BASS STRAIT OIL COMPANY Ltd
ACN 008 694 817

Melville-1

Well Completion Report

Volume 1: Basic Data

(Documentary & Petroleum Mining Sample)

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1. Introduction

Melville-1 was situated in the central portion of the Victorian permit VIC/P42 which is situated in the Gippsland Basin of Bass Strait, approximately 80 kilometres south of Lakes Entrance. The block is operated by Bass Strait Oil Company Ltd. The well was drilled to a total depth of 3345m BRT with the semi-submersible Mobile Offshore Drilling Module (MODU), the *Ocean Bounty*. The rig was contracted directly from the previous operator and commenced tow to the Melville-1 location at 06:30 hours, 14th October 2001. The rig was anchored in position and the Melville-1 well spudded at 06:15 hours, 17th October 2001.

Major problems occurred while drilling the 12.¼" and 8.½" hole sections where 5 days and 1.4 days were lost respectively. These problems were mainly due to a failed 9.5/8" casing cement job that was attributed to a possible mechanical block that may have occurred at the bottom plug, the float collar or the float shoe. Minor lost time was incurred while drilling the 17.½" hole section where 7.5 hours were lost due to various causes and 5 hours were lost while rigging down and backloading, due to inclement weather.

The objective of Melville-1 was to determine if commercial quantities of hydrocarbons were present in the Latrobe and Golden Beach Formations. The prospective sections encountered in this well were not hydrocarbon bearing. The TD of 3345m BRT was reached at 09:15 hours, 13th November 2001. After E-logging, the well was plugged and abandoned, with the last anchor being racked at 23:00 hours, 18th November 2001. The total time to complete the well was 35.7 days, which was 6.18 days more than planned.

2. Well Data

Well Name:	Melville-1
Well Type:	Exploration
Permit:	Vic/P42
Operator:	Bass Strait Oil Company Ltd
Joint Venture Partner:	Inpex Alpha Ltd (50%)
Location:	Latitude: 38° 41′ 02.967″ South Longitude: 147° 59′ 08.391″ East Easting: 585,729.78m Northing: 5,717,796.03m Map Projection: AMG Zone55, CM 147°East
RT Above MSL:	25m
Water Depth:	75m
Total Depth:	3,345m
Drilling Contractor:	Diamond Offshore General Company
Drilling Rig Name/Type:	Ocean Bounty/Semi-Submersible
Mud (Drilling Fluid?) Contractor:	Baroid Australia Ltd
Mud Logging Contractor:	Baker Hughes Inteq
Logging Contractor:	Schlumberger
MWD Contractor:	Anadrill (Schlumberger)
Directional Contractor:	Anadrill (Schlumberger)
Spud Date:	17/10/01, 06:15 Hrs
TD Reached:	13/11/01, 09:10 Hrs
Rig Released:	18/11/01, 23:00 Hrs
Operating Days:	32.69 days
Total Days:	35.68 days
Planned Well Cost:	US$10,581,519
Actual Well Cost:	US$10,520,718
Final Well Status:	Plugged and Abandoned

3. Drilling Operations

3.1 Site Survey

A site survey was not carried out over the Melville-1 location prior to the *Ocean Bounty* moving on location. No instances of shallow gas have occurred in offset wells and seismic data shows no mapable closure, further indicating no shallow gas to be present. Site surveys were carried out by the ROV after arrival on location and before leaving the location.

3.2 Rig Navigation and Positioning

Thales GeoSolutions (Australasia) Limited was contracted to position the *Ocean Bounty* on location at Melville-1 using Thales' Multifix 3 Differential interfaced to a Trimble 4000 series GPS receiver, with differential corrections being provided by Thales' SkyFix/SkyFix Spot Differential GPS Services. The *Ocean Bounty* was positioned at the Melville-1 location at 20:20 hours, 16th October 2001.

The planned Melville-1 location was as follows:

Datum: AGD84
Latitude : 38° 41' 03.176" South
Longitude : 147° 59' 08.332" East
Projection: AMG Zone 55, CM 147° East
Easting : 585,728.30m
Northing : 5,717,789.60m
Intended Rig Heading: 250.0° (T)
Rig Positioning Tolerance: 50m

The actual Melville-1 location was as follows:

Datum: AGD66
Latitude : 38° 41' 02.967" South
Longitude : 147° 59' 08.391" East
Projection: AMG Zone 55, CM 147° East
Easting : 585,729.78m
Northing : 5,717,796.03m
Final Rig Heading: 249.0° (T)

The final Differential GPS drillstem position was 6.60m on a bearing of 12.4° (T) from the planned Melville-1 location.

3.3 Communications

The following is a brief description of the communications setup for voice and data between the *Ocean Bounty*, RBT's Perth office, BSOC and other parties. The existing internet data communication link was utilized on the rig *Ocean Bounty*. The IDEAL system (of Anadrill) was connected to the rig Ethernet LAN thru the hub. The LAN was connected to the Marconi intelligent multiplexer that handles data from the Ethernet, voice from telephone lines and fax. The multiplexer was connected to the Telstra ITERA satellite system. The system supports 64kbps baud rate (approx 8kbps allocated to each voice line with 5 being available on the rig and the remaining to data). The sharing of the baud rate between voice and data was set to be dynamic (that is at any given time, voice was given first priority with remaining bandwidth allocated to data). The connection over the ITERA satellite landed at Bendigo earth station and traveled on fiber optical link to Perth and finally landed at the RBT office in Perth. The linking to the Internet from RBT was handled by INDIGO Internet service providers. The IWW data from the rig would go via the ITERRA satellite system, to RBT and then link to the Internet thru INDIGO and then to the IWW server at Denver, Colorado. Users accessing the IWW data would go to the site www.interact.slb.com (which is hosted at Sedalia, Denver) and access the data. Best in class security is provided for the data through the IWW system (128 bit encryption, https protocol, Appdirect protocol for streaming data, Physical server security, and user name and password authentication) . Personalised training was imparted to users in Bass Strait Oil Company (Melbourne), Inpex (Japan) and RBT (Perth) so that users could look at the data from Home or office in different geographic points e.g. Melbourne, Tokyo and Perth.

3.4 Drilling Activity Summary

Rig Move
The tow from Geographe North-1 to the Melville-1 location commenced at 06:30 hours, 14th October 2001 and the *Ocean Bounty* arrived on location with the first anchor being set at 07:30 hours, 16th October 2001. During the move, the BOP stack and other equipment were pressure tested to the required specifications and the TGB and PGB were prepared for installation. After the anchors were set at 20:30 hours, 16th October 2001, the rig was ballasted down to the drilling draft of 70 feet at 24:00 hours, 16th October 2001.

36" Hole Section, 30" Conductor
After picking up tubulars, the ROV performed a seabed survey that confirmed that the seabed was flat and featureless at 75m water depth. The TGB was run and landed out and the seabed was confirmed at 100m below the rotary table. The TBG was observed at ¾° port forward at 250°. The 36" BHA (26" bit with 36" hole opener) was made up and Melville-1 was spudded at 06:15 hours, 17th October 2001.

The 36" hole was drilled to 146m with seawater while observing returns to the seabed with the ROV and pumping hi-vis PHG sweeps in the middle and at the end of each stand. The hole was displaced with 350 bbls of hi-vis mud at the end of the section.

The PGB, 3 joints of X52, 310 ppf, 30" casing with a 30" x 20" shoe joint with a 20" casing shoe was run and landed at 144m with 5" drillpipe. The TGB was observed to be ¾° - 1° starboard while the PGB was observed to be 1° starboard. The conductor was cemented with 210 bbls of 15.9 ppg (1.91 sg) class G cement.

17.½" Hole Section, 13.3/8" Casing
NB#2 (17. ½", Smith MJ1625, 1x18, 3x22 jets) was made up to a packed drilling assembly and mud motor. Cement, the 20" casing shoe at 144m and new formation from 146m were drilled. To keep the hole clean, one guar gum sweep was pumped every nine metres, with prehydrated gel (PHG) sweeps prior to every connection. The drilling was controlled to a maximum of 50 m/hr from 146m to 742m. Controlled drilling ceased from 742m as the ROP had decreased, averaging 16 m/hr from 742m to 1247m. The ROP increased from 1248m to the section TD at 1438m, averaging 26.9 m/hr. Deviation surveys were taken at 550m (¼°), 964m (¾°) and 1234m (1 ½°). During the last survey the wireline parted and the catcher tool was run with the survey tool being recovered prior to resumption of drilling. At TD the hole was swept with a 100 bbl hi-vis PHG pill and circulated out with 2 x the hole volume of seawater while rotating and working the pipe. The hole was displaced to 1350 bbls of 9.5 ppg (1.14 sg) PHG. While pulling out, tight hole was encountered from 1438m to 1221m with a maximum overpull of 60 klbs. From 1221m to 976m the bit was pumped out of the hole. Backreaming was performed where necessary. The hole packed off at 976m and pipe rotation and circulation were not possible. The string was worked and jarred free with a maximum overpull of 240 klbs. Circulation was re-established, a hi-vis pill was pumped and the hole circulated with seawater. The hole was displaced with 876 bbls of PHG. Pulling out of the hole continued from 976m without further problems. The mud motor and bottom stabilizer were laid out and a wiper trip was performed to bottom. No problems were encountered during the trip in and no fill was observed. 50 bbls of seawater followed by 100 bbls of unweighted PHG were pumped before displacing the hole to 1650 bbls of 10.3 ppg (1.24 sg) PHG. An EMS survey was dropped and the bit pulled out of the hole.

100 joints of 13.3/8", L-80 and 8 joints of 13.3/8", K-55, 68 ppf casing with 3 joints of 13.3/8", L-80, 68 ppf casing in the shoe track, were made up and run and landed with 50 klbs overpull. The shoe was at 1429.4m.

After pressure testing the cement lines to 3000 psi, 10 bbls of dye were pumped, the ball was dropped and the plug sheared with 1000 psi. 750 bbls of 12.5 ppg (1.5 sg) lead slurry were pumped with 1915 strokes followed by a tail slurry of 124 bbls of 15.8 ppg (1.9 sg) pumped with 600 strokes. The dart was dropped and the plug was sheared at 2500 psi. The cement was displaced with 635 bbls of seawater with the rig pumps and the plug was bumped with 6302 strokes at 1100 psi. 150 bbls of fluid were lost to the formation before the plug was bumped.

The casing was pressure tested to 3000 psi for 10 mins.

12.¼" Hole Section, 9.5/8" Casing
The BOP's and LMRP were function tested and the choke & kill lines were pressure tested to 250 psi for 5 mins and 10,000 psi for 15 mins. The rig was deballasted to 65 feet and skidded 15m to starboard before running the BOP's and riser. The last riser joint was pressure tested to 250 psi for 5 mins. The slip joint was made up and the lines pressure tested. The rig was repositioned over the location and the BOP stack was

landed and latched with 50 klbs overpull, which was confirmed with the ROV. The rig was reballasted back to 70 feet. The wellhead, LMRP and connector were pressure tested and both the BOP pods were function tested.

The 17. ½" BHA was laid out and the 9.5/8" casing hanger assembly was made up.

NB#3 (12.¼", Smith MA89BPX, 5x18, 2x16 jets) was made up to a mud motor with an MWD tool suite (CDR/GR/Res) and run in, tagging the top of the cement at 1403.4m. While drilling out the shoe at 557m, the hole was displaced to a 9.4 ppg (1.13 sg) KCl/PHPA/Glycol (Aquadrill) mud system.

3m of new hole to 1441m were drilled prior to pulling the bit into the shoe and performing an FIT to 12.5 ppg (1.5 sg) EMW with a 9.4 ppg (1.13 sg) mud. The mud weight was increased to 9.5 ppg (1.14 sg) whilst drilling ahead from 1441m to 1485m with the ROP being slower than anticipated, averaging 16.8 m/hr. Drilling continued from 1485m with varying parameters as a series of drill-off tests were conducted. Drilling continued down to 1533m during which time 2 x 30 bbls of anti-bit balling sweeps were pumped. The first being a nutplug sweep and the second a caustic sweep. A further drill-off test was conducted but the ROP remained low and at 1533m the decision was taken to pull the bit. At surface, it was found that one junk slot, between bit blades 5 & 6, was balled up, and four jets were blocked, mainly with very coarse fragments of nut plug.

After inspecting NB#3 and unplugging the blocked nozzles, the mud motor was laid out and the bit re-run with a locked rotary assembly. Drilling continued from 1533m, with directional surveys taken as required. Care was taken not to get the bit balled with the ROP averaging 58 m/hr down to 1686m. At 1686m, the ROP abruptly slowed, suggesting the bit had balled up, with ROP's averaging 1.5 m/hr from 1687m to 1690m. Several combinations of drilling parameters and the spotting of anti-balling slugs were attempted to try to improve the ROP. As none of these measures was successful, the bit was pulled at 1698m. It was found that the bit's centre jet had become completely blocked with ground-up cuttings and the junk slot between bit blades 5 & 6 had become balled as in the previous run.

NB#4 (12.¼", Hughes HC605, 5x18 jets) was made up to the previous BHA and run in. Drilling continued after washing the last stand down to bottom at 1698m, circulating for 10 minutes prior to each connection. SCR's were taken at 1726m, 2160m, 2306m and 2480m. Flow checks were performed at 2135m and 2205m. MWD surveys were taken as required. At 2586m the hole was circulated clean prior to pulling for a bit change. No problems were encountered during the trip out. Flow checks were performed at the shoe and at the BOP's.

NB#5 (12.¼", Smith 15GF, 3x20 jets) , a tricone bit, was made up to the previous BHA and run in the hole. At 2371m the pipe was held up with 40 klbs weight and rotation was not possible. The pipe was worked free and the bit pulled back to 2314m where rotation was re-established. The hole was washed and reamed from 2317m to 2586m. New 12.¼" hole was drilled from 2586m to 2626m while reducing the mud weight from 9.8 ppg (1.17 sg) to 9.5 ppg (1.14 sg). Precautionary reaming was performed on connections. At 2706m the hole was circulated for samples to confirm casing TD. The bit was pulled to the shoe without problems. After flow check was performed, the bit was run back to bottom and the hole circulated clean for 1.5 x bottoms up. The string was pulled out of the hole to run 9.5/8" casing.

164 joints of L-80, and 49 joints of P110, 47 ppf, 9.5/8" casing with 3 L-80 joints in the shoe track, were made up and run. The casing was landed with the shoe at 2700.15m. The casing hanger land out on the 18. ¾" wellhead landing shoulder was confirmed and the seal assembly was latched.

The hole was circulated out 1.3 x the casing volume at 15 bbl/min with no losses observed. 10 bbls of drillwater were pumped and the lines were pressure tested to 4000 psi. Another 10 bbls of drillwater were pumped and the ball dropped before another 10 bbls of drillwater were pumped. The bottom plug was launched with a shear out of 1025 psi. 105 bbl of lead slurry at 15.8 ppg (1.9 sg) were mixed and pumped. The dart was dropped and 2 bbls of cement slurry were pumped followed by 3.7 bbls of fresh water. The top plug sheared with 2340 psi. 10 bbls of water were pumped before switching to the rig pumps and displacing the slurry at 12 bbl/min. At 5000 strokes (1072 strokes prior to theoretical volume), the string pressured up. The pressure was increased to 3500 psi in attempt to regain circulation without success. No backflow was seen at bleed off. The pressure was increased to 5000 psi without circulation being re-established. The casing running tool and the cement head were laid out. Attempts to install the 9.5/8" wear bushing failed.

NB#6 (8. ½", Smith FGSS+2, 3 x open jets) was made up to drill the cement and the plugs. After tagging cement at 2228m the casing was circulated to seawater to prevent contamination of the mud system. Cement was drilled from 2228m to 2677m. At 2645m the system was changed back to polymer mud. After pulling back 10 stands and adding an RTTS packer to the string, the string was run back and the RTTS was set at 106m,

just below the BOP's. Circulation through the float collar, shoe, casing and 12.¼" annulus was attempted without success. After several attempts, the pressure below the RTTS was bled off and the packer was unseated. The RTTS packer was removed from the string and the bit run back to bottom. The float and shoe track, but not the shoe, were drilled. The string was pulled back to 2386m and the RTTS packer was added to the string. The string was run back and the RTTS was set at 104m and circulation attempted. All attempts to break circulation failed. The RTTS was again laid out and the shoe and rat hole were drilled to 2706m. After circulating the casing, the string was pulled back and the RTTS packer was added to the string and run in and set at 104m. The cement pump was used to pump down the string and a good circulation rate through the 12.¼" x 9.5/8" annulus was established. After circulating for 2 x bottoms up, the RTTS packer was released and the bit was pulled. A jet sub was run in the hole and the BOP's and wellhead were jetted while boosting the riser. An EZSV cement retainer was made up and run in to hold up at 106m. The EZSV was pulled and a mill was run to 111m without any obstruction being observed. The mill was pulled and the EZSV was re-run to 2670m. The EZSV was set and the 9.5/8" x 12.¼" annulus was circulated. After pressure testing the cement lines, 105 bbls of class G cement slurry were mixed and pumped. The string was pulled and after cleaning the seal assembly receptacle, the seal assembly on the hanger profile was energized and then pressure tested to 6000 psi.

8.½" Hole Section

After pressure testing the stack, the 12.¼" BHA was laid out, the 8. ½" BHA was made up with NB#7 (8. ½", Hughes GT -G1, 3x22 jets) and a junk basket and run in to the top of the EZSV at 2670m. The EZSV was drilled and the bit run to bottom at 2706m where new formation was drilled to 2610m and the junk basket was continually worked. The hole was circulated and an FIT was performed to 13.9 ppg (1.67 sg) EMW with a maximum allowable surface pressure of 1980 psi. It was then decided to drill further to ensure the hole was clean in preparation for the next PDC bit run. At 2730m, the hole was circulated clean and the bit was pulled out of hole. 18 kgs of junk were recovered.

NB#8 (8. ½", BBL 657ASX, 2x12, 4x15 jets) was made up with a mud motor and MWD tool suite (CDR/GR/Res) and run in the hole. The hole was jetted thoroughly one metre from bottom. After drilling started, torque readings of up to 6 kftlbs were recorded indicating the presence of junk. Drilling progressed smoothly averaging 21 m/hr until a clayey formation was penetrated at 2846m. The ROP slowed to less than a 1 m/hr with volcanic cuttings being observed in the returns. The hole was flow checked at 2856m and the bit pulled due to the low ROP.

After laying out the mud motor, NB#9 (8. ½", Hughes MX20D, 3x16 jets) and 3 joints of drill collars were made up with the MWD tool and run in the hole. The hole was jetted clean 1m from bottom before drilling resumed. Despite wide variations in drilling parameters and a decrease in mud weight from 9.7 ppg (1.16sg) to 9.3 ppg (1.12sg), the penetration rate was slow. The average ROP was 5.2 m/hr for the entire run. The bit was pulled at 3102m after 47.7 hours on bottom drilling. On the way out, the bottom part of the hole was sticky and required backreaming from TD to 2937m.

NB#10 (8. ½", Smith FG20 -0DG, 3x16 jets) was made up with an MWD tool and run to bottom without problems. After working the junk basket, drilling resumed from 3102m. A carbide lag check was run at 3165m that indicated the open hole was approximately 8.7" in diameter. No drag noted on connections. TD of 3345m was reached at 09:10 hrs, November 13th 2001. After a wiper trip to 3100m, the bit was pulled out of hole and wireline logs were run.

Run 1: HALS-B, DSST-8, HILTB-FTB, DTC-A, LEH-QT. (3 345m – 2 700m)
Run 2: CSAT
Run 3: CST (Shot 30, Recovered 29. Recorded 29 levels @ 50m spacing from
3341m to 1841mrt)

Abandonment

3. ½" drillpipe handling equipment was rigged up and a 3. ½" mule shoe and 12 joints of 3. ½" drillpipe were picked up. The string was run to 2700m and circulation was broken. The pipe was then run to 2750m and a circulation of 1. ½ x bottoms up was performed. The cement lines were rigged up and after testing the lines to 1000 psi, 5 bbls of drillwater and then 24 bbls of 15.8 ppg (1.90 sg) slurry were pumped, followed by 1.25 bbls of drillwater. The slurry was displaced with 146 bbls of mud. The string was pulled back to 2630m and a total of 165 bbls of mud were reverse circulated, dumping 15 bbls of cement contaminated mud. A slug was pumped and the string pulled out of the hole laying out 54 joints of drillpipe and the 3. ½" mule shoe.

A 9.5/8” EZSV was made up on 3. ½” drillpipe and run in to 2630m. The packer was set and the running tool was released. Abandonment plug 2 from 2630m to 2600m was pumped. The cement lines were rigged up and after testing the lines to 1000 psi pump 5 bbls of drillwater and 7.2 bbls of 15.8 ppg (1.90 sg) slurry were pumped, followed by 1.25 bbls of drillwater and displaced with 141 bbls of 9.3 ppg (1.12 sg) mud. The string was pulled back to 2530m and reverse circulated, dumping 20 bbls of cement contaminated mud. The EZSV was pressure tested to 1000 psi for 10 mins. The hole was displaced to mud and treated with corrosion inhibitor before pulling out and laying down excess drillpipe.

A 9.5/8” casing cutter was made up and run in to 215m. The casing was cut at 214.5m and after flow checking, the cutter was pulled out of the hole. The 9.5/8” casing spear was made up and run in and the 9.5/8” casing and casing hanger were recovered. A 13.3/8” EZSV on a 3. ½” drillpipe stinger was made up and run in to 212m where the EZSV was set and the running tool released. The hole was displaced to seawater and the cement lines were rigged up for abandonment plug 3. After testing the lines to 1000 psi, 5 bbls of drillwater were pumped followed by 24 bbls of 15.8 ppg (1.90 sg) and displaced with 10 bbls of seawater. The pipe was pulled back to 133m and the string contents were reverse circulated. No cement was seen at the surface. The pipe was pulled and the 3. ½” drillpipe and the EZSV running tool were laid out.

The diverter was laid out and the landing joint was picked up and nippled up to the slip joint. The slip joint was collapsed and locked. The pod saddles were rigged down and the rig ballasted to 65 feet. The BOP’s were unlatched and the marine riser tensioner and goosenecks were nippled down and the landing joint laid out. The slip joint was laid out and the riser was pulled and laid out. The BOP’s and LMRP were split and skidded back to the park position.

The 13.3/8” casing cutter and the 18. ¾” wellhead spear were made up and run in and the spear was engaged. The 13.3/8” casing was cut at 109.78m. The HAC was activated using the ROV and then the PGB, TGB, 30” and 20” x 13.3/8” casing were picked up. The wellhead assembly was pulled out of the hole.

A mule shoe was run on 5” drillpipe to 130m after being stabbed into the casing with the aid of the ROV. Abandonment plug 4 was set from 130m to the seabed at 100m. The cement lines were rigged up and after testing to 1000 psi, 5 bbls of drillwater were pumped followed by 30 bbls of 15.8 ppg (1.90 sg) slurry and displaced with 5 bbls of seawater. The pipe was pulled out and flushed.

Anchors pulling operations then began with preparations for backload. A seabed survey was performed with the ROV and the rig was ballasted to 56.5 feet for anchor handling operations. Anchors 7 and 6 were pulled and recovered and anchor 4 was rebolstered. BSOC equipment was prepared for backload but after 4 lifts the crane was unable to be used due to the rig movement from 1.5° to 2.0° pitch. The rig was ballasted down to 56.5 feet and the pitch and roll was reduced to 1° but the conditions were too rough for the boat with the winds up to 40 knots to 45 knots. The last anchor was finally pulled and the rig released at 23:00 hrs, 18th November 2001.

4. Casing Summary

WELL : Melville-1

DIAMETER : 30 "
CSG SHOE MD (Plan / Act.) : 146.00 / 144.00
CSG SHOE TVD (Plan / Act) : 146.00 / 144.00

L.O.T. (Plan / Act.) : 0.00 / 0.00
F.I.T. (Plan / Act.) : 0.00 / 0.00

Pumped 210bbls 15.9ppg neat slurry (1016 sks) mixed with 125bbls S/W plus 1% CaCl BWOC. Pumped down hole at average rate of 6bpm. Displace with 14bbls S/W. ROV monitor good rtns through out. Cmt rtns seen at sea bed. Float holding.

DESCRIPTION	DEPTH	LENGTH	CSG ID	WEIGHT	GRADE	THREAD
20" Shoe Joint, Swedged to 30"	144.0	11.10	18.00		1" Wall	SF-60
2 x Intermediate Joints 30" Casing		23.59	28.00		1" Wall	SF-60
HAC Joint 30"	109.5	12.22	27.00		1.5" Wa	SF-60

DIAMETER : 13.3/8 "
CSG SHOE MD (Plan / Act.) : 1,526.00 / 1,429.40
CSG SHOE TVD (Plan / Act) : 1,526.00 / 1,429.40

L.O.T. (Plan / Act.) : 0.00 / 0.00
F.I.T. (Plan / Act.) : 1.45 / 1.47

Pump 10 bbls dye,dropped ball sheared plug1000psi.Mix & pump 1915sks (750 bbls) lead slurry at 12.5ppg. Tail 600sks (124bbls) at 15.8ppg. Drop dart shear plug at 2500psi. Rig displace 635bbls S/W to bump plug.Test 3000psi. Lost rtns 150 bbls before bump.

DESCRIPTION	DEPTH	LENGTH	CSG ID	WEIGHT	GRADE	THREAD
Shoe Joint	1,429.4	12.58		68.00	L-80	BTC
Intermediate Joint	1,416.8	11.81		68.00	L-80	BTC
Float Collar	1,405.0	12.28		68.00	L-80	BTC
8 x joints 13 3/8" casing	1,392.7	95.58	12.50	68.00	K-55	BTC
100 x joints 13 3/8" casing	1,297.1	1,189.49	12.50	68.00	L-80	BTC
18 3/4" Wellhead	107.6	10.32				BTC

DIAMETER : 9.5/8 "
CSG SHOE MD (Plan / Act.) : 2,786.00 / 2,700.15
CSG SHOE TVD (Plan / Act) : 2,786.00 / 2,700.15

L.O.T. (Plan / Act.) : 0.00 / 0.00
F.I.T. (Plan / Act.) : 1.68 / 1.66

Initial cement job on 31/10 failed, with all cement left inside casing. Drilled out cement in casing, and performed second cement job through EZSV packer set at 2670 m. Pumped 105 bbls of 15.9 ppg (1.9 SG) slurry, and displaced with mud.

DESCRIPTION	DEPTH	LENGTH	CSG ID	WEIGHT	GRADE	THREAD
Shoe Joint	2,700.2	12.59	8.74	47.00	L-80	BTC
Intermediate Joint	2,687.6	11.47	8.74	47.00	L-80	BTC
Float Collar	2,676.1	13.36	8.74	47.00	L-80	BTC
164 joints L-80 and 49 joints P-110 47 lb/ft	2,662.7	2,562.64	8.74	47.00	L80/P11	BTC
9 5/8" pup joint on casing hanger	100.1	3.15	8.74	47.00	L-80	BTC

5. Cementing Summary

	Cement 9 5/8″ Production Casing	Cement 13 3/8″ Surface Casing – Lead Slurry	Cement 13 3/8″ Surface Casing – Tail Slurry	Cement 13 3/8″ Surface Casing – Tail Slurry
Test Number	1	1	1	2
Well Data				
TVD (m)	2786	1526	1526	
BHST (°C)	96	57	57	
BHCT (°C)	73	36	36	
Static Pressure (PSI)	4750	2340	2340	
Mud Weight (lb/gal)	10.0	9.0	9.0	
Slurry Data				
Mixing Water	Drill	Sea	Drill	
Density (lb\gal)	15.8	12.5	15.8	
Water Requirement (gal/sk)	4.92	12.54	5.11	
Fluid Requirement (gal/sk)	5.15	12.99	5.11	
Yield (cuft/sk)	1.16	2.21	1.16	
Cement Type	ABC Class ‘G’	ABC Class ‘G’	ABC Class ‘G’	ABC Class ‘G’
Cement Additives				
HALAD-413L (gal\10bbl)	15			
HR-6L (gal/10bbl)	4			
Econolite (gal/10bbls)		14.6		
NF-5 (gal/10bbl)	0.25	0.25	0.25	
Test Results				
Thickening Time (hr:min)	4:23	5:37	3:57	
API Free Water (%)	Trace	Trace	Trace	Trace
API Fluid Loss (cc/30min)	NA	NA	NA	NA
Comp Strength (psi @ hrs)	500 @ 9:15	500 @ 21:51	500 @ 7:24	500 @ 8 (est)

6. Well Evaluation Logs

The following logging runs were made for the Melville-1 well by Schlumberger.

Run	Hole Size (in.)	Service / Toolstring	Start Depth (m)	Stop Depth (m)	Images and Data
1	12 ¼	PowerPulse / CDR	1438	1533	See Attachments
2	12 ¼	PowerPulse / CDR	1533	1698	See Attachments
3	12 ¼	PowerPulse / CDR	1698	2586	See Attachments
4	12 ¼	PowerPulse / CDR	2586	2706	See Attachments
5	8 ½	PowerPulse / ARC	2706	2856	See Attachments
6	8 ½	PowerPulse / ARC	2856	3102	See Attachments
7	8 ½	PowerPulse / ARC	3102	3445	See Attachments
8	8 ½	ACTS/PEX/HALS/DSI	2700	3346	See Attachments
9	8 ½	ACTS/CSI/GR	1700	3341	See Attachments
10	8 ½	CST/GR	2720	3340	See Attachments

7. Cuttings Samples

SAMPLE TYPE	Sample	Depth Interval (m)	
	Box No.	From	To
Sets A,B,C,D,E (200 g) : Washed & Air Dried	1	1438	1600
	2	1600	1780
	3	1780	1960
	4	1960	2140
	5	2140	2320
	6	2320	2460
	7	2460	2545
	8	2545	2630
	9	2630	2705
	10	2705	2790
	11	2790	2880
	12	2880	2965
	13	2965	3050
	14	3050	3130
	15	3130	3225
	16	3225	3345
Set F (200 g) 20m and 25m interval for biostratigraphy: Washed & Air Dried	1	1438	1740
	2	1740	2080
	3	2080	2400
	4	2400	2800
	5	2800	3345
Set G: Palynology (hot) samples- Bulk Unwashed (200g)	1	2000	2460
	2	2460	2706
	3	2706	2900
	4	2900	3100
	5	3100	3345
Set H: Geochemistry Unwashed Canned Samples	1	2500	2850
	2	2850	3345
Set I: Mud Samples 500 ml Plastic bottles	1	1438	3345
Set J: Samplex Trays	1	1438	3345
Sets K: Charts / worksheets	1	100	3345

Sampling rates were dependent on rate of penetration. Washed cuttings samples were collected at the following intervals:

From (m)	To (m)	Sampling
1438	1450	12
1450	2460	10
2460	3345	5

Figures

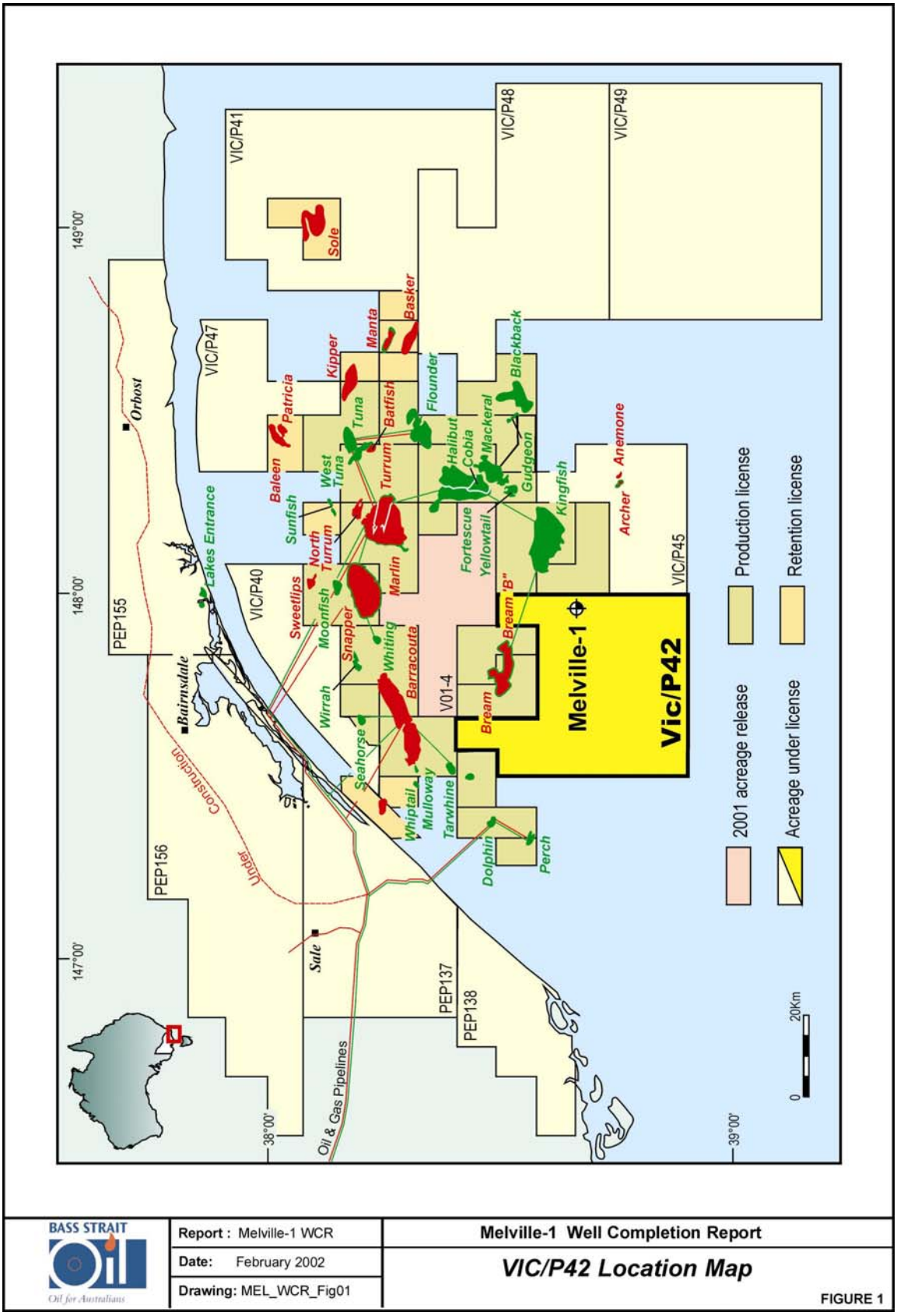

Figure 1. Locality Map

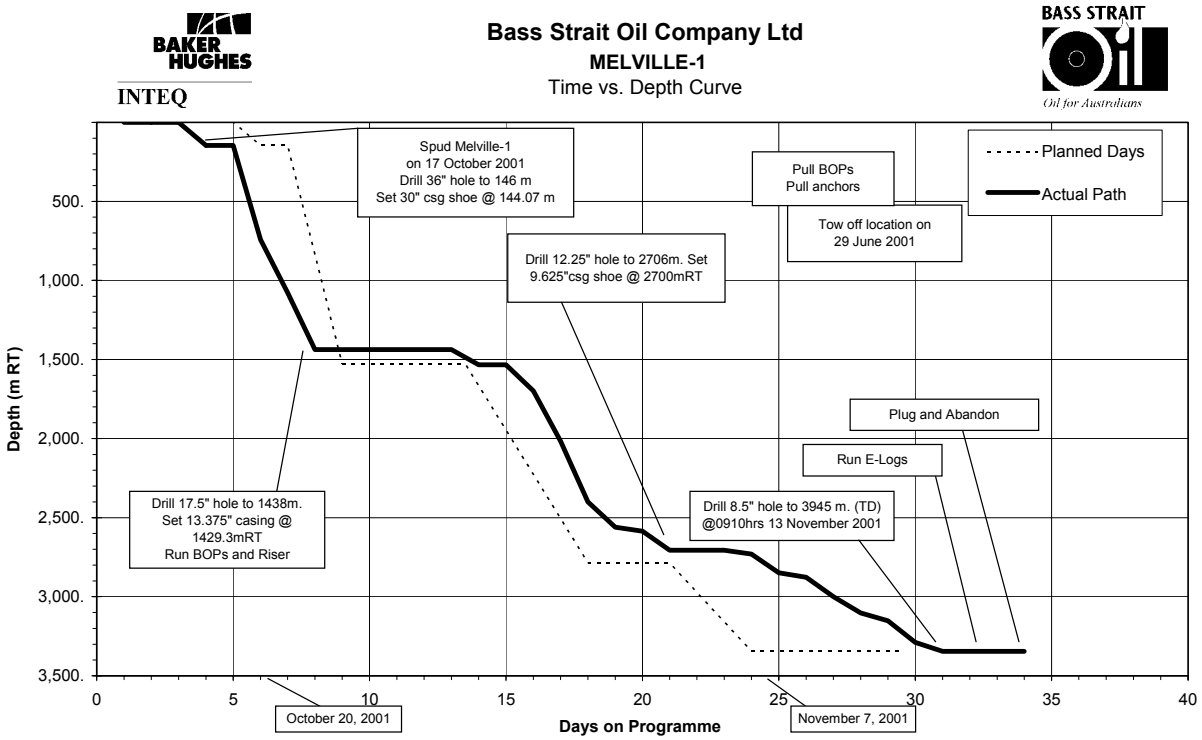

Figure 2. Time vs. Depth Curve

APPENDICES

Appendix A: **Lithological Descriptions**

WELL : MELVILLE #1

Depth (m)	Description
1438.0 - 1533.0	CALCAREOUS CLAYSTONE WITH INTERBEDDED SANDSTONES. CALCAREOUS CLAYSTONE (90%): medium light grey to medium grey, soft to moderately firm, sub blocky to blocky, soft in part, trace very fine grained quartz grains, trace carbonaceous specks, trace disseminated pyrite, trace crystalline calcite, nil to trace glauconite. LIMONITIC SANDSTONE (5%): light brownish grey to brownish grey, clear to translucent iron stained grains, trace to rare pink quartz grains, returned loose, fine to medium grained, trace coarse grains, sub angular to sub rounded, minor angular, moderate to high sphericity, moderately sorted quartz, abundant limonite grains, trace lithic grains, trace nodular pyrite, fair inferred porosity. SANDSTONE (5%): light brownish grey to brownish grey, clear to translucent iron stained grains, returned loose, fine to medium grained, trace coarse grains, sub angular to sub rounded, minor angular, moderate to high sphericity, well sorted quartz, common limonite grains, trace lithic grains, fair inferred porosity.
1533.0 - 1698.0	CALCAREOUS CLAYSTONE (100%): medium light grey to medium grey, light brownish grey, soft to moderately firm, sub blocky to blocky, trace very fine grained quartz grains, nil to trace carbonaceous specks, trace disseminated pyrite, trace crystalline calcite, trace glauconite, nil to trace Forams.
1698.0 - 2015.0	CALCAREOUS CLAYSTONE (100%): medium light grey to light brownish grey, medium grey, soft to moderately firm, sub blocky to blocky, rare quartz silt, trace very fine grained quartz grains, nil to trace carbonaceous specks, nil to trace disseminated pyrite, trace to rare crystalline calcite, trace glauconite, nil to trace Forams. Calcimetry: 30/4 increasing with depth to 40/2
2015.0 - 2100.0	CALCAREOUS CLAYSTONE (100%): medium light grey to light brownish grey, medium grey, soft to moderately firm, sub blocky to blocky, rare quartz silt, trace very fine grained quartz grains, nil to trace carbonaceous specks, nil to trace disseminated pyrite, trace to rare crystalline calcite, trace glauconite, nil to trace Forams.
2100.0 - 2170.0	CALCAREOUS CLAYSTONE (95%): similar to above, becoming light grey to light brownish grey, rarely medium grey, firm to very firm, sub blocky to blocky, minor silt, rare crystalline calcite, rare disseminated very fine quartz grains, trace disseminated and nodular pyrite, trace glauconite, trace Forams. CALCAREOUS SANDSTONE (5%): light brownish grey, very firm to friable, minor moderately hard, very fine to fine grained, subangular to minor subround, subspherical, poorly sorted quartz, abundant calcite and silt matrix, minor Forams, trace to rare glauconite, trace pyrite, no visible porosity, rarely grades to Calcareous Siltstone.

2170.0 - 2220.0	CALCAREOUS CLAYSTONE (85%): as above CALCAREOUS SANDSTONE (5%): similar to above, grades to calcarenite. CALCAREOUS SILTSTONE (10%): brownish grey to light olive grey, firm to friable, abundant calcareous clay matrix, rare to minor very fine subangular subspherical quartz grains, rare glauconite.
2220.0 - 2240.0	CALCAREOUS CLAYSTONE (90%): pale reddish brown to moderate reddish orange, light brown to moderate brown, mottled, soft, occasional firm glauconite aggregates, dispersive, generally amorphous, rare to minor glauconite, trace to rare nodular pyrite, trace to rare medium to coarse well rounded iron stained quartz grains. SANDSTONE (10%): light brown to pale yellowish orange, clear to translucent grains stained grains, returned loose, coarse to very coarse grained, minor medium, sub rounded to rounded, minor angular, moderate to high sphericity, poorly sorted quartz, trace argillaceous matrix. No Shows.
2240.0 - 2320.0	SANDSTONE (70%): very light grey, clear to translucent grains, returned loose, medium to very coarse grained, predominantly coarse to very coarse grained, sub rounded to rounded, minor to common angular, moderate to high sphericity, poorly sorted quartz, trace argillaceous matrix. No Shows. CALCAREOUS CLAYSTONE (30%): light brownish grey to moderate brown, minor pale reddish brown to moderate reddish orange, mottled, soft, dispersive, generally amorphous, minor quartz silt, trace to rare glauconite, trace pyrite, trace to rare medium to coarse well rounded iron stained quartz grains. ARGILLACEOUS SANDSTONE (Tr): medium grey to medium dark grey, disaggregated, clear to translucent grains, very fine to fine grained, angular to sub angular, moderate sphericity, well sorted quartz, abundant medium dark grey silty to argillaceous matrix, trace pyrite, trace chloritised grains, poor inferred porosity, no shows. COAL (Tr): brownish black, moderately firm, sub blocky, earthy to sub vitreous lustre.
2320.0 - 2400.0	SANDSTONE (50%): very light grey, clear to translucent grains, returned loose, medium to very coarse grained, predominantly coarse to very coarse grained, sub angular to angular, minor to common sub rounded, low to moderate sphericity, poorly sorted quartz, rare silica cement, trace quartz overgrowths, trace pyrite cement, trace argillaceous matrix, fair inferred porosity. No Shows. CLAYSTONE (30%): light brownish grey to moderate brown, soft, dispersive, generally amorphous, trace to minor calcareous, minor quartz silt, trace carbonaceous material, trace pyrite, trace to rare very fine to fine quartz grains. SILSTONE (25%): greyish brown to brown and dark brown, friable, subfissile, micaceous, common to abundant carbonaceous material and laminae, minor very fine quartz grains, rare to minor fine pyrite, trace calcite cement, grades to Carbonaceous Siltstone.

COAL (5%): brownish black, moderately firm, sub blocky, earthy to sub vitreous lustre, sub conchoidal fracture in part. Poor sample quality, samples pasted and heavily contaminated with Baracarb grains.

2400.0 - 2425.0 MASSIVE SANDSTONE WITH MINOR CLAYSTONE AND SILSTSTONE INTERBEDS AND TRACE COAL NEAR BASE

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SANDSTONE (90%): very light grey to very light greyish brown, clear to translucent and minor yellow commonly frosted grains, returned loose, medium to granule, predominantly fractured very coarse and granule sized grains, sub angular to well rounded, moderate sphericity, poorly sorted quartz, rare silica cement, minor quartz overgrowths, trace pyrite cement, very good inferred intergranular porosity. No Shows, grades to Siltstone at base of interval.

CLAYSTONE (5%): light brownish grey to moderate brown, soft, dispersive, generally amorphous, trace to minor calcareous, minor quartz silt, trace carbonaceous material, trace pyrite, trace to rare very fine to fine quartz grains.

SILTSTONE (5%): greyish brown to brown and dark brown, friable, subfissile, micaceous, common to abundant carbonaceous material and laminae, minor very fine quartz grains, rare to minor fine pyrite, trace calcite cement, grades to Carbonaceous Siltstone.

COAL (trace): brownish black, moderately firm, sub blocky, earthy to sub vitreous lustre, sub conchoidal fracture in part. NOTE: Poor sample quality, samples 90% pasted and heavily contaminated with Baracarb grains/paste.

2425.0 - 2455.0 INTERBEDDED CLAYSTONE AND SILTSTONE WITH MINOR THIN SANDSTONE INTERBEDS

SANDSTONE (20%): very light grey to very light greyish brown, clear to translucent and minor yellow commonly frosted grains, returned loose, medium to granule grained, predominantly fractured very coarse and granule sized grains, sub angular to well rounded, moderate sphericity, poorly sorted quartz, rare silica cement, minor quartz overgrowths, trace pyrite cement, very good inferred intergranular porosity. No Shows.

CLAYSTONE (50%): light brownish grey to moderate brown, soft, dispersive, generally amorphous, minor calcareous, minor quartz silt, trace to rare carbonaceous material, trace pyrite, trace to rare very fine to fine quartz grains.

SILTSTONE (30%): greyish brown to brown and dark brown, friable, subfissile, micaceous, common to abundant carbonaceous material and laminae, minor very fine quartz grains, rare to minor fine pyrite, trace calcite cement, grades to Carbonaceous Siltstone.

COAL (trace): brownish black, moderately firm, sub blocky, earthy to sub vitreous lustre, sub conchoidal fracture in part. NOTE: VERY POOR SAMPLE QUALITY, 90% PASTED ROCK FLOUR BECAUSE OF LOW ROP.

2455.0 - 2465.0 SANDSTONE WITH MINOR THIN SILTSTONE AND CLAYSTONE INTERBEDS

SANDSTONE (80%): very light grey to very light greyish brown, clear to translucent and minor yellow commonly frosted grains, returned

	loose, medium to granule grained, predominantly fractured very coarse and granule sized grains, sub angular to well rounded, moderate sphericity, poorly sorted quartz, rare silica cement, minor quartz overgrowths, trace pyrite cement, trace nodular pyrite, very good inferred intergranular porosity. No Shows. CLAYSTONE (10%): light brownish grey to moderate brown, soft, dispersive, generally amorphous, minor calcareous, minor quartz silt, trace to rare carbonaceous material, trace pyrite, trace to rare very fine to fine quartz grains. SILTSTONE (10%): greyish brown to brown and dark brown, friable, subfissile, micaceous, common to abundant carbonaceous material and laminae, minor very fine quartz grains, rare to minor fine pyrite, trace calcite cement, grades to Carbonaceous Siltstone. NOTE: VERY POOR SAMPLE QUALITY, 90% PASTED ROCK FLOUR BECAUSE OF LOW ROP.
2465.0 - 2485.0	THINLY INTERBEDDED SANDSTONE, CLAYSTONE AND SILTSTONE WITH TRACE COAL SANDSTONE (40%): very light grey to very light greyish brown, clear to translucent and minor yellow commonly frosted grains, returned loose, medium to granule grained, predominantly fractured very coarse and granule sized grains, sub angular to well rounded, moderate sphericity, poorly sorted quartz, rare silica cement, minor quartz overgrowths, trace pyrite cement, very good inferred intergranular porosity. No Shows. CLAYSTONE (30%): light brownish grey to moderate brown, soft, dispersive, generally amorphous, minor calcareous, minor quartz silt, trace to rare carbonaceous material, trace pyrite, trace to rare very fine to fine quartz grains. SILTSTONE (30%): greyish brown to brown and dark brown, friable, subfissile, micaceous, common to abundant carbonaceous material and laminae, minor very fine quartz grains, rare to minor fine pyrite, trace calcite cement, rarely grades to Carbonaceous Siltstone and to Silty Sandstone. COAL: (trace), brownish black, moderately firm, sub blocky, earthy to sub vitreous lustre, sub conchoidal fracture in part. NOTE: VERY POOR SAMPLE QUALITY, 90% PASTED ROCK FLOUR BECAUSE OF LOW ROP.
2485.0 - 2500.0	MASSIVE SANDSTONE WITH THIN INTERBEDS OF CLAYSTONE AND SILTSTONE NEAR BASE SANDSTONE (90%): very light grey to very light greyish brown, clear to translucent and minor yellow commonly frosted grains, returned loose, medium to granule grained, predominantly fractured very coarse and granule sized grains, sub angular to well rounded, moderate sphericity, poorly sorted quartz, rare silica cement, minor quartz overgrowths, trace pyrite cement, very good inferred intergranular porosity. No Shows. CLAYSTONE (5%): light brownish grey to moderate brown, soft, dispersive, generally amorphous, minor calcareous, minor quartz silt, trace to rare carbonaceous material, trace pyrite, trace to rare very fine to fine quartz grains. SILTSTONE (5%): greyish brown to brown and dark brown, friable, subfissile, micaceous, common to abundant carbonaceous material

and laminae, minor very fine quartz grains, rare to minor fine pyrite, trace calcite cement, grades to Carbonaceous Siltstone.
COAL: (trace), brownish black, moderately firm, sub blocky, earthy to sub vitreous lustre, sub conchoidal fracture in part.

2500.0 - 2515.0

THINLY INTERBEDDED CLAYSTONE AND SILTSTONE WITH RARE THIN SANDSTONE INTERBEDS

SANDSTONE (15%): very light grey to very light greyish brown, clear to translucent and minor yellow commonly frosted grains, returned loose, medium to granule grained, predominantly fractured very coarse and granule sized grains, sub angular to well rounded, moderate sphericity, poorly sorted quartz, rare silica cement, minor quartz overgrowths, trace pyrite cement, very good inferred intergranular porosity. No Shows.

CLAYSTONE (40%): light brownish grey to moderate brown, soft, dispersive, generally amorphous, minor calcareous, minor quartz silt, trace to rare carbonaceous material, trace pyrite, trace to rare very fine to fine quartz grains.

SILTSTONE (45%): greyish brown to brown and dark brown, friable, subfissile, micaceous, common to abundant carbonaceous material and laminae, minor very fine quartz grains, rare to minor fine pyrite, trace calcite cement, grades to Carbonaceous Siltstone.

COAL (trace): brownish black, moderately firm, sub blocky, earthy to sub vitreous lustre, sub conchoidal fracture in part. NOTE: VERY POOR SAMPLE QUALITY, 90% PASTED ROCK FLOUR BECAUSE OF LOW ROP.

2515.0 - 2530.0

MASSIVE SANDSTONE WITH RARE SILTSTONE AND CLAYSTONE LAMINAE NEAR BASE

SANDSTONE (90%): very light grey to very light greyish brown, clear to translucent and minor yellow commonly frosted grains, returned loose, medium to granule grained, predominantly fractured very coarse and granule sized grains, sub angular to well rounded, moderate sphericity, poorly sorted quartz, rare silica cement, minor quartz overgrowths, trace pyrite cement, very good inferred intergranular porosity. No Shows.

CLAYSTONE (5%): light brownish grey to moderate brown, soft, dispersive, generally amorphous, minor calcareous, minor quartz silt, trace to rare carbonaceous material, trace pyrite, trace to rare very fine to fine quartz grains.

SILTSTONE (5%): greyish brown to brown and dark brown, friable, subfissile, micaceous, common to abundant carbonaceous material and laminae, minor very fine quartz grains, rare to minor fine pyrite, trace calcite cement, grades to Carbonaceous Siltstone.

COAL (trace): brownish black, moderately firm, sub blocky, earthy to sub vitreous lustre, sub conchoidal fracture in part. NOTE: VERY POOR SAMPLE QUALITY, 90% PASTED ROCK FLOUR BECAUSE OF LOW ROP.

2530.0 - 2545.0

THINLY INTERBEDDED SILTSTONE AND CLAYSTONE WITH MINOR SANDSTONE INTERBEDS

SANDSTONE (20%): very light grey to very light greyish brown, clear to translucent and minor yellow commonly frosted grains, returned

	loose, medium to granule grained, predominantly fractured very coarse and granule sized grains, sub angular to well rounded, moderate sphericity, poorly sorted quartz, rare silica cement, minor quartz overgrowths, trace pyrite cement, very good inferred intergranular porosity. No Shows. CLAYSTONE (35%): light brownish grey to moderate brown, soft, dispersive, generally amorphous, minor calcareous, minor quartz silt, trace to rare carbonaceous material, trace pyrite, trace to rare very fine to fine quartz grains SILTSTONE (45%): greyish brown to brown and dark brown, friable, subfissile, micaceous, common to abundant carbonaceous material and laminae, minor very fine quartz grains, rare to minor fine pyrite, trace calcite cement, grades to Carbonaceous Siltstone. COAL: (trace), brownish black, moderately firm, sub blocky, earthy to sub vitreous lustre, sub conchoidal fracture in part. NOTE: VERY POOR SAMPLE QUALITY, 90% PASTED ROCK FLOUR BECAUSE OF LOW ROP.
2545.0 - 2560.0	SANDSTONE WITH VERY MINOR SILTSTONE AND CLAYSTONE INTERBEDS SANDSTONE (80%): very light grey to very light greyish brown, clear to translucent and minor yellow commonly frosted grains, returned loose, medium to granule grained, predominantly fractured very coarse and granule sized grains, sub angular to well rounded, moderate sphericity, poorly sorted quartz, rare silica cement, minor quartz overgrowths, trace pyrite cement, very good inferred intergranular porosity. No Shows. CLAYSTONE (20%): light brownish grey to moderate brown, soft, dispersive, generally amorphous, minor calcareous, minor quartz silt, trace to rare carbonaceous material, trace pyrite, trace to rare very fine to fine quartz grains. SILTSTONE (20%): greyish brown to brown and dark brown, friable, subfissile, micaceous, common to abundant carbonaceous material and laminae, minor very fine quartz grains, rare to minor fine pyrite, trace calcite cement, grades to Carbonaceous Siltstone. COAL (trace): brownish black, moderately firm, sub blocky, earthy to sub vitreous lustre, sub conchoidal fracture in part. NOTE: VERY POOR SAMPLE QUALITY, 90% PASTED ROCK FLOUR BECAUSE OF LOW ROP.
2560.0 - 2567.0	SANDSTONE WITH MINOR CLAYSTONE AND SILTSTONE INTERBEDS TOWARDS BASE, TRACE COAL LAMINAE SANDSTONE (60%): very light grey to very light greyish brown, clear to translucent, minor frosted grains, returned loose, fine to coarse, predominantly medium grained, sub angular to well rounded, moderate sphericity, poorly sorted quartz, rare silica cement, minor quartz overgrowths, trace pyrite cement, very good inferred intergranular porosity. No Shows. CLAYSTONE (20%): light brownish grey to moderate brown, soft, dispersive, generally amorphous, minor calcareous, minor quartz silt, trace to rare carbonaceous material, trace pyrite, trace to rare very fine to fine quartz grains

	SILTSTONE (20%): greyish brown to brown and dark brown, friable, subfissile, micaceous, common to abundant carbonaceous material and laminae, minor very fine quartz grains, rare to minor fine pyrite, trace calcite cement, grades to Carbonaceous Siltstone. COAL (trace): brownish black, moderately firm, sub blocky, earthy to sub vitreous lustre, sub conchoidal fracture in part. NOTE: very poor sample quality, 90% pasted rock flour and Baracarb calcite mud additive. Sample percentages derived from MWD.
2567.0 - 2586.0	INTERBEDDED SILTSTONE AND CLAYSTONE WITH MINOR SANDSTONE INTERBEDS AND TRACE COAL SANDSTONE: (20%), as above. CLAYSTONE: (30%), as above. SILTSTONE: (50%), as above. COAL: (trace), as above.
2586.0 - 2615.0	INTERBEDDED SANDSTONE, SILTSTONE AND CLAYSTONE WITH MINOR COAL SANDSTONE (40%): very light grey to very light greyish brown, clear to translucent, commonly frosted grains, returned loose, medium to granule grained, predominantly fractured very coarse and granule sized grains, sub angular to well rounded, moderate sphericity, poorly sorted quartz, rare silica cement, minor quartz overgrowths, trace pyrite cement, very good inferred intergranular porosity. No Shows. SANDSTONE(2) (Tr): very light grey to light brownish grey, rarely very light green, very soft, very fine to medium grained, predominantly fine grained, subangular to subround, subspherical, poorly sorted, common to abundant silt matrix, minor argillaceous matrix, rare to minor carbonaceous material, poor visible porosity, no shows. CLAYSTONE (30%): light brownish grey to moderate brown, light grey, medium grey, greenish grey, very firm, subblocky, minor moderately hard, minor calcareous, minor quartz silt, trace to rare carbonaceous material, trace pyrite, trace to rare very fine to fine quartz grains CARBONACEOUS SILTSTONE (20%): light brown to dark brown, predominantly dark brown, friable, abundant carbonaceous laminae, minor to common very fine quartz sand, trace argillaceous matrix in part, commonly grades to Siltstone, rarely grades to Silty Sandstone. COAL (10%): brownish black, moderately firm, sub blocky, earthy to sub vitreous lustre, sub conchoidal fracture in part.
2615.0 - 2660.0	SANDSTONE WITH MINOR SILTSTONE, CLAYSTONE AND COAL SANDSTONE (95%): very light grey to very light brownish grey, clear to translucent, common frosted grains, returned loose, medium to granule sized grains, predominantly medium grained, trace fractured very coarse and granule sized grains, sub angular to well rounded, moderate sphericity, moderately sorted quartz, rare silica cement, minor quartz overgrowths, trace pyrite cement, trace nodular pyrite, trace greyish brown and white mica, nil to trace chloritised grains, good inferred intergranular porosity. No Shows. CLAYSTONE (Tr): as above.

	SILTSTONE (5%): as above.
	COAL (Tr): as above.
2660.0 - 2685.0	SANDSTONE INTERBEDDED WITH AND GRADING TO SILTSTONE
	SANDSTONE (70%): as above.
	SILTSTONE (30%): greyish brown to brownish grey, friable, subfissile, micaceous, common to abundant carbonaceous material and laminae, minor very fine quartz grains, rare to minor fine pyrite, trace calcite cement, grades to Carbonaceous Siltstone.
2685.0 - 2695.0	CLAYSTONE WITH MINOR SILTSTONE AND SANDSTONE
	SANDSTONE (20%): as above.
	CLAYSTONE (70%): light brownish grey to brownish grey, moderately firm, dispersive, generally amorphous, minor calcareous, minor quartz silt, trace to rare carbonaceous material, trace pyrite, trace very fine quartz grains. (No actual competent cuttings returned)
	SILTSTONE (10%): as above.
2695.0 - 2706.0	SANDSTONE AND CLAYSTONE WITH MINOR SILTSTONE
	SANDSTONE (60%): as above.
	CLAYSTONE (30%): as above.
	SILTSTONE (10%): as above.
2706.0 - 2730.0	SANDSTONE AND MINOR SILTSTONE
	SANDSTONE (80%): very light grey to very light brownish grey, clear to translucent, common frosted grains, predominantly returned loose, trace moderately firm medium grained aggregates, medium to granule sized grains, predominantly medium grained, trace fractured very coarse and granule sized grains, sub angular to well rounded, moderate sphericity, moderately sorted quartz, rare silica cement, minor quartz overgrowths, trace pyrite cement, trace nodular pyrite, trace greyish brown and white mica, good inferred intergranular porosity, no shows.
	SILTSTONE (20%): medium grey to medium dark grey, brownish grey, firm, subfissile, micaceous, common to abundant argillaceous matrix, rare carbonaceous material, minor very fine quartz grains, rare to minor fine pyrite, trace calcite cement, grades to silty claystone.
2730.0 - 2770.0	SANDSTONE WITH MINOR SILTSTONE
	SANDSTONE (70%): very light grey to very light brownish grey, clear to translucent, common frosted grains, returned loose, abundant rock flour, medium to granule sized grains, predominantly medium grained, trace fractured very coarse and granule sized grains, sub angular to well rounded, moderate sphericity, moderately sorted quartz, rare silica cement, minor quartz overgrowths, trace pyrite cement, trace greyish brown and white mica, good inferred intergranular porosity. No Shows.

	SILTSTONE (30%): medium grey to medium dark grey, brownish grey, firm, subfissile, micaceous, common to abundant argillaceous matrix, common carbonaceous material, minor very fine quartz grains, rare to minor fine pyrite, trace calcite cement, grades to silty claystone.
2770.0 - 2775.0	SANDSTONE WITH CARBONACEOUS SILTSTONE
	SANDSTONE (70%): as above.
	CARBONACEOUS SILTSTONE (30%): brownish grey to grayish brown, brownish black, firm, subfissile, micaceous, common to abundant argillaceous matrix, common to abundant carbonaceous material, trace very fine quartz grains, trace pyrite, trace coaly fragments, trace calcite, grades to carbonaceous claystone.
2775.0 - 2810.0	SANDSTONE WITH MINOR SILTSTONE
	SANDSTONE (70%): as above.
	SILTSTONE (30%): as above.
2810.0 - 2815.0	CARBONACEOUS SILTSTONE WITH MINOR SANDSTONE
	CARBONACEOUS SILTSTONE (80%): as above
	SANDSTONE (20%): as above.
2815.0 - 2820.0	SANDSTONE AND SILTSTONE
	SANDSTONE (60%): as above, good inferred intergranular porosity, no shows.
	SILTSTONE (40%): medium grey to medium dark grey, brownish grey, firm, subfissile, micaceous, common to abundant argillaceous matrix, common carbonaceous material, minor very fine quartz grains, rare to minor fine pyrite, trace calcite cement, grades to silty claystone, rarely to carbonaceous siltstone.
2820.0 - 2840.0	SANDSTONE AND VERY MINOR SILTSONE
	SANDSTONE (90%): as above.
	SILTSTONE (10%): as above.
2840.0 - 2846.0	SANDSTONE AND MINOR SILTSTONE
	SANDSTONE (80%): similar to above, minor pyrite cement, minor carbonaceous fragments, good inferred intergranular porosity, no shows.
	SILTSTONE (20%): as above, minor disseminated very fine pyrite.
2846.0 - 2849.0	CLAYSTONE AND SILTSTONE WITH MINOR SANDSTONE
	SANDSTONE (20%): similar to above, minor medium grained, friable to moderately hard, rare silica cement, minor pyrite cement, trace silt matrix, minor to common carbonaceous fragments, moderate intergranular porosity, no shows.

	SILTSTONE (30%): medium dark grey, brownish grey, moderately hard, subfissile, micaceous, common to abundant argillaceous matrix, common carbonaceous material, minor to common disseminated and nodular pyrite, grades to silty claystone. CLAYSTONE (50%): medium grey to dark grey, very firm to moderately hard, common silt, minor very fine disseminated pyrite and nodular pyrite, rare carbonaceous streaks.
2849.0 - 2850.0	CLAYSTONE WITH SILTSTONE AND MINOR SANDSTONE SANDSTONE (20%): very light grey to very light brownish grey, clear to translucent, common frosted grains, returned loose, friable to moderately hard aggregates, abundant rock flour, medium to granule sized grains, predominantly coarse to very coarse grained, trace fractured very coarse and granule sized grains, sub angular to well rounded, moderate sphericity, moderately sorted quartz, rare silica cement, minor quartz overgrowths, minor pyrite cement, minor to common carbonaceous fragments and laminae, moderate intergranular porosity, no shows. SILTSTONE (30%): medium dark grey, brownish grey, moderately hard to hard, subfissile, micaceous, common to abundant argillaceous matrix, common carbonaceous material, minor to common disseminated and nodular pyrite, grades to silty claystone. CLAYSTONE (50%): medium grey to dark grey, very firm to moderately hard, common silt, minor very fine disseminated pyrite and nodular pyrite, rare carbonaceous streaks.
2850.0 - 2852.0	SILTSTONE CLAYSTONE AND TUFF SILTSTONE (35%): as above. CLAYSTONE: (35%), as above. TUFF (30%): very light grey, very firm to hard, greasy in part, sub fissile,very fine shards in amorphous matrix, predominantly well silicified, common coarse pyrite, common sericite weathering, minor chlorite.
2852.0 - 2854.0	SILTSTONE CLAYSTONE TUFF AND BASALT SILTSTONE (15%): as above. CLAYSTONE: (15%), as above. TUFF (50%): similar to above, very hard, well silicified. abundant pyrite. BASALT (20%): very dark green to greenish black, very hard, very finely crystalline, ferromagnesian minerals.
2854.0 - 2855.0	TUFF AND BASALT WITH MINOR SILTSTONE AND CLAYSTONE TUFF (50%): similar to above, very light grey, very hard where silicified, greasy in part, sub fissile, very fine shards in amorphous matrix, predominantly well silicified, abundant fine disseminated and coarse pyrite, common sericite weathering, minor chlorite. BASALT (20%): very dark green to greenish black, green, grey, very hard, very finely crystalline, ferromagnesian minerals. SILTSTONE (15%): as previously described, medium dark grey, brownish grey, moderately hard to hard, subfissile, micaceous, common to abundant argillaceous matrix, common carbonaceous

material, minor to common disseminated and nodular pyrite, grades to silty claystone.
CLAYSTONE (15%): as previously described, medium grey to dark grey, very firm to moderately hard, common silt, minor very fine disseminated pyrite and nodular pyrite, rare carbonaceous streaks.
NOTE: very poor sample quality, 99% pasted by PDC bit with

2855.0 - 2864.0

BASALT (100%): similar to above, greyish green to greenish black, very hard and finely crystalline where fresh, common weathering to greyish red and moderately hard where weathered, fine crystalline where fresh, common greyish red weathering, basal few metres conatsins common yellowish white feldspars, altered to light green in part, possible zeolite minerals, minor fine to medium crystalline pyrite and coarse aggregates, no visible porosity.

2864.0 - 2870.0

SANDSTONE WITH RARE CARBONACEOUS SILTSTONE

SANDSTONE (95%):very light grey, clear to translucent, common white, minor frosted grains, returned loose, very fine to granule sized grains, predominantly medium to coarse grained, common fractured very coarse and granule size, angular to subangular, rarely subrounded, moderate sphericity, poorly sorted quartz and rare feldspar, rare to minor silica cement, minor quartz overgrowths, rare pyrite cement, rare white argillaceous matrix, trace carbonaceous fragments, good inferred intergranular porosity, no shows.

CARBONACEOUS SILTSTONE (5%): brownish grey to grayish brown, brownish black, firm, subfissile, micaceous, trace very fine quartz grains, rare pyrite, rare coarse coal fragments, grades to siltstone.

2870.0 - 2905.0

SANDSTONE WITH MINOR SILTSTONE INTERBEDS

SANDSTONE (85%): white to very light yellowish grey, also clear to translucent and common white, rarely frosted grains, returned loose and as friable to moderately hard aggregates, very fine to granule size, predominantly fine to medium grained, angular to subangular, moderate sphericity, poorly sorted quartz and rare to minor feldspar, rare silica cement, common quartz overgrowths, rare pyrite cement, minor to common white argillaceous matrix, rare quartz silt matrix, rare fine carbonaceous fragments, poor to good inferred intergranular porosity, no shows.

SILTSTONE (15%): medium dark grey, brownish grey, friable to moderately hard, subfissile, micaceous, rare to minor argillaceous matrix, common carbonaceous material, rare fine

2905.0 - 2925.0

SANDSTONE WITH MINOR SILTSTONE

SANDSTONE (80%): light brownish grey, very light grey, friable to hard, predominantly hard, very fine to medium predominantly fine to medium, angular to subangular, moderate sphericity, poorly sorted quartz and rare feldspar, rare to minor silica cement, minor quartz overgrowths, rare pyrite cement, minor to common white argillaceous and very light brown siliceous silt, common fine to coarse carbonaceous fragments, rare to minor coarse mica, poor to moderate intergranular porosity, no shows. Commonly grades to argillaceous sandstone and rarely grades to sandy siltstone.

SILTSTONE (20%): brownish grey to grayish brown, brownish black, firm to minor hard, subfissile, micaceous, common to abundant

	carbonaceous streaks and laminae, common very fine quartz grains, rare pyrite.
2925.0 - 2960.0	SANDSTONE WITH MINOR INTERBEDDED SILTSTONE
	SANDSTONE (90%): light brownish grey, very light grey, friable to hard, predominantly hard, very fine to granule predominantly coarse to granule, common fine to medium aggregates, common rock flour, angular to subangular, moderate sphericity, poorly sorted quartz and rare feldspar, rare to minor strong silica cement, minor quartz overgrowths, rare pyrite cement, trace argillaceous and very light brown siliceous silt matrix, minor fine to coarse carbonaceous fragments, rare to minor coarse mica, poor to moderate intergranular porosity, no shows.
	SILTSTONE (10%): brownish grey to greyish brown, brownish black in part, firm to minor hard, subfissile, micaceous, common to abundant carbonaceous streaks and laminae, common very fine quartz grains, rare pyrite.
2960.0 - 2975.0	INTERBEDDED SILTSTONE AND SANDSTONE
	SILTSTONE (70%): as above.
	SANDSTONE (30%): as above.
2975.0 - 2990.0	CLAYSTONE AND SILTSTONE WITH VERY MINOR SANDSTONE AND TRACE COAL
	SANDSTONE (10%): as above.
	SILTSTONE (30%): generally as above, trace nodular pyrite.
	CLAYSTONE (60%): medium grey to brownish grey, moderately firm, blocky to sub blocky, common quartz silt, common carbonaceous material, trace disseminated pyrite, non calcareous, grading to silty claystone.
	COAL (tr): brownish black, moderately firm, blocky, sub conchoidal fracture, moderately bright to bright lustre.
2990.0 - 3000.0	SANDSTONE WITH COMMON SILTSTONE AND CLAYSTONE INTERBEDS AND TRACE COAL
	SANDSTONE (60%): generally as above, predominantly light brownish grey, friable, fine to medium grained, common quartz overgrowths, abundant quartzose silt matrix, common carbonaceous fragments, poor intergranular porosity.
	SILTSTONE (20%): as above, grades to Carbonaceous Siltstone.
	CLAYSTONE (20%): as above.
	COAL: as above.
3000.0 - 3015.0	SANDSTONE, SILTSTONE AND CLAYSTONE WITH TRACE COAL
	SANDSTONE (75%): similar to that previously described, light brownish grey, minor very light grey, loose, also friable to hard, predominantly hard, fine to coarse predominantly medium grained, angular to subangular, moderate sphericity, very poorly sorted quartz, rare silica cement, minor quartz overgrowths, rare pyrite

	cement, minor to abundant very light brown siliceous silt matrix, minor argillaceous matrix, minor fine to coarse carbonaceous fragments, poor intergranular porosity, no shows. SILTSTONE (15%): as previously described, brownish grey to greyish brown, brownish black in part, becoming lighter with depth, firm to minor hard, subfissile, micaceous, common to abundant carbonaceous streaks and laminae, common very fine quartz grains, rare pyrite. Grades to carbonaceous siltstone. CLAYSTONE (10%): as previously described, medium grey to brownish grey, moderately firm, blocky to sub blocky, common quartz silt, trace to rare carbonaceous material, trace disseminated pyrite. Grades to silty claystone. COAL (tr): as previously described, brownish black, moderately firm, blocky, sub conchoidal fracture, moderate to bright vitreous lustre.
3015.0 - 3025.0	SILTSTONE AND SANDSTONE WITH COMMON CLAYSTONE SANDSTONE (30%): similar to above, predominantly very fine to medium grained and friable. SILTSTONE (50%): as above, grades to Carbonaceous Siltstone. CLAYSTONE (20%): as above.
3025.0 - 3095.0	INTERBEDDED CLAYSTONE AND SILTSTONE WITH MINOR SANDSTONE AND COAL CLAYSTONE (60%): as above, grades to carbonaceous siltstone. SILTSTONE (30%): as above. SANDSTONE: (10%) as above. COAL (Tr): black, bright lustre, hard, blocky, brittle, sub conchoidal fracture.
3095.0 - 3102.0	SILTSTONE WITH COMMON SANDSTONE AND CLAYSTONE, TRACE COAL SANDSTONE (20%): similar to above, very fine to course, predominantly fine to medium grained, friable to hard, minor to common silt matrix, poor visible porosity, no shows. Grades to sandy siltstone. SILTSTONE (40%): similar to above, predominantly light brownish grey with minor to common very fine quartz sand, also common dark grey and very hard with minor fine carbonaceous material. CLAYSTONE (40%): as above, minor to common carbonaceous material. COAL (tr): as above.
3102.0 - 3130.0	SILTSTONE AND CLAYSTONE WITH VERY MINOR SANDSTONE AND TRACE COAL SANDSTONE (10%): similar to that previously described, light brownish grey, very light grey, friable to hard, predominantly hard, very fine to coarse, predominantly fine to medium grained, angular to subangular, moderate sphericity, poorly sorted quartz and rare

	feldspar, rare to minor strong silica cement, minor quartz overgrowths, rare pyrite cement, minor to common light brown siliceous silt matrix, trace argillaceous matrix, minor fine to coarse carbonaceous fragments, rare to minor coarse mica, poor visible porosity, no shows. Grades to sandy siltstone. SILTSTONE (45%): similar to that previously described, greyish brown to brownish grey, predominantly light brownish grey, minor dark grey, friable to very hard, quartzose, minor to abundant clay matrix, common to abundant carbonaceous streaks, minor to common disseminated very fine quartz sand, trace pyrite. CLAYSTONE (45%): as previously described, brownish grey to grey, firm to moderately hard, blocky to sub blocky, common quartz silt, minor to common carbonaceous material, trace disseminated pyrite, rarely grades to carbonaceous siltstone. COAL (tr): as above.
3130.0 - 3145.0	SILTSTONE WITH SUBORDINATE SANDSTONE AND CLAYSTONE SANDSTONE (35%): similar to above, light brownish grey, minor very light grey and white, friable to hard, rarely very hard, very fine to medium, predominantly very fine to fine, trace coarse grained, angular to subangular, subspherical, poorly sorted quartz, minor to common silica cement, nil to rare calcite cement, minor to common quartzose and carbonaceous silt matrix, minor argillaceous matrix in part, rare to common medium grained carbonaceous fragments, rare lithic grains, trace coarse mica, trace coarse pyrite, trace dark green and black coarse fresh fine crystalline basaltic volcanic grains, poor visible porosity, no shows. Grades to sandy siltstone. SILTSTONE (40%): similar to above, light brownish grey, dark grey, friable to very hard, minor sub fissile, quartzose and moderately carbonaceous where brownish grey, micaceous where dark grey, minor to common very fine quartz sand, trace calcareous in part. CLAYSTONE (25%): similar to above, brownish grey to grey, firm to moderately hard, blocky to sub blocky, common quartz silt, minor carbonaceous material, trace disseminated pyrite.
3145.0 - 3152.0	SANDSTONE (15%): as above. SILTSTONE (60%): as above. CLAYSTONE (25%): as above.
3152.0 - 3175.0	SILTSTONE WITH MINOR SANDSTONE AND CLAYSTONE SILTSTONE (70%): light brownish grey, dark grey, friable to very hard, minor sub fissile, quartzose and moderately carbonaceous where brownish grey, micaceous where dark grey, minor to common very fine quartz sand, trace calcareous in part. Rarely grades to carbonaceous siltstone. SANDSTONE (15%): similar to that previously described, light brownish grey, minor very light grey and white, friable to hard, rarely very hard, very fine to medium, predominantly very fine to fine, trace coarse and very coarse grains, angular to subangular, subspherical, poorly sorted quartz, common strong silica cement, nil to rare calcite cement, trace coarse pyrite cement, minor to common quartzose and

	carbonaceous silt matrix, minor argillaceous matrix in part, rare to common medium grained carbonaceous fragments, rare lithic grains, trace coarse mica, trace dark green and black coarse fresh fine crystalline basaltic volcanic grains, very poor visible porosity, no shows. Grades to silty sandstone. CLAYSTONE (15%): as previously described, brownish grey to grey, firm to moderately hard, blocky to sub blocky, common quartz silt, minor carbonaceous material, trace disseminated pyrite.
3175.0 - 3190.0	SILTSTONE WITH MINOR SANDSTONE AND CLAYSTONE, TRACE COAL SILTSTONE (70%): as above, rarely grades to carbonaceous siltstone. SANDSTONE (20%): generally as above, very fine to fine grained, predominantly fine grained, abundant silt matrix, rare lithic grains, trace chlorite, commonly grades to silty sandstone, no visible porosity. CLAYSTONE (10%): as above. COAL (tr): black, dull to moderately bright lustre, hard, blocky, brittle, sub conchoidal fracture.
3190.0 - 3215.0	SILTSTONE WITH MINOR CLAYSTONE AND SANDSTONE AND TRACE COAL. SILTSTONE (60%): as above, minor to common lithic grains, rarely grades to carbonaceous siltstone. CLAYSTONE (30%): as above. SANDSTONE (10%): as above, minor lithic grains. COAL (Tr): as above.
3215.0 - 3225.0	SANDSTONE WITH MINOR SILTSTONE AND CLAYSTONE SANDSTONE (80%): similar to above, light brownish grey, minor very light grey and white, friable to hard, rarely very hard, very fine to medium, predominantly very fine to fine, trace coarse grained, angular to subangular, subspherical, poorly sorted quartz, minor to common silica cement, nil to rare calcite cement, minor to common quartzose and carbonaceous silt matrix, minor argillaceous matrix in part, rare to common medium grained carbonaceous fragments, rare to minor lithic grains, trace coarse mica, trace coarse pyrite, poor visible porosity, no shows. Grades to sandy siltstone. SILTSTONE (10%): similar to above, light brownish grey, dark grey, friable to very hard, minor sub fissile, quartzose and moderately carbonaceous where brownish grey, micaceous where dark grey, minor to common very fine quartz sand, trace calcareous in part. CLAYSTONE: (10%) similar to above, brownish grey to grey, firm to moderately hard, blocky to sub blocky, common quartz silt, minor carbonaceous material, trace disseminated pyrite.

3225.0 - 3260.0	SILTSTONE WITH MINOR CLAYSTONE AND SANDSTONE AND TRACE COAL SILTSTONE (60%): as above, minor to common lithic grains, rarely grades to carbonaceous siltstone. CLAYSTONE (30%): as above. SANDSTONE (10%): as above, minor lithic grains. COAL (Tr): as above.
3260.0 - 3265.0	SANDSTONE WITH MINOR SILTSTONE, VERY MINOR CLAYSTONE AND TRACE COAL SANDSTONE (70%): as above. SILTSTONE (20%): as above. CLAYSTONE (10%): as above. COAL (Tr): as above.
3265.0 - 3270.0	SILTSTONE WITH COMMON SANDSTONE, MINOR CLAYSTONE AND TRACE COAL SILTSTONE (50%): as above. SANDSTONE (30%): as above, minor lithic grains. CLAYSTONE (10%): as above. COAL (Tr): as above.
3270.0 - 3280.0	SANDSTONE WITH MINOR SILTSTONE, VERY MINOR CLAYSTONE AND TRACE COAL SANDSTONE (70%): as above. SILTSTONE (20%): as above. CLAYSTONE (10%): as above. COAL (Tr): as above.
3280.0 - 3289.0	SANDSTONE AND SILTSTONE WITH MINOR CLAYSTONE AND TRACE COAL SANDSTONE (40%): as above. SILTSTONE (40%): as above. CLAYSTONE (20%): as above. COAL (Tr): as above.
3289.0 - 3320.0	SILTSTONE WITH MINOR SANDSTONE, VERY MINOR CLAYSTONE AND TRACE COAL SILTSTONE (60%): similar to that previously described, predominantly dark grey, minor light brownish grey, friable to very hard, mostly very hard, sub fissile, predominantly dark micas, minor

	quartzose and moderately carbonaceous where brownish grey, minor very fine quartz sand and minor to common lithic grains, trace calcareous in part. SANDSTONE (20%): similar to that previously described, light brownish grey, minor very light grey and white, friable to hard, rarely very hard, very fine to fine, rarely medium grained, trace coarse grained, angular to subangular, subspherical, poorly sorted quartz, minor to common silica cement, nil to rare calcite cement, minor to common quartzose and carbonaceous silt matrix, minor argillaceous matrix in part, minor lithic grains, rare to common medium grained carbonaceous fragments, trace coarse pyrite, poor visible porosity, no shows. Grades to sandy siltstone. CLAYSTONE (10%): similar to that previously described, brownish grey to grey, firm to moderately hard, blocky to sub blocky, common quartz silt, minor carbonaceous material, trace disseminated pyrite. COAL (tr): black, very hard, very brittle, blocky to conchoidal fracture, bright lustre.
3320.0 - 3330.0	SILTSTONE WITH COMMON COAL, MINOR CLAYSTONE AND TRACE SANDSTONE SILTSTONE (65%): as above. COAL (20%): similar to above, black, very hard, very brittle, blocky to conchoidal fracture, bright lustre. CLAYSTONE (15%): as above. SANDSTONE (tr): as above, very fine to fine grained.
3330.0 - 3345.0	GREEN SILTSTONE AND SANDSTONE SILTSTONE (50%): light greyish green to greyish green, white, friable to hard, sucrosic, quartzose, white green matrix in part, white matrix in part, commonly chloritised. Grades to very fine sandstone SANDSTONE (50%): green, white, friable to hard, very fine to medium, predominantly fine grained, subangular, subspherical, moderately sorted, minor to common silica cement, minor chloritised matrix, grains of possible volcanic origin, no visible porosity, no shows.

Appendix B: Sidewall Core Descriptions

Core No.	Depth (mRT)	Rec. (mm)	Sidewall Core Description
30	2720.2	20	**SANDSTONE:** white to very light grey, clear to translucent grains, moderately firm, appears fine to predominantly medium grained, (Fracturing of many coarser grains due to bullet impact apparent), minor coarse to granule sized grains, angular to sub angular, moderately sorted quartz, trace pyrite cement, trace quartz overgrowths, trace medium dark grey argillaceous matrix, trace brownish grey mica. **Fluorescence:** trace dull to moderately bright yellow diffuse fluorescence.
29	2755	13	**SILTSTONE with interlaminated SANDSTONE:** medium grey to brownish grey, moderately firm, finely laminated, trace micaceous, common to abundant argillaceous matrix, rare carbonaceous material, common very fine quartz grains, trace pyrite, trace calcite cement, grades to silty sandstone. **SANDSTONE:** generally as above, predominantly fine grained.
28	2763.5	20	**SANDSTONE:** as above. **Fluorescence:** as above
27	2797.5	15	**SANDSTONE:** white to very light grey, moderately firm, medium to granule grained, (Fracturing of many coarser grains due to bullet impact apparent), abundant coarse to granule sized grains, angular to sub angular, minor sub rounded, moderately sorted quartz, common strong silica cement, trace pyrite cement, trace quartz overgrowths, trace light grey argillaceous matrix, trace brownish grey mica. **Fluorescence:** 10% dull to moderately bright yellow direct fluorescence, slow moderately bright yellow blooming cut, moderately thick moderately bright to bright residual ring.
26	2804	15	**CLAYSTONE:** light grey to medium light grey, light brownish grey, soft, trace carbonaceous fragments and wisps, trace mica, trace to rare quartz silt, non calcareous.
25	2841.5	15	**CLAYSTONE:** light grey to medium light grey, light brownish grey, soft, rare to minor quartz silt, trace very fine to fine quartz grains, trace carbonaceous fragments, trace mica, non calcareous.
24	2848	22	**VOLCANIC:** greenish black, greyish green, very hard, very fine grained mosaic of greenish black ?ferromagnesian minerals and white feldspar, partly altered to greyish green clay possible sericite, common pyrite. Sample severely brecciated by bullet.
23	2865	20	**SANDSTONE:** white to very light grey, clear to translucent, moderately firm, predominantly fine to medium grained, trace coarse grains, minor fractured grains, angular to subangular, rare sub rounded, moderate sphericity, moderately sorted quartz, trace feldspar grains, rare to minor silica cement, minor quartz overgrowths, trace pyrite cement, rare white argillaceous matrix, nil to trace carbonaceous fragments, fair inferred intergranular porosity. **Fluorescence:** trace dull to moderately bright yellow diffuse fluorescence.
22	2897.2	20	**SANDSTONE:** white very light grey, clear to translucent, moderately firm, fine to very coarse grained, predominantly medium to coarse grained, common fractured grains, angular to subangular, trace sub rounded, moderate sphericity, poorly sorted quartz, trace to rare silica cement, minor quartz overgrowths, rare white argillaceous matrix, trace pyrite, trace to rare lithic grains, nil to trace carbonaceous fragments, fair inferred intergranular porosity. **Fluorescence:** trace dull to moderately bright yellow diffuse fluorescence.
21	2901.5	14	**SANDSTONE:** white to very light grey, clear to translucent, moderately firm, predominantly very fine to fine grained, trace medium grains, trace fractured grains, angular to subangular, low to moderate sphericity, moderately well sorted

			quartz, rare to minor silica cement, trace quartz overgrowths, rare white argillaceous matrix, trace pyrite, nil to trace carbonaceous fragments, fair inferred intergranular porosity. **Fluorescence:** trace dull to moderately bright yellow diffuse fluorescence.
20	2911	13	**SANDSTONE:** white very light grey, clear to translucent, moderately firm, predominantly medium to coarse grained, trace fine and very coarse grains, common fractured grains, angular to subangular, trace sub rounded, moderate sphericity, moderately sorted quartz, trace to rare silica cement, minor quartz overgrowths, rare white argillaceous matrix, trace lithic grains, trace feldspar, good inferred intergranular porosity. **Fluorescence:** trace patchy dull to moderately bright yellow diffuse fluorescence.
19	2935	18	**SANDSTONE:** white to very light grey, clear to translucent, rare white, fine to granule sized grains, predominantly medium to coarse grained, common fractured very coarse and granule size grains, angular to subangular, rare sub rounded, moderate sphericity, poorly sorted quartz and minor feldspar, rare to minor silica cement, minor quartz overgrowths, rare pyrite cement, abundant yellowish grey argillaceous matrix, trace carbonaceous fragments, poor inferred intergranular porosity. No shows.
18	2971	24	**SANDSTONE:** white to very light grey, clear to translucent, trace white, moderately firm, fine to very coarse sized grains, predominantly medium to coarse grained, common fractured coarse and very coarse grains, angular to subangular, trace sub rounded, moderate sphericity, poorly sorted quartz and trace feldspar, rare to minor silica cement, minor quartz overgrowths, rare white argillaceous matrix, nil to trace carbonaceous fragments, poor inferred intergranular porosity. **Fluorescence:** trace patchy dull to moderately bright yellow diffuse fluorescence.
17	2975.5	21	**CLAYSTONE:** medium grey to brownish grey, moderately firm to firm, amorphous, common quartz silt, trace disseminated pyrite, non calcareous, grading to silty claystone.
16	3008	11	**SANDSTONE:** white to very light grey, moderately firm, very fine to coarse grained, predominantly fine to medium, angular to subangular, moderate sphericity, moderately well sorted quartz and trace feldspar, rare to minor strong silica cement, minor quartz overgrowths, nil to trace argillaceous matrix, trace carbonaceous fragments, trace mica, poor to moderate intergranular porosity. **Fluorescence:** trace patchy dull to moderately bright yellow diffuse fluorescence.
15	3039	16	**CLAYSTONE:** brownish grey to medium dark grey, firm to moderately hard, blocky to sub blocky, rare quartz silt, trace carbonaceous material and coal fragments, nil to trace disseminated pyrite, non calcareous.
14	3044	28	**COAL:** greyish black to black, predominantly moderately bright lustre, rare bright, moderately firm, sub blocky, trace brittle laminae, subconchoidal fracture.
13	3084.3	20	**SANDSTONE:** (50%), white to very light grey, moderately firm, fine to very coarse grained, predominantly coarse, angular to subangular, moderate sphericity, moderately well sorted quartz, minor strong silica cement, common quartz overgrowths, minor argillaceous matrix, rare carbonaceous fragments, rare coarse lithic grains, trace mica. Sample severely brecciated by bullet. **Fluorescence:** trace patchy dull to moderately bright yellow diffuse fluorescence, very slow, very weak dull blueish white cut. **CLAYSTONE:** (50%), olive grey, very firm, blocky to sub blocky, minor quartz silt, trace very fine quartz sand, trace carbonaceous material and coal fragments, nil to trace disseminated pyrite, non calcareous, no apparent bedding.
12	3114	22	**SILTY CLAYSTONE:** dark grey, very firm to moderately hard, sub blocky, abundant mica and quartz silt, trace carbonaceous material, trace very fine disseminated pyrite, non calcareous. Grades to argillaceous siltstone.
11	3132.5	20	**SANDSTONE:** light grey to medium grey, moderately hard, very fine to medium grained, predominantly fine grained, angular to sub round, subspherical, moderately sorted quartz and rare feldspar, rare patchy silica cement, common

			argillaceous matrix, rare dark grey shaley lithic grains, rare carbonaceous streaks, rare mica, trace chloritised grains, very poorly laminated, poor visible intergranular porosity, no fluorescence.
10	3152	22	**C ARBONACEOUS SILTSTONE:** greyish black, firm, minor coal fragments, rare scattered medium to very coarse angular quartz grains. Very slow, very weak cut fluorescence.
9	3164.5	14	**SANDSTONE:** olive grey, hard, very fine to medium grained, predominantly fine to medium grained, angular to sub round, subspherical, moderately sorted quartz, minor silica cement, common argillaceous matrix, rare carbonaceous streaks, rare mica, rare chloritised grains, no visible bedding, no visible, no fluorescence.
8	3215.5	11	**CLAYSTONE:** greyish black, firm, abundant clay to silt size carbonaceous material, rare coarse carbonaceous material, trace pyrite
7	3220	34	**SANDSTONE:** very light grey to light grey, firm, friable, very fine to rarely medium grained, predominantly fine grained, angular to sub round, sub spherical, moderately well sorted quartz and rare feldspar, minor quartz overgrowths and trace silica cement, common argillaceous matrix, minor grey, green, orange lithic grains, rare carbonaceous fragments, no apparent bedding, very poor intergranular porosity, no fluorescence.
6	3251	13	**ARGILLACEOUS SANDSTONE:** very light grey, very firm, sticky, very fine to fine grained, angular to subangular, sub spherical, poorly sorted, very abundant clay and silt matrix, minor carbonaceous streaks, minor green, orange and grey lithic grains, rare mica, trace pyrite, poorly thinly laminated, common medium grey carbonaceous and micaceous silty laminae, no visible porosity, no fluorescence.
5	3273.2	23	**SANDSTONE:** light grey, friable, very fine to coarse, predominantly fine to medium grained, rare coarse, angular to subangular, sub spherical, moderately sorted quartz, abundant argillaceous matrix, rare grey and trace green lithic grains, rare carbonaceous material, rare mica, no bedding apparent, very poor intergranular porosity, no fluorescence.
4	3328	22	**SILTSTONE:** blueish grey to medium grey, firm, sub blocky, very fine grained, argillaceous, trace very fine disseminated pyrite, no bedding apparent.
3	3336	21	**ALTERED ?VOLCANIC:** dark greenish grey to greenish black, hard to very hard, microveins of white waxy clay type mineral , trace white very fine altered ?feldspar . Sample severely brecciated by bullet.
2			BULLET LOST
1	3340.5	38	**CLAYSTONE:** dark greenish grey, greyish red purple, very firm to hard, fissile, waxy altered clay material, may be derived by alteration of volcanic material.

Appendix C: Palynological Summary

Palynological analysis of Melville–1, offshore Gippsland Basin.

by Alan D. Partridge

Introduction.

Twenty-three cuttings and five sidewall cores were analysed in Melville–1 over an 1100 metre interval extending from 2230m to within 20 metres of the T.D.

The palynological analysis performed on Melville–1 is based on thirteen cuttings samples initially prepared as urgent or rush palynological preparations while the well was drilling, and an additional ten cuttings and five sidewall cores given normal palynological processing after the well had reached Total Depth. Initial results on the urgent samples were provided in Provisional Reports #1 and #2 issued on 2nd and 13th November 2001, while the additional samples, and further observations on the rush samples were provided in Provisional Reports #3 to #5 issued between 24th November and 21st December 2001.

Most of the palynological samples are restricted to the 2280-2290m depth interval. The analysis is also limited to cuttings down to the casing shoe at 2700m as no sidewall cores were shot in the 12–1/4 inch open-hole prior to setting the 9–5/8 inch casing. Average spacing between the cuttings in the upper part of the aforementioned interval is 39 metres. Below the casing point the thirteen productive samples (10 cuttings and 5 sidewall cores) analysed provide an effective average sample spacing of >50 metres.

Although the overall results of the palynological analysis is considered good, with only two samples ultimately proving to be age indeterminate, significant problems were encountered in the laboratory processing of the cuttings samples caused by the use of a KCl/PHPA/Glycol mud system. The PHPA mud additive reacted adversely with the organic matter during the palynological processing resulting in extremely low recovery of organic matter and palynomorphs in the initial processing. Eight of the cuttings therefore needed to be reprocessed to achieve workable and reliable assemblages

Because of the processing difficulties the cuttings generally only gave low to moderate organic residue yields, containing low concentrations of palynomorphs, whereas most sidewall cores gave high yields and moderate to high concentrations of palynomorphs. Overall the palynomorph preservation was poor to fair and only occasionally good. Notwithstanding the low yields and poor preservation moderate to high diversity spore-pollen assemblages were recorded from most samples and moderate diversity microplankton assemblages from eight cuttings samples in the upper part of the interval.

Basic assemblage data for Melville–1, Gippsland Basin.

Sample Type	Depth	Visual Yield	Palynomorph Concentration	Preservation	No. SP Species	No. MP* Species
Cuttings †	2230m	Low	Low	Poor	19+	11+
Cuttings	2260	Very low	Low	Poor-fair	21+	11+
Cuttings †	2270m	Low	Low	Very poor-fair	19+	17+
Cuttings †	2280m	Low	Low	Poor	12+	10+
Cuttings †	2310m	Low	Low	Poor	34+	11+
Cuttings	2360m	High	Low	Very poor	33+	8+
Cuttings	2380m	Moderate	Low	Poor	22+	2+
Cuttings #	2485m	Moderate	Moderate	Poor	20+	NR
Cuttings #	2535m	Low	Very low	Very poor	13+	NR
Cuttings #	2585m	Moderate	Low	Poor	21+	2+
Cuttings	2605m	Moderate	High-moderate	Poor	29+	10+
Cuttings †	2640m	Low	Low	Poor-fair	21+	6+
Cuttings #†	2690m	Low	Very low	Poor	30+	3+
SWC 29	2755m	Moderate	Moderate	Poor-fair	34+	NR
Cuttings #	2780m	Low	Very low	Very poor	16+	4+
Cuttings #†	2820m	Low	Very low	Poor	28+	2+
SWC 25	2841.5m	High	High	Fair	30+	1
Cuttings †	2865m	Very low	Very low	Poor	11+	1+
Cuttings #†	2880m	Low	Low	Poor-fair	24+	(3+)
Cuttings #	2915m	Low	Low	Poor-fair	21+	(1+)
Cuttings #†	2960m	Low	Very low	Poor	15+	(1+)
SWC 17	2975m	Moderate	Low	Fair	31+	2+
Cuttings #	3030m	Low	Low	Poor	26+	1+
SWC 15	3039m	Moderate	Low	Poor	23+	1+
Cuttings #	3075m	Low	Low	Very poor	11+	NR
Cuttings #	3155m	Moderate	Moderate	Poor-fair	29+	2+
Cuttings #	3185m	Moderate	Low	Poor	23+	1
SWC 4	3328m	Moderate	Essentially barren	Very poor	2+	NR

Samples given urgent palynological processing
† Samples re-processed to improve yields.
* Microplankton diversity numbers in brackets refer to caved species.
NR = Not recorded.

Species abundances and occurrences in Melville–1, Gippsland Basin.

Sample Type:	Cutts	Cutts	Cutts	Cutts	Cutts	Cutts	Cutts	Cutts	Cutts
Depth (metres):	2230	2260	2270	2280	2310	2360	2380	2485	2535
Spore-Pollen as % of SP count									
Araucariacites australis	2.3%	4.3%	7.5%	5.6%	0.9%	X		0.8%	
Australopollis obscurus						1.0%	2.2%		2.2%
Baculatisporites spp.		4.3%	2.5%		X	1.0%	2.2%	0.8%	
Beaupreaidites verrucosus					0.9%				
Cicatricosisporites/Ruffordiaspora sp.					RW				
Clavifera triplex					0.9%	1.9%		0.8%	
Cupanieidites orthoteichus					X				
Cyatheacidites annulatus	2.3%								
Cyathidites splendens						X	X	X	
Cyathidites spp. large >40µm	2.3%				1.8%	2.9%	3.2%	X	
Cyathidites spp. small <40µm	9.3%	15.2%	15.0%	5.6%	7.3%	5.8%	3.2%	2.3%	4.4%
Dacrycarpites australiensis			X			X			
Dicotetradites clavatus					2.8%		1.1%		
Dictyophyllidites spp.		X				1.0%	X		
Dilwynites granulatus	7.0%	8.7%	2.5%	5.6%	3.7%	9.7%	6.5%	0.8%	8.9%
Dilwynites tuberculatus		X							
Ericipites scabratus					0.9%				
Foveotriletes balteus					X				
Foveotriletes crater	X								
Gambierina edwardsii								X	
Gambierina rudata			RW					2.3%	2.2%
Gleicheniidites circinidites	2.3%	2.2%	X		6.4%	11.7%	2.2%	6.2%	2.2%
Haloragacidites harrisii	2.3%	6.5%	15.0%	27.8%	14.7%	3.9%	7.5%	X	
Herkosporites elliottii						X			
Ilexpollenites spp.					1.8%		1.1%		
Ischyosporites gremius			5.0%	X		X			
Ischyosporites irregularis †		X							
Laevigatosporites major	2.3%					X			
Laevigatosporites musa †									
Laevigatosporites ovatus		2.2%	2.5%		0.9%		8.6%	8.5%	2.2%
Latrobosporites crassus						1.0%		X	
Lygistepollenites balmei						6.8%	7.5%	8.5%	13.3%
Lygistepollenites florinii	2.3%	2.2%	2.5%	5.6%	4.6%	3.9%	6.5%	0.8%	2.2%
Malvacipollis diversus					0.9%				
Malvacipollis subtilis	2.3%				0.9%				
Matonisporites gigantis					cf.				
Matonisporites ornamentalis				X					
Microcachryidites antarcticus	X	2.2%			0.9%	4.9%	5.4%	0.8%	
Nothofagidites asperus	2.3%		2.5%						
Nothofagidites brachyspinulosus			5.0%		0.9%	1.0%			
Nothofagidites deminutus	X	2.2%							
Nothofagidites emarcidus/heterus	46.5%	4.3%	5.0%	11.1%	4.6%				
Nothofagidites endurus								3.9%	2.2%

Continued…

Species abundances and occurrences in Melville–1 (continued).

Sample Type:	Cutts	Cutts	Cutts	Cutts	Cutts	Cutts	Cutts	Cutts	Cutts
Depth (metres):	2230	2260	2270	2280	2310	2360	2380	2485	2535
Spore-Pollen as % of SP count									
Nothofagidites flemingii			2.5%	5.6%		1.0%			
Nothofagidites vansteenisii	4.7%								
Periporopollenites polyoratus						X	X		
Peromonolites spp.					0.9%				
Phyllocladidites mawsonii		4.3%			X	1.9%	7.5%	38.0%	20.0%
Podocarpidites spp.	9.3%	19.6%	20.0%	X	11.9%	28.2%	18.3%	12.4%	22.2%
Polypodiidites spp		2.2%	X		0.9%				
Proteacidites angulatus									cf.
Proteacidites annularis							X		
Proteacidites grandis					3.7%				
Proteacidites pachypolus				5.6%					
Proteacidites reticuloscabratus					X				
Proteacidites tenuiexinus						X			
Proteacidites spp.	X	8.7%	2.5%	11.1%	16.5%	7.8%	1.1%	2.3%	15.5%
Retitriletes spp.							1.1%	X	
Rugulatisporites mallatus						X			
Stereisporites antiquisporites	2.3%		2.5%		0.9%		1.1%	2.3%	
Trichotomosulcites subgranulatus		2.2%			0.9%	1.0%	9.7%	5.4%	
Tricolp(or)ates spp.		2.2%	7.5%		6.4%	2.9%	2.2%	2.3%	2.2%
Tricolporites sphaerica					X				
Trilete spores undiff.		6.5%		16.7%	1.8%		2.2%	0.8%	
Triporopollenites spp.						1.0%			
Tripunctisporis maastrichtiensis						X			
Verrucosisporites kopukuensis						X			
Total spores:	21%	33%	28%	22%	22%	25%	24%	22%	9%
Total Gymnosperms:	21%	43%	33%	17%	23%	56%	61%	67%	67%
Total Angiosperms:	58%	24%	40%	61%	55%	18%	15%	11%	24%
Total Spore-Pollen Count:	**43**	**46**	**40**	**18**	**109**	**103**	**93**	**129**	**45**
Microplankton as % of MP count									
Apectodinium homomorphum					28%				
Apectodinium reburrus †						17%	100%		
Apteodinium australiense	1%								
Cerebrocysta zigzag †	8%	CV	CV	CV					
Cyclopsiella vieta			X						
Deflandrea spp.			4%	27%					
Deflandrea dartmooria					8%				
Deflandrea heterophlycta		X	CV						
Deflandrea medcalfii						X			
Deflandrea phosphoritica			X	cf.					
Enneadocysta partridgei			16%	13%					
Glaphyrocysta retiintexta					X	33%			
Hystiocysta variata †		2%	1%						
Hystrichokolpoma rigaudiae	X								

Continued…

Species abundances and occurrences in Melville–1 (continued).

Sample Type:	Cutts	Cutts	Cutts	Cutts	Cutts	Cutts	Cutts	Cutts	Cutts
Depth (metres):	2230	2260	2270	2280	2310	2360	2380	2485	2535
Microplankton as % of MP count									
Hystrichosphaeridium tubiferum			1%						
Impagidinium spp.	X	X	X						
Kenleyia spp.					3%				
Lingulodinium machaerophorum	1%		1%	X					
Microplankton undiff.	23%	37%	16%	13%	21%	17%			
Muratodinium fimbriatum					3%				
Nematosphaeropsis balcombiana	X	X	X			CV			
Operculodinium centrocarpum	11%	5%	21%	33%	3%				
Paralecaniella indentata			1%		8%	X			
Paucilobimorpha inaequalis		2%							
Paucilobimorpha tripus			4%						
Phthanoperidinium eocenicum		X							
Protoellipsodinium simplex ms.	8%	CV	CV	CV		CV			
Pyxidinopsis pontus ms.	4%	CV		CV					
Senegalinium dilwynense							cf.		
Spinidinium/Vozzhennikovia spp.		5%	3%	13%	26%	17%			
Spiniferites spp.	41%	49%	28%	X	3%	17%			
Systematophora placacantha	1%		3%						
Tectatodinium marlum †		X	cf.						
Thalassiphora pelagica				X	X				
Vozzhennikovia rotunda		X	X	X					
Total Microplankton Count:	**73**	**41**	**75**	**15**	**39**	**6**	**28**	**0**	**0**
Combined SP + MP count:	**116**	**87**	**115**	**33**	**148**	**109**	**121**	**129**	**45**
MP % of SP + MP count:	62.9%	47.1%	65.2%	45.5%	26.4%	5.5%	23.1%		
Other Palynomorphs as % of total count									
Fungal fruiting bodies						0.9%			
Fungal spores & hyphae	2.5%	2.1%	1.5%		5.1%	6.0%	1.6%	1.5%	6.3%
Botryococcus braunii					0.6%				
Microforaminiferal liners	2.5%	3.2%	1.5%	X					
Scolecodonts		1.1%							
Reworked Spore-pollen			0.8%		0.6%				
Plicatipollenites spp. (Permian)	RW								
Caved microplankton		2.1%	9.8%	17.5%					
Total Others Count:	**6**	**8**	**18**	**7**	**10**	**8**	**2**	**2**	**3**
TOTAL COUNT:	**122**	**95**	**133**	**40**	**158**	**117**	**123**	**131**	**48**

† Unpublished manuscript species name.

Abbreviations:

X = Species present but not recorded in count.

RW = Reworked species.

CV = Caved species.

cf = Compare with species.

Species abundances and occurrences in Melville–1, Gippsland Basin.

Sample Type:	Cutts	Cutts	Cutts	Cutts	SWC	Cutts	Cutts	SWC	Cutts
Depth (metres):	2585	2605	2640	2690	2755	2780	2820	2841.5	2865
Spore-Pollen as % of SP count									
Aequitriradites spinulosus					X		0.8%		
Angiosperm pollen undiff.				1.7%	0.7%			3.1%	X
Araucariacites australis			1.2%	1.7%	3.9%		3.2%		
Australopollis obscurus	1.7%								
Baculatisporites spp.	0.9%	2.7%		3.4%	0.7%	1.9%	0.8%	0.8%	
Battenipollis croccodilus †							0.8%	6.3%	
Battenipollis sectilis						1.9%	0.8%	4.7%	
Camarozonosporites bullatus							X		
Camarozonosporites heskermensis					X				
Camarozonosporites horrendus †								X	
Ceratosporites equalis								X	
Clavifera triplex	X								
Cupressacites sp.	1.7%	1.8%		1.7%	0.7%			X	
Cyathidites splendens		X	X	X	X		X	X	
Cyathidites spp. large >40µm	6.9%	0.9%	4.8%	1.7%	3.3%	1.9%	4.0%	3.1%	
Cyathidites spp. small <40µm	0.9%	0.9%	3.6%	3.4%	2.6%	X	7.2%	10.9%	X
Densoisporites velatus								0.8%	
Dicotetradites clavatus					0.7%			X	
Dictyophyllidites spp.			1.2%						
Dilwynites granulatus	7.8%	5.4%	4.8%		1.3%				
Ericipites scabratus		0.9%							
Forcipites longus				X			0.8%	1.6%	
Gambierina rudata	3.4%		1.2%	11.2%	9.2%	5.7%	2.4%	7.0%	
Gleicheniidites circinidites	3.4%	0.9%		0.9%	0.7%	1.9%	3.2%	0.8%	X
Grapnelispora evansii				0.9%					
Gymnosperm pollen undiff.								0.8%	
Haloragacidites harrisii		0.9%	6.0%			CV			
Herkosporites elliottii	0.9%	0.9%			X			3.1%	
Ilexpollenites spp.		X							
Laevigatosporites major								X	X
Laevigatosporites ovatus	3.4%	0.9%	2.4%	3.4%	1.3%	3.8%	0.8%	6.3%	X
Latrobosporites amplus			1.2%	X	X			X	
Latrobosporites crassus		X					0.8%		
Liliacidites spp.							1.6%		
Lygistepollenites balmei	6.9%	0.9%	6.0%	1.7%		1.9%	2.4%	X	
Lygistepollenites florinii	3.4%	6.3%	6.0%	5.2%	1.3%	1.9%	2.4%	0.8%	X
Microalatidites paleogenicus	0.9%								
Microcachryidites antarcticus	2.7%		1.7%	2.6%	5.7%	1.6%	0.8%		
Nothofagidites endurus	0.9%	1.2%	0.9%	2.6%	1.9%	1.6%	2.3%		
Nothofagidites senectus				2.0%		6.4%	8.6%		
Osmundacidites wellmanii						0.8%			

Continued…

Species abundances and occurrences in Melville–1 (continued).

Sample Type:	Cutts	Cutts	Cutts	Cutts	SWC	Cutts	Cutts	SWC	Cutts
Depth (metres):	2585	2605	2640	2690	2755	2780	2820	2841.5	2865
Spore-Pollen as % of SP count									
Peninsulapollis gillii		0.9%	1.2%	0.9%	4.6%	1.9%	0.8%	0.8%	
Perotrilites majus							0.8%	cf.	
Phyllocladidites mawsonii	7.8%	7.1%	9.6%	8.6%	13.2%	5.7%	8.0%	2.3%	X
Podocarpidites spp.	28.4%	52.7%	21.7%	13.8%	22.4%	49.1%	9.6%	10.2%	X
Polypodiidites spp		0.9%	1.2%						
Proteacidites angulatus	2.6%	X							
Proteacidites clinei †				X	1.3%				
Proteacidites grandis			1.2%						
Proteacidites otwayensis †							0.8%		
Proteacidites palisadus							1.6%		
Proteacidites reticuloconcavus †				1.7%	0.7%				
Proteacidites spp.	6.9%	3.6%	18.1%	19.0%	15.8%	3.8%	20.0%	10.2%	
Retitriletes spp.				2.6%	0.7%	3.8%	1.6%	2.3%	
Rotverrusporites stellatus †			X						
Stereisporites antiquisporites	8.6%	X		1.7%	2.6%		4.8%	1.6%	
Stereisporites regium							0.8%		
Tetracolporites verrucosus					X				
Trichotomosulcites subgranulatus	0.9%	0.9%		5.2%	0.7%	1.9%		0.8%	
Tricolp(or)ates spp.		5.4%	3.6%	2.6%	2.0%	1.9%	0.8%	4.7%	
Tricolpites confessus				0.9%	0.7%				
Tricolpites waiparaensis							1.6%	0.8%	
Tricolporites lilliei				cf.	0.7%		2.4%	2.3%	
Trilete spores undiff.	0.9%	0.9%	1.2%	0.9%		1.9%	4.0%	1.6%	
Triporoletes reticulatus						1.9%			
Triporopollenites spp.	X		1.2%		1.3%			0.8%	
Tripunctisporis maastrichtiensis		X	1.2%	2.6%	X				
Total spores:	26%	9%	17%	22%	12%	17%	30%	31%	
Total Gymnosperms:	59%	79%	49%	40%	46%	66%	27%	16%	
Total Angiosperms:	15%	13%	34%	39%	42%	17%	42%	53%	
Total Spore-Pollen Count:	**116**	**112**	**83**	**116**	**152**	**53**	**125**	**128**	

Continued…

Species abundances and occurrences in Melville–1 (continued).

Sample Type:	Cutts	Cutts	Cutts	Cutts	SWC	Cutts	Cutts	SWC	Cutts
Depth (metres):	2585	2605	2640	2690	2755	2780	2820	2841.5	2865
Microplankton as % of MP count									
Alisocysta margarita		4%							
Amosopollis cruciformis	90%	4%	5%	50%		33%			
Circulisporites parvus		4%						100%	
Deflandrea speciosus		X	11%			CV			
Glaphyrocysta retiintexta		11%				CV	CV		
Hystrichosphaeridium tubiferum			18%						
Impagidinium spp.			X						
Microplankton undiff.	10%	25%	13%	17%		50%			
Morkallacysta sp.		cf.		cf.					
Operculodinium centrocarpum		X	8%						
Paralecaniella indentata			26%	X			50%		X
Protoellipsodinium simplex ms.			CV						CV
Spinidinium/Vozzhennikovia spp.		46%				17%			
Spiniferites spp.	CV	7%	11%	33%					
Trithyrodinium evittii			8%						
Total Microplankton Count:	**20**	**28**	**38**	**6**	**0**	**6**	**2**	**1**	
Combined SP + MP count:	**136**	**140**	**121**	**122**	**152**	**59**	**127**	**129**	
MP % of SP + MP count:	14.7%	20.0%	31.4%	4.9%		10.2%	1.6%	0.8%	
Other Palynomorphs as % of total count									
Fungal fruiting bodies		1.3%							
Fungal spores & hyphae	3.5%	4.7%	0.8%	2.4%	5.0%			5.1%	
Botryococcus braunii				X					
Reworked Spore-pollen						3.3%	0.8%		
Neoraistrickia truncata				RW					
Pilosisporites notensis					RW				
Caved microplankton			2.4%				0.8%		
Total Others Count:	**5**	**9**	**4**	**3**	**8**	**2**	**2**	**7**	
TOTAL COUNT:	**141**	**149**	**125**	**125**	**160**	**61**	**129**	**136**	

† Unpublished manuscript species name.

Abbreviations:

X = Species present but not recorded in count.

RW = Reworked species.

CV = Caved species.

cf = Compare with species.

Species abundances and occurrences in Melville–1, Gippsland Basin.

Sample Type:	Cutts	Cutts	Cutts	SWC	Cutts	SWC	Cutts	Cutts	Cutts
Depth (metres):	2880	2915	2960	2975	3030	3039	3075	3155	3185
Spore-Pollen as % of SP count									
Aequitriradites spinulosus	0.8%				0.7%				
Appendicisporites distocarinatus				0.9%					0.7%
Araucariacites australis	3.3%		1.9%	3.7%			1.9%	0.7%	7.4%
Arcellites disciformis								0.7%	
Australopollis obscurus				1.9%	0.7%			1.4%	0.7%
Baculatisporites spp.				5.6%	5.9%	10.3%		1.4%	
Balmeisporites holodictyus				0.9%				0.7%	
Battenipollis croccodilus †				CV?					
Camarozonosporites australiense		X			X				
Ceratosporites equalis						X			X
Cicatricosisporites/Ruffordiaspora sp.	0.8%	0.6%		4.6%		0.9%		2.1%	
Clavifera triplex				X		0.9%			
Coptospora pileolus †								X	
Corollina torosa						X			0.7%
Crybelosporites striatus		RW			cf.				X
Cupressacites sp.								0.7%	X
Cyatheacidites tectifera				0.9%		6.5%			
Cyathidites splendens	X	X	X						
Cyathidites spp. large >40µm	1.6%	1.8%	2.8%	3.7%	0.7%	3.7%		2.1%	3.7%
Cyathidites spp. small <40µm	4.9%	2.4%	8.5%	24.1%	3.0%	9.3%	3.8%	4.1%	8.8%
Dacrycarpites australiensis		X			X				
Densoisporites velatus	1.6%	1.8%			0.7%				
Dictyophyllidites spp.	1.6%	1.2%	0.9%	1.9%	2.2%	4.7%		0.7%	0.7%
Dilwynites granulatus	0.8%		0.9%				1.9%	0.7%	6.6%
Forcipites sabulosus	1.6%	0.6%		CV?					
Foveogleicheniidites confossus				X		X			
Gleicheniidites circinidites	2.4%	19.2%	17.0%	4.6%	10.4%	12.1%	13.3%	8.9%	3.7%
Gymnosperm pollen undiff.		0.6%			1.5%				0.7%
Herkosporites elliottii	1.6%			0.9%		3.7%		1.4%	
Laevigatosporites major			X			X			
Laevigatosporites musa †				1.9%				X	
Laevigatosporites ovatus	2.4%	4.8%	3.8%	1.9%	1.5%		1.9%	11.6%	2.9%
Latrobosporites amplus				X					
Lygistepollenites balmei	0.8%								
Lygistepollenites florinii	0.8%	0.6%		0.9%	1.5%				
Microcachryidites antarcticus	4.1%	1.2%	7.5%		4.4%	X	2.9%	6.2%	6.6%
Nothofagidites senectus	2.4%		1.9%						
Osmundacidites wellmanii		0.6%		1.9%		0.9%			1.5%
Peninsulapollis gillii	1.6%								CV?
Peromonolites spp.				1.9%					
Perotrilites majus					0.7%	0.9%		X	0.7%

Continued…

Sample Type:	Cutts	Cutts	Cutts	SWC	Cutts	SWC	Cutts	Cutts	Cutts
Depth (metres):	2880	2915	2960	2975	3030	3039	3075	3155	3185
Spore-Pollen as % of SP count									
Phyllocladidites eunuchus †				0.9%	0.7%		2.9%		
Phyllocladidites mawsonii	19.5%	20.4%	12.3%		8.9%	0.9%	4.8%	0.7%	1.5%
Podocarpidites spp.	17.9%	29.3%	24.5%	17.6%	40.7%	28.0%	58.1%	32.9%	25.7%
Proteacidites spp.	17.9%	1.8%	0.9%						
Retitriletes spp.	0.8%	0.6%	2.8%	2.8%	1.5%	7.5%		1.4%	
Rugulatisporites mallatus		X	X		X				
Rugulatisporites robustus †				X		X		X	
Stereisporites antiquisporites	0.8%	1.8%					1.9%	2.7%	X
Trichotomosulcites subgranulatus	1.6%	6.0%	11.3%	0.9%	5.9%	1.9%	5.7%	15.1%	24.3%
Tricolp(or)ates spp.	3.3%	0.6%	0.9%		1.5%		1.0%	0.7%	
Tricolpites confessus	3.3%	1.8%	0.9%						
Tricolporites lilliei				CV					
Trilete spores undiff.	1.6%	2.4%	0.9%	11.1%	3.7%	4.7%		2.1%	0.7%
Triporoletes reticulatus								0.7%	
Triporopollenites spp.						0.9%			
Verrucosisporites admirabilis †				1.9%	3.0%	1.9%		0.7%	1.5%
Total spores:	21%	37%	37%	71%	34%	68%	21%	41%	25%
Total Gymnosperms:	49%	58%	58%	24%	64%	31%	78%	57%	74%
Total Angiosperms:	30%	5%	5%	5%	2%	1%	1%	2%	1%
Total Spore-Pollen Count:	**123**	**167**	**106**	**108**	**135**	**107**	**105**	**146**	**136**
Microplankton as % of MP count									
Amosopollis cruciformis				X	X			X	X
Circulisporites parvus						X		100%	
Morkallacysta sp.				100%					
Operculodinium centrocarpum	CV		CV						
Spiniferites spp.		CV							
Total Microplankton Count:	**0**	**1**	**1**	**1**	**0**	**0**	**0**	**1**	**0**
Combined SP + MP count:	**123**	**168**	**107**	**109**	**135**	**107**	**105**	**147**	**136**
MP % of SP + MP count:		0.6%	0.9%	0.9%				0.7%	
Other Palynomorphs as % of total count									
Fungal fruiting bodies							0.9%		X
Fungal spores & hyphae	1.6%						3.6%		4.2%
Reworked Spore-pollen	1.6%	0.6%		0.9%					0.7%
Microbaculatispora spp.				RW					
Murospora florida					RW				
Neoraistrickia truncata					RW			RW	
Striatoabietes multistriatus									RW
Caved microplankton	1.6%								
Total Others Count:	**6**	**1**		**1**			**5**		**7**
TOTAL COUNT:	**129**	**169**	**107**	**110**	**135**	**107**	**110**	**147**	**143**

† Unpublished manuscript species name.

Abbreviations:

X = Species present but not recorded in count.
CV = Caved species.
RW = Reworked species.
cf = Compare with species.

Appendix D: Vitrinite Reflectance Summary

Vitrinite Reflectance Analyses

by Alan C Cook

KK # Ref #.	Depth (m) /Type	$\overline{R}_v$max	Range	N	Sample description including liptinite fluorescence, maceral abundances, mineral fluorescence
T8368 Ctgs	2060-2070 $\overline{R}_I$max	0.40 0.98	0.26-0.50 0.64-1.31	15 7	Rare lamalginite yellow to orange. (Calcareous claystone> carbonate. Dom sparse, V=L>L. Vitrinite and inertinite sparse, liptinite rare. Fossil fragments abundant. Mineral fluorescence pervasive orange to dull orange. Iron oxides rare. Pyrite common.)
T8369 Ctgs	2280-2290 $\overline{R}_I$max	0.43 0.71	0.32-0.53 -	9 1	Rare lamalginite yellow. (Carbonate>sandstone>calcareous claystone. Dom rare, V>I>L. All three maceral groups rare. Fossil fragments sparse. Reworked vitrinite rare. Mineral fluorescence absent. Iron oxides major. Pyrite sparse.)
T8370 SWC-#26	2804 $\overline{R}_I$max	0.57 1.31	0.51-0.63 0.89-1.90	16 15	Rare sporinite and lamalginite orange. (Siltstone>claystone. Dom abundant, I>V>L. Inertinite abundant, vitrinite sparse, liptinite rare. Mineral fluorescence pervasive orange to dull orange. Iron oxides sparse. Pyrite abundant.)
T8371 SWC-#21	2901.5 $\overline{R}_I$max	0.56 1.40	0.53-0.59 1.20-1.64	2 5	Rare liptodetrinite yellow to orange. (Sandstone>carbonate. Dom rare, I>V>L. All three maceral groups rare. Mineral fluorescence patchy moderate orange to dull orange. Iron oxides rare. Pyrite sparse.)
T8372 SWC-#17	2975.5 $\overline{R}_I$max	0.56 1.44	0.54-0.56 1.05-1.98	4 15	Rare lamalginite orange, rare cutinite dull orange. (Carbonate> calcareous siltstone. Dom abundant, I>>L>V. Inertinite abundant, liptinite and vitrinite rare. Mineral fluorescence pervasive moderate orange to dull orange. Iron oxides sparse. Pyrite major.)
T8373 SWC-#13	3084.3 $\overline{R}_I$max	0.61 1.38	0.51-0.69 0.93-2.15	10 14	Fluorescing liptinite absent. (Siltstone>> carbonate>"coal". "Coal" sparse, vitrite probably represents rafted logs. Dom abundant, I>>V. Inertinite abundant, liptinite and liptinite absent. A single grain of natural coke, R 2.28%, is present, isotropic and presumably from mud cake. Mineral fluorescence weakly patchy moderate orange to weak dull orange. Iron oxides common. Pyrite sparse.)

ACC Wednesday, 6 March 2002

ATTACHMENTS

1. Wireline Logs

1.1 Combined_csi_check_shot.pds
1.2 Combined_cst.pds
1.3 Combined_nuclear_200.pds
1.4 Combined_nuclear_500.pds
1.5 Combined_sonic_200.pds
1.6 Combined_sonic_500.pds
1.7 HALS_DSI_TLD_MCFL_075LUP_ML.DLIS
1.8 HALS_DSI_TLD_MCFL_077PUP_RL_ML.DLIS
1.9 Melville_1_hals_dsi_tld_mcfl_Mainlog_075lup.dlis
1.10 Melville_1_hals_dsi_tld_mcfl_Repeat_077pup.dlis
1.11 Melville_1_seis_csi_084lnp.dlis
1.12 Melville_1-131414-seis_csi_084lnp.dlis

2. MWD/LWD Logs

2.1 ARC_VISIONResistivity_200MD.pdf
2.2 ARC_VISIONResistivity_500MD.pdf
2.3 CDR_Resisitivity_200MD.pdf
2.4 CDR_Resisitivity_500MD.pdf
2.5 Melville-1_DLIS_1225section.dlis
2.6 Melville-1_DLIS_85_section.dlis
2.7 ARC_VISIONResisitivity_Ascii
2.8 CDR_Resisitivity_Ascii
2.9 Melville-1_Survey.TXT

3. Mudlog

3.1 Melville-1LogHeader.pdf
3.2 Melville1_mlog.pdf
3.3 Melville1%Lith.txt
3.4 Melville1Descriptions.txt
3.5 Melville1InterpLith.txt
3.6 Melville1_drill.pdf
3.7 Melville1_press.pdf
3.8 Melville1_press_sum.pdf
3.9 Melville1geopress.asc
3.10 Melville1_chromdat_1430-3345mtd.asc
3.11 Melville1_drilldata_50-3345mtd.asc
3.12 Melville1_gasdata_1430-3345mtd.asc
3.13 Melville1calcimetry.asc
3.14 Melville1chrom.asc
3.15 Melville1drill.asc
3.16 Melville1totalgas.asc