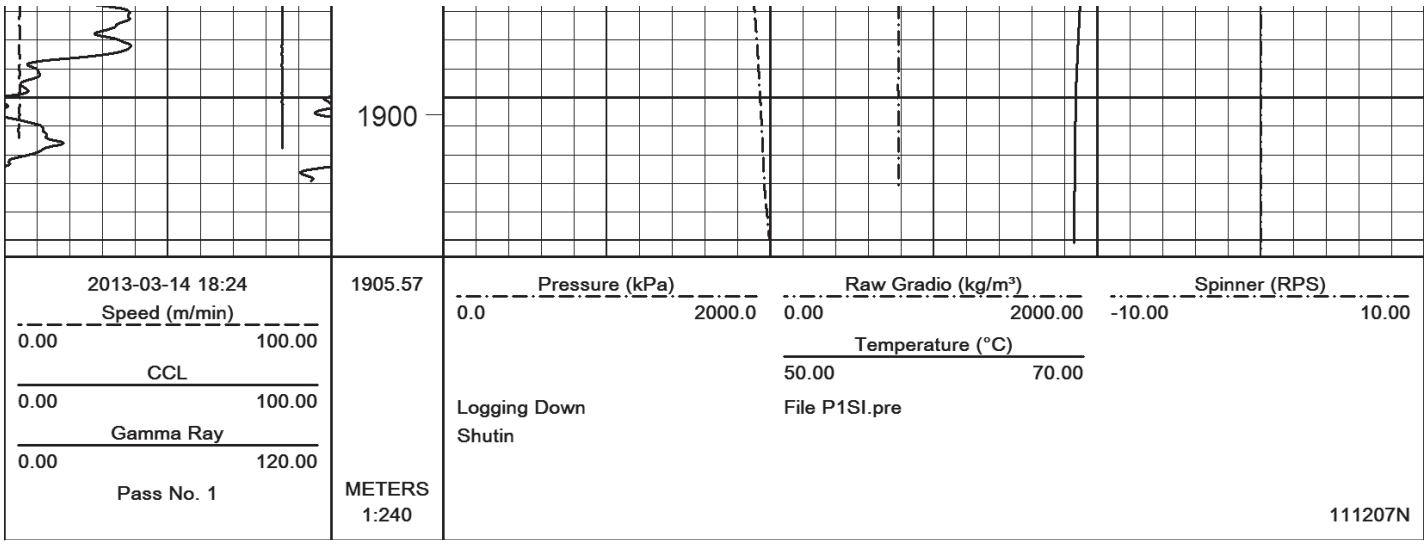

1575
1600
1625

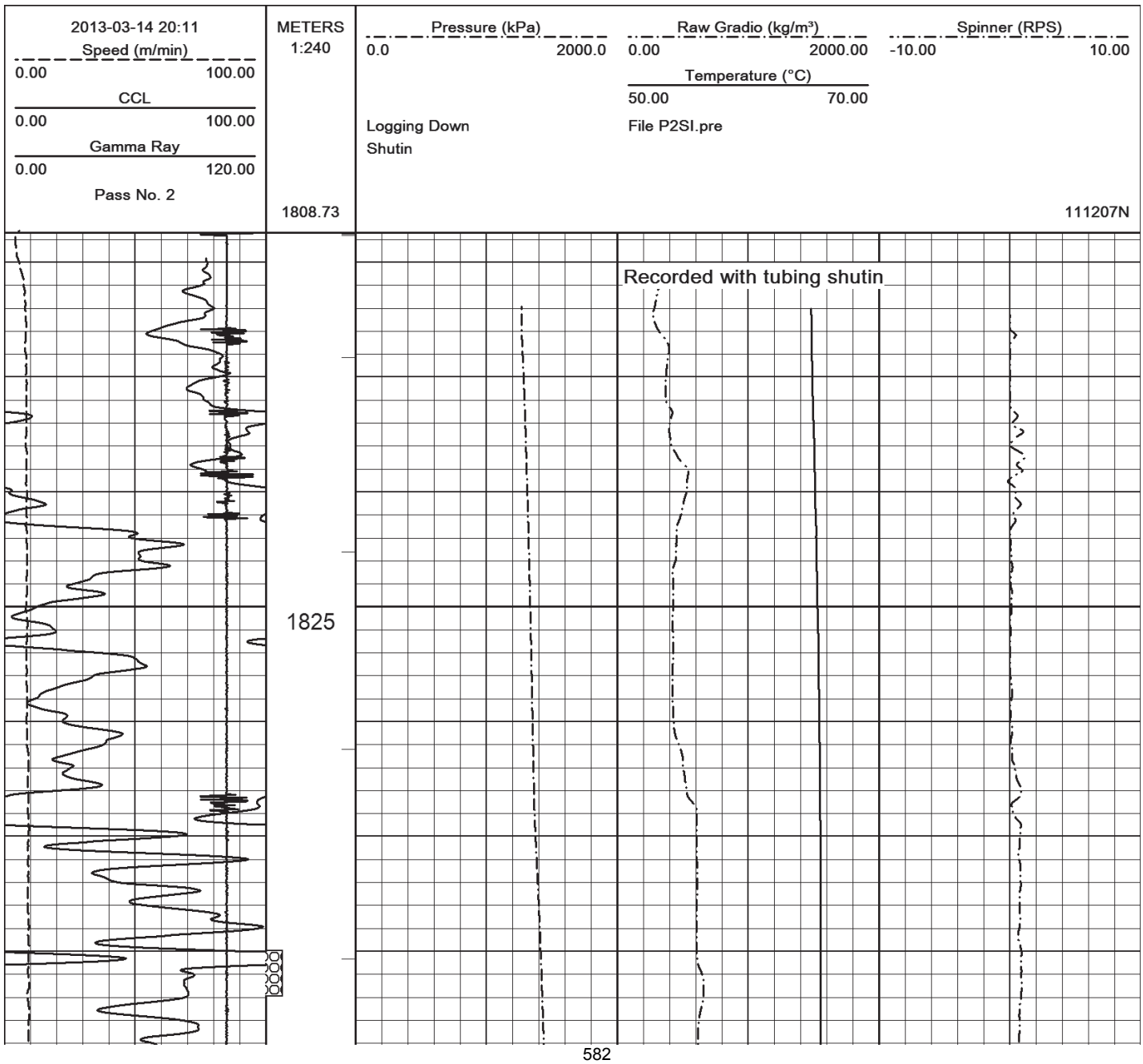

1650
1675

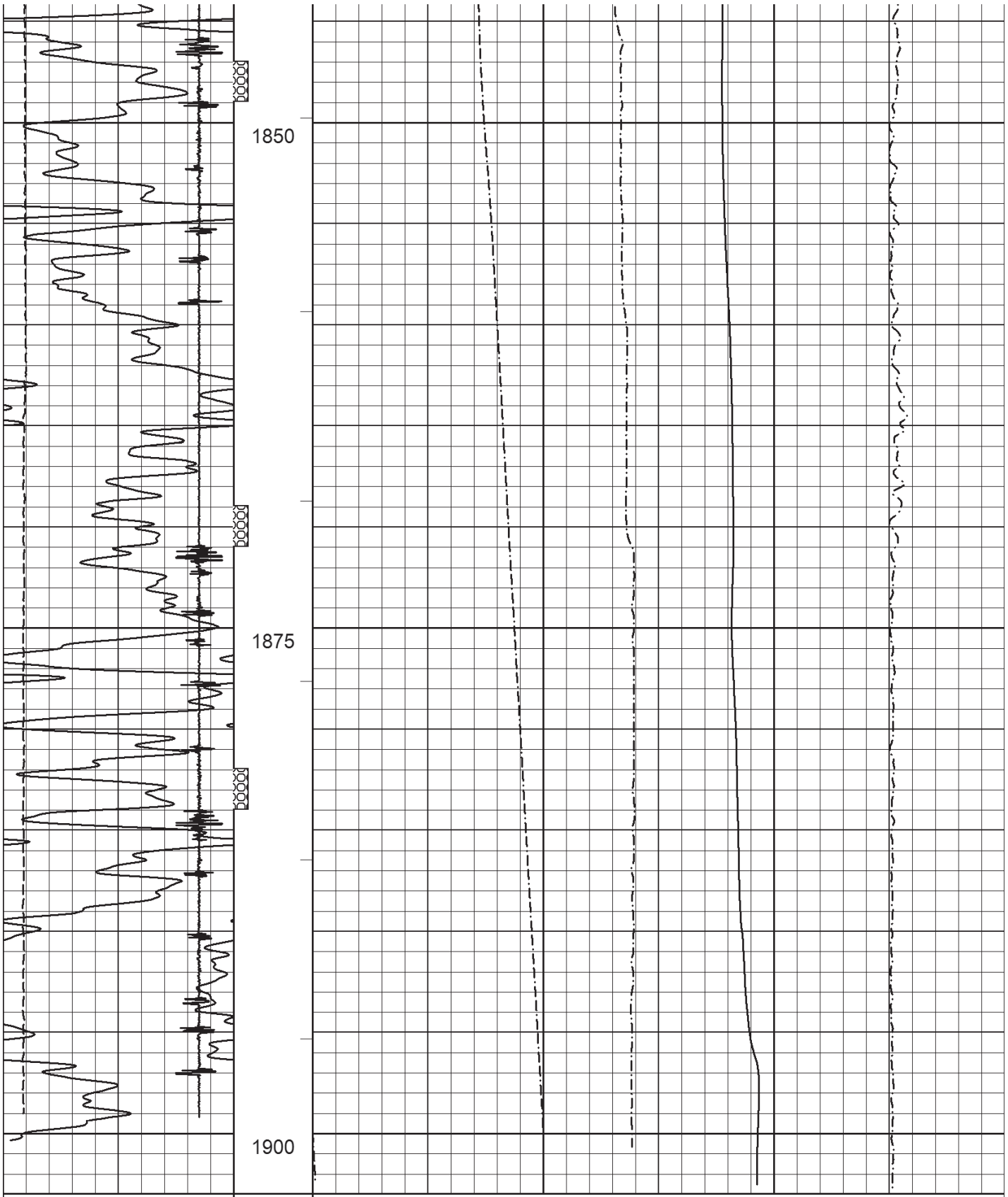

1700
1725
1750


1775
1800
1825
Line Speed
Gamma Ray
Tubing Collars
Gradio
Temperature
Spinner


Pressure
177.8 mm
Perfs
1850
1875


1900
2013-03-14 18:24
Speed (m/min)
0.00
100.00
CCL
0.00
100.00
Gamma Ray
0.00
120.00
Pass No. 1
1905.57
METERS
1:240
Pressure (kPa)
0.0
2000.0
Raw Gradio (kg/m³)
0.00
2000.00
Temperature (°C)
50.00
70.00
Spinner (RPS)
-10.00
10.00
Logging Down
Shutin
File P1SI.pre
111207N


2013-03-14 20:11
Speed (m/min)
0.00
100.00
CCL
0.00
100.00
Gamma Ray
0.00
120.00
Pass No. 2
1808.73
METERS
1:240
Pressure (kPa)
0.0
2000.0
Raw Gradio (kg/m³)
0.00
2000.00
Temperature (°C)
50.00
70.00
Spinner (RPS)
-10.00
10.00
Logging Down
Shutin
File P2SI.pre
111207N
Recorded with tubing shutin
1825



2013-03-14 20:11

Speed (m/min)
0.00 100.00

CCL
0.00 100.00

Gamma Ray
0.00 120.00

1903.01

METERS

Pressure (kPa)
0.0 2000.0

Raw Gradio (kg/m³)
0.00 2000.00

Temperature (°C)
50.00 70.00

Spinner (RPS)
-10.00 10.00

Logging Down
Shutin

File P2SI.pre

Pass No. 2

1:240

111207N

2013-03-14 21:45

Speed (m/min)
0.00 100.00

CCL
0.00 100.00

Gamma Ray
0.00 120.00

Pass No. 3

METERS
1:240

1809.37

Pressure (kPa)
0.0 2000.0

Raw Gradio (kg/m³)
0.00 2000.00

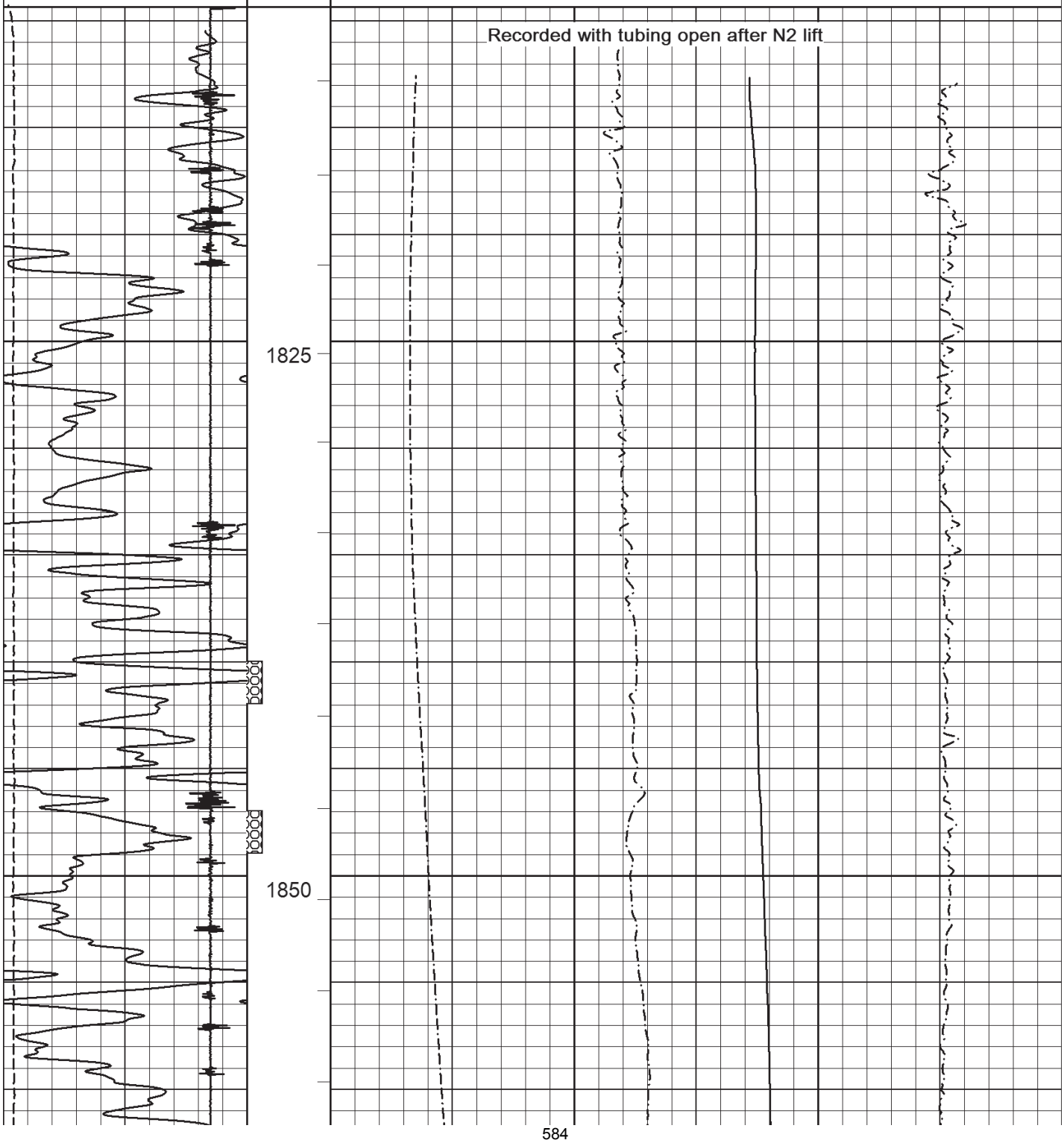
Temperature (°C)
50.00 70.00

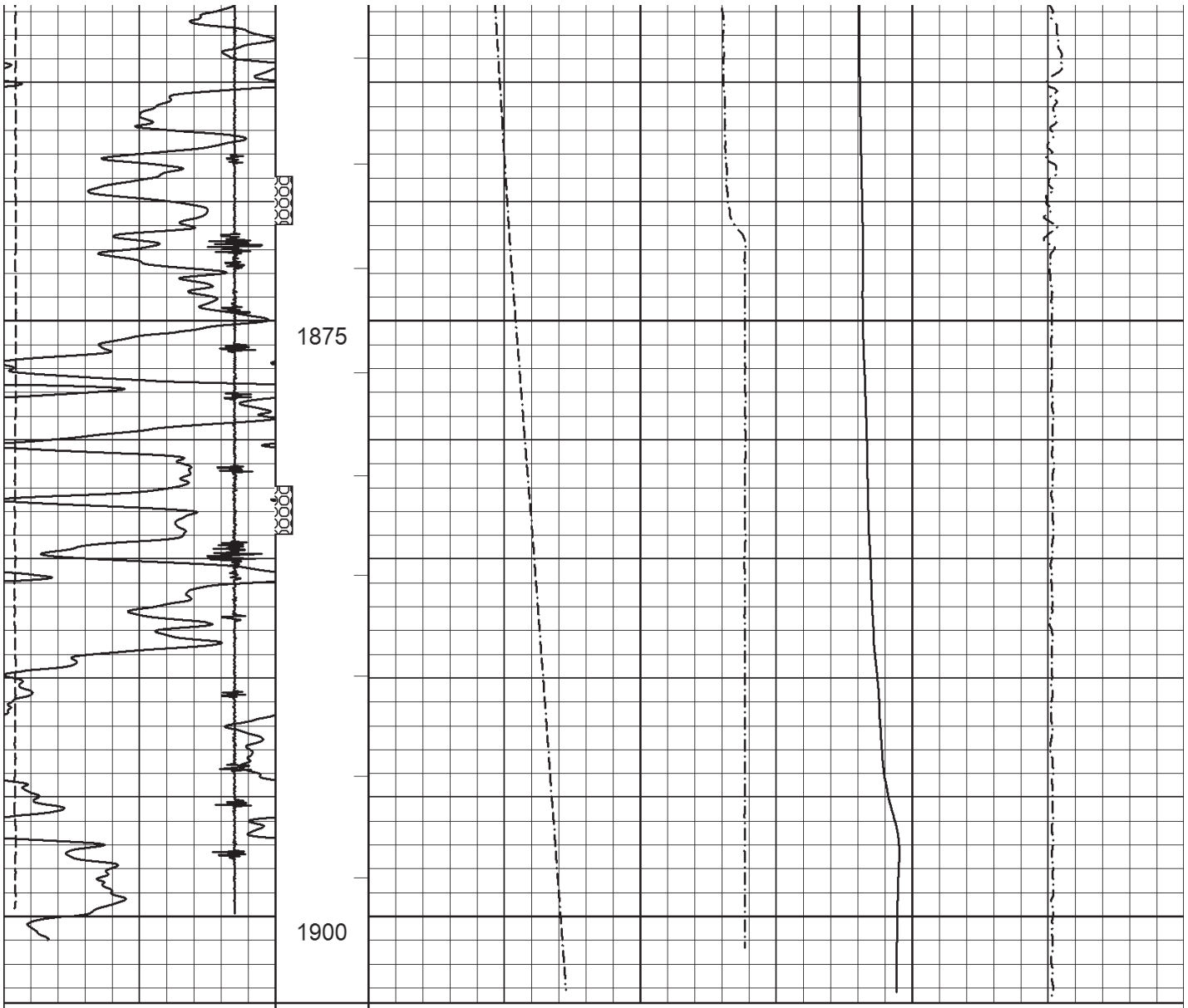
Spinner (RPS)
-10.00 10.00

Logging Down
Shutin

File P3OPEN.pre

111207N





2013-03-14 21:45
Speed (m/min)
0.00 100.00
CCL
0.00 100.00
Gamma Ray
0.00 120.00
Pass No. 3

1903.67
METERS
1:240

Pressure (kPa)
0.0 2000.0
Raw Gradio (kg/m³)
0.00 2000.00
Temperature (°C)
50.00 70.00
Spinner (RPS)
-10.00 10.00
Logging Down
Shutin
File P3OPEN.pre
111207N

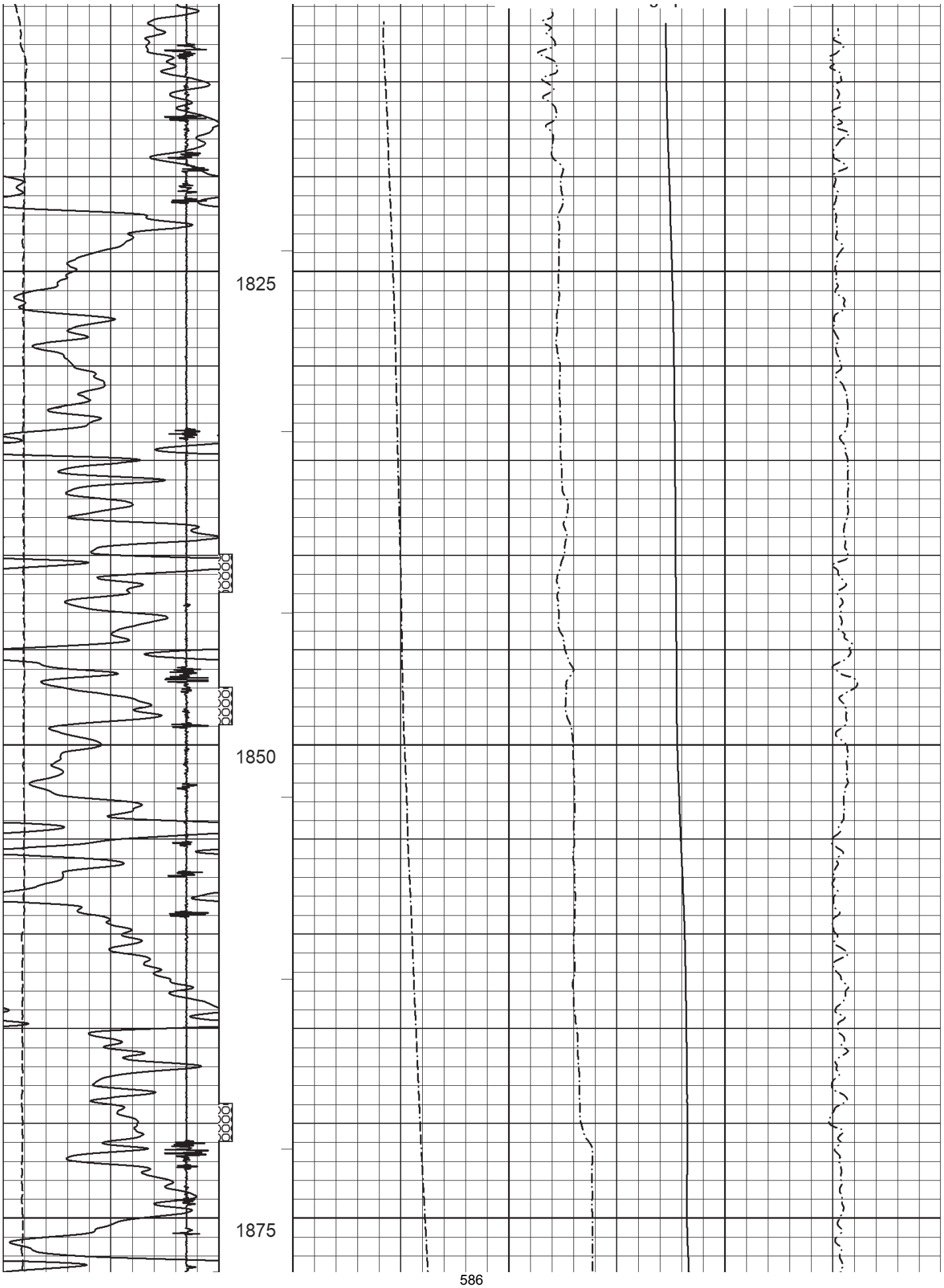
2013-03-14 22:18
Speed (m/min)
0.00 100.00
CCL
0.00 100.00
Gamma Ray
0.00 120.00
Pass No. 4

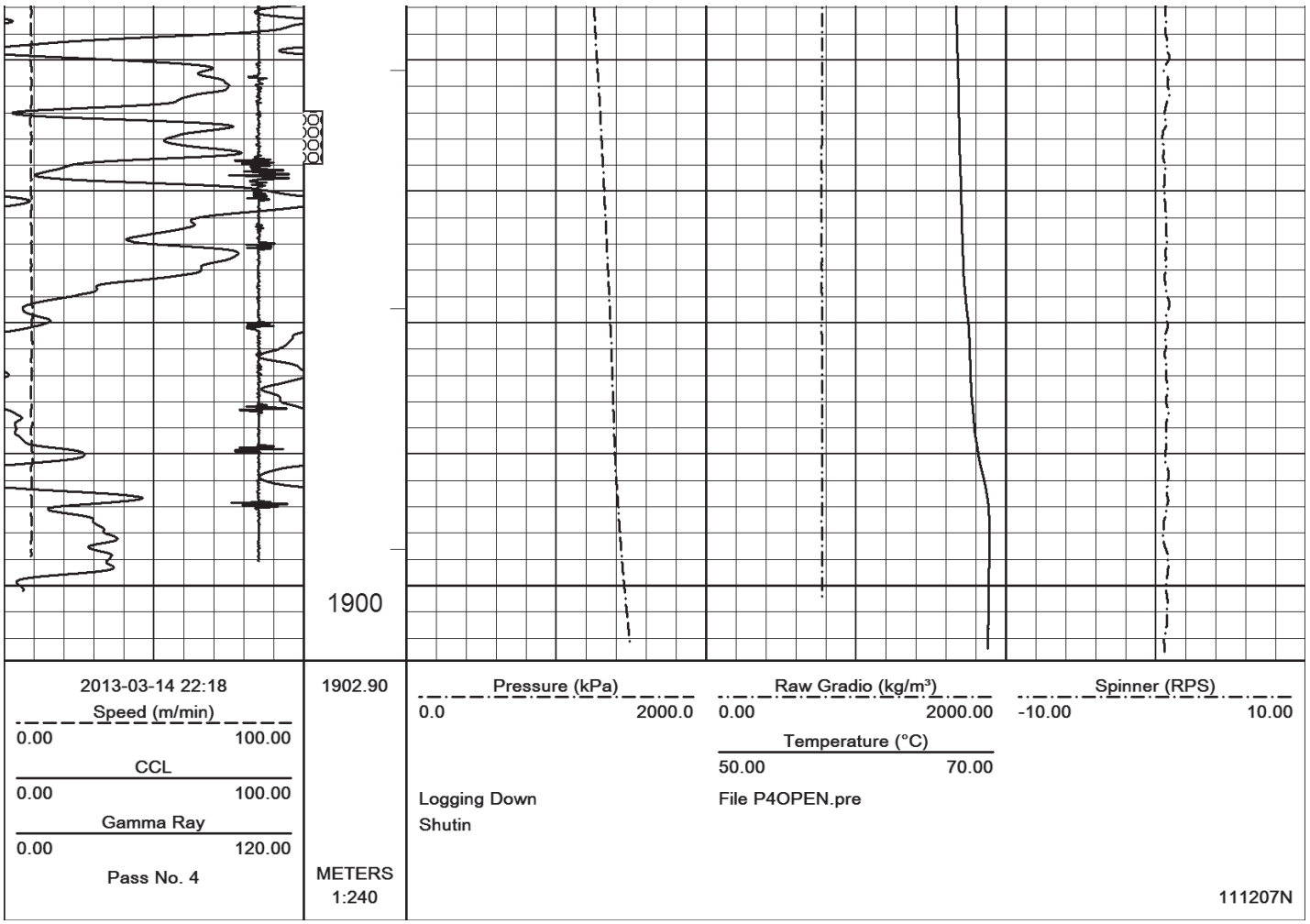
1808.62

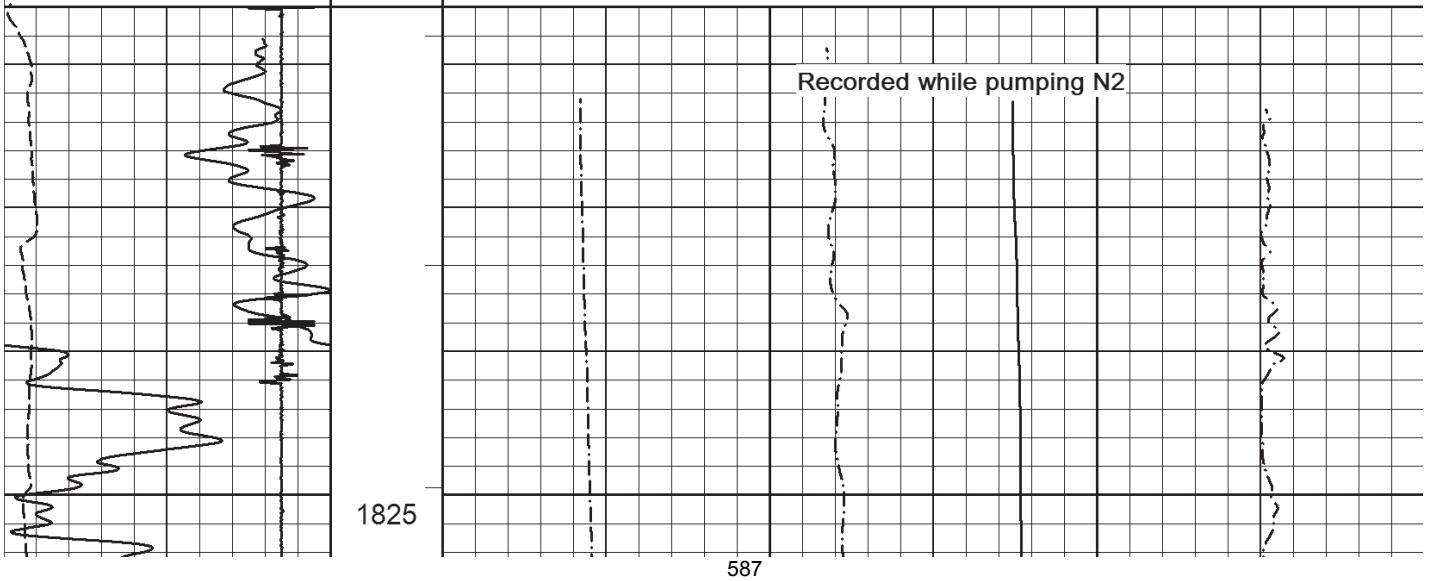
METERS
1:240

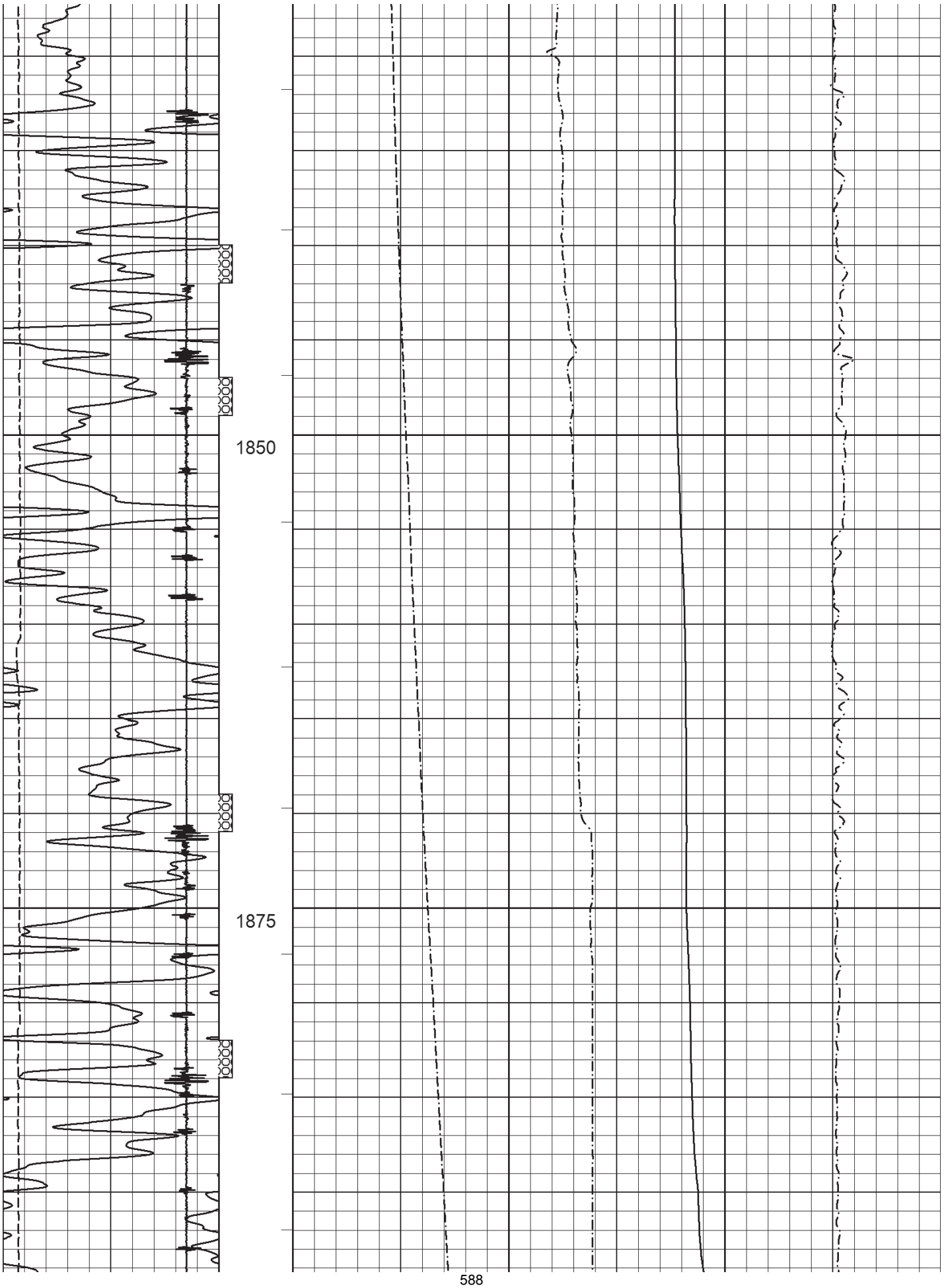
Pressure (kPa)
0.0 2000.0
Raw Gradio (kg/m³)
0.00 2000.00
Temperature (°C)
50.00 70.00
Spinner (RPS)
-10.00 10.00
Logging Down
Shutin
File P4OPEN.pre
111207N

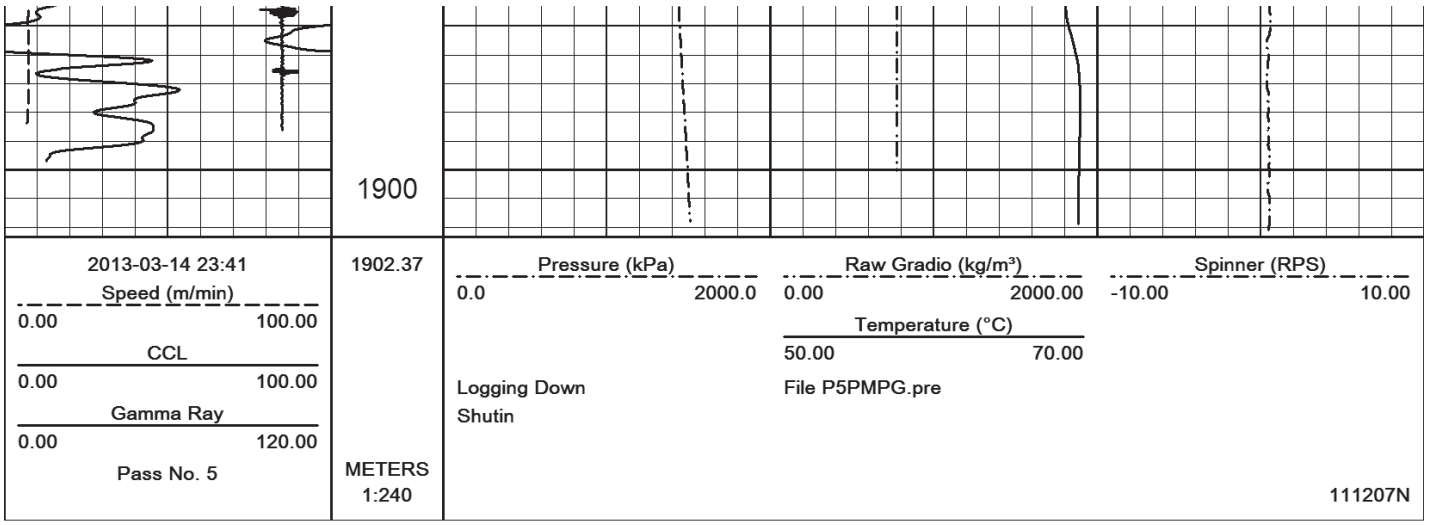
Recorded with tubing open after N2 lift


1825
1850
1875


1900
2013-03-14 22:18
Speed (m/min)
0.00
100.00
CCL
0.00
100.00
Gamma Ray
0.00
120.00
Pass No. 4
1902.90
METERS
1:240
Pressure (kPa)
0.0
2000.0
Raw Gradio (kg/m³)
0.00
2000.00
Temperature (°C)
50.00
70.00
Spinner (RPS)
-10.00
10.00
Logging Down
Shutin
File P4OPEN.pre
111207N


1825
2013-03-14 23:41
Speed (m/min)
0.00
100.00
CCL
0.00
100.00
Gamma Ray
0.00
120.00
Pass No. 5
1808.00
METERS
1:240
Pressure (kPa)
0.0
2000.0
Raw Gradio (kg/m³)
0.00
2000.00
Temperature (°C)
50.00
70.00
Spinner (RPS)
-10.00
10.00
Logging Down
Shutin
File P5PMPG.pre
111207N
Recorded while pumping N2


1850
1875



PureEnergy
Providing Superior Value

Company	**MGM ENERGY CORP**
Well	**MGM SHELL EAST MACKAY 1-78**
Field	**EAST MACKAY**
UWI	
Province	**N.W.T.**

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Company Name	**MGM ENERGY CORP.**
Well Name	**MGM SHELL EAST MACKAY I-78**
Unique Well ID	**00/I78 64-50 125-30 / 2**
Formation	**UPPER/LOWER CANOL**
Well License Number	**00207**
Test Type	**Static Gradient**
Start Test Date	**2013/09/19**
Final Test Date	**2013/09/19**
Prepared By	**Pam Cruickshank**
Report Date	**2013/09/19**

FMC Technologies Canada Ltd.
10th Floor, 333 - 11th Avenue SW, Calgary, Alberta T2R 1L9
Phone: 403-262-4000 Fax: 403-237-9731
www.fmctechnologies.com

FMC Technologies **Static Gradient**

Well Information

Company Name MGM ENERGY CORP.

Well Name MGM SHELL EAST MACKAY I-78

Contact	DICK HEENAN
Surface Location	00/I78 64-50 125-30 / 2
Unique Well ID	00/I78 64-50 125-30 / 2
Well Type	Vertical
Well Fluid Type	01 Oil
H2S Indicator	No

KB Elevation (SL)	160.70 m
GL Elevation (SL)	155.10 m
CF Elevation (SL)	155.10 m
KB-GL Offset	5.60 m
KB-CF Offset	5.60 m

Formation UPPER/LOWER CANOL

Top(Log KB)	1840.00 m	Bottom(Log KB)	1884.00 m
Top(TVD KB)	1840.00 m	Bottom(TVD KB)	1884.00 m

Test Information

Test Type	Static Gradient
Test Purpose (AEUB)	Initial Test
Tubing OD	88.9 mm
Tubing ID	76.0 mm
Tubing Depth(Log KB)	1962.30000 m
Tubing Depth(TVD KB)	1962.30000 m
Casing OD	177.8 mm
Casing ID	161.7 mm
Casing Depth(Log KB)	1978.00000 m
Casing Depth(TVD KB)	1978.00000 m
Packer Depth(Log KB)	1819.11000 m
Packer Depth(TVD KB)	1819.11000 m
PBTD(Log KB)	1978.00 m
PBTD(TVD KB)	1978.00 m

Start Test Date	2013/09/19 17:15:00
Final Test Date	2013/09/19 19:51:05
Date Well Shut-In	2013/03/18 08:00:00
Tubing Pressure: Initial	223.00 kPa(a)
Tubing Pressure: Final	174.00 kPa(a)
Casing Pressure: Initial	93.00 kPa(a)
Casing Pressure: Final	93.00 kPa(a)
Representative	John Higgins
Prepared By	Pam Cruickshank
Qualified By	Steve Dawson
Report Date	2013/09/19

Test Results

Gauge Serial Number Used in Summary	8067
Run Depth (Log KB)	1940.10 m
Run Depth (TVD KB)	1940.10 m
Pressure at Stop Depth	14251.94 kPa(a)
MPP(TVD KB)	1862.00 m
Representative Pressure at MPP	14304.43 kPa(a)
Reservoir Temperature	74.37 °C
Liquid Level(TVD KB)	1907.12 m

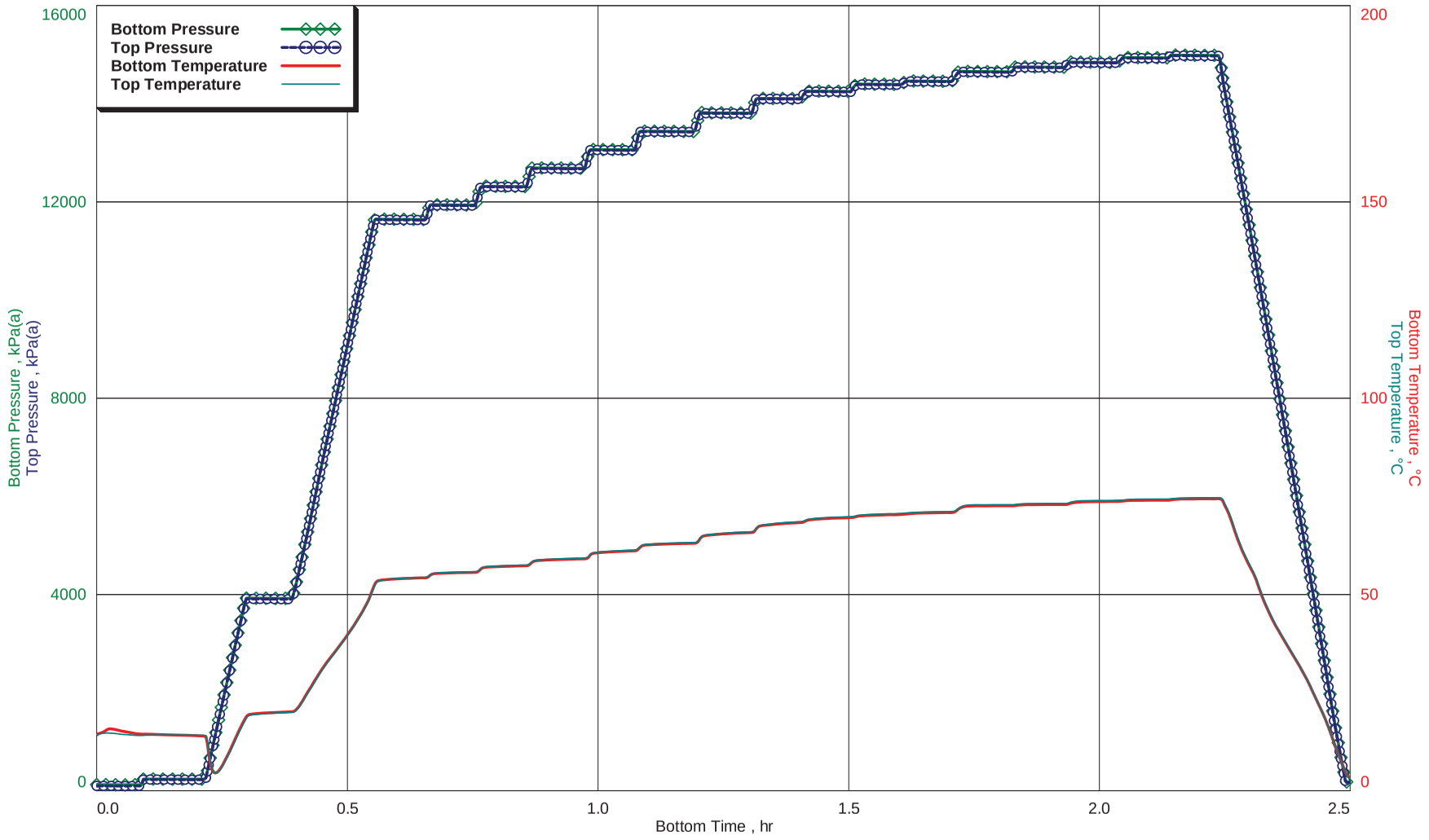
Remarks

For AB wells, the Interval (Log Depth mKB) must match the GCI Interval in the petroleum Registry for a successful submission

MGM ENERGY CORP.
00/I78 64-50 125-30 / 2
Start Test Date: 2013/09/19
Final Test Date: 2013/09/19

MGM SHELL EAST MACKAY I-78
Formation: UPPER/LOWER CANOL

Static Gradient Plot



593

Bottom

MGM ENERGY CORP.
00/I78 64-50 125-30 / 2
Start Test Date: 2013/09/19
Final Test Date: 2013/09/19

MGM SHELL EAST MACKAY I-78
Formation: UPPER/LOWER CANOL

Bottom

Gauge Serial Number	8067		Gauge Type	Strain	
Gauge Manufacturer	Spartek Systems		Maximum Recorder Range	41370.00	kPa
Run Depth (Log KB)	1940.10	m	Date of Last Calibration	2012/11/28	
Gauge Start Date	2013/09/19 17:15:00		Gauge Stop Date	2013/09/19 19:51:05	
Date Gauge On Bottom	2013/09/19 19:23:45		Date Gauge Off Bottom	2013/09/19 19:29:15	

Test Data

Top(TVD KB)	1840.00	m	Bottom(TVD KB)	1884.00	m
Pool Datum Depth (SS)		m	Well Datum Depth		m
Tubing Pressure: Initial	223.00	kPa(a)	Tubing Pressure: Final	174.00	kPa(a)
Casing Pressure: Initial	93.00	kPa(a)	Casing Pressure: Final	93.00	kPa(a)
Start Test Date	2013/09/19 17:15:00		Date Well Shut-In	2013/03/18 08:00:00	

Depth m	Time hh:mm:ss	Duration min	Pressure kPa(a)	Gradient kPa/m	Temp. °C	Gradient °C/m
5.60	17:27:55	12.92	237.40		13.86	
				7.363		0.012
505.60	17:38:15	10.33	3918.91		20.11	
				7.723		0.034
1505.60	17:54:15	16.00	11641.87		54.24	
				7.458		0.035
1545.10	18:00:15	6.00	11936.46		55.63	
				7.569		0.034
1595.10	18:06:25	6.17	12314.92		57.31	
				7.415		0.035
1645.10	18:13:15	6.83	12685.65		59.08	
				7.523		0.040
1695.10	18:19:15	6.00	13061.80		61.10	
				7.462		0.039
1745.10	18:26:25	7.17	13434.91		63.03	
				7.518		0.055
1795.10	18:33:15	6.83	13810.79		65.77	
				7.350		0.063
1835.10	18:39:05	5.83	14104.78		68.30	
				7.358		0.063
1855.10	18:45:15	6.17	14251.94		69.56	
				7.176		0.040
1875.10	18:51:15	6.00	14395.45		70.36	
				6.385		0.051
1885.10	18:57:15	6.00	14459.30		70.87	
				9.653		0.086
1905.10	19:04:25	7.17	14652.36		72.59	
				9.340		0.033
1915.10	19:10:45	6.33	14745.76		72.92	
				9.656		0.077
1925.10	19:17:05	6.33	14842.33		73.69	
				9.421		0.032
1935.10	19:23:05	6.00	14936.54		74.01	
				9.790		0.072
1940.10	19:29:15	6.17	14985.49		74.37	

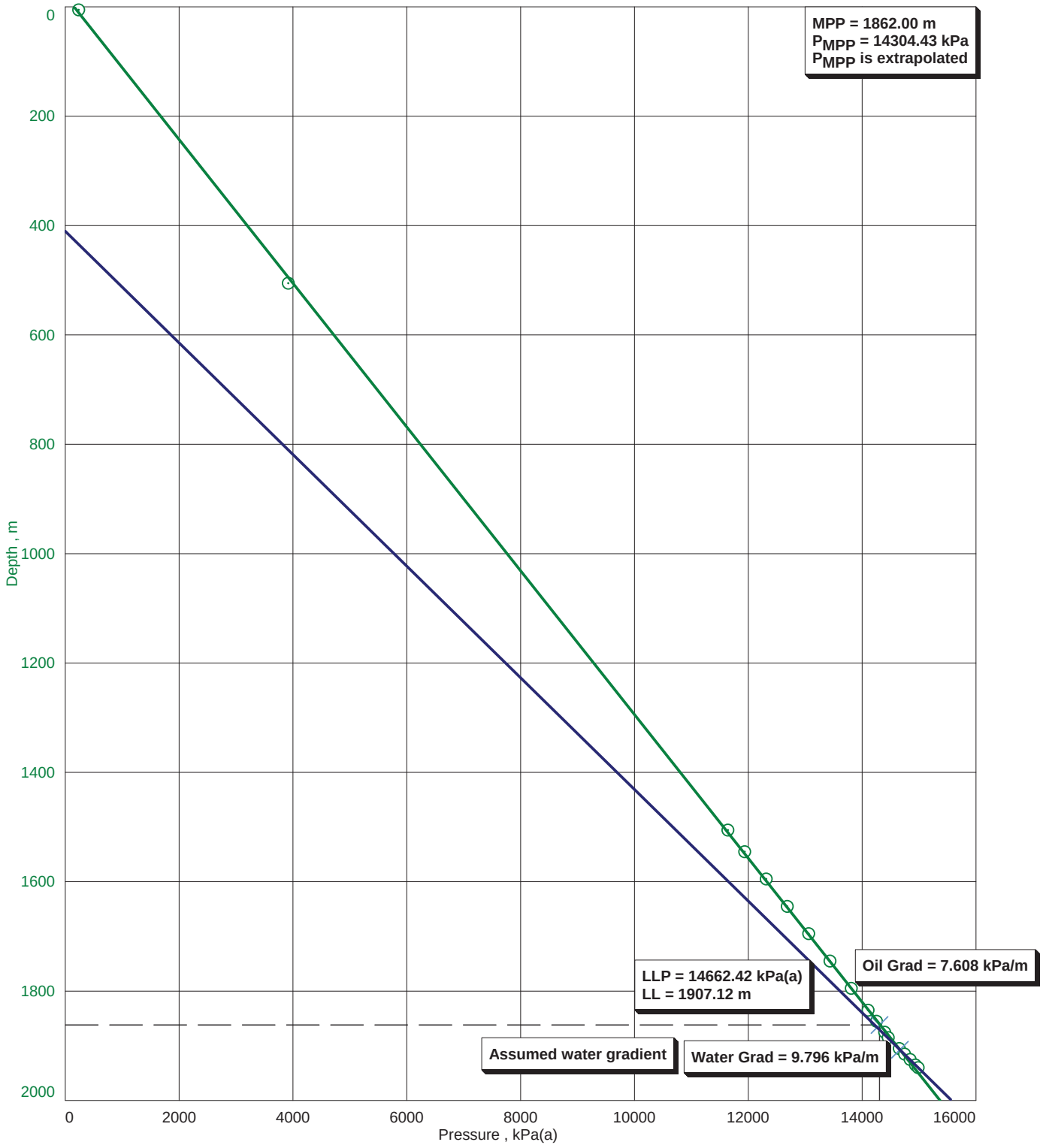
Results

Oil	7.608 kPa/m	Oil - Water Interface	1907.12 m	14662.42 kPa(a)

MGM ENERGY CORP.
00/I78 64-50 125-30 / 2
Start Test Date: 2013/09/19
Final Test Date: 2013/09/19

MGM SHELL EAST MACKAY I-78
Formation: UPPER/LOWER CANOL

Bottom Gradient



Top

MGM ENERGY CORP.
00/I78 64-50 125-30 / 2
Start Test Date: 2013/09/19
Final Test Date: 2013/09/19

MGM SHELL EAST MACKAY I-78
Formation: UPPER/LOWER CANOL

Top

Gauge Serial Number	80050		Gauge Type	Strain	
Gauge Manufacturer	Spartek Systems		Maximum Recorder Range	41370.00	kPa
Run Depth (Log KB)	1939.85	m	Date of Last Calibration	2012/11/28	
Gauge Start Date	2013/09/19 17:15:00		Gauge Stop Date	2013/09/19 19:51:05	
Date Gauge On Bottom	2013/09/19 19:23:45		Date Gauge Off Bottom	2013/09/19 19:29:15	

Test Data

Top(TVD KB)	1840.00	m	Bottom(TVD KB)	1884.00	m
Pool Datum Depth (SS)		m	Well Datum Depth		m
Tubing Pressure: Initial	223.00	kPa(a)	Tubing Pressure: Final	174.00	kPa(a)
Casing Pressure: Initial	93.00	kPa(a)	Casing Pressure: Final	93.00	kPa(a)
Start Test Date	2013/09/19 17:15:00		Date Well Shut-In	2013/03/18 08:00:00	

Depth m	Time hh:mm:ss	Duration min	Pressure kPa(a)	Gradient kPa/m	Temp. °C	Gradient °C/m
5.35	17:27:55	12.92	225.44		14.09	
				7.355		0.012
505.35	17:38:15	10.33	3902.94		19.99	
				7.727		0.034
1505.35	17:54:15	16.00	11629.45		54.36	
				7.357		0.036
1545.35	18:00:15	6.00	11923.74		55.80	
				7.621		0.034
1594.85	18:06:15	6.00	12300.98		57.47	
				7.476		0.036
1644.85	18:13:25	7.17	12674.80		59.28	
				7.511		0.040
1694.85	18:19:15	5.83	13050.37		61.30	
				7.482		0.038
1744.85	18:26:15	7.00	13424.44		63.22	
				7.512		0.055
1794.85	18:33:15	7.00	13800.05		65.97	
				7.368		0.064
1834.85	18:39:05	5.83	14094.77		68.53	
				7.356		0.064
1854.85	18:45:15	6.17	14241.89		69.80	
				7.192		0.041
1874.85	18:51:15	6.00	14385.72		70.62	
				6.382		0.051
1884.85	18:57:15	6.00	14449.54		71.13	
				9.593		0.087
1904.85	19:04:25	7.17	14641.40		72.87	
				9.369		0.031
1914.85	19:10:45	6.33	14735.09		73.18	
				9.661		0.077
1924.85	19:17:05	6.33	14831.70		73.95	
				9.351		0.035
1934.85	19:23:05	6.00	14925.20		74.30	
				9.869		0.071
1939.85	19:29:15	6.17	14974.55		74.66	

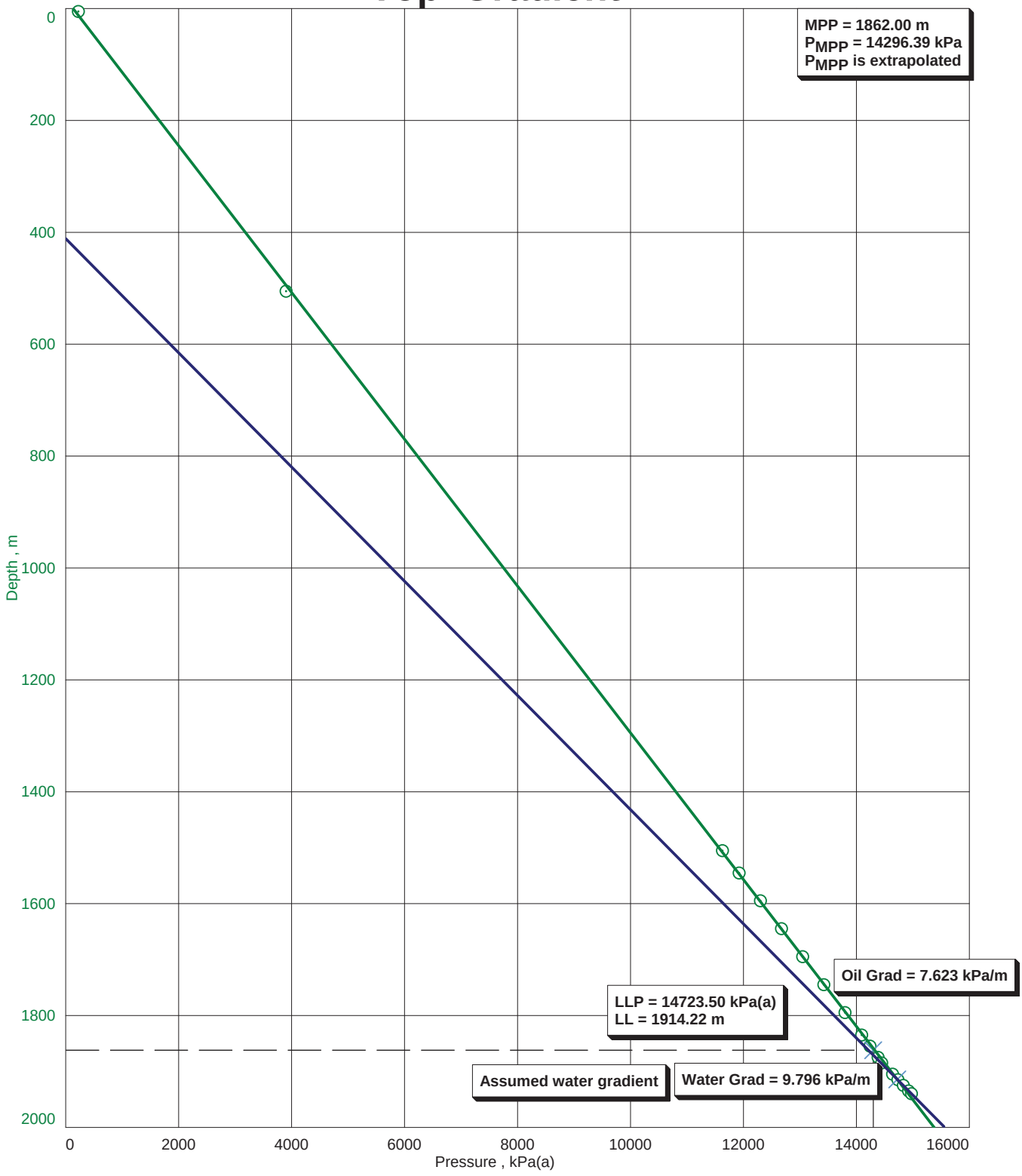
Results

Oil	7.623	kPa/m	Oil - Water Interface	1914.22 m	14723.50 kPa(a)

MGM ENERGY CORP.
00/I78 64-50 125-30 / 2
Start Test Date: 2013/09/19
Final Test Date: 2013/09/19

MGM SHELL EAST MACKAY I-78
Formation: UPPER/LOWER CANOL

Top Gradient



Company Name MGM ENERGY CORP.
Unique Well ID 00/I78 64-50 125-30 / 2
Start Test Date 2013/09/19
Final Test Date 2013/09/19

MGM SHELL EAST MACKAY I-78
UPPER/LOWER CANOL

	Bottom Date	Bottom Time	Bottom Pres.	Bottom Temp.	Top Time	Top Pres.	Top Temp.
	YYYY/MM/DD HH:mm:ss	h	kPa(a)	°C	h	kPa(a)	°C
1	2013/09/19 17:15:00	0.0000	123.51	14.23	0.0000	97.68	14.00
2	2013/09/19 17:15:40	0.0111	124.02	14.84	0.0111	97.18	14.60
3	2013/09/19 17:16:45	0.0292	123.98	15.75	0.0292	96.72	14.66
4	2013/09/19 17:18:05	0.0514	123.16	15.17	0.0514	95.87	14.33
5	2013/09/19 17:19:25	0.0736	121.33	14.64	0.0736	96.46	14.11
6	2013/09/19 17:20:45	0.0958	238.40	14.43	0.0958	226.90	14.14
7	2013/09/19 17:22:05	0.1181	238.61	14.35	0.1181	226.75	14.18
8	2013/09/19 17:23:25	0.1403	238.36	14.26	0.1403	226.27	14.18
9	2013/09/19 17:24:45	0.1625	237.35	14.16	0.1625	225.63	14.18
10	2013/09/19 17:26:05	0.1847	236.94	14.09	0.1847	224.84	14.17
11	2013/09/19 17:27:25	0.2069	236.43	14.02	0.2069	224.27	14.15
12	2013/09/19 17:28:45	0.2292	798.03	5.77	0.2292	781.48	6.25
13	2013/09/19 17:30:05	0.2514	1827.21	6.61	0.2514	1814.29	6.39
14	2013/09/19 17:31:25	0.2736	2838.14	12.46	0.2736	2825.01	12.00
15	2013/09/19 17:32:45	0.2958	3844.96	18.30	0.2958	3831.73	17.89
16	2013/09/19 17:34:05	0.3181	3924.22	19.65	0.3181	3908.46	19.46
17	2013/09/19 17:35:25	0.3403	3922.80	19.83	0.3403	3906.56	19.69
18	2013/09/19 17:36:45	0.3625	3920.82	19.98	0.3625	3904.92	19.84
19	2013/09/19 17:38:05	0.3847	3919.36	20.10	0.3847	3903.18	19.98
20	2013/09/19 17:39:25	0.4069	4636.34	22.14	0.4069	4621.80	21.90
21	2013/09/19 17:40:45	0.4292	5684.21	26.80	0.4292	5671.20	26.51
22	2013/09/19 17:42:05	0.4514	6773.04	31.28	0.4514	6760.00	31.03
23	2013/09/19 17:43:25	0.4736	7820.25	35.07	0.4736	7806.85	34.90
24	2013/09/19 17:44:45	0.4958	8877.76	38.93	0.4958	8865.33	38.78
25	2013/09/19 17:46:05	0.5181	9938.84	43.13	0.5181	9927.32	42.97
26	2013/09/19 17:47:25	0.5403	10991.90	48.07	0.5403	10981.28	47.88
27	2013/09/19 17:48:45	0.5625	11649.71	53.53	0.5625	11638.10	53.43
28	2013/09/19 17:50:05	0.5847	11646.97	53.86	0.5847	11634.44	53.86
29	2013/09/19 17:51:25	0.6069	11645.11	54.04	0.6069	11632.95	54.09
30	2013/09/19 17:52:45	0.6292	11644.09	54.15	0.6292	11631.39	54.25
31	2013/09/19 17:54:05	0.6514	11642.28	54.23	0.6514	11629.72	54.36
32	2013/09/19 17:55:25	0.6736	11941.51	55.30	0.6736	11928.89	55.38
33	2013/09/19 17:56:45	0.6958	11940.67	55.44	0.6958	11927.76	55.57
34	2013/09/19 17:58:05	0.7181	11939.17	55.53	0.7181	11926.20	55.68
35	2013/09/19 17:59:25	0.7403	11937.27	55.59	0.7403	11924.22	55.75
36	2013/09/19 18:00:45	0.7625	12209.95	56.02	0.7625	12199.26	56.11
37	2013/09/19 18:02:05	0.7847	12319.45	57.00	0.7847	12307.05	57.13
38	2013/09/19 18:03:25	0.8069	12317.11	57.13	0.8069	12304.47	57.28
39	2013/09/19 18:04:45	0.8292	12315.58	57.22	0.8292	12302.58	57.38
40	2013/09/19 18:06:05	0.8514	12313.71	57.30	0.8514	12301.25	57.46
41	2013/09/19 18:07:25	0.8736	12693.22	58.54	0.8736	12680.96	58.64
42	2013/09/19 18:08:45	0.8958	12691.11	58.76	0.8958	12678.40	58.90
43	2013/09/19 18:10:05	0.9181	12689.60	58.88	0.9181	12677.26	59.05
44	2013/09/19 18:11:25	0.9403	12687.69	58.97	0.9403	12675.59	59.15
45	2013/09/19 18:12:45	0.9625	12686.49	59.05	0.9625	12673.93	59.24

Print Filter: Approximately every 8 lines

Gauge Name	Serial Number	Start Date	Start Time	Run Depth (TVD)
Bottom	8067	2013/09/19	17:15:00	1940.10 m
Top	80050	2013/09/19	17:15:00	1939.85 m

Company Name MGM ENERGY CORP.
Unique Well ID 00/I78 64-50 125-30 / 2
Start Test Date 2013/09/19
Final Test Date 2013/09/19

MGM SHELL EAST MACKAY I-78
UPPER/LOWER CANOL

	Bottom Date	Bottom Time	Bottom Pres.	Bottom Temp.	Top Time	Top Pres.	Top Temp.
	YYYY/MM/DD HH:mm:ss	h	kPa(a)	°C	h	kPa(a)	°C
46	2013/09/19 18:14:05	0.9847	13065.66	60.10	0.9847	13053.51	60.15
47	2013/09/19 18:15:25	1.0069	13066.19	60.70	1.0069	13054.67	60.84
48	2013/09/19 18:16:45	1.0292	13064.78	60.88	1.0292	13052.92	61.05
49	2013/09/19 18:18:05	1.0514	13063.19	61.01	1.0514	13051.32	61.20
50	2013/09/19 18:19:25	1.0736	13066.96	61.11	1.0736	13056.98	61.32
51	2013/09/19 18:20:45	1.0958	13441.76	62.60	1.0958	13430.36	62.73
52	2013/09/19 18:22:05	1.1181	13440.40	62.76	1.1181	13428.99	62.92
53	2013/09/19 18:23:25	1.1403	13438.80	62.87	1.1403	13427.99	63.05
54	2013/09/19 18:24:45	1.1625	13437.58	62.95	1.1625	13426.12	63.14
55	2013/09/19 18:26:05	1.1847	13435.71	63.02	1.1847	13424.57	63.21
56	2013/09/19 18:27:25	1.2069	13822.78	64.70	1.2069	13811.25	64.74
57	2013/09/19 18:28:45	1.2292	13816.24	65.22	1.2292	13805.80	65.34
58	2013/09/19 18:30:05	1.2514	13814.14	65.44	1.2514	13803.72	65.59
59	2013/09/19 18:31:25	1.2736	13812.87	65.60	1.2736	13802.13	65.78
60	2013/09/19 18:32:45	1.2958	13810.96	65.73	1.2958	13800.63	65.92
61	2013/09/19 18:34:05	1.3181	14110.19	67.11	1.3181	14099.73	67.17
62	2013/09/19 18:35:25	1.3403	14109.60	67.72	1.3403	14099.31	67.88
63	2013/09/19 18:36:45	1.3625	14107.88	68.00	1.3625	14097.56	68.21
64	2013/09/19 18:38:05	1.3847	14106.03	68.19	1.3847	14095.82	68.41
65	2013/09/19 18:39:25	1.4069	14139.27	68.35	1.4069	14130.79	68.57
66	2013/09/19 18:40:45	1.4292	14257.82	69.11	1.4292	14247.69	69.33
67	2013/09/19 18:42:05	1.4514	14256.17	69.31	1.4514	14245.73	69.55
68	2013/09/19 18:43:25	1.4736	14254.39	69.45	1.4736	14244.10	69.70
69	2013/09/19 18:44:45	1.4958	14252.46	69.54	1.4958	14242.53	69.78
70	2013/09/19 18:46:05	1.5181	14403.09	69.93	1.5181	14392.85	70.14
71	2013/09/19 18:47:25	1.5403	14400.82	70.13	1.5403	14390.50	70.38
72	2013/09/19 18:48:45	1.5625	14398.74	70.23	1.5625	14388.82	70.51
73	2013/09/19 18:50:05	1.5847	14397.37	70.31	1.5847	14387.62	70.58
74	2013/09/19 18:51:25	1.6069	14407.69	70.36	1.6069	14399.45	70.63
75	2013/09/19 18:52:45	1.6292	14464.63	70.66	1.6292	14454.70	70.91
76	2013/09/19 18:54:05	1.6514	14462.95	70.75	1.6514	14453.72	71.01
77	2013/09/19 18:55:25	1.6736	14461.69	70.81	1.6736	14451.18	71.07
78	2013/09/19 18:56:45	1.6958	14459.38	70.86	1.6958	14449.83	71.12
79	2013/09/19 18:58:05	1.7181	14645.32	71.67	1.7181	14636.22	71.74
80	2013/09/19 18:59:25	1.7403	14658.71	72.52	1.7403	14647.35	72.80
81	2013/09/19 19:00:45	1.7625	14657.19	72.57	1.7625	14645.57	72.85
82	2013/09/19 19:02:05	1.7847	14655.07	72.58	1.7847	14643.96	72.86
83	2013/09/19 19:03:25	1.8069	14654.01	72.59	1.8069	14642.31	72.87
84	2013/09/19 19:04:45	1.8292	14710.78	72.61	1.8292	14701.72	72.88
85	2013/09/19 19:06:05	1.8514	14751.95	72.84	1.8514	14740.69	73.12
86	2013/09/19 19:07:25	1.8736	14749.80	72.89	1.8736	14738.71	73.16
87	2013/09/19 19:08:45	1.8958	14748.14	72.91	1.8958	14737.30	73.18
88	2013/09/19 19:10:05	1.9181	14746.37	72.91	1.9181	14735.88	73.18
89	2013/09/19 19:11:25	1.9403	14849.25	73.14	1.9403	14839.04	73.41
90	2013/09/19 19:12:45	1.9625	14847.68	73.55	1.9625	14837.14	73.86

Print Filter: Approximately every 8 lines

Gauge Name	Serial Number	Start Date	Start Time	Run Depth (TVD)
Bottom	8067	2013/09/19	17:15:00	1940.10 m
Top	80050	2013/09/19	17:15:00	1939.85 m

Company Name MGM ENERGY CORP.
Unique Well ID 00/I78 64-50 125-30 / 2
Start Test Date 2013/09/19
Final Test Date 2013/09/19

MGM SHELL EAST MACKAY I-78
UPPER/LOWER CANOL

	Bottom Date	Bottom Time	Bottom Pres.	Bottom Temp.	Top Time	Top Pres.	Top Temp.
	YYYY/MM/DD HH:mm:ss	h	kPa(a)	°C	h	kPa(a)	°C
91	2013/09/19 19:14:05	1.9847	14846.42	73.64	1.9847	14835.25	73.93
92	2013/09/19 19:15:25	2.0069	14845.13	73.67	2.0069	14833.53	73.94
93	2013/09/19 19:16:45	2.0292	14842.88	73.69	2.0292	14832.02	73.95
94	2013/09/19 19:18:05	2.0514	14942.31	73.88	2.0514	14931.65	74.16
95	2013/09/19 19:19:25	2.0736	14940.64	73.98	2.0736	14929.56	74.27
96	2013/09/19 19:20:45	2.0958	14938.73	74.00	2.0958	14928.41	74.29
97	2013/09/19 19:22:05	2.1181	14937.39	74.01	2.1181	14926.88	74.30
98	2013/09/19 19:23:25	2.1403	14969.97	74.02	2.1403	14960.09	74.30
99	2013/09/19 19:24:45	2.1625	14991.03	74.31	2.1625	14979.42	74.58
100	2013/09/19 19:26:05	2.1847	14988.97	74.34	2.1847	14977.84	74.62
101	2013/09/19 19:27:25	2.2069	14987.66	74.36	2.2069	14976.32	74.64
102	2013/09/19 19:28:45	2.2292	14985.98	74.37	2.2292	14974.52	74.65
103	2013/09/19 19:30:05	2.2514	14192.76	72.34	2.2514	14172.27	72.73
104	2013/09/19 19:31:25	2.2736	12952.32	64.78	2.2736	12931.36	65.21
105	2013/09/19 19:32:45	2.2958	11692.41	58.17	2.2958	11671.58	58.52
106	2013/09/19 19:34:05	2.3181	10415.95	51.74	2.3181	10394.01	52.10
107	2013/09/19 19:35:25	2.3403	9126.68	44.90	2.3403	9104.20	45.16
108	2013/09/19 19:36:45	2.3625	7825.68	39.60	2.3625	7802.05	39.79
109	2013/09/19 19:38:05	2.3847	6511.41	34.88	2.3847	6486.96	35.03
110	2013/09/19 19:39:25	2.4069	5186.96	29.95	2.4069	5161.09	30.07
111	2013/09/19 19:40:45	2.4292	3843.33	24.17	2.4292	3817.18	24.25
112	2013/09/19 19:42:05	2.4514	2485.64	17.96	2.4514	2458.08	18.02
113	2013/09/19 19:43:25	2.4736	1126.08	10.23	2.4736	1100.10	10.23
114	2013/09/19 19:44:45	2.4958	180.58	3.68	2.4958	167.18	3.57
115	2013/09/19 19:46:05	2.5181	181.40	3.32	2.5181	169.86	3.03
116	2013/09/19 19:47:25	2.5403	112.41	3.68	2.5403	100.94	3.09
117	2013/09/19 19:48:45	2.5625	113.09	3.86	2.5625	101.90	3.31
118	2013/09/19 19:50:05	2.5847	113.26	4.09	2.5847	102.40	3.87
119	2013/09/19 19:51:05	2.6014	114.85	4.75	2.6014	101.85	4.75

Print Filter: Approximately every 8 lines

Gauge Name	Serial Number	Start Date	Start Time	Run Depth (TVD)
Bottom	8067	2013/09/19	17:15:00	1940.10 m
Top	80050	2013/09/19	17:15:00	1939.85 m

Company Name	**MGM ENERGY CORP.**
Well Name	**MGM SHELL EAST MACKAY I-78**
Unique Well ID	**00/I78 64-50 125-30 / 2**
Formation	**UPPER/LOWER CANOL**
Well License Number	**002079**
Test Type	**Build-Up**
Start Test Date	**2013/03/15**
Final Test Date	**2013/09/19**
Prepared By	**Cory Strang**
Report Date	**2013/09/23**

FMC Technologies Canada Ltd.
10th Floor, 333 - 11th Avenue SW, Calgary, Alberta T2R 1L9
Phone: 403-262-4000 Fax: 403-237-9731
www.fmctechnologies.com

FMC Technologies **Build-Up**

Well Information

Company Name	MGM ENERGY CORP.
Well Name	MGM SHELL EAST MACKAY I-78
Contact	DICK HEENAN
Surface Location	00/I78 64-50 125-30 / 2
Unique Well ID	00/I78 64-50 125-30 / 2
Well Type	NA/Unknown
Well Fluid Type	01 Oil
H2S Indicator	No

KB Elevation (SL)	160.70 m
GL Elevation (SL)	155.10 m
CF Elevation (SL)	155.10 m
KB-GL Offset	5.60 m
KB-CF Offset	5.60 m

Formation UPPER/LOWER CANOL

Top(Log KB)	1840.00 m	Bottom(Log KB)	1884.00 m
Top(TVD KB)	1840.00 m	Bottom(TVD KB)	1884.00 m

Test Information

Test Type	Build-Up
Test Purpose	Initial Test

Tubing OD	88.9 mm
Tubing ID	76.0 mm
Tubing Depth(Log KB)	1962.30000 m
Tubing Depth(TVD KB)	1962.30000 m
Casing OD	177.8 mm
Casing ID	161.7 mm
Casing Depth(Log KB)	1978.00000 m
Casing Depth(TVD KB)	1978.00000 m
Packer Depth(Log KB)	1819.11000 m
Packer Depth(TVD KB)	1819.11000 m
PBTD(Log KB)	1978.00 m
PBTD(TVD KB)	1978.00 m

Start Test Date	2013/03/15 16:20:00
Final Test Date	2013/09/19 16:35:32
Date Well Shut-In	2013/03/16 14:07:01
Tubing Pressure: Initial	902.00 kPa(a)
Tubing Pressure: Final	343.00 kPa(a)
Casing Pressure: Initial	123.00 kPa(a)
Casing Pressure: Final	93.00 kPa(a)

Representative	John Higgins
Prepared By	Cory Strang
Qualified By	Keith Armstrong
Report Date	2013/09/23

Test Results

Gauge Serial Number	80671
Run Depth (Log KB)	1833.30 m
Run Depth (TVD KB)	1833.30 m
Pressure at Stop Depth	13638.20 kPa(a)
MPP Depth	1862.00 m
Reservoir Temperature	69.32 °C

Remarks

For AB wells, the Interval (Log Depth mKB) must match the GCI Interval in the Petroleum Registry for a successful submission

Recorder

Company Name	MGM ENERGY CORP.	Well Name	MGM SHELL EAST MACKAY I-78
Unique Well ID	00/I78 64-50 125-30 / 2	Formation	UPPER/LOWER CANOL
Start Test Date	2013/03/15		
Final Test Date	2013/09/19		

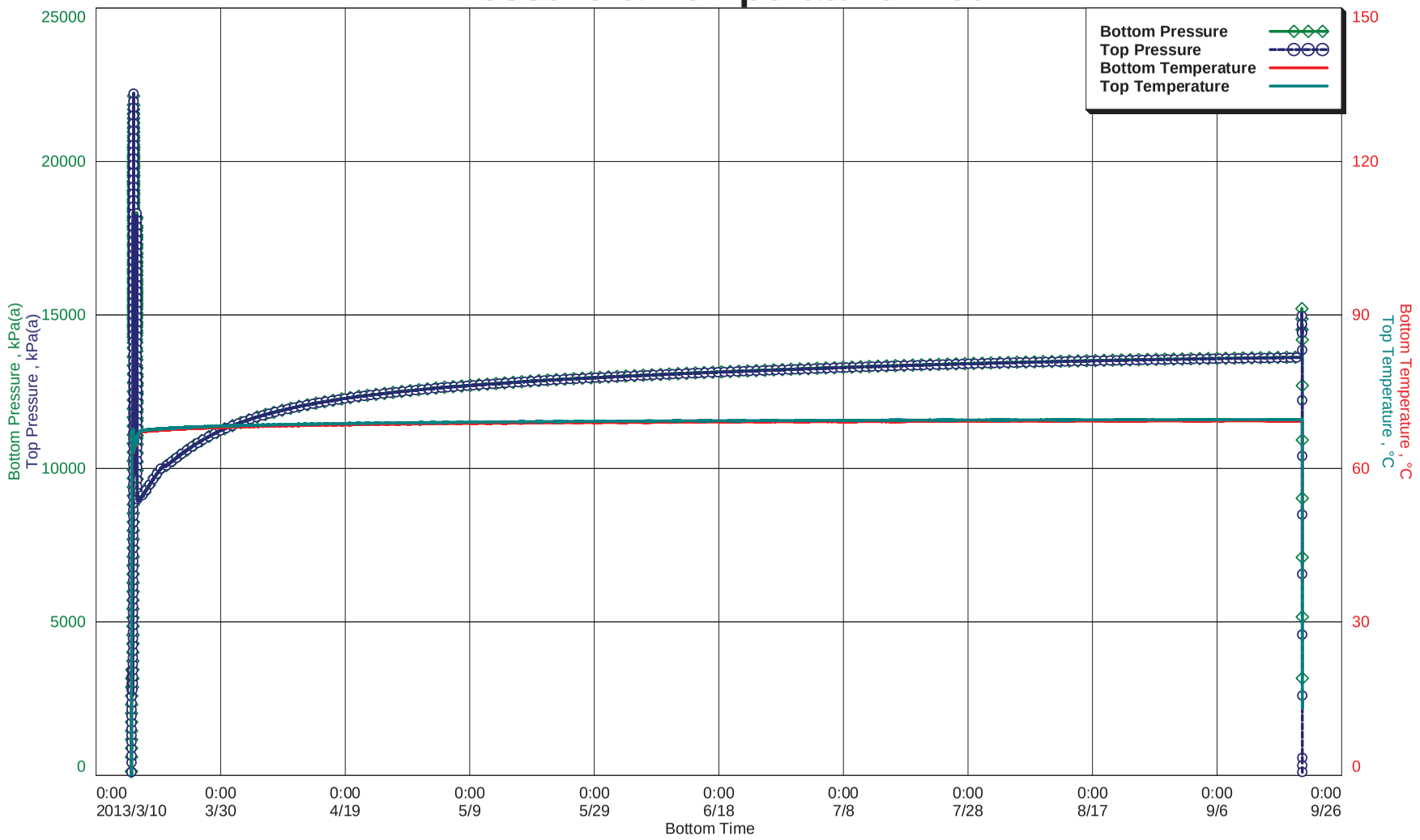
Gauge Name	Bottom	Gauge Type	Electronic
Gauge Serial Number	80671	Gauge Manufacturer	Spartek
Run Depth (TVD KB)	1833.30	Gauge Model	SS2500
Date of Last Calibration	2012/11/28	Maximum Recorder Range	40370.00
Gauge Start Date	2013/03/15	Gauge Start Time	16:20:00
Gauge Stop Date	2013/09/19	Gauge Stop Time	16:35:32
Date Gauge On Bottom	2013/03/15	Time Gauge On Bottom	17:15:00
Date Gauge Off Bottom	2013/09/19	Time Gauge Off Bottom	14:47:32

Gauge Name	Top	Gauge Type	Electronic
Gauge Serial Number	80050	Gauge Manufacturer	Spartek
Run Depth (TVD KB)	1833.05	Gauge Model	SS2500
Date of Last Calibration	2012/11/28	Maximum Recorder Range	40370.00
Gauge Start Date	2013/03/15	Gauge Start Time	16:20:00
Gauge Stop Date	2013/09/19	Gauge Stop Time	16:35:32
Date Gauge On Bottom	2013/03/15	Time Gauge On Bottom	17:15:00
Date Gauge Off Bottom	2013/09/19	Time Gauge Off Bottom	14:47:32

MGM ENERGY CORP.
00/I78 64-50 125-30 / 2
Start Test Date: 2013/03/15
Final Test Date: 2013/09/19

MGM SHELL EAST MACKAY I-78
Formation: UPPER/LOWER CANOL

Pressure & Temperature Plot

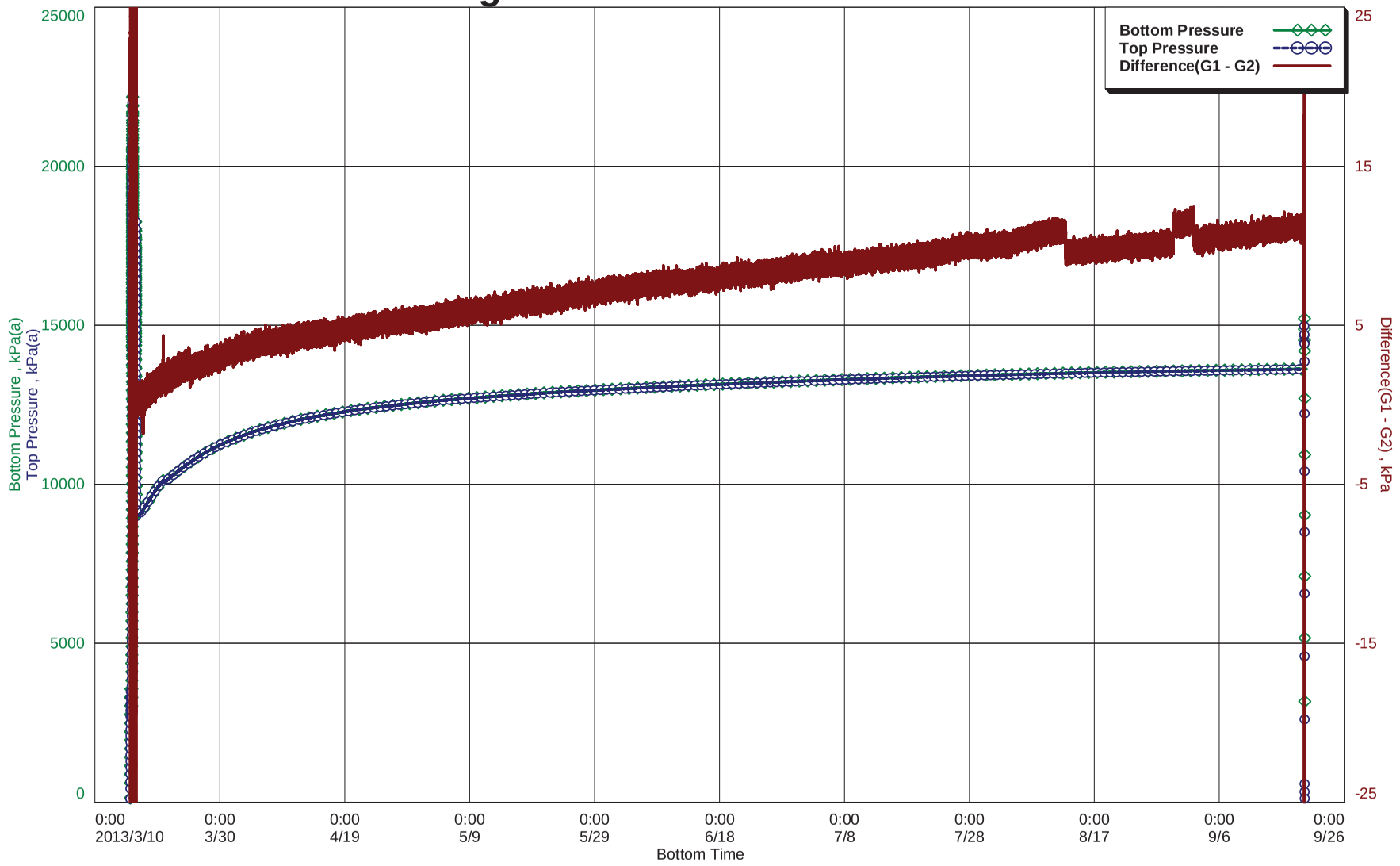


604

MGM ENERGY CORP.
00/I78 64-50 125-30 / 2
Start Test Date: 2013/03/15
Final Test Date: 2013/09/19

MGM SHELL EAST MACKAY I-78
Formation: UPPER/LOWER CANOL

Gauge Pressure Differential Plot



605

Company Name MGM ENERGY CORP.
Unique Well ID 00/I78 64-50 125-30 / 2
Start Test Date 2013/03/15
Final Test Date 2013/09/19

MGM SHELL EAST MACKAY I-78
UPPER/LOWER CANOL

	Bottom Date	Bottom Time	Bottom Pres.	Bottom Temp.	Bottom G1 - G2	Top Time	Top Pres.	Top Temp.
	YYYY/MM/DD HH:mm:ss	h	kPa(a)	°C	kPa	h	kPa(a)	°C
1	2013/03/15 16:20:00	0.0000	129.58	13.57	26.09	0.0000	103.49	13.54
2	2013/03/15 16:38:14	0.3039	920.80	-1.36	5.90	0.3039	914.90	-0.44
3	2013/03/15 16:55:44	0.5956	1060.82	30.30	0.39	0.5956	1060.42	29.97
4	2013/03/15 17:13:14	0.8872	3200.73	64.11	-2.52	0.8872	3203.25	64.08
5	2013/03/15 17:14:59	0.9164	3328.23	64.87	-7.81	0.9164	3336.04	64.93
6	2013/03/15 17:15:00	0.9167	3328.61	64.88	-7.38	0.9167	3336.00	64.93
7	Set Recorders @ 1833.3 mKB (Set Nipple Plug)							
8								
9	2013/03/15 17:15:01	0.9169	3328.66	64.89	-7.52	0.9169	3336.18	64.94
10	2013/03/15 17:30:44	1.1789	3343.00	66.81	-0.28	1.1789	3343.28	67.03
11	2013/03/15 17:48:14	1.4706	3384.98	66.93	0.68	1.4706	3384.30	67.16
12	2013/03/15 18:05:44	1.7622	3418.13	66.94	1.13	1.7622	3417.00	67.18
13	2013/03/15 18:23:14	2.0539	3458.38	66.95	1.03	2.0539	3457.35	67.18
14	2013/03/15 18:40:44	2.3456	3490.98	66.95	0.93	2.3456	3490.05	67.19
15	2013/03/15 18:58:14	2.6372	3529.47	66.96	0.54	2.6372	3528.93	67.20
16	2013/03/15 19:15:44	2.9289	3557.99	66.95	0.03	2.9289	3557.96	67.19
17	2013/03/15 19:33:14	3.2206	3596.53	66.96	1.03	3.2206	3595.50	67.20
18	2013/03/15 19:50:44	3.5122	3391.35	66.95	0.18	3.5122	3391.17	67.19
19	2013/03/15 20:08:14	3.8039	2966.87	66.75	-0.28	3.8039	2967.15	66.98
20	2013/03/15 20:25:44	4.0956	2638.75	66.67	-1.04	4.0956	2639.79	66.90
21	2013/03/15 20:43:14	4.3872	2682.82	66.72	-0.61	4.3872	2683.43	66.95
22	2013/03/15 21:00:44	4.6789	2724.41	66.80	-0.68	4.6789	2725.09	67.03
23	2013/03/15 21:18:14	4.9706	2771.78	66.86	-0.26	4.9706	2772.04	67.09
24	2013/03/15 21:35:44	5.2622	2864.82	66.91	-0.12	5.2622	2864.94	67.14
25	2013/03/15 21:53:14	5.5539	3723.92	67.02	-1.30	5.5539	3725.22	67.25
26	2013/03/15 22:10:44	5.8456	4660.16	67.18	-1.90	5.8456	4662.06	67.40
27	2013/03/15 22:28:14	6.1372	5591.50	67.40	-1.24	6.1372	5592.74	67.63
28	2013/03/15 22:45:44	6.4289	6391.03	67.25	-1.15	6.4289	6392.18	67.47
29	2013/03/15 23:03:14	6.7206	7095.79	66.47	-1.32	6.7206	7097.11	66.66
30	2013/03/15 23:20:44	7.0122	7790.86	65.83	-0.80	7.0122	7791.65	66.01
31	2013/03/15 23:38:14	7.3039	8324.29	65.24	-5.16	7.3039	8329.46	65.43
32	2013/03/15 23:55:44	7.5956	12939.73	64.75	-7.38	7.5956	12947.11	64.97
33	2013/03/16 00:13:14	7.8872	15400.51	64.06	-13.23	7.8872	15413.75	64.25
34	2013/03/16 00:30:44	8.1789	15340.16	64.06	55.77	8.1789	15284.39	64.29
35	2013/03/16 00:48:14	8.4706	14993.64	63.85	36.19	8.4706	14957.45	64.07
36	2013/03/16 01:05:44	8.7622	13890.43	63.22	2.57	8.7622	13887.86	63.45
37	2013/03/16 01:23:14	9.0539	13625.84	63.50	3.03	9.0539	13622.81	63.75
38	2013/03/16 01:40:44	9.3456	13363.98	63.69	3.16	9.3456	13360.83	63.95
39	2013/03/16 01:58:14	9.6372	13125.40	63.85	2.78	9.6372	13122.62	64.10
40	2013/03/16 02:15:44	9.9289	12907.06	64.01	2.28	9.9289	12904.78	64.25
41	2013/03/16 02:33:14	10.2206	12706.98	64.09	2.10	10.2206	12704.88	64.33
42	2013/03/16 02:50:44	10.5122	12522.47	64.12	2.16	10.5122	12520.31	64.36
43	2013/03/16 03:08:14	10.8039	12348.60	64.16	2.36	10.8039	12346.24	64.40
44	2013/03/16 03:25:44	11.0956	12184.85	64.21	2.51	11.0956	12182.34	64.45
45	2013/03/16 03:43:14	11.3872	12028.33	64.28	2.20	11.3872	12026.13	64.51

Print Filter: Approximately every 1050 lines

Gauge Name	Serial Number	Start Date	Start Time	Run Depth (TVD)
Bottom	80671	2013/03/15	16:20:00	1833.30 m
Top	80050	2013/03/15	16:20:00	1833.05 m

Company Name MGM ENERGY CORP.
Unique Well ID 00/I78 64-50 125-30 / 2
Start Test Date 2013/03/15
Final Test Date 2013/09/19

MGM SHELL EAST MACKAY I-78
UPPER/LOWER CANOL

	Bottom Date	Bottom Time	Bottom Pres.	Bottom Temp.	Bottom G1 - G2	Top Time	Top Pres.	Top Temp.
	YYYY/MM/DD HH:mm:ss	h	kPa(a)	°C	kPa	h	kPa(a)	°C
46	2013/03/16 04:00:44	11.6789	11879.95	64.34	2.14	11.6789	11877.80	64.58
47	2013/03/16 04:18:14	11.9706	11736.80	64.42	2.17	11.9706	11734.64	64.65
48	2013/03/16 04:35:44	12.2622	11599.94	64.48	1.41	12.2622	11598.53	64.72
49	2013/03/16 04:53:14	12.5539	11469.97	64.55	1.68	12.5539	11468.29	64.79
50	2013/03/16 05:10:44	12.8456	11345.37	64.64	2.10	12.8456	11343.27	64.86
51	2013/03/16 05:28:14	13.1372	11224.56	64.71	2.17	13.1372	11222.39	64.93
52	2013/03/16 05:45:44	13.4289	11108.84	64.77	1.43	13.4289	11107.41	65.00
53	2013/03/16 06:03:14	13.7206	10998.54	64.82	1.52	13.7206	10997.02	65.05
54	2013/03/16 06:20:44	14.0122	10891.55	64.87	1.81	14.0122	10889.74	65.09
55	2013/03/16 06:38:14	14.3039	10788.47	64.91	1.19	14.3039	10787.28	65.14
56	2013/03/16 06:55:44	14.5956	10690.83	64.96	1.69	14.5956	10689.14	65.18
57	2013/03/16 07:13:14	14.8872	10596.26	65.00	1.58	14.8872	10594.68	65.22
58	2013/03/16 07:30:44	15.1789	10505.99	65.04	1.69	15.1789	10504.29	65.27
59	2013/03/16 07:48:14	15.4706	10418.34	65.08	1.63	15.4706	10416.71	65.30
60	2013/03/16 08:05:44	15.7622	10333.82	65.13	1.07	15.7622	10332.75	65.36
61	2013/03/16 08:23:14	16.0539	10253.08	65.19	1.35	16.0539	10251.73	65.42
62	2013/03/16 08:40:44	16.3456	10175.37	65.25	1.91	16.3456	10173.46	65.48
63	2013/03/16 08:58:14	16.6372	10202.54	65.31	1.36	16.6372	10201.18	65.54
64	2013/03/16 09:15:44	16.9289	10126.58	65.36	0.93	16.9289	10125.66	65.58
65	2013/03/16 09:33:14	17.2206	10053.98	65.39	1.36	17.2206	10052.61	65.62
66	2013/03/16 09:50:44	17.5122	9983.72	65.43	0.68	17.5122	9983.04	65.65
67	2013/03/16 10:08:14	17.8039	9916.47	65.47	0.73	17.8039	9915.75	65.69
68	2013/03/16 10:25:44	18.0956	9851.57	65.51	0.92	18.0956	9850.64	65.74
69	2013/03/16 10:43:14	18.3872	9910.21	65.55	0.46	18.3872	9909.75	65.78
70	Begin Slickline ops to pull/re-run Nipple Plug (not holding)							
71								
72	2013/03/16 10:57:55	18.6319	9997.32	65.58	-7.81	18.6319	10005.13	65.81
73	2013/03/16 10:57:56	18.6322	9997.31	65.58	-14.69	18.6322	10012.00	65.81
74	2013/03/16 10:57:57	18.6325	9997.27	65.58	-12.13	18.6325	10009.40	65.81
75	2013/03/16 11:00:44	18.6789	9996.48	65.59	0.94	18.6789	9995.54	65.81
76	2013/03/16 11:18:14	18.9706	9928.27	65.62	1.24	18.9706	9927.03	65.85
77	2013/03/16 11:35:44	19.2622	12959.53	65.73	-18.05	19.2622	12977.58	65.96
78	2013/03/16 11:53:14	19.5539	15649.66	65.75	-63.38	19.5539	15713.04	65.99
79	2013/03/16 12:10:44	19.8456	14175.68	65.17	4.43	19.8456	14171.25	65.37
80	2013/03/16 12:28:14	20.1372	15070.81	64.89	12.74	20.1372	15058.07	65.11
81	2013/03/16 12:45:44	20.4289	15313.58	64.75	14.18	20.4289	15299.40	65.00
82	2013/03/16 13:03:14	20.7206	12454.19	64.58	27.23	20.7206	12426.97	64.81
83	2013/03/16 13:20:44	21.0122	13484.09	64.61	3.33	21.0122	13480.76	64.85
84	2013/03/16 13:38:14	21.3039	12624.20	64.90	3.17	21.3039	12621.03	65.16
85	2013/03/16 13:55:44	21.5956	12081.55	65.00	3.71	21.5956	12077.84	65.25
86	2013/03/16 14:07:00	21.7833	13276.02	65.06	17.78	21.7833	13242.63	65.31
87	2013/03/16 14:07:01	21.7836	13295.75	65.07	67.02	21.7836	13228.72	65.31
88	Nipple Plug re-set & holding - used as shut in time for this test.							
89	2013/03/16 14:07:02	21.7839	13277.27	65.06	62.34	21.7839	13214.93	65.31
90	2013/03/16 14:13:14	21.8872	11015.27	65.07	17.54	21.8872	10997.73	65.31

Print Filter: Approximately every 1050 lines

Gauge Name	Serial Number	Start Date	Start Time	Run Depth (TVD)
Bottom	80671	2013/03/15	16:20:00	1833.30 m
Top	80050	2013/03/15	16:20:00	1833.05 m

Company Name MGM ENERGY CORP.
Unique Well ID 00/I78 64-50 125-30 / 2
Start Test Date 2013/03/15
Final Test Date 2013/09/19

MGM SHELL EAST MACKAY I-78
UPPER/LOWER CANOL

	Bottom Date	Bottom Time	Bottom Pres.	Bottom Temp.	Bottom G1 - G2	Top Time	Top Pres.	Top Temp.
	YYYY/MM/DD HH:mm:ss	h	kPa(a)	°C	kPa	h	kPa(a)	°C
91	2013/03/16 14:30:44	22.1789	9352.15	65.07	3.16	22.1789	9348.99	65.32
92	2013/03/16 14:48:14	22.4706	9065.40	65.22	0.57	22.4706	9064.83	65.48
93	2013/03/16 15:05:44	22.7622	9000.34	65.40	0.57	22.7622	8999.77	65.67
94	2013/03/16 15:23:14	23.0539	8979.56	65.57	0.30	23.0539	8979.26	65.84
95	2013/03/16 15:40:44	23.3456	8967.82	65.71	0.65	23.3456	8967.17	65.99
96	2013/03/16 15:58:14	23.6372	8956.87	65.83	0.30	23.6372	8956.56	66.10
97	2013/03/16 16:15:44	23.9289	8952.28	65.94	0.12	23.9289	8952.16	66.21
98	2013/03/16 16:33:14	24.2206	8950.54	66.02	0.44	24.2206	8950.10	66.30
99	2013/03/16 16:50:44	24.5122	8947.53	66.11	0.23	24.5122	8947.30	66.37
100	2013/03/16 17:08:14	24.8039	8944.48	66.17	0.08	24.8039	8944.40	66.44
101	2013/03/16 17:25:44	25.0956	8942.73	66.24	0.24	25.0956	8942.49	66.50
102	2013/03/16 17:43:14	25.3872	8941.44	66.29	-0.14	25.3872	8941.58	66.56
103	2013/03/16 18:00:44	25.6789	8940.20	66.34	0.31	25.6789	8939.88	66.61
104	2013/03/16 18:18:14	25.9706	8948.76	66.40	0.36	25.9706	8948.40	66.66
105	2013/03/16 18:35:44	26.2622	8952.59	66.44	0.21	26.2622	8952.38	66.70
106	2013/03/16 18:53:14	26.5539	8953.79	66.47	0.18	26.5539	8953.61	66.74
107	2013/03/16 19:10:44	26.8456	8954.12	66.51	0.32	26.8456	8953.80	66.77
108	2013/03/16 19:28:14	27.1372	8953.03	66.55	0.73	27.1372	8952.30	66.80
109	2013/03/16 19:45:44	27.4289	8954.15	66.58	0.02	27.4289	8954.13	66.83
110	2013/03/16 20:03:14	27.7206	8957.38	66.61	0.57	27.7206	8956.81	66.87
111	2013/03/16 20:20:44	28.0122	8958.44	66.64	0.72	28.0122	8957.72	66.89
112	2013/03/16 20:38:14	28.3039	8961.41	66.67	0.50	28.3039	8960.91	66.92
113	2013/03/16 20:55:44	28.5956	8964.65	66.70	0.13	28.5956	8964.51	66.94
114	2013/03/16 21:13:14	28.8872	8965.74	66.72	0.41	28.8872	8965.32	66.97
115	2013/03/16 21:30:44	29.1789	8966.31	66.74	0.18	29.1789	8966.13	66.99
116	2013/03/16 21:48:14	29.4706	8970.28	66.76	0.32	29.4706	8969.96	67.01
117	2013/03/16 22:05:44	29.7622	8973.54	66.78	0.42	29.7622	8973.11	67.03
118	2013/03/16 22:23:14	30.0539	8975.04	66.80	0.08	30.0539	8974.97	67.05
119	2013/03/16 22:40:44	30.3456	8975.10	66.82	0.04	30.3456	8975.06	67.07
120	2013/03/16 22:58:14	30.6372	8976.75	66.83	0.62	30.6372	8976.13	67.08
121	2013/03/16 23:15:44	30.9289	8980.66	66.85	0.22	30.9289	8980.44	67.10
122	2013/03/16 23:33:14	31.2206	8984.16	66.87	0.81	31.2206	8983.34	67.12
123	2013/03/16 23:50:44	31.5122	8986.40	66.88	0.75	31.5122	8985.65	67.13
124	2013/03/17 00:08:14	31.8039	8989.08	66.90	0.53	31.8039	8988.56	67.14
125	2013/03/17 00:25:44	32.0956	8993.88	66.91	0.83	32.0956	8993.05	67.15
126	2013/03/17 00:43:14	32.3872	9007.31	66.92	0.47	32.3872	9006.85	67.17
127	2013/03/17 01:00:44	32.6789	9009.94	66.93	0.26	32.6789	9009.68	67.18
128	2013/03/17 01:18:14	32.9706	9012.26	66.94	-0.55	32.9706	9012.81	67.20
129	2013/03/17 01:35:44	33.2622	9020.18	66.96	0.39	33.2622	9019.79	67.20
130	2013/03/17 01:53:14	33.5539	9022.36	66.96	0.23	33.5539	9022.13	67.22
131	2013/03/17 02:10:44	33.8456	9025.35	66.97	0.49	33.8456	9024.86	67.23
132	2013/03/17 02:28:14	34.1372	9029.81	66.98	0.35	34.1372	9029.46	67.24
133	2013/03/17 02:45:44	34.4289	9033.92	66.99	0.56	34.4289	9033.36	67.25
134	2013/03/17 03:03:14	34.7206	9037.23	67.00	0.48	34.7206	9036.75	67.26
135	2013/03/17 03:20:44	35.0122	9039.60	67.01	0.25	35.0122	9039.35	67.27

Print Filter: Approximately every 1050 lines

Gauge Name	Serial Number	Start Date	Start Time	Run Depth (TVD)
Bottom	80671	2013/03/15	16:20:00	1833.30 m
Top	80050	2013/03/15	16:20:00	1833.05 m

Company Name MGM ENERGY CORP.
Unique Well ID 00/I78 64-50 125-30 / 2
Start Test Date 2013/03/15
Final Test Date 2013/09/19

MGM SHELL EAST MACKAY I-78
UPPER/LOWER CANOL

	Bottom Date	Bottom Time	Bottom Pres.	Bottom Temp.	Bottom G1 - G2	Top Time	Top Pres.	Top Temp.
	YYYY/MM/DD HH:mm:ss	h	kPa(a)	°C	kPa	h	kPa(a)	°C
136	2013/03/17 03:38:14	35.3039	9044.03	67.02	0.48	35.3039	9043.55	67.28
137	2013/03/17 03:55:44	35.5956	9047.70	67.03	0.67	35.5956	9047.03	67.28
138	2013/03/17 04:13:14	35.8872	9051.59	67.04	0.97	35.8872	9050.62	67.29
139	2013/03/17 04:30:44	36.1789	9053.42	67.05	0.73	36.1789	9052.68	67.30
140	2013/03/17 04:48:14	36.4706	9054.89	67.05	0.63	36.4706	9054.26	67.30
141	2013/03/17 05:05:44	36.7622	9057.63	67.06	0.23	36.7622	9057.41	67.31
142	2013/03/17 05:23:14	37.0539	9060.82	67.06	0.37	37.0539	9060.45	67.32
143	2013/03/17 05:40:44	37.3456	9063.21	67.07	0.43	37.3456	9062.78	67.32
144	2013/03/17 05:58:14	37.6372	9064.84	67.08	0.29	37.6372	9064.55	67.33
145	2013/03/17 06:15:44	37.9289	9069.86	67.08	0.26	37.9289	9069.60	67.34
146	2013/03/17 06:33:14	38.2206	9074.34	67.09	0.59	38.2206	9073.75	67.34
147	2013/03/17 06:50:44	38.5122	9081.69	67.10	0.14	38.5122	9081.55	67.35
148	2013/03/17 07:08:14	38.8039	9084.88	67.10	0.57	38.8039	9084.31	67.36
149	2013/03/17 07:25:44	39.0956	9084.82	67.10	0.00	39.0956	9084.82	67.36
150	2013/03/17 07:43:14	39.3872	9088.71	67.11	0.24	39.3872	9088.47	67.37
151	2013/03/17 08:00:44	39.6789	9093.00	67.12	0.28	39.6789	9092.73	67.37
152	2013/03/17 08:18:14	39.9706	9097.62	67.13	0.46	39.9706	9097.16	67.38
153	2013/03/17 08:35:44	40.2622	9100.14	67.13	0.70	40.2622	9099.44	67.39
154	2013/03/17 08:53:14	40.5539	9104.91	67.14	0.11	40.5539	9104.80	67.39
155	2013/03/17 09:10:44	40.8456	9108.85	67.14	0.11	40.8456	9108.74	67.40
156	2013/03/17 09:28:14	41.1372	9112.68	67.15	0.53	41.1372	9112.15	67.40
157	2013/03/17 09:45:44	41.4289	9116.06	67.15	1.07	41.4289	9114.99	67.40
158	2013/03/17 10:03:14	41.7206	9120.21	67.15	-0.11	41.7206	9120.32	67.41
159	2013/03/17 10:20:44	42.0122	9122.26	67.16	-0.41	42.0122	9122.67	67.42
160	2013/03/17 10:38:14	42.3039	9125.48	67.16	0.45	42.3039	9125.03	67.42
161	2013/03/17 10:55:44	42.5956	9128.45	67.17	0.15	42.5956	9128.30	67.42
162	2013/03/17 11:13:14	42.8872	9131.58	67.17	0.17	42.8872	9131.41	67.43
163	2013/03/17 11:30:44	43.1789	9134.18	67.18	0.06	43.1789	9134.12	67.44
164	2013/03/17 11:48:14	43.4706	9137.79	67.18	0.83	43.4706	9136.95	67.43
165	2013/03/17 12:05:44	43.7622	9140.88	67.19	0.53	43.7622	9140.35	67.44
166	2013/03/17 12:23:14	44.0539	9141.29	67.19	0.23	44.0539	9141.06	67.44
167	2013/03/17 12:40:44	44.3456	9145.98	67.19	0.58	44.3456	9145.40	67.45
168	2013/03/17 12:58:14	44.6372	9139.07	67.20	0.16	44.6372	9138.91	67.45
169	2013/03/17 13:15:44	44.9289	9123.22	67.20	0.70	44.9289	9122.52	67.46
170	2013/03/17 13:33:14	45.2206	9106.94	67.20	0.18	45.2206	9106.76	67.46
171	2013/03/17 13:50:44	45.5122	9094.38	67.20	0.19	45.5122	9094.19	67.46
172	2013/03/17 14:08:14	45.8039	9125.76	67.21	0.25	45.8039	9125.51	67.47
173	2013/03/17 14:25:44	46.0956	9140.13	67.21	0.56	46.0956	9139.56	67.47
174	2013/03/17 14:43:14	46.3872	9147.75	67.22	0.51	46.3872	9147.24	67.47
175	2013/03/17 15:00:44	46.6789	9151.26	67.22	0.18	46.6789	9151.08	67.48
176	2013/03/17 15:18:14	46.9706	9153.87	67.22	0.11	46.9706	9153.75	67.48
177	2013/03/17 15:35:44	47.2622	9156.38	67.23	0.14	47.2622	9156.24	67.49
178	2013/03/17 15:53:14	47.5539	9160.49	67.24	0.36	47.5539	9160.13	67.49
179	2013/03/17 16:10:44	47.8456	9163.32	67.23	0.07	47.8456	9163.25	67.49
180	2013/03/17 16:57:30	48.6250	9183.13	67.20	-1.09	48.6250	9184.22	67.45

Print Filter: Approximately every 1050 lines

Gauge Name	Serial Number	Start Date	Start Time	Run Depth (TVD)
Bottom	80671	2013/03/15	16:20:00	1833.30 m
Top	80050	2013/03/15	16:20:00	1833.05 m

Company Name MGM ENERGY CORP.
Unique Well ID 00/I78 64-50 125-30 / 2
Start Test Date 2013/03/15
Final Test Date 2013/09/19

MGM SHELL EAST MACKAY I-78
UPPER/LOWER CANOL

	Bottom Date	Bottom Time	Bottom Pres.	Bottom Temp.	Bottom G1 - G2	Top Time	Top Pres.	Top Temp.
	YYYY/MM/DD HH:mm:ss	h	kPa(a)	°C	kPa	h	kPa(a)	°C
181	2013/03/17 18:25:00	50.0833	9209.56	67.22	-0.18	50.0833	9209.74	67.46
182	2013/03/17 19:52:30	51.5417	9230.23	67.23	0.20	51.5417	9230.03	67.47
183	2013/03/17 21:20:00	53.0000	9246.25	67.24	0.44	53.0000	9245.81	67.49
184	2013/03/17 22:47:30	54.4583	9265.69	67.25	0.50	54.4583	9265.19	67.50
185	2013/03/18 00:15:00	55.9167	9283.96	67.26	0.26	55.9167	9283.70	67.51
186	2013/03/18 01:42:30	57.3750	9302.18	67.27	0.54	57.3750	9301.64	67.53
187	2013/03/18 03:10:00	58.8333	9320.39	67.29	0.63	58.8333	9319.76	67.53
188	2013/03/18 04:37:30	60.2917	9340.83	67.30	1.07	60.2917	9339.76	67.54
189	2013/03/18 06:05:00	61.7500	9360.21	67.30	0.59	61.7500	9359.62	67.55
190	2013/03/18 07:32:30	63.2083	9380.37	67.31	0.63	63.2083	9379.74	67.56
191	2013/03/18 09:00:00	64.6667	9400.98	67.32	1.10	64.6667	9399.88	67.57
192	2013/03/18 10:27:30	66.1250	9418.54	67.33	0.36	66.1250	9418.18	67.58
193	2013/03/18 11:55:00	67.5833	9438.54	67.33	0.82	67.5833	9437.72	67.58
194	2013/03/18 13:22:30	69.0417	9457.03	67.34	1.04	69.0417	9455.99	67.59
195	2013/03/18 14:50:00	70.5000	9476.26	67.35	1.05	70.5000	9475.21	67.60
196	2013/03/18 16:17:30	71.9583	9495.21	67.36	0.55	71.9583	9494.66	67.60
197	2013/03/18 17:45:00	73.4167	9515.34	67.36	1.13	73.4167	9514.21	67.61
198	2013/03/18 19:12:30	74.8750	9531.80	67.36	0.84	74.8750	9530.95	67.62
199	2013/03/18 20:40:00	76.3333	9550.48	67.37	1.01	76.3333	9549.46	67.62
200	2013/03/18 22:07:30	77.7917	9568.60	67.37	0.62	77.7917	9567.98	67.63
201	2013/03/18 23:35:00	79.2500	9586.52	67.38	1.07	79.2500	9585.46	67.64
202	2013/03/19 01:02:30	80.7083	9606.39	67.38	0.30	80.7083	9606.09	67.64
203	2013/03/19 02:30:00	82.1667	9629.77	67.39	0.81	82.1667	9628.96	67.64
204	2013/03/19 03:57:30	83.6250	9648.76	67.40	1.68	83.6250	9647.09	67.65
205	2013/03/19 05:25:00	85.0833	9666.18	67.40	1.08	85.0833	9665.09	67.66
206	2013/03/19 06:52:30	86.5417	9684.97	67.41	1.70	86.5417	9683.27	67.66
207	2013/03/19 08:20:00	88.0000	9700.73	67.41	1.57	88.0000	9699.17	67.67
208	2013/03/19 09:47:30	89.4583	9719.15	67.41	1.14	89.4583	9718.01	67.67
209	2013/03/19 11:15:00	90.9167	9737.05	67.42	1.26	90.9167	9735.79	67.68
210	2013/03/19 12:42:30	92.3750	9754.56	67.42	1.11	92.3750	9753.45	67.68
211	2013/03/19 14:10:00	93.8333	9771.12	67.42	1.29	93.8333	9769.83	67.68
212	2013/03/19 15:37:30	95.2917	9789.14	67.42	1.13	95.2917	9788.01	67.69
213	2013/03/19 17:05:00	96.7500	9807.55	67.43	1.59	96.7500	9805.96	67.70
214	2013/03/19 18:32:30	98.2083	9823.80	67.43	1.17	98.2083	9822.64	67.69
215	2013/03/19 20:00:00	99.6667	9843.11	67.44	1.16	99.6667	9841.94	67.71
216	2013/03/19 21:27:30	101.1250	9860.50	67.45	1.35	101.1250	9859.14	67.71
217	2013/03/19 22:55:00	102.5833	9875.57	67.45	0.79	102.5833	9874.78	67.72
218	2013/03/20 00:22:30	104.0417	9892.81	67.45	1.59	104.0417	9891.22	67.72
219	2013/03/20 01:50:00	105.5000	9908.91	67.46	1.36	105.5000	9907.55	67.73
220	2013/03/20 03:17:30	106.9583	9925.19	67.47	1.28	106.9583	9923.91	67.73
221	2013/03/20 04:45:00	108.4167	9942.74	67.46	0.93	108.4167	9941.81	67.73
222	2013/03/20 06:12:30	109.8750	9958.16	67.47	1.25	109.8750	9956.92	67.74
223	2013/03/20 07:40:00	111.3333	9973.97	67.48	1.56	111.3333	9972.40	67.75
224	2013/03/20 09:07:30	112.7917	9990.51	67.48	1.61	112.7917	9988.89	67.76
225	2013/03/20 10:35:00	114.2500	10005.69	67.49	1.27	114.2500	10004.43	67.76

Print Filter: Approximately every 1050 lines

Gauge Name	Serial Number	Start Date	Start Time	Run Depth (TVD)
Bottom	80671	2013/03/15	16:20:00	1833.30 m
Top	80050	2013/03/15	16:20:00	1833.05 m

Company Name MGM ENERGY CORP.
Unique Well ID 00/I78 64-50 125-30 / 2
Start Test Date 2013/03/15
Final Test Date 2013/09/19

MGM SHELL EAST MACKAY I-78
UPPER/LOWER CANOL

	Bottom Date	Bottom Time	Bottom Pres.	Bottom Temp.	Bottom G1 - G2	Top Time	Top Pres.	Top Temp.
	YYYY/MM/DD HH:mm:ss	h	kPa(a)	°C	kPa	h	kPa(a)	°C
226	2013/03/20 12:02:30	115.7083	10019.69	67.49	1.54	115.7083	10018.15	67.76
227	2013/03/20 13:30:00	117.1667	10033.95	67.50	1.89	117.1667	10032.06	67.77
228	2013/03/20 14:57:30	118.6250	10048.79	67.51	1.57	118.6250	10047.21	67.77
229	2013/03/20 16:25:00	120.0833	10064.18	67.51	1.52	120.0833	10062.66	67.78
230	2013/03/20 17:52:30	121.5417	10080.02	67.51	1.73	121.5417	10078.30	67.78
231	2013/03/20 19:20:00	123.0000	10095.54	67.52	1.67	123.0000	10093.87	67.79
232	2013/03/20 20:47:30	124.4583	10111.03	67.53	1.60	124.4583	10109.43	67.79
233	2013/03/20 22:15:00	125.9167	10113.42	67.53	1.88	125.9167	10111.54	67.80
234	2013/03/20 23:42:30	127.3750	10060.96	67.52	1.36	127.3750	10059.61	67.80
235	2013/03/21 01:10:00	128.8333	10066.57	67.53	1.81	128.8333	10064.76	67.80
236	2013/03/21 02:37:30	130.2917	10072.92	67.54	1.74	130.2917	10071.18	67.81
237	2013/03/21 04:05:00	131.7500	10081.74	67.55	1.58	131.7500	10080.16	67.81
238	2013/03/21 05:32:30	133.2083	10085.89	67.55	1.52	133.2083	10084.37	67.82
239	2013/03/21 07:00:00	134.6667	10093.56	67.56	1.15	134.6667	10092.41	67.82
240	2013/03/21 08:27:30	136.1250	10101.99	67.56	1.46	136.1250	10100.53	67.83
241	2013/03/21 09:55:00	137.5833	10110.82	67.57	1.71	137.5833	10109.12	67.83
242	2013/03/21 11:22:30	139.0417	10119.50	67.57	1.51	139.0417	10118.00	67.84
243	2013/03/21 12:50:00	140.5000	10129.38	67.57	2.31	140.5000	10127.07	67.84
244	2013/03/21 14:17:30	141.9583	10138.16	67.58	1.90	141.9583	10136.26	67.85
245	2013/03/21 15:45:00	143.4167	10147.59	67.58	2.07	143.4167	10145.52	67.85
246	2013/03/21 17:12:30	144.8750	10157.65	67.59	1.52	144.8750	10156.13	67.85
247	2013/03/21 18:40:00	146.3333	10167.20	67.59	1.88	146.3333	10165.32	67.86
248	2013/03/21 20:07:30	147.7917	10176.36	67.60	1.63	147.7917	10174.73	67.86
249	2013/03/21 21:35:00	149.2500	10186.00	67.60	1.98	149.2500	10184.02	67.86
250	2013/03/21 23:02:30	150.7083	10196.06	67.61	1.88	150.7083	10194.17	67.87
251	2013/03/22 00:30:00	152.1667	10206.29	67.61	1.46	152.1667	10204.83	67.88
252	2013/03/22 01:57:30	153.6250	10216.27	67.62	1.65	153.6250	10214.62	67.88
253	2013/03/22 03:25:00	155.0833	10226.98	67.62	1.87	155.0833	10225.11	67.88
254	2013/03/22 04:52:30	156.5417	10236.17	67.62	1.86	156.5417	10234.31	67.89
255	2013/03/22 06:20:00	158.0000	10245.05	67.62	1.61	158.0000	10243.44	67.89
256	2013/03/22 07:47:30	159.4583	10254.63	67.63	1.58	159.4583	10253.04	67.90
257	2013/03/22 09:15:00	160.9167	10263.89	67.64	1.63	160.9167	10262.26	67.90
258	2013/03/22 10:42:30	162.3750	10273.64	67.64	1.51	162.3750	10272.13	67.91
259	2013/03/22 12:10:00	163.8333	10283.44	67.64	1.66	163.8333	10281.78	67.91
260	2013/03/22 13:37:30	165.2917	10293.56	67.65	2.24	165.2917	10291.32	67.91
261	2013/03/22 15:05:00	166.7500	10303.24	67.65	2.12	166.7500	10301.12	67.92
262	2013/03/22 16:32:30	168.2083	10312.70	67.66	1.56	168.2083	10311.15	67.92
263	2013/03/22 18:00:00	169.6667	10322.80	67.66	1.33	169.6667	10321.47	67.93
264	2013/03/22 19:27:30	171.1250	10331.95	67.67	2.15	171.1250	10329.80	67.93
265	2013/03/22 20:55:00	172.5833	10341.56	67.67	1.63	172.5833	10339.93	67.93
266	2013/03/22 22:22:30	174.0417	10351.12	67.67	2.03	174.0417	10349.09	67.94
267	2013/03/22 23:50:00	175.5000	10360.75	67.67	2.08	175.5000	10358.67	67.95
268	2013/03/23 01:17:30	176.9583	10370.00	67.68	2.35	176.9583	10367.65	67.95
269	2013/03/23 02:45:00	178.4167	10379.09	67.68	2.00	178.4167	10377.09	67.95
270	2013/03/23 04:12:30	179.8750	10388.34	67.69	2.22	179.8750	10386.13	67.96

Print Filter: Approximately every 1050 lines

Gauge Name	Serial Number	Start Date	Start Time	Run Depth (TVD)
Bottom	80671	2013/03/15	16:20:00	1833.30 m
Top	80050	2013/03/15	16:20:00	1833.05 m

Company Name MGM ENERGY CORP.
Unique Well ID 00/I78 64-50 125-30 / 2
Start Test Date 2013/03/15
Final Test Date 2013/09/19

MGM SHELL EAST MACKAY I-78
UPPER/LOWER CANOL

	Bottom Date	Bottom Time	Bottom Pres.	Bottom Temp.	Bottom G1 - G2	Top Time	Top Pres.	Top Temp.
	YYYY/MM/DD HH:mm:ss	h	kPa(a)	°C	kPa	h	kPa(a)	°C
271	2013/03/23 05:40:00	181.3333	10397.94	67.69	1.86	181.3333	10396.08	67.96
272	2013/03/23 07:07:30	182.7917	10407.56	67.70	1.92	182.7917	10405.64	67.96
273	2013/03/23 08:35:00	184.2500	10417.52	67.70	2.05	184.2500	10415.48	67.97
274	2013/03/23 10:02:30	185.7083	10426.79	67.70	1.76	185.7083	10425.03	67.97
275	2013/03/23 11:30:00	187.1667	10436.44	67.70	2.72	187.1667	10433.72	67.97
276	2013/03/23 12:57:30	188.6250	10444.83	67.71	1.57	188.6250	10443.25	67.98
277	2013/03/23 14:25:00	190.0833	10455.10	67.72	2.44	190.0833	10452.65	67.98
278	2013/03/23 15:52:30	191.5417	10464.19	67.72	2.33	191.5417	10461.86	67.99
279	2013/03/23 17:20:00	193.0000	10473.60	67.72	2.48	193.0000	10471.11	67.99
280	2013/03/23 18:47:30	194.4583	10482.51	67.73	1.96	194.4583	10480.55	67.99
281	2013/03/23 20:15:00	195.9167	10491.33	67.73	2.10	195.9167	10489.23	68.00
282	2013/03/23 21:42:30	197.3750	10500.40	67.74	2.47	197.3750	10497.93	68.00
283	2013/03/23 23:10:00	198.8333	10509.01	67.73	2.71	198.8333	10506.31	68.00
284	2013/03/24 00:37:30	200.2917	10518.14	67.74	2.86	200.2917	10515.28	68.01
285	2013/03/24 02:05:00	201.7500	10526.88	67.74	2.35	201.7500	10524.54	68.01
286	2013/03/24 03:32:30	203.2083	10535.65	67.75	2.40	203.2083	10533.25	68.01
287	2013/03/24 05:00:00	204.6667	10544.34	67.75	2.61	204.6667	10541.73	68.02
288	2013/03/24 06:27:30	206.1250	10553.32	67.75	2.51	206.1250	10550.81	68.02
289	2013/03/24 07:55:00	207.5833	10561.81	67.75	2.03	207.5833	10559.78	68.03
290	2013/03/24 09:22:30	209.0417	10570.83	67.76	2.52	209.0417	10568.30	68.03
291	2013/03/24 10:50:00	210.5000	10579.39	67.76	2.05	210.5000	10577.34	68.04
292	2013/03/24 12:17:30	211.9583	10587.84	67.77	2.20	211.9583	10585.64	68.03
293	2013/03/24 13:45:00	213.4167	10596.65	67.77	2.48	213.4167	10594.17	68.04
294	2013/03/24 15:12:30	214.8750	10604.96	67.77	2.60	214.8750	10602.36	68.04
295	2013/03/24 16:40:00	216.3333	10615.84	67.78	2.98	216.3333	10612.86	68.04
296	2013/03/24 18:07:30	217.7917	10624.67	67.78	2.73	217.7917	10621.94	68.05
297	2013/03/24 19:35:00	219.2500	10634.21	67.78	2.18	219.2500	10632.03	68.05
298	2013/03/24 21:02:30	220.7083	10642.32	67.79	2.74	220.7083	10639.58	68.06
299	2013/03/24 22:30:00	222.1667	10649.96	67.79	2.44	222.1667	10647.52	68.06
300	2013/03/24 23:57:30	223.6250	10658.02	67.79	2.28	223.6250	10655.74	68.06
301	2013/03/25 01:25:00	225.0833	10666.62	67.80	2.63	225.0833	10663.99	68.07
302	2013/03/25 02:52:30	226.5417	10673.58	67.80	2.97	226.5417	10670.61	68.07
303	2013/03/25 04:20:00	228.0000	10681.36	67.81	2.60	228.0000	10678.76	68.07
304	2013/03/25 21:39:55	245.3319	10780.08	67.84	2.75	245.3319	10777.33	68.10
305	2013/03/26 15:09:55	262.8319	10868.56	67.87	2.17	262.8319	10866.39	68.14
306	2013/03/27 08:39:55	280.3319	10956.89	67.91	2.38	280.3319	10954.51	68.17
307	2013/03/28 02:09:55	297.8319	11039.30	67.94	2.75	297.8319	11036.55	68.21
308	2013/03/28 19:39:55	315.3319	11116.40	67.97	2.54	315.3319	11113.86	68.24
309	2013/03/29 13:09:55	332.8319	11192.25	68.01	3.02	332.8319	11189.23	68.27
310	2013/03/30 06:39:55	350.3319	11260.10	68.03	2.98	350.3319	11257.12	68.29
311	2013/03/31 00:09:55	367.8319	11321.81	68.06	3.14	367.8319	11318.67	68.32
312	2013/03/31 17:39:55	385.3319	11381.65	68.08	2.81	385.3319	11378.84	68.34
313	2013/04/01 11:09:55	402.8319	11438.89	68.11	4.14	402.8319	11434.75	68.37
314	2013/04/02 04:39:55	420.3319	11493.44	68.13	3.48	420.3319	11489.96	68.40
315	2013/04/02 22:09:55	437.8319	11545.94	68.16	3.77	437.8319	11542.17	68.42

Print Filter: Approximately every 1050 lines

Gauge Name	Serial Number	Start Date	Start Time	Run Depth (TVD)
Bottom	80671	2013/03/15	16:20:00	1833.30 m
Top	80050	2013/03/15	16:20:00	1833.05 m

Company Name MGM ENERGY CORP.
Unique Well ID 00/I78 64-50 125-30 / 2
Start Test Date 2013/03/15
Final Test Date 2013/09/19

MGM SHELL EAST MACKAY I-78
UPPER/LOWER CANOL

	Bottom Date	Bottom Time	Bottom Pres.	Bottom Temp.	Bottom G1 - G2	Top Time	Top Pres.	Top Temp.
	YYYY/MM/DD HH:mm:ss	h	kPa(a)	°C	kPa	h	kPa(a)	°C
316	2013/04/03 15:39:55	455.3319	11597.13	68.18	3.35	455.3319	11593.78	68.44
317	2013/04/04 09:09:55	472.8319	11650.63	68.20	2.81	472.8319	11647.83	68.46
318	2013/04/05 02:39:55	490.3319	11693.33	68.23	3.67	490.3319	11689.66	68.48
319	2013/04/05 20:09:55	507.8319	11735.97	68.25	3.76	507.8319	11732.21	68.50
320	2013/04/06 13:39:55	525.3319	11776.89	68.27	3.68	525.3319	11773.21	68.53
321	2013/04/07 07:09:55	542.8319	11816.30	68.29	4.12	542.8319	11812.18	68.55
322	2013/04/08 00:39:55	560.3319	11853.18	68.31	3.97	560.3319	11849.21	68.56
323	2013/04/08 18:09:55	577.8319	11889.32	68.32	4.01	577.8319	11885.31	68.58
324	2013/04/09 11:39:55	595.3319	11924.25	68.34	3.64	595.3319	11920.61	68.60
325	2013/04/10 05:09:55	612.8319	11959.77	68.36	4.68	612.8319	11955.08	68.62
326	2013/04/10 22:39:55	630.3319	11992.93	68.38	4.39	630.3319	11988.54	68.63
327	2013/04/11 16:09:55	647.8319	12025.39	68.39	4.33	647.8319	12021.06	68.64
328	2013/04/12 09:39:55	665.3319	12055.93	68.41	4.64	665.3319	12051.30	68.67
329	2013/04/13 03:09:55	682.8319	12082.76	68.42	4.65	682.8319	12078.11	68.67
330	2013/04/13 20:39:55	700.3319	12110.48	68.43	4.44	700.3319	12106.04	68.70
331	2013/04/14 14:09:55	717.8319	12137.09	68.46	4.70	717.8319	12132.38	68.71
332	2013/04/15 07:39:55	735.3319	12161.94	68.47	4.40	735.3319	12157.54	68.73
333	2013/04/16 09:58:55	761.6486	12198.21	68.49	4.41	761.6486	12193.80	68.75
334	2013/04/17 20:58:55	796.6486	12244.50	68.52	5.23	796.6486	12239.26	68.77
335	2013/04/19 07:58:55	831.6486	12293.72	68.55	4.84	831.6486	12288.87	68.80
336	2013/04/20 18:58:55	866.6486	12337.66	68.57	4.76	866.6486	12332.90	68.83
337	2013/04/22 05:58:55	901.6486	12373.12	68.59	4.63	901.6486	12368.49	68.85
338	2013/04/23 16:58:55	936.6486	12408.13	68.62	4.92	936.6486	12403.21	68.88
339	2013/04/25 03:58:55	971.6486	12440.46	68.63	4.79	971.6486	12435.67	68.89
340	2013/04/26 14:58:55	1006.6486	12475.02	68.66	5.62	1006.6486	12469.39	68.91
341	2013/04/28 01:58:55	1041.6486	12506.95	68.68	5.02	1041.6486	12501.93	68.93
342	2013/04/29 12:58:55	1076.6486	12537.16	68.69	5.03	1076.6486	12532.13	68.95
343	2013/04/30 23:58:55	1111.6486	12567.26	68.71	5.46	1111.6486	12561.80	68.97
344	2013/05/02 10:58:55	1146.6486	12595.36	68.73	5.28	1146.6486	12590.08	68.99
345	2013/05/03 21:58:52	1181.6478	12626.69	68.75	5.38	1181.6478	12621.31	69.00
346	2013/05/05 08:58:52	1216.6478	12652.19	68.76	5.86	1216.6478	12646.33	69.02
347	2013/05/06 19:58:52	1251.6478	12672.40	68.78	5.74	1251.6478	12666.66	69.03
348	2013/05/08 06:58:52	1286.6478	12694.39	68.79	5.85	1286.6478	12688.54	69.05
349	2013/05/09 17:58:52	1321.6478	12716.23	68.81	5.88	1321.6478	12710.35	69.07
350	2013/05/11 04:58:52	1356.6478	12737.60	68.82	6.20	1356.6478	12731.40	69.08
351	2013/05/12 15:58:52	1391.6478	12757.97	68.84	6.53	1391.6478	12751.44	69.09
352	2013/05/14 02:58:52	1426.6478	12777.95	68.85	5.67	1426.6478	12772.28	69.11
353	2013/05/15 13:58:52	1461.6478	12798.00	68.86	6.42	1461.6478	12791.58	69.12
354	2013/05/17 00:58:52	1496.6478	12818.22	68.87	6.46	1496.6478	12811.76	69.13
355	2013/05/18 11:58:52	1531.6478	12839.44	68.89	6.48	1531.6478	12832.95	69.14
356	2013/05/19 22:58:52	1566.6478	12859.47	68.90	6.66	1566.6478	12852.81	69.15
357	2013/05/21 09:58:52	1601.6478	12876.30	68.91	6.29	1601.6478	12870.01	69.17
358	2013/05/22 20:58:52	1636.6478	12892.93	68.92	6.47	1636.6478	12886.46	69.18
359	2013/05/24 07:58:52	1671.6478	12909.99	68.93	7.00	1671.6478	12902.99	69.19
360	2013/05/25 18:58:52	1706.6478	12925.83	68.94	6.96	1706.6478	12918.87	69.20

Print Filter: Approximately every 1050 lines

Gauge Name	Serial Number	Start Date	Start Time	Run Depth (TVD)
Bottom	80671	2013/03/15	16:20:00	1833.30 m
Top	80050	2013/03/15	16:20:00	1833.05 m

Company Name MGM ENERGY CORP.
Unique Well ID 00/I78 64-50 125-30 / 2
Start Test Date 2013/03/15
Final Test Date 2013/09/19

MGM SHELL EAST MACKAY I-78
UPPER/LOWER CANOL

	Bottom Date	Bottom Time	Bottom Pres.	Bottom Temp.	Bottom G1 - G2	Top Time	Top Pres.	Top Temp.
	YYYY/MM/DD HH:mm:ss	h	kPa(a)	°C	kPa	h	kPa(a)	°C
361	2013/05/27 05:58:52	1741.6478	12940.68	68.95	6.90	1741.6478	12933.78	69.21
362	2013/05/28 16:58:52	1776.6478	12955.33	68.97	6.71	1776.6478	12948.63	69.22
363	2013/05/30 03:58:52	1811.6478	12970.22	68.97	6.73	1811.6478	12963.49	69.23
364	2013/05/31 14:58:52	1846.6478	12984.74	68.98	7.06	1846.6478	12977.68	69.24
365	2013/06/02 01:58:52	1881.6478	13000.39	68.99	7.56	1881.6478	12992.83	69.25
366	2013/06/03 12:58:52	1916.6478	13014.04	69.00	7.59	1916.6478	13006.44	69.26
367	2013/06/04 23:58:52	1951.6478	13028.17	69.01	7.92	1951.6478	13020.25	69.26
368	2013/06/06 10:58:52	1986.6478	13041.62	69.02	7.66	1986.6478	13033.96	69.27
369	2013/06/07 21:58:52	2021.6478	13054.80	69.03	7.12	2021.6478	13047.68	69.28
370	2013/06/09 08:58:52	2056.6478	13068.89	69.04	7.80	2056.6478	13061.09	69.28
371	2013/06/10 19:58:52	2091.6478	13082.15	69.04	7.05	2091.6478	13075.10	69.29
372	2013/06/12 06:58:52	2126.6478	13095.30	69.05	7.40	2126.6478	13087.89	69.30
373	2013/06/13 17:58:52	2161.6478	13107.91	69.06	7.65	2161.6478	13100.26	69.31
374	2013/06/15 04:58:52	2196.6478	13120.70	69.07	8.00	2196.6478	13112.70	69.31
375	2013/06/16 15:58:52	2231.6478	13132.08	69.07	7.80	2231.6478	13124.28	69.32
376	2013/06/18 02:58:52	2266.6478	13144.01	69.08	7.50	2266.6478	13136.51	69.33
377	2013/06/19 13:58:52	2301.6478	13155.10	69.09	7.83	2301.6478	13147.27	69.34
378	2013/06/21 00:57:44	2336.6289	13166.85	69.09	8.39	2336.6289	13158.46	69.34
379	2013/06/22 11:57:44	2371.6289	13177.50	69.10	7.95	2371.6289	13169.54	69.35
380	2013/06/23 22:57:44	2406.6289	13189.13	69.10	8.59	2406.6289	13180.54	69.36
381	2013/06/25 09:57:44	2441.6289	13199.81	69.11	7.96	2441.6289	13191.85	69.36
382	2013/06/26 20:57:44	2476.6289	13210.24	69.12	8.06	2476.6289	13202.18	69.37
383	2013/06/28 07:57:44	2511.6289	13221.98	69.12	8.37	2511.6289	13213.61	69.38
384	2013/06/29 18:57:44	2546.6289	13232.74	69.13	8.25	2546.6289	13224.50	69.38
385	2013/07/01 05:57:44	2581.6289	13244.48	69.13	8.61	2581.6289	13235.87	69.38
386	2013/07/02 16:57:44	2616.6289	13255.32	69.14	8.69	2616.6289	13246.63	69.40
387	2013/07/04 03:57:44	2651.6289	13266.06	69.15	8.75	2651.6289	13257.31	69.39
388	2013/07/05 14:57:44	2686.6289	13276.49	69.15	8.44	2686.6289	13268.06	69.40
389	2013/07/07 01:57:44	2721.6289	13287.59	69.15	8.96	2721.6289	13278.63	69.41
390	2013/07/08 12:57:44	2756.6289	13296.80	69.15	8.60	2756.6289	13288.20	69.42
391	2013/07/09 23:57:44	2791.6289	13307.06	69.16	8.96	2791.6289	13298.09	69.41
392	2013/07/11 10:57:44	2826.6289	13316.71	69.17	8.86	2826.6289	13307.84	69.42
393	2013/07/12 21:57:44	2861.6289	13326.75	69.17	9.28	2861.6289	13317.47	69.42
394	2013/07/14 08:57:44	2896.6289	13335.87	69.18	9.20	2896.6289	13326.67	69.43
395	2013/07/15 19:57:44	2931.6289	13345.64	69.18	9.77	2931.6289	13335.87	69.44
396	2013/07/17 06:57:44	2966.6289	13354.45	69.19	9.52	2966.6289	13344.93	69.44
397	2013/07/18 17:57:44	3001.6289	13363.72	69.19	9.18	3001.6289	13354.54	69.44
398	2013/07/20 04:57:44	3036.6289	13372.25	69.20	9.16	3036.6289	13363.09	69.45
399	2013/07/21 15:57:44	3071.6289	13380.87	69.20	9.30	3071.6289	13371.56	69.45
400	2013/07/23 02:57:44	3106.6289	13390.39	69.20	9.84	3106.6289	13380.55	69.45
401	2013/07/24 13:57:44	3141.6289	13398.17	69.20	9.77	3141.6289	13388.40	69.46
402	2013/07/26 00:57:44	3176.6289	13406.66	69.21	9.74	3176.6289	13396.91	69.46
403	2013/07/27 11:57:44	3211.6289	13414.84	69.21	9.96	3211.6289	13404.88	69.47
404	2013/07/28 22:57:44	3246.6289	13422.99	69.22	10.14	3246.6289	13412.85	69.47
405	2013/07/30 09:57:44	3281.6289	13430.44	69.22	9.85	3281.6289	13420.59	69.48

Print Filter: Approximately every 1050 lines

Gauge Name	Serial Number	Start Date	Start Time	Run Depth (TVD)
Bottom	80671	2013/03/15	16:20:00	1833.30 m
Top	80050	2013/03/15	16:20:00	1833.05 m

Company Name MGM ENERGY CORP.
Unique Well ID 00/I78 64-50 125-30 / 2
Start Test Date 2013/03/15
Final Test Date 2013/09/19

MGM SHELL EAST MACKAY I-78
UPPER/LOWER CANOL

	Bottom Date	Bottom Time	Bottom Pres.	Bottom Temp.	Bottom G1 - G2	Top Time	Top Pres.	Top Temp.
	YYYY/MM/DD HH:mm:ss	h	kPa(a)	°C	kPa	h	kPa(a)	°C
406	2013/07/31 20:57:44	3316.6289	13438.63	69.22	10.23	3316.6289	13428.39	69.48
407	2013/08/02 07:57:44	3351.6289	13445.79	69.23	9.83	3351.6289	13435.97	69.48
408	2013/08/03 18:57:44	3386.6289	13453.59	69.23	10.32	3386.6289	13443.26	69.49
409	2013/08/05 05:57:44	3421.6289	13460.35	69.24	10.17	3421.6289	13450.18	69.49
410	2013/08/06 16:57:44	3456.6289	13467.26	69.24	10.02	3456.6289	13457.24	69.50
411	2013/08/08 03:57:44	3491.6289	13475.08	69.24	11.35	3491.6289	13463.73	69.50
412	2013/08/09 14:57:32	3526.6256	13481.18	69.25	11.11	3526.6256	13470.07	69.50
413	2013/08/11 01:57:32	3561.6256	13488.12	69.25	11.36	3561.6256	13476.76	69.50
414	2013/08/12 12:57:32	3596.6256	13494.50	69.25	9.62	3596.6256	13484.89	69.50
415	2013/08/13 23:57:32	3631.6256	13500.48	69.25	9.26	3631.6256	13491.21	69.51
416	2013/08/15 10:57:32	3666.6256	13506.73	69.26	9.55	3666.6256	13497.18	69.52
417	2013/08/16 21:57:32	3701.6256	13513.25	69.27	9.97	3701.6256	13503.28	69.52
418	2013/08/18 08:57:32	3736.6256	13518.83	69.27	9.88	3736.6256	13508.95	69.52
419	2013/08/19 19:57:32	3771.6256	13524.95	69.27	9.76	3771.6256	13515.19	69.52
420	2013/08/21 06:57:32	3806.6256	13530.85	69.27	9.88	3806.6256	13520.96	69.53
421	2013/08/22 17:57:32	3841.6256	13536.17	69.27	9.57	3841.6256	13526.61	69.53
422	2013/08/24 04:57:32	3876.6256	13541.87	69.28	9.63	3876.6256	13532.24	69.53
423	2013/08/25 15:57:32	3911.6256	13547.70	69.28	10.33	3911.6256	13537.37	69.53
424	2013/08/27 02:57:32	3946.6256	13552.28	69.28	9.66	3946.6256	13542.63	69.54
425	2013/08/28 13:57:32	3981.6256	13557.85	69.29	10.31	3981.6256	13547.54	69.55
426	2013/08/30 00:57:32	4016.6256	13562.51	69.29	11.56	4016.6256	13550.95	69.54
427	2013/08/31 11:57:32	4051.6256	13567.45	69.29	11.54	4051.6256	13555.91	69.55
428	2013/09/01 22:57:32	4086.6256	13572.62	69.29	11.25	4086.6256	13561.37	69.55
429	2013/09/03 09:57:32	4121.6256	13576.65	69.30	10.22	4121.6256	13566.42	69.56
430	2013/09/04 20:57:32	4156.6256	13581.51	69.30	10.31	4156.6256	13571.20	69.56
431	2013/09/06 07:57:32	4191.6256	13586.51	69.30	10.44	4191.6256	13576.06	69.55
432	2013/09/07 18:57:32	4226.6256	13590.15	69.30	10.37	4226.6256	13579.78	69.55
433	2013/09/09 05:57:32	4261.6256	13594.83	69.31	10.57	4261.6256	13584.27	69.56
434	2013/09/10 16:57:32	4296.6256	13599.55	69.31	10.44	4296.6256	13589.11	69.56
435	2013/09/12 03:57:32	4331.6256	13603.79	69.31	10.81	4331.6256	13592.98	69.57
436	2013/09/13 14:57:32	4366.6256	13608.58	69.31	11.04	4366.6256	13597.54	69.57
437	2013/09/15 01:57:32	4401.6256	13612.37	69.32	10.64	4401.6256	13601.73	69.57
438	2013/09/16 12:57:32	4436.6256	13616.97	69.32	11.06	4436.6256	13605.91	69.57
439	2013/09/17 23:57:32	4471.6256	13620.62	69.32	10.92	4471.6256	13609.70	69.58
440	2013/09/19 10:57:32	4506.6256	13624.26	69.32	11.16	4506.6256	13613.10	69.58
441	2013/09/19 14:45:32	4510.4256	13638.02	69.32	11.75	4510.4256	13626.26	69.56
442	2013/09/19 14:47:32	4510.4589	13638.20	69.32	11.96	4510.4589	13626.25	69.57
443	Final BU Pressure - Begin ops to pull Nipple Plug & Recorders to surface.							
444	2013/09/19 14:49:32	4510.4922	13638.25	69.32	-1337.10	4510.4922	14975.35	69.64
445	2013/09/19 16:35:32	4512.2589	3166.77	37.57	3070.57	4512.2589	96.20	14.72

Print Filter: Approximately every 1050 lines

Gauge Name	Serial Number	Start Date	Start Time	Run Depth (TVD)
Bottom	80671	2013/03/15	16:20:00	1833.30 m
Top	80050	2013/03/15	16:20:00	1833.05 m

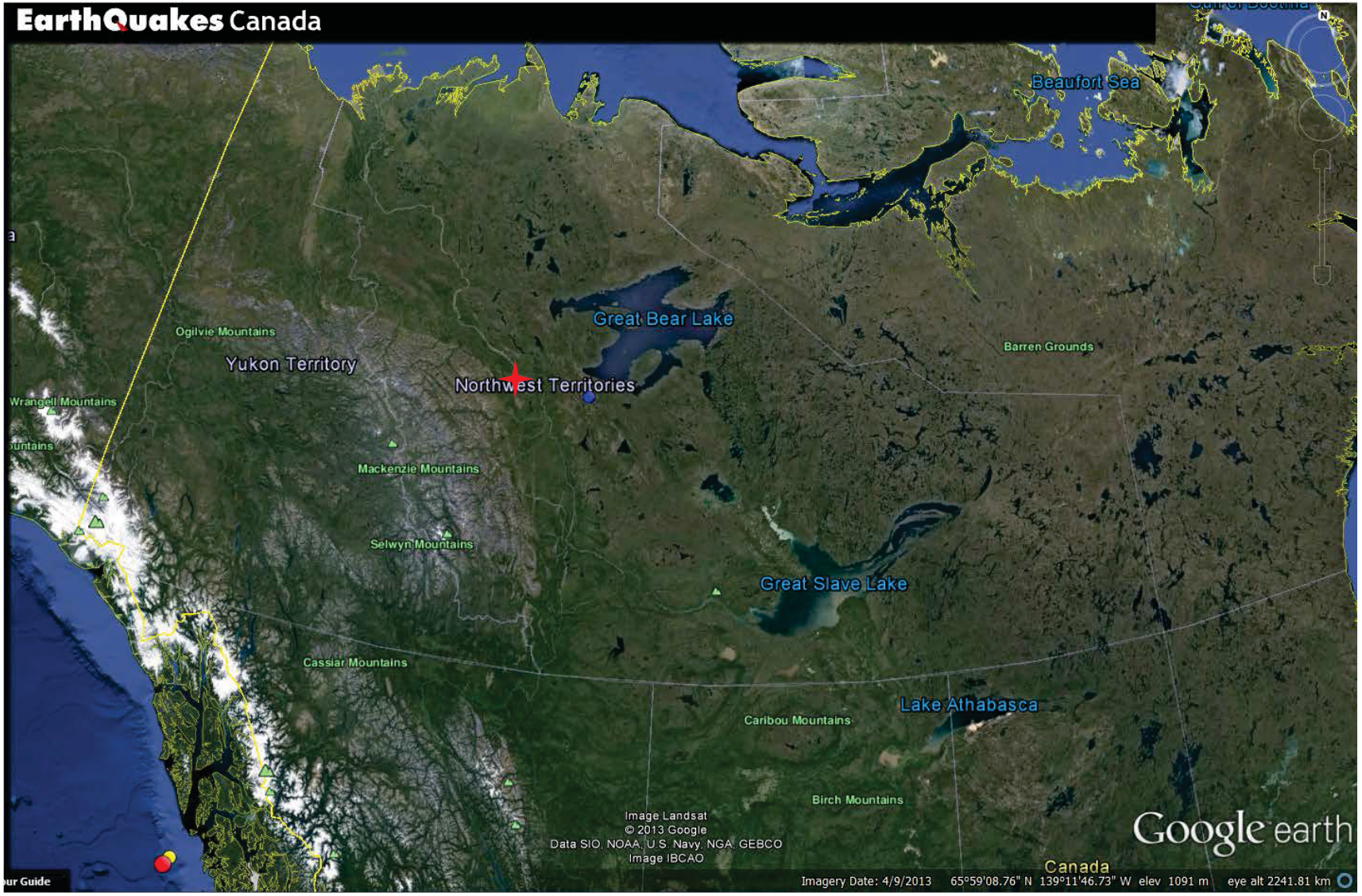
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Appendix A17 Seismic Event Records Q1 2013

Seismic Activity in the NWT – Q1 – 2013

Map of all earthquakes recored as “felt” by NRCan – January 1, 2013 to March 31, 2013 – within a 1500km radius of East Mackay I-78

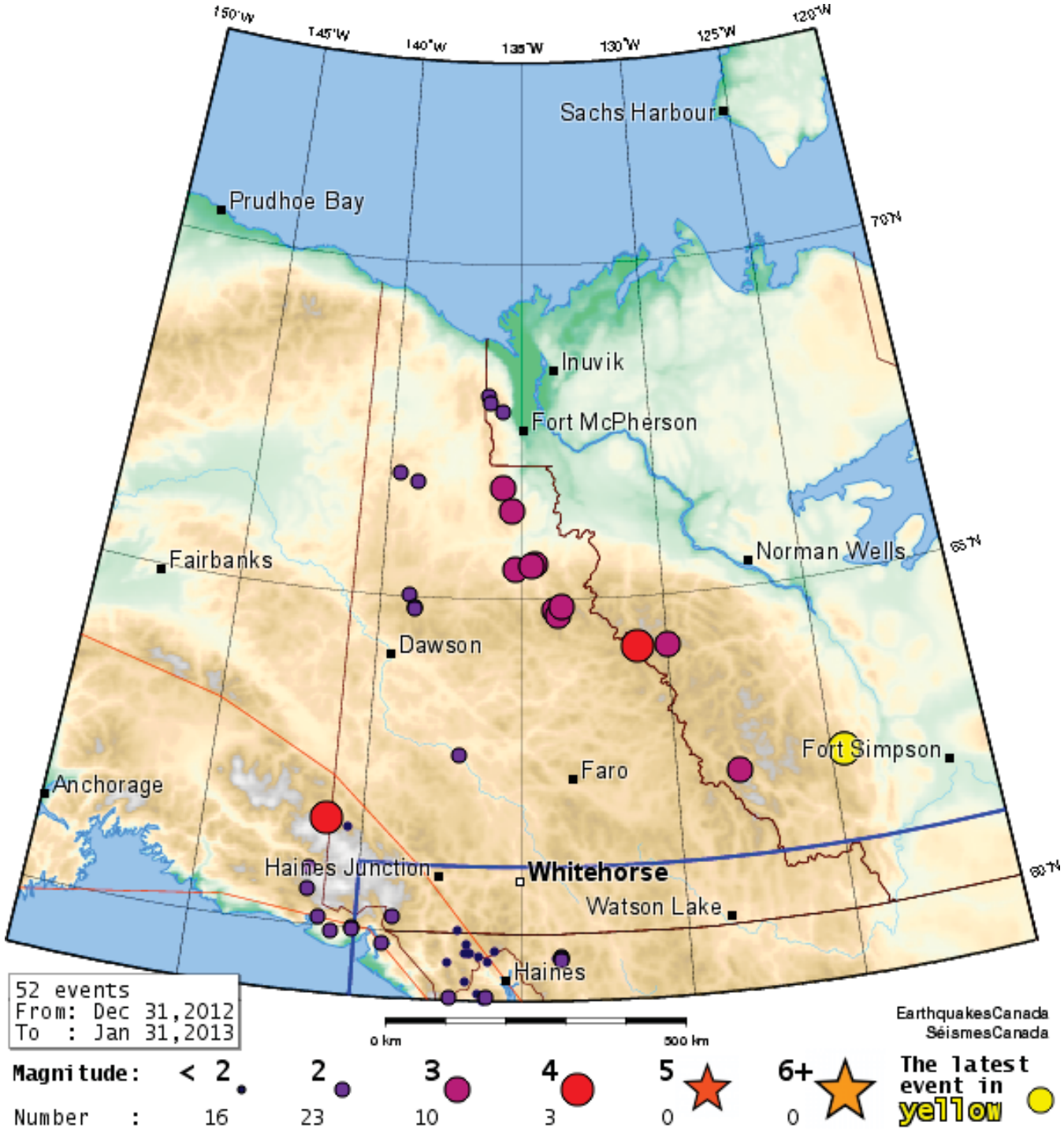
Feb 2 – 177km E of NormanWells – magnitude 4.8 – depth 10,000m – the only one in the Northwest Territories or Yukon
Jan 5 – 209 km SSE of Sitka – magnitude 7.5 – depth 10,000m
Jan 31 – 187 km SSE of Sitka – magnitude 5.9 – depth 1,000m



January 2013

Natural Resources Canada links: Earthquakes Canada

The Yukon, western Northwest Territories
Earthquakes of the last 30 days



Canada::Northern Canada::The Yukon, western Northwest Territories

RSS feed:

All times are listed in Coordinated Universal Time(UT).
What time is it where I live?

Table of Earthquakes in the last 30 days

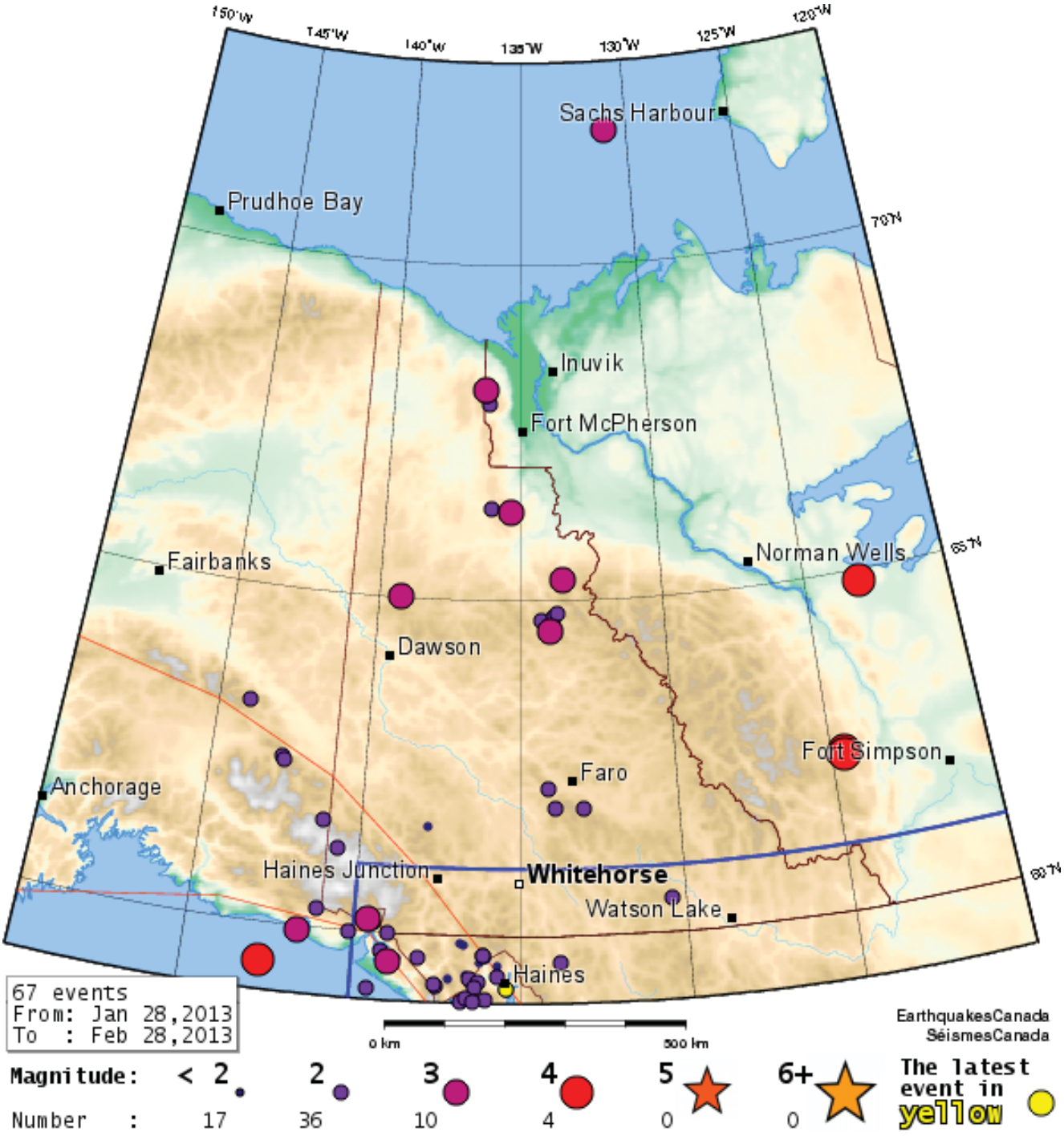
Date	Time	Lat	Lon	Depth	Mag	Felt?	Region
2013/01/30	15:05:15	62.36	-124.58	1.0	4.4	No	185 km W of Fort Simpson,NT
2013/01/29	12:18:42	59.61	-133.84	5.0	2.4	No	96 km ENE of Haines,AK
2013/01/29	12:10:02	59.06	-136.06	1.0	2.3	No	47 km W of Haines,AK
2013/01/29	09:23:21	66.32	-135.35	1.0	3.1	No	130 km SW of Fort McPherson,NT
2013/01/29	00:11:28	67.93	-136.27	1.0	2.5	No	95 km WNW of Fort McPherson,NT
2013/01/27	16:12:21	64.81	-138.77	5.0	2.4	No	88 km NE of Dawson,YT
2013/01/27	16:10:38	64.84	-138.75	1.0	2.8	No	92 km NE of Dawson,YT
2013/01/27	11:35:15	59.98	-140.06	5.0	2.1	No	83 km NW of Yakutat,AK
2013/01/27	10:33:29	59.29	-136.70	1.0	1.7	No	86 km W of Haines,AK
2013/01/26	16:25:06	64.25	-131.03	1.0	4.3	No	236 km WSW of Norman Wells,NT
2013/01/26	12:32:25	59.73	-135.82	1.0	1.6	No	76 km NW of Haines,AK
2013/01/25	12:51:59	65.50	-134.66	1.0	3.1	No	216 km S of Fort McPherson,NT
2013/01/23	16:56:49	66.65	-135.73	100.0	3.0	No	104 km WSW of Fort McPherson,NT
2013/01/22	23:58:08	64.87	-133.62	1.0	3.8	No	288 km SSE of Fort McPherson,NT
2013/01/18	13:38:59	59.57	-137.21	1.0	1.5	No	123 km WNW of Haines,AK
2013/01/16	22:59:18	60.11	-141.12	10.0	2.3	No	128 km WNW of Yakutat,AK
2013/01/16	03:18:49	59.81	-139.16	5.0	2.0	No	60 km NNE of Yakutat,AK
2013/01/15	20:28:37	62.66	-137.03	15.0	2.1	No	196 km ESE of Dawson,YT
2013/01/14	21:45:04	60.05	-136.92	1.0	1.8	No	85 km SE of Haines Jct.,YT
2013/01/14	18:08:38	59.71	-136.69	1.0	1.6	No	106 km WNW of Haines,AK
2013/01/14	08:47:56	61.50	-140.44	10.0	1.7	No	177 km WNW of Haines Jct.,YT
2013/01/14	06:51:33	59.69	-136.53	15.0	1.2	No	97 km WNW of Haines,AK
2013/01/13	09:36:38	66.72	-138.92	5.0	2.7	No	210 km W of Fort McPherson,NT
2013/01/12	18:49:22	60.84	-141.52	1.0	2.1	No	206 km NW of Yakutat,AK
2013/01/12	15:17:18	64.76	-133.76	1.0	3.3	No	282 km E of Dawson,YT
2013/01/12	08:48:44	61.63	-141.06	1.0	1.7	No	213 km WNW of Haines Jct.,YT
2013/01/12	04:33:35	59.63	-133.85	5.0	2.6	No	97 km ENE of Haines,AK
2013/01/12	04:31:03	65.45	-135.20	5.0	3.2	No	224 km SSW of Fort McPherson,NT
2013/01/12	03:40:54	60.52	-141.50	5.0	2.7	No	176 km WNW of Yakutat,AK
2013/01/11	19:32:48	59.63	-134.00	1.0	1.9	No	90 km ENE of Haines,AK
2013/01/11	11:16:34	65.52	-134.50	1.0	3.0	No	213 km S of Fort McPherson,NT
2013/01/10	14:59:29	59.64	-133.86	20.0	2.1	No	97 km ENE of Haines,AK
2013/01/09	15:35:57	59.03	-137.13	1.0	2.0	No	108 km W of Haines,AK
2013/01/08	16:55:37	59.92	-140.68	1.0	2.7	No	96 km WNW of Yakutat,AK
2013/01/07	13:58:32	59.10	-136.31	5.0	1.9	No	61 km W of Haines,AK
2013/01/07	09:06:00	60.19	-138.89	1.0	2.0	No	96 km WSW of Haines Jct.,YT
2013/01/06	20:31:16	62.63	-137.10	10.0	1.9	No	197 km ESE of Dawson,YT
2013/01/06	11:55:25	61.62	-141.21	1.0	2.0	No	219 km WNW of Haines Jct.,YT
2013/01/05	15:18:19	66.84	-139.63	1.0	2.9	No	234 km W of Fort McPherson,NT
2013/01/05	03:20:51	59.84	-136.63	1.0	1.6	No	112 km SE of Haines Jct.,YT
2013/01/04	21:39:33	65.01	-139.00	1.0	2.9	No	107 km NNE of Dawson,YT
2013/01/04	13:07:08	59.71	-136.57	10.0	1.9	No	100 km WNW of Haines,AK
2013/01/04	00:34:28	62.27	-127.98	1.0	3.2	No	243 km NNE of Watson Lk.,YT

2013/01/03	16:06:47	59.64	-136.27	5.0	0.9	No	83 km WNW of Haines,AK
2013/01/03	06:41:00	67.80	-135.72	5.0	2.4	No	67 km WNW of Fort McPherson,NT
2013/01/02	15:12:50	60.00	-140.06	10.0	2.4	No	85 km NW of Yakutat,AK
2013/01/02	03:23:28	68.04	-136.29	10.0	2.7	No	103 km WNW of Fort McPherson,NT
2013/01/01	03:49:08	64.24	-129.96	1.0	3.2	No	194 km WSW of Norman Wells,NT
2012/12/31	13:45:13	59.57	-136.00	15.0	1.4	No	67 km WNW of Haines,AK
2012/12/31	11:38:27	61.60	-141.16	10.0	4.1	No	216 km WNW of Haines Jct.,YT
2012/12/31	10:14:32	64.83	-133.84	1.0	3.4	No	281 km E of Dawson,YT

February 2013

Natural Resources Canada links: Earthquakes Canada

The Yukon, western Northwest Territories
Earthquakes of the last 30 days



Canada::Northern Canada::The Yukon, western Northwest Territories

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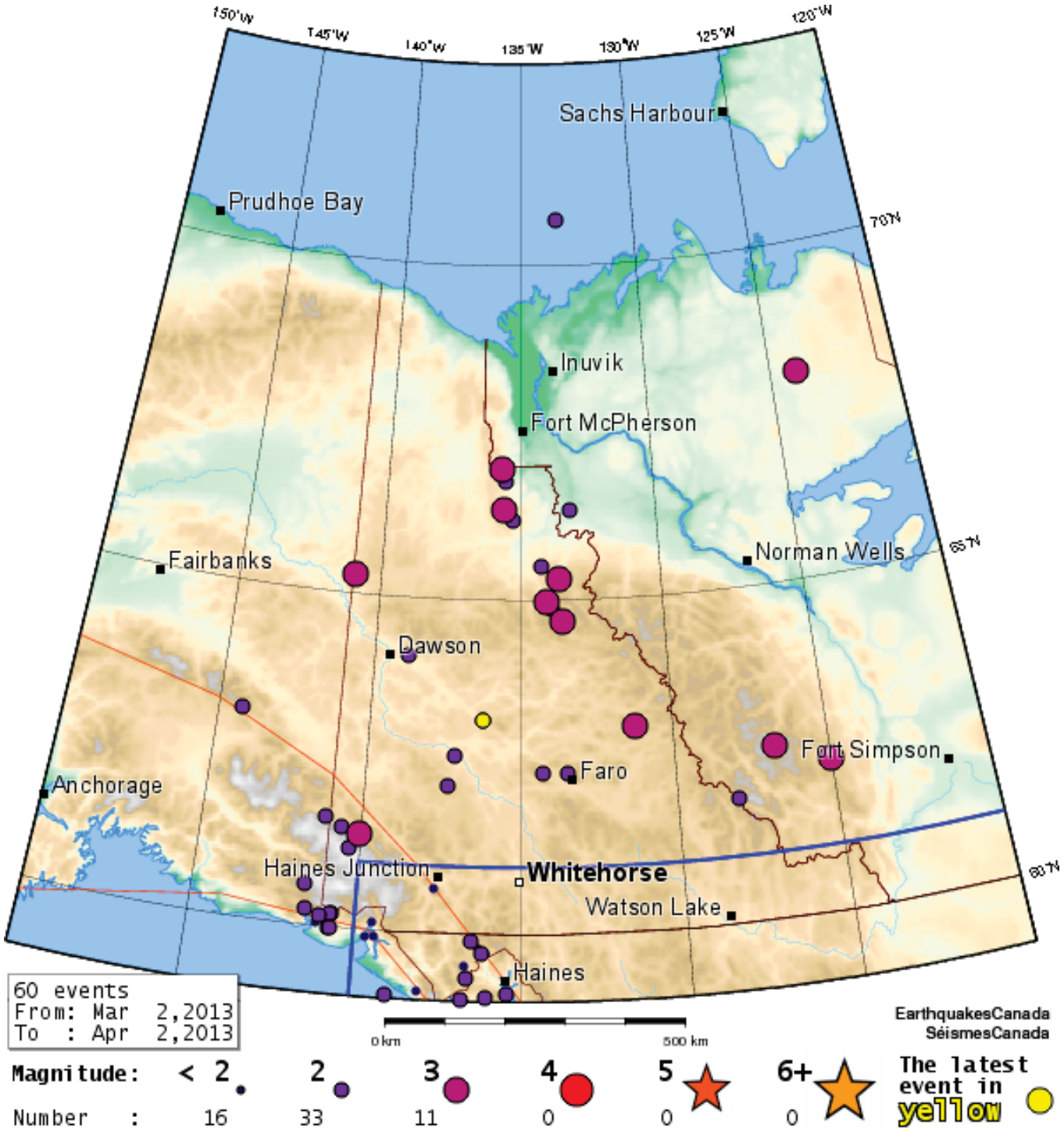
Table of Earthquakes in the last 30 days

Date	Time	Lat	Lon	Depth	Mag	Felt?	Region
2013/02/27	10:45:06	59.20	-135.45	5.0	2.5	No	15 km WNW of Haines,AK
2013/02/26	23:56:28	59.92	-141.64	1.0	3.8	No	140 km WNW of Yakutat,AK
2013/02/26	22:33:42	59.43	-142.68	1.0	4.5	No	181 km W of Yakutat,AK
2013/02/25	18:06:31	59.71	-136.15	5.0	2.6	No	84 km WNW of Haines,AK
2013/02/25	17:00:02	59.69	-136.13	10.0	1.5	No	82 km WNW of Haines,AK
2013/02/25	11:51:19	62.19	-134.11	15.0	2.6	No	169 km NE of Whitehorse,YT
2013/02/25	05:12:04	61.60	-137.94	5.0	1.9	No	97 km NNW of Haines Jct.,YT
2013/02/25	03:48:14	59.34	-137.15	1.0	1.8	No	112 km W of Haines,AK
2013/02/25	03:34:56	59.85	-136.70	10.0	1.5	No	110 km SE of Haines Jct.,YT
2013/02/24	20:15:39	61.19	-140.67	1.0	2.9	No	176 km W of Haines Jct.,YT
2013/02/24	06:33:33	65.02	-139.24	1.0	3.1	No	106 km N of Dawson,YT
2013/02/24	00:08:44	59.98	-138.98	5.0	2.5	No	81 km NE of Yakutat,AK
2013/02/22	00:19:24	59.03	-136.39	1.0	2.4	No	66 km W of Haines,AK
2013/02/21	18:32:59	59.72	-139.16	10.0	2.3	No	50 km NE of Yakutat,AK
2013/02/21	03:30:14	59.71	-136.15	1.0	1.7	No	84 km WNW of Haines,AK
2013/02/19	17:55:31	61.88	-133.00	10.0	2.4	No	169 km ENE of Whitehorse,YT
2013/02/19	12:25:17	60.50	-130.41	1.0	2.8	No	97 km WNW of Watson Lk.,YT
2013/02/19	07:44:53	60.12	-139.44	1.0	2.0	No	92 km N of Yakutat,AK
2013/02/19	01:53:24	59.08	-136.61	1.0	2.2	No	79 km W of Haines,AK
2013/02/18	14:06:00	59.27	-137.53	1.0	2.4	No	111 km E of Yakutat,AK
2013/02/18	13:14:19	59.25	-137.51	5.0	2.2	No	112 km E of Yakutat,AK
2013/02/17	22:50:11	59.97	-138.92	5.0	1.8	No	82 km NE of Yakutat,AK
2013/02/17	17:27:31	59.29	-136.51	8.1	0.9	No	75 km W of Haines,AK
2013/02/17	05:59:16	60.17	-139.60	3.7	3.5	No	98 km N of Yakutat,AK
2013/02/16	11:59:29	68.12	-136.39	20.0	3.6	No	112 km WNW of Fort McPherson,NT
2013/02/16	09:39:41	59.18	-137.55	10.0	1.9	No	111 km E of Yakutat,AK
2013/02/15	11:22:19	62.42	-142.61	1.0	2.3	No	243 km WSW of Dawson,YT
2013/02/14	09:42:46	59.24	-136.39	1.0	2.1	No	67 km W of Haines,AK
2013/02/14	06:45:05	68.06	-136.41	1.0	2.6	No	108 km WNW of Fort McPherson,NT
2013/02/14	04:26:27	64.80	-133.73	1.0	2.9	No	285 km E of Dawson,YT
2013/02/14	02:57:24	59.70	-136.14	10.0	1.0	No	83 km WNW of Haines,AK
2013/02/14	02:45:10	59.54	-135.73	15.0	1.1	No	56 km NW of Haines,AK
2013/02/14	02:18:46	59.66	-136.03	1.0	1.6	No	76 km NW of Haines,AK

2013/02/13	15:44:21	59.70	-136.14	5.0	2.7	No	83 km WNW of Haines,AK
2013/02/11	21:28:55	60.26	-141.13	5.0	2.1	No	142 km WNW of Yakutat,AK
2013/02/11	00:29:22	63.25	-143.95	10.0	2.3	No	241 km W of Dawson,YT
2013/02/09	17:14:45	59.98	-140.12	5.0	2.1	No	84 km NW of Yakutat,AK
2013/02/09	10:45:05	59.88	-136.79	10.0	1.4	No	105 km SE of Haines Jct.,YT
2013/02/08	17:03:50	61.90	-133.91	1.0	2.5	No	144 km NE of Whitehorse,YT
2013/02/08	13:45:28	59.02	-136.76	10.0	2.3	No	88 km W of Haines,AK
2013/02/08	05:05:27	59.59	-136.20	15.0	1.1	No	76 km WNW of Haines,AK
2013/02/08	00:26:01	64.74	-133.87	1.0	2.8	No	277 km E of Dawson,YT
2013/02/06	22:40:21	59.56	-138.90	10.0	3.0	No	44 km ENE of Yakutat,AK
2013/02/06	18:55:58	62.46	-142.71	1.0	2.3	No	241 km ENE of Valdez,AK
2013/02/05	23:39:13	59.16	-139.51	1.0	2.3	No	14 km S of Yakutat,AK
2013/02/05	17:37:56	71.97	-131.08	35.0	3.6	No	201 km W of Sachs Harbour,NT
2013/02/05	02:17:55	59.71	-136.15	10.0	1.8	No	84 km WNW of Haines,AK
2013/02/04	18:36:47	64.70	-134.31	1.0	2.9	No	256 km E of Dawson,YT
2013/02/04	16:19:32	59.28	-136.36	8.0	1.9	No	66 km W of Haines,AK
2013/02/04	12:35:28	59.64	-138.05	1.0	2.1	No	90 km ENE of Yakutat,AK
2013/02/04	03:33:57	61.60	-141.19	8.7	2.1	No	217 km WNW of Haines Jct.,YT
2013/02/03	05:01:08	64.84	-123.12	10.0	4.8	Yes	177 km E of Norman Wells,NT.
2013/02/03	02:51:03	65.30	-133.53	5.0	3.8	No	241 km SSE of Fort McPherson,NT
2013/02/02	04:58:47	59.38	-135.70	1.0	2.2	No	40 km WNW of Haines,AK
2013/02/01	09:48:11	66.36	-136.07	1.0	2.1	No	139 km WSW of Fort McPherson,NT
2013/02/01	09:05:35	62.33	-124.77	20.0	3.3	No	193 km W of Fort Simpson,NT
2013/02/01	06:43:56	59.40	-136.63	10.0	1.6	No	85 km WNW of Haines,AK
2013/01/31	14:01:46	59.62	-138.66	1.0	1.7	No	59 km ENE of Yakutat,AK
2013/01/31	10:14:29	62.32	-124.59	1.0	4.1	No	184 km W of Fort Simpson,NT
2013/01/31	09:12:06	64.54	-134.02	1.0	3.4	No	266 km E of Dawson,YT
2013/01/30	15:05:15	62.36	-124.58	1.0	4.4	No	185 km W of Fort Simpson,NT
2013/01/30	10:22:11	59.32	-136.26	1.0	2.1	No	63 km WNW of Haines,AK
2013/01/29	12:18:42	59.61	-133.84	5.0	2.4	No	96 km ENE of Haines,AK
2013/01/29	12:10:02	59.06	-136.06	1.0	2.3	No	47 km W of Haines,AK
2013/01/29	09:23:21	66.32	-135.35	1.0	3.1	No	130 km SW of Fort McPherson,NT
2013/01/29	00:11:28	67.93	-136.27	1.0	2.5	No	95 km WNW of Fort McPherson,NT
2013/01/28	23:16:45	59.35	-136.51	1.0	2.4	No	77 km W of Haines,AK

March 2013

The Yukon, western Northwest Territories
Earthquakes of the last 30 days



Canada::Northern Canada::The Yukon, western Northwest Territories

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All times are listed in Coordinated Universal Time(UT).
What time is it where I live?

Table of Earthquakes in the last 30 days

Date	Time	Lat	Lon	Depth	Mag	Felt?	Region
2013/03/27	06:24:54	59.79	-136.29	23.6	1.6	No	96 km WNW of Haines,AK
2013/03/27	01:17:56	63.05	-131.22	15.0	3.0	No	327 km ENE of Whitehorse,YT
2013/03/25	02:03:36	65.49	-134.29	5.0	2.9	No	217 km S of Fort McPherson,NT
2013/03/24	21:26:21	59.34	-136.65	0.0	2.5	No	85 km W of Haines,AK
2013/03/24	01:58:11	65.22	-140.97	10.0	2.9	No	148 km NW of Dawson,YT
2013/03/24	01:30:03	61.49	-140.64	1.0	2.3	No	186 km WNW of Haines Jct.,YT
2013/03/23	08:51:02	61.19	-140.36	1.0	2.7	No	160 km W of Haines Jct.,YT
2013/03/23	02:23:56	59.11	-135.42	1.0	2.0	No	11 km W of Haines,AK
2013/03/23	01:44:21	62.64	-137.17	10.0	2.0	No	193 km ESE of Dawson,YT
2013/03/23	00:44:15	59.97	-140.69	5.0	2.0	No	101 km WNW of Yakutat,AK
2013/03/22	16:16:57	65.26	-140.91	1.0	3.2	No	151 km NW of Dawson,YT
2013/03/22	13:56:32	59.88	-139.63	1.0	1.9	No	66 km NNW of Yakutat,AK
2013/03/22	02:32:32	66.75	-135.55	20.0	2.3	No	91 km WSW of Fort McPherson,NT
2013/03/21	13:04:08	62.27	-124.99	5.0	3.1	No	203 km W of Fort Simpson,NT
2013/03/20	11:02:47	62.38	-133.52	10.0	2.7	No	200 km NE of Whitehorse,YT
2013/03/19	20:39:39	64.85	-133.89	1.0	2.8	No	279 km E of Dawson,YT
2013/03/19	07:16:36	61.61	-141.13	1.0	1.7	No	215 km WNW of Haines Jct.,YT
2013/03/19	07:12:14	61.62	-141.14	1.0	2.3	No	216 km WNW of Haines Jct.,YT
2013/03/19	04:27:38	66.34	-135.62	20.0	3.0	No	133 km SW of Fort McPherson,NT
2013/03/19	00:51:36	62.19	-137.35	1.0	2.6	No	160 km N of Haines Jct.,YT
2013/03/18	08:43:32	66.18	-135.30	20.0	2.0	No	145 km SW of Fort McPherson,NT
2013/03/18	06:45:50	59.12	-138.04	1.0	1.9	No	84 km E of Yakutat,AK
2013/03/18	01:22:10	60.67	-137.64	3.4	1.3	No	10 km SW of Haines Jct.,YT
2013/03/18	01:04:08	70.66	-133.48	35.0	2.2	No	262 km N of Inuvik,NT
2013/03/17	11:36:33	59.89	-139.38	10.0	1.6	No	67 km N of Yakutat,AK
2013/03/17	11:28:00	60.10	-139.45	1.0	1.9	No	89 km N of Yakutat,AK
2013/03/17	10:14:50	61.85	-128.07	1.0	2.9	No	197 km NNE of Watson Lk.,YT
2013/03/17	08:56:30	63.09	-144.22	1.0	2.4	No	244 km NE of Valdez,AK
2013/03/17	03:24:01	61.41	-140.06	1.0	1.6	No	154 km WNW of Haines Jct.,YT
2013/03/17	02:17:29	60.22	-141.50	1.0	2.1	No	153 km WNW of Yakutat,AK
2013/03/17	01:21:52	61.41	-140.06	1.0	2.2	No	154 km WNW of Haines Jct.,YT
2013/03/17	01:16:51	61.41	-140.05	1.0	3.5	No	154 km WNW of Haines Jct.,YT
2013/03/16	17:18:06	59.02	-136.76	4.0	2.6	No	87 km W of Haines,AK
2013/03/16	15:53:02	60.58	-141.60	11.3	2.7	No	185 km WNW of Yakutat,AK
2013/03/16	01:23:28	59.52	-136.68	10.0	1.6	No	94 km WNW of Haines,AK
2013/03/15	09:33:26	59.72	-136.18	1.0	1.9	No	86 km WNW of Haines,AK

2013/03/14	12:45:28	59.71	-136.18	5.0	2.0	No	86 km WNW of Haines,AK
2013/03/14	09:08:18	59.70	-136.15	10.0	1.2	No	83 km WNW of Haines,AK
2013/03/13	13:52:43	60.15	-141.05	4.0	2.5	No	129 km WNW of Yakutat,AK
2013/03/13	06:09:45	64.97	-134.09	1.0	3.0	No	274 km E of Dawson,YT
2013/03/13	04:04:28	60.04	-141.13	5.7	1.9	No	123 km WNW of Yakutat,AK
2013/03/11	16:31:35	59.88	-136.52	1.0	2.4	No	111 km SE of Haines Jct.,YT
2013/03/10	18:21:02	59.05	-138.94	15.0	2.4	No	41 km ESE of Yakutat,AK
2013/03/10	09:21:34	66.32	-133.17	1.0	2.2	No	135 km SE of Fort McPherson,NT
2013/03/09	18:24:59	62.41	-134.32	1.0	2.6	No	190 km NNE of Whitehorse,YT
2013/03/09	13:36:12	66.94	-135.74	20.0	3.3	No	80 km WSW of Fort McPherson,NT
2013/03/07	23:35:36	62.58	-126.77	1.0	3.1	No	295 km NE of Watson Lk.,YT
2013/03/07	06:51:24	64.11	-138.82	14.1	2.6	No	29 km E of Dawson,YT
2013/03/06	08:59:42	65.30	-133.63	1.0	3.5	No	240 km SSE of Fort McPherson,NT
2013/03/06	04:02:11	61.51	-140.66	5.0	1.7	No	188 km WNW of Haines Jct.,YT
2013/03/05	22:30:12	68.07	-123.92	5.0	3.1	No	329 km NE of Norman Wells,NT
2013/03/05	12:55:56	59.97	-140.75	1.0	2.1	No	103 km WNW of Yakutat,AK
2013/03/05	04:18:56	59.70	-136.09	5.0	1.9	No	81 km NW of Haines,AK
2013/03/04	17:32:25	64.67	-133.57	1.0	3.0	No	289 km E of Dawson,YT
2013/03/03	20:37:14	62.64	-137.08	10.0	1.9	No	196 km ESE of Dawson,YT
2013/03/03	01:13:38	60.17	-140.71	1.0	1.9	No	119 km NW of Yakutat,AK
2013/03/02	21:54:20	60.18	-140.74	5.0	2.6	No	121 km NW of Yakutat,AK
2013/03/02	21:52:12	60.18	-140.72	5.0	2.0	No	120 km NW of Yakutat,AK
2013/03/02	08:00:59	59.05	-136.05	1.0	2.5	No	47 km W of Haines,AK

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Appendix A18 Excerpt – Water…Monitoring Report (AECOM)

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Excerpt from the MGM Shell East Mackay I-78 Groundwater, Surface Water, and Water Supply Well Monitoring Report, July 2013 by AECOM

MGM drilled three groundwater-monitoring wells on the MGM-Shell East Mackay I-78 prior to the drilling of the exploration oil well.

- I-78 GW001 is located 58.3 m north and 60.6 m east of the exploration well. This monitoring well reached a total depth (TD) of 121.9 m Below Ice Surface (mBIS). A 178 mm diameter steel surface casing was set to 7.6 mBIS. The well was completed with 50 mm PVC pipe with slotted pipe (20 slot – 0.020 inch slots) placed in the lower water bearing zone, Sandstone B (66.0 to 74.0 mBIS).
- I-78 GW002, was drilled 65.3 m north and 26.6 m east of the I-78 exploration well. GW002 reached a TD of 81.4 mBIS. A 178 mm diameter steel surface casing was set to 8.4 mBIS. The well was completed with 50 mm PVC pipe with slotted pipe (20 slot) placed in the lower water bearing zone, Sandstone B.
- I-78 GW003, is located 9.7 m north and 75.2 m east of the I-78 exploration well. GW003 reached a TD of 85.3 mBIS. A 248 mm diameter steel surface casing was set to a final depth of 8.5 mBIS . The well was completed with 100 mm diameter PVC pipe with slotted PVC pipe in the water bearing zone, Sandstone B. GW003 was completed as a potential water supply well.

Two sandstone units were encountered: Sandstone A, a water bearing sandstone with a lower flow rate; and Sandstone B, the completed aquifer with a higher flow rate. This unit was judged to be the higher producing aquifer based on the responses in the electrical logs and observations made during the drilling.

Baseline groundwater sampling at monitoring wells I-78 GW001, GW002, and GW003 was conducted on January 22 to 23, 2013 before oil well operations began (January 27, 2013).

I-78 GW003 was also sampled after approximately 23.5 hours of pumping during a 24 hour pump test on February 2, 2013, and all three wells were sampled again on March 7 to 9, 2013, after all hydraulic fracturing operations were complete. Two different methods were used to determine the transmissivity and storativity of the aquifer using the drawdown data from the 24 hour pump test and the 24 hour recovery test. The sustainable yield (Q20) is the volume of water per day that can be sustainably pumped from the aquifer over a 20 year period without causing excessive drawdown in the aquifer. Alberta Environment and Sustainable Resource Development use the Farvolden Method to calculate Q20. Using the average transmissivity calculated from the Hantush and Jacob method of 15.5 m2/day, the Q20 of the aquifer at GW003 is 167 m3/day or 30 USgpm.

For I-78 GW003 the following summarizes the groundwater sampling results:

- The laboratory pH measured for the baseline, post pump test, and the post fracture sampling events was 8.94, 8.82, and 9.24, respectively (guideline of 6.5-9.0).
- The fluoride concentration measured for the baseline and the post fracture sampling events was 0.21 mg/L and 0.27 mg/L, respectively; fluoride was not analyzed in the post pump test sample in February.

- The concentration of the following dissolved metal parameters decreased between the baseline and post fracture sampling events
    - dissolved arsenic (baseline = 0.006 mg/L, post pump test <0.00040, post fracture <0.001, guideline of 0.005 mg/L),
    - dissolved cadmium (baseline = 0.000026 mg/L, post pump test <0.00010 mg/L, post fracture <0.000016 mg/L, guideline of 0.000017 mg/L).
    - dissolved copper concentration was equal to the guideline on the baseline-sampling event (0.002 mg/L) and below the guideline on the post pump test and post fracture event (<0.0010 and <0.002 mg/L, respectively).
- The microbiology results indicate that no coliform bacteria were detected.

In April of 2013, MGM Energy Corp., on behalf of itself and its partner Shell Canada Ltd., commissioned a petrophysical evaluation by Taggart Petrophysical Services (Taggart) of Calgary, Alberta of the shallow interval on the East Mackay I-78 lease. Additionally, the well log data from the main exploration wellbore was also evaluated with the objective of identifying the depth to which potable water may exist, and if any hydraulic barriers exist that could mark the base of any potable groundwater sources. For the purpose of this report "potable" refers to the water salinity. Potable water is defined as water with salinity values lower than 500 ppm (the Canadian Drinking Water Guideline for treated water); non-potable water is defined by salinity values greater than 500 ppm.

Potable Water

Potable water aquifers exist in the sands between surface and 129 mMD. These sands are part of the Tertiary Summit Creek Formation. The evidence to support this interpretation includes: Salinity values of 250 to 350 ppm calculated using the electric conductivity measured directly from water sampled from a depth of 66 to 74 mMD; and GW001 was drilled to a total depth of 122 mMD encountering no other significant aquifers below "Sandstone B" (66 to 74 mMD).

Non-Potable Water

No evidence of potential aquifers was observed in the East Fork Formation (129 to 765 mMD). This zone primarily consists of shales that would act as a hydraulic barrier/hard seal (aquatard) preventing vertical migration of groundwater. Formation water encountered in the Upper and Middle Little Bear Formation sands (765 and 925 mMD) is not potable with a salinity of 1700 ppm. Formation water encountered in the Little Bear Formation sands at 1162 mMD is saline (7000 ppm) and is not potable. There is no evidence of salinity slowly increasing between the Middle Little Bear Formation sands and the Lower Little Bear Formation sands. This indicates that there is a hydraulic barrier/hard seal (aquatard) between the middle and lower sands that prevents the vertical migration of the formation water.

This summary is an excerpt from the AECOM report (MGM Shell East Mackay I-78 Groundwater, Surface Water, and Water Supply Well Monitoring Report, July 2013, AECOM) which includes the complete evaluation of potable water zones encountered in this well. The AECOM report was previously received by the SLWB on July 30/13, NWT Geoscience Office (Yellowknife) received it on July 26/13, and the NEB on July 24, 2013. The reader is directed to the AECOM report as the only complete and correct record of testing.

Appendix A19 NEB Forms

Operations Authorization

Well Approval

Approval to Alter the Condition of a Well

Well Operations Report ("Well Termination Report")

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National Energy Board



Office national de l'énergie

File: OA-1202-002
16 January 2013

Mr. Dick Heenan
Drilling Manager
MGM Energy Corp.
4100, 350-7th Avenue S.W.
Calgary, AB T2P 3N9

Dear Mr. Heenan:

Operations Authorization Application for MGM Energy Corp. (MGM) for the MGM-Shell East Mackay I-78

Please find attached an Operations Authorization (OA) for the proposed work over a period of two (2) years. The OA is subject to the terms and conditions provided in the attachment. Any change or deviation from the approved program will require the additional specific approval of the Chief Conservation Officer.

The operator is required to notify the National Energy Board (NEB) prior to the commencement of the well operations by e-mail: dailyreports@neb-one.gc.ca.

All oil and gas activities are to meet the requirements of the *Canada Oil and Gas Drilling and Production Regulations*, *Canada Labour Code, Part II* and the *Oil and Gas Occupational Safety and Health Regulations*.

If you have any questions, please contact Gary Woo, Project Manager, at 403-299-3143.

Yours truly,

Patrick Smyth
Chief Conservation Officer

444 Seventh Avenue SW
Calgary, Alberta T2P 0X8

444, Septième Avenue S.-O.
Calgary (Alberta) T2P 0X8

Canada

Telephone/Téléphone : 403-292-4800
Facsimile/Télécopieur : 403-292-5503
http://www.neb-one.gc.ca
Telephone/Téléphone : 1-800-899-1265
Facsimile/Télécopieur : 1-877-288-8803

Attachment
MGM Energy Corp. (MGM)
Operations Authorization OA-1202-002
Terms and Conditions

1. MGM shall request approval from the Chief Conservation Officer of any proposed changes or deviations to the authorized program, work or activities including but not limited to key personnel, the safety plan, the environmental protection plan and contingency plans.

2. MGM shall implement or cause to be implemented all of the commitments, policies, practices, mitigative measures, recommendations and procedures for safety and/or the protection of the environment referred to its application and subsequent filings.

3. MGM shall provide an updated operator contact list for this program prior to any work or activity.

4. MGM shall include the NEB in the distribution of the water well monitoring report it is required to submit annually to the Sahtu Land and Water Board as per Water Licence S12L1-001 Part B Item 2.

5. MGM shall complete a camp inspection and ensure that the camp is fit for habitation. Applicable permitting (food permit handling/fire inspection) documents are to be readily available/posted on location prior to spud.

6. While conducting work or activities authorized by the NEB, MGM shall report each suspected seismic event, its start time, duration, and estimate of event magnitude by email to dailyreports@neb-one.gc.ca. MGM shall immediately report to the NEB 24-hour Incident Cell Phone (403-807-9473), any disruption or safety shutdown of its operations resulting from a suspected seismic.

7. MGM shall submit to the Chief Conservation Officer, no later than 10 days following the approval of this Operations Authorization, a copy of the Bank of Montreal procedures concerning the transfer of monies to the Calgary branch with respect to the amended Letter of Credit submitted as proof of financial responsibility.

National Energy Board | Office national de l'énergie

NATIONAL ENERGY BOARD
Exploration and Production
NOV 06 2012

OPERATIONS AUTHORIZATION

APPLICATION

MGM ENERGY CORP.

(Name of Operator)

Hereby applies for authorization of a proposed:

☒ Drilling Program ☐ Production Program ☐ Installation/Removal Program ☐ Other
Please Specify:

under paragraph 5(1)(b) of the *Canada Oil and Gas Operations Act (R.S.C., 1985, c. O-7) and* Part 2 of the *Canada Oil and Gas Drilling and Production Regulations* (SOR/2009-0315) using equipment and procedures described in the application .

Changes in equipment or procedures, outside the scope of this application, require the approval of the Board in order that this authorization remains valid. An approved copy of this notice is to be posted at each work site and is subject to the terms and conditions attached to this authorization.

Licence No.	Exploration Licence 466	NEB Operating Licence No.	1202
Region	NWT Mainland		
Field	East MacKay		
Anticipated date of commencement	2013/01/10	Proposed Duration	57 months
Scope of Work	Drill, evaluate, complete, hydraulically fracture, & test (as required) one vertical well		

"I certify that the information provided on this form is true and correct"

Name	Richard Heenan	Telephone	(403) 781-7819 Ext
Job Designation	Drilling Manager	E-Mail	dick.heenan@mgmenergy.com
Signature	Richard Heenan	Date	2012/11/2

Responsible Officer of Company

NATIONAL ENERGY BOARD AUTHORIZATION
(Board Use Only)

The operator named above is hereby authorized under paragraph 5(1)(b) of the *Canada Oil and Gas Operations Act (R.S.C., 1985, c. O-7)* and is subject to the terms and conditions attached to this authorization.

Job Designation	Chief Conservation Officer		
Signature	*NEB Authority*	Date	16 January 2013
Operation Authorization (OA) No.	OA-1202-002	Expiry Date	16 January 2015

Canada

National Energy Board



Office national de l'énergie

WID # 2078
16 January 2013

Mr. Dick Heenan
Drilling Manager
MGM Energy Corp.
4100, 350 - 7th Avenue S.W.
Calgary, AB T2P 3N9

Dear Mr. Heenan:

Approval to Drill a Well (ADW) Application MGM Energy Corp. (MGM) for the MGM-Shell East Mackay I-78 Well

MGM is hereby granted approval to drill the above referenced well. Please find the attached ADW form for the proposed work and note that the ADW is subject to the terms and conditions provided on the attachment. In addition, the well approval is granted under Operations Authorization OA-1202-002 and is subject to the terms and conditions of that OA.

Any change or deviation from the approved program will require the additional specific approval of the Chief Conservation Officer.

All oil and gas activities are to meet the requirements of the *Canada Oil and Gas Drilling and Production Regulations*, *Canada Labour Code, Part II* and the *Oil and Gas Occupational Safety and Health Regulations*.

If you have any questions, please contact Gary Woo, Project Manager, at 403-299-3143.

Yours truly,

Patrick Smyth
Chief Conservation Officer

444 Seventh Avenue SW
Calgary, Alberta T2P 0X8

444, Septième Avenue S.-O.
Calgary (Alberta) T2P 0X8

Canada

Telephone/Téléphone : 403-292-4800
Facsimile/Télécopieur : 403-292-5503
http://www.neb-one.gc.ca
Telephone/Téléphone : 1-800-899-1265
Facsimile/Télécopieur : 1-877-288-8803

Attachment
Approval to Drill a Well Terms and Conditions for:
MGM-Shell East Mackay I-78

1. A copy of the *Canada Oil and Gas Drilling and Production Regulations,* the *Canada Labour Code Part II* and the *Oil and Gas Occupational Safety and Health Regulations* are to be kept at the well site and shall be made available on request by any person at the well site.

2. MGM shall report by March 31 of each year on the results of its monitoring and inspection of each suspended well as required by section 57 of the *Canada Oil and Gas Drilling and Production Regulations*.

3. MGM shall submit two paper copies and one electronic (on CD/DVD, in PDF format) of all the data for the "Well History Report" within 45 days after the rig release date. In addition, MGM shall submit one LAS copy of final log prints on compact disc. Please ensure compact discs are maximized and submitted with the final report.

4. MGM shall submit, with the Well History Report, a final well survey certified by a person licensed under the *Canada Land Surveyor Act*.

5. MGM shall include a report on the potable water zones with the Well History Report that includes identification and evaluation of the potable water zones of the MGM-Shell East Mackay I-78.

6. MGM shall deliver all drill cuttings and core that are collected during drilling or well operations to the Geological Survey of Canada in Calgary at 3303 33rd Street NW to the attention of the Head, Core and Sample Repository. Copies of the transmittal letters for the collected samples are to be forwarded to the Chief Conservation Officer.

7. MGM shall submit to dailyreports@neb-one.gc.ca a copy of the CAODC drilling rig inspection report and confirmation that all corrective actions have been satisfactorily implemented prior to spud.

National Energy Board | Office national de l'énergie

APPROVAL TO DRILL A WELL

APPLICATION

This application is submitted under Section 10 of the *Canada Oil and Gas Drilling and Production Regulations* (SOR/2009-0315). When granted under Section 13 of the Regulations, this form is the requisite approval for the commencement of well operations. An approved copy of this notice is to be posted at each drill site.

Well Name	MGM - Shell East MacKay I-78	Operator	MGM Energy Corp.
Well Type	Exploratory Well	If Other Type, please specify	N/A
NEB Operating Licence No.	1202	Operations Authorization No.	Pending
Drilling Rig or Unit	37	Contractor	Akita Sahtu Drilling
Licence No.	Exploration Licence 466	Estimated Well Cost	$35,000,000.00
Station Keeping	Not Applicable	Land Structure	Conventional Land
Land Use Permit No.	S12A-001	Issued by:	Sahtu Land and Water Board
Water Licence No.	S12L1-001	Issued by:	Sahtu Land and Water Board
Location Unit	I	Section 78	Grid 64 50 125 30
Coordinates (NAD 27)	*Surface* Lat 64 ° 47 ' 42.1 "		Long 125 ° 43 ' 19.1 "
	Bottom Hole Lat 64 ° 47 ' 42.1 "		Long 125 ° 43 ' 19.1 "
Region	NWT Mainland		
Target Formation	Canol & Bluefish	Field/Pool	/
Well Path	Vertical	Discovery Well	
Elevation KB/RT	160.7 m	Ground Level / Seafloor	155 m
Approximate Spud Date	Jan 15 2013	Est. Days on Location	60 days
Anticipated Total Depth	2020 m KB		

EVALUATION PROGRAM

Sample Type	Top to Bottom Interval (m KB)	Sample Interval (m)	Comments
Select	20-2020	5.0	Interval may be altered by geologist due to recovery / penetration
Other	40-2020	Other	50m to 1800 & 5m to TD - mud gas isotubes
Select	-	Select	
Conventional Cores	1817-1965	Other	78 mm core as warranted
Logs and Tests	20-2020	Other	all SP-DIL-sonic-density- plus MREX-FLEX main hole

CASING PROGRAM

O.D. (mm)	Weight (kg/m)	Grade	Setting Depth (m KB)
244	59.5	L-80	400 (or comperant formation)
178	38.7	L-80	2020

Additional Information

"I certify that the information provided on this form is true and correct"

Name	*Richard Heenan*	Telephone	(403) 781-7819 Ext
Job Designation	Drilling Manager	E-Mail	dick.heenan@mgmenergy.com
Operator	MGM Energy Corp.		
Signature	R Heenan	Date	2012/12/13

Responsible Officer of Company

NATIONAL ENERGY BOARD APPROVAL

(Board Use Only)

This well approval is granted under section 13 of the *Canada Oil and Gas Drilling and Production Regulations* (SOR/2009-0315) and is subject to the terms and conditions attached to this approval and Operations Authorization No. OA-1202-002.

Job Designation	Chief Conservation Officer	Well Identifier	2078
		Unique Well Identifier	300I786450125300
Signature		Date	16 January 2013

NEB Authority

Canada

National Energy Board



Office national de l'énergie

WID # 2078
14 February 2013

Mr. Dick Heenan
Drilling Manager
MGM Energy Corp.
4100, 350 - 7th Avenue S.W.
Calgary, AB T2P 3N9

Dear Mr. Heenan:

Approval to Alter the Condition of a Well (ACW) for the MGM-Shell East MacKay I-78 Well (I-78)

MGM Energy Corp. (MGM) is hereby granted approval to complete the above referenced well. Please find the attached ACW form for the proposed work and note that the ACW is subject to the terms and conditions provided in the attachment. In addition, the well approval is granted under Operations Authorization OA-1202-002 and is subject to the terms and conditions of that OA.

In accordance with subsection 52(4) of the *Canada Oil and Gas Drilling and Production Regulations*, MGM is hereby approved to conduct formation flow tests on the Canol Formation and the Bluefish Formation of the I-78 well.

All oil and gas activities are to meet the requirements of the *Canada Oil and Gas Drilling and Production Regulations*, the *Oil and Gas Occupational Safety and Health Regulations* and *Canada Labour Code, Part II*.

.../2

444 Seventh Avenue SW
Calgary, Alberta T2P 0X8

444, Septième Avenue S.-O.
Calgary (Alberta) T2P 0X8

Canada

Telephone/Téléphone : 403-292-4800
Facsimile/Télécopieur : 403-292-5503
http://www.neb-one.gc.ca
Telephone/Téléphone : 1-800-899-1265
Facsimile/Télécopieur : 1-877-288-8803

Please ensure the NEB 24/7 incident cell number 403-807-9473 is listed as the number to call in the event of an incident and the NWT-Nunavut 24-hour Spill Report Line number 867-920-8130 is listed as the number to call in the event of a reportable spill.

If you have any questions, please contact Abul Kabir at 403-292-5048.

Yours truly,

Patrick Smyth
Chief Conservation Officer

Attachment

Attachment
Approval to Alter the Condition of a Well Terms and Conditions for
MGM-Shell East MacKay I-78

1. A copy of the *Canada Oil and Gas Drilling and Production Regulations*, the Canada Labour Code Part II and the Oil and Gas Occupational Safety and Health Regulations are to be kept at the well site and shall be made available on request by any person at the well site.

2. MGM shall report by March 31 of each year the results of its monitoring and inspection of each suspended well as required by section 57 of the *Canada Oil and Gas Drilling and Production Regulations.*

3. MGM shall provide the Material Safety Data Sheets (MSDS) of the chemicals that MGM utilized in its hydraulic fracturing operations with the Final Well Report.

4. MGM shall submit two paper copies and one electronic version (on CD/DVD, in PDF format) of all data for the "Well History Report" within 90 days of the rig release date. In addition, MGM shall submit one LAS copy of final log prints on compact disc. MGM is to ensure compact discs are maximized and submitted with the final reports.

National Energy Board | Office national de l'énergie

APPROVAL TO ALTER CONDITION OF A WELL

APPLICATION

This application is submitted under Section 10 of the *Canada Oil and Gas Drilling and Production Regulations* (SOR/2009-0315). When granted under Section 13 of the Regulations, this form is the requisite approval for the commencement of well operations. An approved copy of this notice is to be posted at each drill site.

Well Name	MGM - Shell East MacKay I-78		
Well Identifier	2078	Operations Authorization No.	OA-1202-002
Operator	MGM Energy Corp	Current Depth	1960.5 m
NEB Operating Licence No.	1202	Licence No.	Exploration Licence 466
Contractor	Akita Sahtu Drilling	Drilling Rig or Unit	37
Station Keeping	Select	Land Structure	Conventional Land
Current Well Status	Drilling	Anticipated Well Status Change	Suspended after testing
Land Use Permit No.	S12A-001	Issued by:	Sahtu Land and Water Board
Water Licence No.	S12L1-001	Issued by:	Sahtu Land and Water Board
Location Unit	I	Section 78	Grid 64 50 125 30
Coordinates (NAD 27) *Surface*	Lat 64 ° 47 ' 42.1 "		Long 125 ° 43 ' 19.1 "
Bottom Hole	Lat 64 ° 47 ' 42.1 "		Long 125 ° 43 ' 19.1 "
Ground Level / Seafloor	155 m	Elevation KB/RT	161.2 m
Approximate Date of Commencement	12-Feb-13	Est. Days on Location	40 days

WELL OPERATION PROGRAM

Activity Type	Top to Bottom Interval (m KB)	Comments
Completion	1823-1918	Prognosis depths intervals- perforations will be less
Suspension	1823-1918	Prognosis depths intervals- perforations will be less
Completion	1943-1964	Prognosis depths intervals- perforations will be less
Suspension	1943-1964	Prognosis depths intervals- perforations will be less
Select	-	

Additional Information

This is a shale oil exploration well - not yet spudded

"I certify that the information provided on this form is true and correct"

Name	*Richard Heenan*	Telephone	(403) 781 7819 Ext
Job Designation	Drilling Manager	E-Mail	dick.heenan@mgmenergy.com
Operator	MGM Energy Corp		
Signature	R Heenan	Date	2013/01/25

Responsible Officer of Company

NATIONAL ENERGY BOARD APPROVAL

(Board Use Only)

This well approval is granted under section 13 of the *Canada Oil and Gas Drilling and Production Regulations* (SOR/2009-0315) and is subject to the terms and conditions attached to this approval and Operations Authorization No. OA-1202-002.

Job Designation	Chief Conservation Officer	Well Identifier	2078
		Unique Well Identifier	300I781450125301
Signature		Date	14 February 2013

NEB Authority

NATIONAL ENERGY BOARD
Exploration and Production
JAN 29 2013

Canada

National Energy Board / Office national de l'énergie

WELL TERMINATION RECORD

Well Name	MGM - Shell East MacKay I-78	Well ID	2978
Operator	MGM Energy Corp	Current Well Status	Suspended
Total Depth	2001 m KB	Licence No.	Exploration Licence 466
Location	Unit I Section 78	Grid	64' 50" 125' 30"
Coordinates (NAD27)	*Surface* Lat 64 ° 47 ' 42.1 "	Long	125 ° 43 ' 18.3 "
	Bottom Hole Lat 64 ° 47 ' 42.1 "	Long	125 ° 43 ' 18.3 "
Region	NWT Mainland		
Target Formation	Canol & Bluefish	Field/Pool	East MacKay / Canol
Elevation KB/RT	161.24 m	Ground Level / Seafloor	155.00 m
Spud/Re-Entry Date	27-Jan-13	Rig Release Date	25-Feb-13

CASING AND CEMENTING PROGRAM

O.D. (mm)	Weight (kg/m)	Grade	Setting Depth (m KB)	Cementing (m^3)
244.5	59.5	L-80	403	18.2
177.8	38.7	L-80	1988	45.4

PLUGGING PROGRAM

Type of Plug	Interval (m KB)	Felt	Depth (m KB)	Cement (m^3)
Select	-	Select		
Select	-	Select		
Select	-	Select		
Select	-	Select		
Select	-	Select		

PERFORATION

Interval (m KB)	Comments
1946-1948	Bluefish
1882-1884	Lower Canol
1869-1871	Middle Canol
1840-1849	Upper Canol (1840-1842 & 1847-1849)

Lost Circulation/Overpressure Zones	N/A
Equipment Left on Seafloor (Describe)	N/A
Provision for Re-entry (Describe and attach sketch)	Wellhead in place with BPV installed in dognut - double master vales closed, chained & locked - openings bull plugged w/ needle valves
Other Downhole Completion/Suspension	Recorders on 93.7mm R-lock @ 1833mCF & R plug set in 93.7mm R nipple @ 1813mCF

"I certify that the information provided on this form is true and correct"

Name	*Dick Heenan*	Telephone	(403) 781-7819 Ext
Job Designation	Drilling Manager	E-Mail	dick.heenan@mgmenergy.com
Operator	MGM Energy Corp		
Signature	D Heenan	Date	2013/11/14

Responsible Officer of Company

NATIONAL ENERGY BOARD USE ONLY

The details of this document have been examined and verified by

Job Designation		Well Identifier	Unique Well Identifier
Signature		Date	

NEB Authority

Canada

End of MGM – Shell East MacKay I-78 Well History Report