9111-C80-3-1

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# WELL SUMMARY

# FOR

# COLUMBIA GAS DEVELOPMENT OF CANADA

# COLUMBIA et al KOTANEELEE YT-I-48

# WELL SUMMARY

# FOR

# COLUMBIA GAS DEVELOPMENT OF CANADA

# COLUMBIA et al KOTANEELEE YT-I-48

CONTENTS



PREPARED BY


INTERNATIONAL DRILLING FLUIDS

TECHNICAL SERVICES DEPARTMENT


JULY 1991

**COLUMBIA GAS DEVELOPMENT OF CANADA**

**COLUMBIA et al KOTANEELEE YT-I-48**

**WELL DATA**

| | |
|---|---|
| **RIG:** | KENTING HI-TOWER #07 |
| **DATE SPUDDED:** | RE-ENTRY APRIL 29, 1991 |
| **DATE RIG RELEASED:** | JUNE 24, 1991 |
| **TOTAL DEPTH:** | 3915m |
| **TOTAL DAYS:** | 58 |

| CASING | DEPTH | FLUID TYPE | DAYS | INTERVAL COST PROGRAMMED | ACTUAL |
|---|---|---|---|---|---|
| 178mm (Liner) | 3273m | Gel/Chemical/Wtd | 26 | $ 12,040.00 | $ 27,242.50 |
| 127mm | 3915m | Polymer/Wtd | 32 | 70,340.00 | 117,875.80 |
| | | **WELL TOTAL** | | **$ 82,380.00** | **$ 145,118.30** |

**OPERATOR REPRESENTATIVE:** Mr. Harold Rugg
Mr. Bob Toole
Mr. Neil Bliss

**CONTRACTOR REPRESENTATIVE:** Mr. Jim Signer
Mr. Phil Bosomworth

**IDF ENGINEER:** Mr. Rick Reinhart
Mr. Jim Wieler

**All costs based on field estimates and at published book price.**

**COLUMBIA GAS DEVELOPMENT OF CANADA**

**COLUMBIA et al KOTANEELEE YT-I-48**

**MATERIAL CONSUMPTION BY INTERVAL**

**HOLE SIZE:** **178mm CASING**

**FLUID TYPE:** **GEL/CHEMICAL/WTD**

| PRODUCT | UNIT SIZE | QUANTITY | UNIT PRICE | TOTAL COST |
|---|---|---|---|---|
| Gel | 100lb | 390 | $ 10.00 | $ 3,900.00 |
| Barite | 40kg | 1629 | 12.50 | 20,362.00 |
| Caustic Soda | 50lb | 30 | 30.00 | 900.00 |
| Soda Ash | 40kg | 12 | 20.00 | 240.00 |
| Sulban | 19kg | 6 | 250.00 | 1,500.00 |
| Sodium Bicarbonate | 100lb | 5 | 40.00 | 140.00 |
| Sawdust | sacks | 28 | 5.00 | 137.20 |

**INTERVAL TOTAL** **$ 27,242.50**

**COLUMBIA GAS DEVELOPMENT OF CANADA**

**COLUMBIA et al KOTANEELEE YT-I-48**

**MATERIAL CONSUMPTION BY INTERVAL**

**HOLE SIZE:** **152mm**

**FLUID TYPE:** **POLYMER/WTD**

| PRODUCT | UNIT SIZE | QUANTITY | UNIT PRICE | TOTAL COST |
|---|---|---|---|---|
| Barite | 40kg | 2260 | $ 12.50 | $ 28,250.00 |
| Caustic Soda | 50lb | 44 | 30.00 | 1,320.00 |
| Soda Ash | 40kg | 28 | 20.00 | 560.00 |
| Sulban | 19kg | 14 | 250.00 | 3,500.00 |
| Lime | 25kg | 20 | 8.58 | 171.60 |
| Sawdust | sacks | 160 | 5.00 | 800.00 |
| Kwikseal | 40lb | 75 | 26.00 | 1,950.00 |
| **IDF-FLR** | 50lb | 45 | 160.00 | 7,200.00 |
| Drispac S. Lo | 50lb | 56 | 162.40 | 9,094.40 |
| ASP-721 | 20L | 56 | 135.00 | 7,560.00 |
| **IDVIS D** | 25kg | 40 | 420.00 | 16,800.00 |
| PTS-200 | 20L | 69 | 260.00 | 17,940.00 |
| X-Cide | 6lb | 40 | 140.00 | 5,600.00 |
| Sodium Sulfite | 50lb | 30 | 49.00 | 1,470.70 |
| Defoamer | 20L | 19 | 150.00 | 2,850.00 |
| Flo Plex | 50lb | 21 | 125.00 | 2,625.00 |
| Glass Beads | 50lb | 36 | 80.00 | 2,880.00 |
| **IDF FCL** | 25kg | 10 | 32.00 | 320.00 |
| Visplex | 25kg | 1 | 225.00 | 225.00 |
| Celloflake | 25lb | 40 | 23.10 | 924.00 |
| Mica | 25kg | 20 | 15.89 | 317.80 |
| DFLC | 25lb | 31 | 178.00 | 5,518.00 |

**INTERVAL TOTAL** **$ 117,875.80**

**COLUMBIA GAS DEVELOPMENT OF CANADA**

**COLUMBIA et al KOTANEELEE YT-I-48**

**MATERIAL CONSUMPTION BY INTERVAL**

**TOTALS FOR WELL**

| PRODUCT | UNIT SIZE | QUANTITY | UNIT PRICE | TOTAL COST |
|---|---|---|---|---|
| Mica | 25kg | 20 | $ 15.89 | $ 317.80 |
| Gel | 100lb | 390 | 10.00 | 3,900.00 |
| Barite | 40kg | 3889 | 12.50 | 48,612.50 |
| Caustic Soda | 50lb | 74 | 30.00 | 2,220.00 |
| Soda Ash | 40kg | 40 | 20.00 | 800.00 |
| Sulban | 19kg | 20 | 250.00 | 5,000.00 |
| Sodium Bicarbonate | 100lb | 5 | 40.00 | 200.00 |
| Sawdust | sacks | 188 | 5.00 | 940.00 |
| Lime | 25kg | 20 | 8.58 | 171.60 |
| Kwikseal | 40lb | 56 | 26.00 | 1,950.00 |
| **IDF-FLR** | 50lb | 45 | 160.00 | 7,200.00 |
| Drispac | 50lb | 56 | 162.40 | 9,094.40 |
| ASP-721 | 20L | 56 | 135.00 | 7,560.00 |
| **IDVIS D** | 25kg | 40 | 420.00 | 16,800.00 |
| PTS-200 | 20L | 69 | 260.00 | 17,940.00 |
| **IDF FCL** | 25kg | 10 | 32.00 | 320.00 |
| X-Cide | 6lb | 40 | 140.00 | 5,600.00 |
| Sodium Sulfite | 50lb | 30 | 49.00 | 1,470.00 |
| Defoamer | 20L | 19 | 150.00 | 2,850.00 |
| Glass Beads | 50lb | 36 | 80.00 | 2,880.00 |
| Visplex | 25kg | 1 | 225.00 | 225.00 |
| Flo Plex | 50lb | 21 | 125.00 | 2,625.00 |
| Celloflake | 25lb | 40 | 23.10 | 924.00 |
| DFLC | 25lb | 31 | 178.00 | 5,518.00 |

**WELL TOTAL** **$ 145,118.30**

**COLUMBIA GAS DEVELOPMENT OF CANADA**

**COLUMBIA et al KOTANEELEE YT-I-48**

## DISCUSSION BY INTERVALS

**HOLE SIZE:** **178mm CASING**

**MUD TYPE:** **GEL/CHEMICAL (Weighted)**

Mixed 90m³ of kill mud at 1200kg/m³. Displaced the hole to mud and built volume increasing the yeild point to a level high enough to suspend the Barite. The possibility of $H_2S$ required raising and controlling the pH at 11.0 with Caustic Soda. Also pre-treated with 1.6kg/m³ of Sulban ($H_2S$ Scavenger). Mixed a Barite pill prior to each trip (45 sacks) which continued to increase the density. Controlled the density at 1200kg/m³ with water dilution at 20/L min. when circulating. Due to the high bottom hole temperature of approximately 350°F the viscosity at the shaker was 20 to 40 sec/L higher than at the suction. Set a bridge plug at 3331 metres. Whipstock packer at 3277 metres, logged and ran in with mill. Milled a window in the 178mm casing. Kicked off and drilled 152mm hole to 3290 metres.

**HOLE SIZE:** **152mm**

**MUD TYPE:** **POLYMER (Weighted)**

Pre-mixed a weighted Polymer system on May 25, 1991. Displaced the hole over to the Polymer system and built volume and condition the mud. Drilled ahead, mixing 1 jug of X-Cide and 3 pails PTS-200 daily to prevent the Polymers from breaking down due to the high bottom hole temperature (350°F+). Maintained the viscosity at 35-45 s/L using **IDVIS D** and ASP-721. Controlled pH at 10.5 using Caustic Soda. The Yield point was 10 (Pa) until 3435 metres and then started to climb to 14. Increased $H_2O$ additions and added 27 sacks **IDF FCL** to lower the yield point. ASP-721 additions were stopped on June 8th at 3530 metres and resumed on June 17th at 3680. The fluid loss climbed from 10mL to 37mL. Used Drispac S. Lo and **IDF-FLR** to control the filtrate. Fluid loss was very unstable until additions of Flo Plex (3.7kg/m³) at 3800 metres. Fluid loss dropped below 8mL.

While drilling from 3784 metres - 3822 metres, the hole took approximately 8m³ fluid. Prior to a trip out with Bit #17, a 14m³ L.C.M. pill was spotted in the annulus. No further losses were encountered while drilling. TD was 3915 metres. Logged and ran 127mm liner. Lost approximately 21m³ while running liner. Pumped L.C.M. and by passed shaker screens while circulating prior to cementing.

## COLUMBIA GAS DEVELOPMENT OF CANADA

## COLUMBIA et al KOTANEELEE YT-I-48

## CONCLUSIONS AND RECOMMENDATIONS

**HOLE SIZE:** **178mm CASING**

**MUD TYPE:** **GEL/CHEMICAL (Weighted)**

Pre-mixed a weighted Gel system prior to drilling out the bridge plug. The density was raised to 1200kg/$m^3$ due to expected gas pressures. Maintained the pH at 10.5-11.0 and pre-treated with .6kg/$m^3$ Sulban due to the possibility of $H_2S$. This mud system was used to cut a window in the casing at 3273 metres with no problems.

**HOLE SIZE:** **152mm**

**MUD TYPE:** **POLYMER**

Pre-mixed and displaced the hole with a weighted Polymer system after the window was cut in the casing. The Polymer system was used to prevent any damage to the producing formation. The density was controlled in the 1180-1210kg/$m^3$ range due to the possibility of high formation pressures. The hole was directionally drilled to stay away from the old hole. Fished for cones at 3664 metres and 3695 metres. The hole was in good shape and no problems were encountered other then the difficulty keeping the fluid loss down. Flo Plex was added to lower fluid loss below 12mL and no further problems were reported.

## COLUMBIA GAS DEVELOPMENT OF CANADA

## COLUMBIA et al KOTANEELEE YT-I-48

### PROGRAMMED PRODUCT COST DISCUSSION

| | | |
|---|---|---|
| **Programmed Product Cost** | **$** | **82,380.00** |
| **Actual Cost** | **$** | **145,118.30** |

### PRODUCT COST SUMMARY vs PROGRAMMED COST

| Product | Programmed Usage | Actual Usage | Cost Difference | Reason For Use |
|---|---|---|---|---|
| Bentonite | 200 | 390 | $ 1,900.00 | viscosity |
| Barite | 1800 | 3889 | 26,112.50 | density |
| Bicarbonate | 50 | 5 | (1,800.00) | cement contamination |
| Caustic Soda | 42 | 74 | 960.00 | pH control |
| **IDBOND** (ASP 721) | 50 | 56 | 810.00 | shale control |
| **IDF FCL** | 40 | 10 | (960.00) | thinner |
| Soda Ash | 5 | 40 | 700.00 | water hardness control |
| X-Cide 207 | 20 | 40 | 2,800.00 | Biocide |
| **IDF-FLR** (Drispac) | 60 | 101 | 6,560.00 | fluid loss |
| DFLC | 30 | 31 | 178.00 | thinner |
| **IDVIS D** | 25 | 40 | 6,300.00 | viscosity |
| PTS 200 | 80 | 69 | (2,860.00) | temperature stability |
| Mica | -- | 20 | 317.80 | LCM |
| Sulban | -- | 20 | 5,000.00 | $H_2S$ Scavenger |
| Sawdust | -- | 188 | 940.00 | LCM |
| Lime | -- | 20 | 171.60 | camp use |
| Kwik-Seal | -- | 56 | 1,950.00 | LCM |
| Sodium Sulphite | -- | 30 | 1,470.00 | polymer stability |
| **DEFOAMER** | -- | 19 | 2,850.00 | gas entrapment |
| Glass Beads | -- | 36 | 2,880.00 | torque reducer |
| **VISPLEX** | -- | 1 | 225.00 | viscosity |
| **FLOPLEX** | -- | 21 | 2,625.00 | fluid loss |
| Celloflake | -- | 40 | 924.00 | LCM |

**COLUMBIA GAS DEVELOPMENT OF CANADA**

**COLUMBIA et al KOTANEELEE YT-I-48**

## PRODUCT USE DISCUSSION

### WORKOVER

The product cost for the workover section of the re-entry was $15,000.00 over our estimated program cost. This overrun was due to the time spent on this section (estimated 4 days, actual 26 days) and the Barite used for trip pills during this time ($12,000.00). Extra Bentonite, Caustic Soda and four pails of Sulban accounted for the balance of the cost in excess of the estimate.

### RE-DRILL

The re-drill section of the project was accomplished within the programmed time frame, but the product cost was $47,500.00 above the programmed estimate. Barite use was again the biggest reason as about $14,000.00 over the programmed estimate was used. Trip pills and lost circulation accounted for the use. The centrifuge was used to reduce the density as it climbed above levels required for pressure control due to the many trip pills used.

Fluid loss control was the only drilling fluid problem experienced on this well. The programmed combination of **IDF-FLR**, Drispac, PTS 200 and Sodium Sulphite could not stabilize the fluid loss once bottom hole temperatures climbed to the expected high levels. **FLOPLEX** was brought to location and used to stabilize the fluid loss. Fluid loss control contributed to $7,800.00 of the cost over programmed estimate.

Lost circulation while drilling and running liner accounted for $4,200.00 of lost circulation material and losses of $7,200.00 of mud. The mud was on standby in a premix tank on location, but the cost to build the additional volume had not been included in our estimate.

Glass Beads were used to reduce torque between the casing and drillstring when kicking off ($2,880.00). Scavenger to control hydrogen sulphide ($5,000.00), Biocide to ensure bacteria did not become a problem ($2,800.00 above estimate) and **DEFOAMER** to reduce gas entrapment ($2,850.00) accounted for the balance of the cost over programmed estimate.

## COLUMBIA GAS DEVELOPMENT OF CANADA

## COLUMBIA et al KOTANEELEE YT-I-48

### FUTURE AREA WELLS or RE-ENTRIES

### PROGRAM RECOMMENDATIONS

1. The Polymer system is the best system to use on main hole or on a re-entry section in this area. It provides shale stability if these sections are in open hole, does not flocculate due to the high bottom hole temperatures and provides even cleaning ability through the different annular sizes. In addition, it appears that no formation damage was done as the well cleaned up and is producing as expected.

2. Programs for fluid loss control in the area will have to include product equivalent to **FLOPLEX** in the Polymer system. Conventional fluid loss polymers along with polymer stabilizers could not control the fluid loss adequately.

3. The balance between losses or gains from the producing formation appear to be very close, whole mud loss occurred both drilling and when running the casing. Although the losses were not severe on this well potential for serious problems exist and should be planned for. High mud weight to fight pressure may contribute to losses that would cause a serious well control problem.

4. Use a storage shed for mud products on location. Product bags were on location for over three (3) months and the shrink wrap started to break down. Product loss could have been a greater problem if the weather turned worse.

**COLUMBIA GAS DEVELOPMENT OF CANADA**

**COLUMBIA et al KOTANEELEE YT-I-48**

## MATERIAL SUPPLY RECORD

| PRODUCT | RECEIVED | RETURNED | USED | COST | TOTAL |
|---|---|---|---|---|---|
| Mica | 20 | 0 | 20 | $ 15.89 | $ 317.80 |
| Gel | 665 | 275 | 390 | 10.00 | 3,900.00 |
| Caustic Soda | 210 | 136 | 74 | 30.00 | 2,220.00 |
| Barite | 6196 | 2307 | 3889 | 12.50 | 48,612.50 |
| Soda Ash | 40 | 0 | 40 | 20.00 | 800.00 |
| Sulban | 100 | 80 | 20 | 250.00 | 5,000.00 |
| Lime | 20 | 0 | 20 | 8.58 | 171.60 |
| Sodium Bicarbonate | 60 | 55 | 5 | 40.00 | 200.00 |
| Sawdust | 288 | 100 | 188 | 4.90 | 940.00 |
| **IDF-FLR** | 80 | 35 | 45 | 160.00 | 7,200.00 |
| Drispac S. Lo | 80 | 24 | 56 | 162.40 | 9,094.40 |
| ASP-721 | 80 | 24 | 56 | 135.00 | 7,560.00 |
| **IDVIS D** | 80 | 40 | 40 | 420.00 | 16,800.00 |
| PTS-200 | 158 | 89 | 69 | 260.00 | 17,940.00 |
| **IDF FCL** | 60 | 50 | 10 | 32.00 | 320.00 |
| X-Cide | 42 | 2 | 40 | 140.00 | 5,600.00 |
| Sodium Sulfite | 30 | 0 | 30 | 49.00 | 1,470.00 |
| Kwikseal | 150 | 75 | 75 | 26.00 | 1,950.00 |
| Defoamer | 20 | 1 | 19 | 150.00 | 2,850.00 |
| Visplex | 10 | 9 | 1 | 225.00 | 225.00 |
| Celloflake | 40 | 0 | 40 | 23.10 | 924.00 |
| Glass Beads | 64 | 28 | 36 | 80.00 | 2,880.00 |
| Flo Plex | 56 | 35 | 21 | 125.00 | 2,625.00 |
| DFLC | 35 | 4 | 31 | 178.00 | 5,518.00 |

| | |
|---|---|
| **MATERIAL COST** | **$ 145,118.30** |
| **ENGINEER COST** | **$ 21,375.00** |
| **SHRINKWRAPS** | **$ 3,060.00** |
| **FREIGHT** | **$ 30,852.50** |
| **PALLETS** | **$ 3,084.00** |
| **LOADING & UNLOADING** | **$ 693.54** |
| **POLY TARP** | **$ 150.00** |
| **FREIGHT ADJUSTMENT** | **$ 2,831.81** |
| **G.S.T.** | **$ 14,791.80** |
| **TOTAL COST** | **$ 221,930.25** |

**International Drilling Fluids Corporation**

# DAILY PRODUCT COST & LOCATION INVENTORY SUMMARY

REPORT NO. #01

WELL YT-T-48 OPERATOR COLGAS KOTANEELEE STOCK POINT FT. ST. JOHN

| | | DATE APR-29-1991 DEPTH | | | DATE DEPTH | | | DATE DEPTH | | | DATE DEPTH | | | DATE DEPTH | | | DATE DEPTH | | | DATE DEPTH | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | # | | | # | | | # | | | # | | | # | | | # | | | # | | | |
| PRODUCT | UNIT KG | ON HAND | REC'D | USED | ON HAND | REC'D | USED | ON HAND | REC'D | USED | ON HAND | REC'D | USED | ON HAND | REC'D | USED | ON HAND | REC'D | USED | ON HAND | REC'D | USED | BALANCE FORWARD |
| GEL | 45 | 665 | | $ | 10.00 | | | | | | | | | | | | | | | | | | |
| BARITE | 40 | 6196 | | $ | 17.50 | | | | | | | | | | | | | | | | | | |
| CAUSTIC | 23 | 210 | | $ | 30.00 | | | | | | | | | | | | | | | | | | |
| SODA ASH | 40 | 40 | | $ | 20.00 | | | | | | | | | | | | | | | | | | |
| SULFAN | 19 | 100 | | $ | 210.00 | | | | | | | | | | | | | | | | | | |
| LIME | 25 | 20 | | $ | 8.60 | | | | | | | | | | | | | | | | | | |
| BI-CARB | 45 | 60 | | $ | 40.00 | | | | | | | | | | | | | | | | | | |
| SAWDUST | 18 | 288 | | $ | 4.90 | | | | | | | | | | | | | | | | | | |
| F.C.L | 23 | 60 | | $ | 32.00 | | | | | | | | | | | | | | | | | | |
| F.L.R. REG. | 23 | 80 | | $ | 160.00 | | | | | | | | | | | | | | | | | | |
| DRISP. LO | 23 | 80 | | $ | 162.40 | | | | | | | | | | | | | | | | | | |
| ASP. 721 | 20/L | 80 | | $ | 100.00 | | | | | | | | | | | | | | | | | | |
| POLY TEMP | 25 | 50 | | $ | 559.30 | | | | | | | | | | | | | | | | | | |
| I.D.O/S-D | 25 | 80 | | $ | 420.00 | | | | | | | | | | | | | | | | | | |
| PTS-200 | 20/L | 158 | | $ | 260.00 | | | | | | | | | | | | | | | | | | |
| DFCL | 25 | 30 | | $ | 178.00 | | | | | | | | | | | | | | | | | | |
| X-CIDE | 6 LB | 42 | | $ | 140.00 | | | | | | | | | | | | | | | | | | |
| NA+ SULFITE | 50# | 30 | | $ | 49.70 | | | | | | | | | | | | | | | | | | |
| K SEAL-M | 18 | 150 | | $ | 23.80 | | | | | | | | | | | | | | | | | | |
| DEFOAMER | 20/L | 20 | | $ | 136.50 | | | | | | | | | | | | | | | | | | |
| DAILY MUD COST | | | | | | | | | | | | | | | | | | | | | | | |
| ENGINEERING COST | | | | | | | | | | | | | | | | | | | | | | | |
| TRUCKING COST | | | | | | | | | | | | | | | | | | | | | | | |
| TOTAL DAILY COST | | | | | | | | | | | | | | | | | | | | | | | |
| CUMULATIVE TOTAL COST | | | | | | | | | | | | | | | | | | | | | | | |

**International Drilling Fluids Corporation** — DAILY PRODUCT COST & LOCATION INVENTORY SUMMARY — REPORT NO: 1A.

WELL YT-I-48 OPERATOR COLGAS KOTANEELEE STOCK POINT FT. ST. JOHN

| PRODUCT | UNIT KG | DATE APR-29-91 DEPTH # | | | DATE DEPTH # | | | DATE DEPTH # | | | DATE DEPTH # | | | DATE DEPTH # | | | DATE DEPTH # | | | DATE DEPTH # | | | BALANCE FORWARD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ON HAND | REC'D | USED | ON HAND | REC'D | USED | ON HAND | REC'D | USED | ON HAND | REC'D | USED | ON HAND | REC'D | USED | ON HAND | REC'D | USED | ON HAND | REC'D | USED | |
| L.D. FREE | 20.3/L | 4 | | $ | 890.40 | | | | | | | | | | | | | | | | | | |
| DISPLEX | 25 | 10 | | $ | 250.00 | | | | | | | | | | | | | | | | | | |
| CACO3 GRIT | 25 | 112 | | $ | 5.90 | | | | | | | | | | | | | | | | | | |
| CELLOFLAKE | 11 | 40 | | $ | 23.10 | | | | | | | | | | | | | | | | | | |
| MICA-COARSE | 25 | 20 | | $ | 17.50 | | | | | | | | | | | | | | | | | | |
| WALNUT-C | 23 | 20 | | $ | 20.30 | | | | | | | | | | | | | | | | | | |
| PALLETS | - | 187 | | $ | 15.00 | | | | | | | | | | | | | | | | | | |
| GLASS BEADS (MAY 31) | | 64 | | $ | 80.00 | | | | | | | | | | | | | | | | | | |
| FLOPLEX (JUNE 2) | 50lb | 56 | | $ | 125.00 | | | | | | | | | | | | | | | | | | |
| DAILY MUD COST | | | | | | | | | | | | | | | | | | | | | | | |
| ENGINEERING COST | | | | | | | | | | | | | | | | | | | | | | | |
| TRUCKING COST | | | | | | | | | | | | | | | | | | | | | | | |
| TOTAL DAILY COST | | | | | | | | | | | | | | | | | | | | | | | |
| CUMULATIVE TOTAL COST | | | | | | | | | | | | | | | | | | | | | | | |

**International Drilling Fluids Corporation**

# DAILY PRODUCT COST & LOCATION INVENTORY SUMMARY

REPORT NO. 2

WELL ETAL KOTANEELEE OPERATOR COLUMBIA GAS STOCK POINT JUNE-16-1991 @ 20:00 HRS.

| | | DATE DELIVERED | DEPTH | | DATE | DEPTH | | DATE | DEPTH | | DATE USED | DEPTH | | DATE | DEPTH | | DATE | DEPTH | | DATE MAT. ON LOCATION | DEPTH | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | # | | | # | | | # | | | # | | | # | | | # | | | # | | | |
| PRODUCT | UNIT KG | ON HAND | REC'D | USED | ON HAND | REC'D | USED | ON HAND | REC'D | USED | ON HAND | REC'D | USED | ON HAND | REC'D | USED | ON HAND | REC'D | USED | ON HAND | REC'D | USED | BALANCE FORWARD |
| GEL | | 665 | | | | | | | | | 355 | | | | | | | | | | | | 310 |
| BARITE | | 6196 | | | | | | | | | 3585 | | | | | | | | | | | | 2611 |
| CAUSTIC | | 210 | | | | | | | | | 30 | | | | | | | | | | | | 180 |
| SODA ASH | | 40 | | | | | | | | | 16 | | | | | | | | | | | | 24 |
| SOLDAN | | 100 | | | | | | | | | 14 | | | | | | | | | | | | 86 |
| BI-CARB | | 60 | | | | | | | | | 5 | | | | | | | | | | | | 55 |
| F.L.R. | | 80 | | | | | | | | | 19 | | | | | | | | | | | | 61 |
| ASP-721 | | 80 | | | | | | | | | 26 | | | | | | | | | | | | 54 |
| L.D. VIS-D | | 80 | | | | | | | | | 33 | | | | | | | | | | | | 47 |
| PTS-200 | | 64 | | | | | | | | | 39 | | | | | | | | | | | | 25 |
| X-CIDE | | 42 | | | | | | | | | 22 | | | | | | | | | | | | 20 |
| SULPHITE | | 30 | | | | | | | | | 17 | | | | | | | | | | | | 13 |
| DEFOAM | | 20 | | | | | | | | | 11 | | | | | | | | | | | | 9 |
| SAWDUST | | 288 | | | | | | | | | 88 | | | | | | | | | | | | 200 |
| DRISPAC-LO | | 80 | | | | | | | | | 48 | | | | | | | | | | | | 36 |
| LIME | | 20 | | | | | | | | | 4 | | | | | | | | | | | | 16 |
| DFLC | | 30 | | | | | | | | | 27 | | | | | | | | | | | | 3 |
| BEADS | | 64 | | | | | | | | | 25 | | | | | | | | | | | | 39 |
| F.C.L. | | 60 | | | | | | | | | - | | | | | | | | | | | | 60 |
| POLY TEMP | | 50 | | | | | | | | | - | | | | | | | | | | | | 50 |
| DAILY MUD COST | | | | | | | | | | | | | | | | | | | | | | | |
| ENGINEERING COST | | | | | | | | | | | | | | | | | | | | | | | |
| TRUCKING COST | | | | | | | | | | | | | | | | | | | | | | | |
| TOTAL DAILY COST | | | | | | | | | | | | | | | | | | | | | | | |
| CUMULATIVE TOTAL COST | | | | | | | | | | | | | | | | | | | | | | | |

**International Drilling Fluids Corporation**

# DAILY PRODUCT COST & LOCATION INVENTORY SUMMARY

REPORT NO.

WELL ETAL KOTANEELEE OPERATOR COLUMBIA GAS STOCK POINT JONE-16@20,000 LBS.

| | | DATE DELIVERED DEPTH | | | DATE DEPTH | | | DATE DEPTH | | | DATE USED DEPTH | | | DATE DEPTH | | | DATE MAT. ON LOCATION DEPTH | | | DATE DEPTH | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
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| PRODUCT | UNIT KG | ON HAND | REC'D | USED | ON HAND | REC'D | USED | ON HAND | REC'D | USED | ON HAND | REC'D | USED | ON HAND | REC'D | USED | ON HAND | REC'D | USED | ON HAND | REC'D | USED | BALANCE FORWARD |
| K.SEAL-M | | 150 | | | | | | | | | - | | | | | | | | | | | | 150 |
| I.D. FREE | | 4 | | | | | | | | | - | | | | | | | | | | | | 4 |
| VISPLEX | | 25 | | | | | | | | | - | | | | | | | | | | | | 25 |
| CACO3 GRIT | | 112 | | | | | | | | | - | | | | | | | | | | | | 112 |
| CELLOFLAKE | | 40 | | | | | | | | | - | | | | | | | | | | | | 40 |
| MICA COARSE | | 20 | | | | | | | | | - | | | | | | | | | | | | 20 |
| WALNUT-C. | | 20 | | | | | | | | | - | | | | | | | | | | | | 20 |
| PALLETS | | 187 | | | | | | | | | ? | | | | | | | | | | | | 187 |
| SH.WRPS | | 187 | | | | | | | | | ? | | | | | | | | | | | | 187 |
| | | | | | | | | | | | | | | | | | | | | | | | |
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| DAILY MUD COST | | | | | | | | | | | | | | | | | | | | | | | |
| ENGINEERING COST | | | | | | | | | | | | | | | | | | | | | | | |
| TRUCKING COST | | | | | | | | | | | | | | | | | | | | | | | |
| TOTAL DAILY COST | | | | | | | | | | | | | | | | | | | | | | | |
| CUMULATIVE TOTAL COST | | | | | | | | | | | | | | | | | | | | | | | |

**International Drilling Fluids Corporation** DAILY PRODUCT COST & LOCATION INVENTORY SUMMARY REPORT NO. 3

WELL COLGAS et al KOTANELEE OPERATOR COLUMBIA GAS DEVEL. STOCK POINT FT. ST. JOHN

| | DATE 06-17 DEPTH 3685 | | | DATE 06-18 DEPTH 3695 | | | DATE 06-19 DEPTH 3733 | | | DATE 06-20 DEPTH 3772 | | | DATE 06-21 DEPTH 3790 | | | DATE 06-22 DEPTH 3820 | | | DATE 06-23 DEPTH 3887 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | # | | | # | | | # | | | # | | | # | | | # | | | # | | | |
| PRODUCT | ON HAND | REC'D | USED | ON HAND | REC'D | USED | ON HAND | REC'D | USED | ON HAND | REC'D | USED | ON HAND | REC'D | USED | ON HAND | REC'D | USED | ON HAND | REC'D | USED | BALANCE FORWARD |
| GEL | 310 | | | 310 | | | 310 | | | 310 | | | 310 | | | 310 | | | 310 | | | 310 |
| BARITE | 2611 | | 35 | 2576 | | 73 | 2503 | | 35 | 2468 | | | 2468 | | 35 | 2433 | | 35 | 2398 | | 10 | 2388 |
| CAUSTIC | 180 | | | 180 | | | 180 | | | 180 | | | 180 | | 2 | 178 | | | 178 | | 5 | 173 |
| SODA ASH | 24 | | | 24 | | | 24 | | | 24 | | | 24 | | | 24 | | | 24 | | 6 | 18 |
| SULBAN | 86 | | | 86 | | | 86 | | | 86 | | | 86 | | | 86 | | | 86 | | 4 | 82 |
| BICARB. | 55 | | | 55 | | | 55 | | | 55 | | | 55 | | | 55 | | | 55 | | | 55 |
| F.L.R. | 61 | | 1 | 60 | | 5 | 55 | | 6 | 49 | | | 49 | | 5 | 44 | | 6 | 38 | | 3 | 35 |
| A.S.P. 721 | 54 | | 3 | 51 | | 4 | 47 | | 10 | 37 | | 3 | 34 | | 2 | 32 | | 7 | 25 | | | 25 |
| IDVIS D | 47 | | | 47 | | | 47 | | 2 | 45 | | | 45 | | | 45 | | | 45 | | | 45 |
| PTS - 200 | 119 | | | 119 | | | 119 | | 4 | 115 | | | 115 | | 3 | 112 | | | 112 | | | 112 |
| X-CIDE | 20 | | 3 | 17 | | | 17 | | 2 | 15 | | 1 | 14 | | | 14 | | 1 | 13 | | 1 | 12 |
| SULFITE | 13 | | | 13 | | | 13 | | 1 | 12 | | 1 | 11 | | | 11 | | 1 | 10 | | 1 | 9 |
| DEFOAMER | 9 | | | 9 | | 1 | 8 | | | 8 | | | 8 | | | 8 | | | 8 | | 2 | 6 |
| SAWDUST | 200 | | | 200 | | | 200 | | | 200 | | | 200 | | | 200 | | 70 | 130 | | | 130 |
| DRISPAC LO | 32 | | | 32 | | | 32 | | | 32 | | 5 | 27 | | | 27 | | | 27 | | | |
| LIME | 16 | | | 16 | | | 16 | | | 16 | | | 16 | | | 16 | | | 16 | | | 16 |
| DEFL | 3 | | | 3 | | | 3 | | | 3 | | | 3 | | | 3 | | | 3 | | | 3 |
| BEADS | 39 | | | 39 | | | 39 | | | 39 | | | 39 | | | 39 | | | 39 | | 7 | 32 |
| FCL | 60 | | | 60 | | | 60 | | | 60 | | | 60 | | | 60 | | | 60 | | | 60 |
| POLYTEMP | 50 | | | 50 | | | 50 | | | 50 | | | 50 | | | 50 | | | 50 | | | 50 |
| DAILY MUD COST | | | | | | | | | | | | | | | | | | | | | | |
| ENGINEERING COST | | | | | | | | | | | | | | | | | | | | | | |
| TRUCKING COST | | | | | | | | | | | | | | | | | | | | | | |
| TOTAL DAILY COST | | | | | | | | | | | | | | | | | | | | | | |
| CUMULATIVE TOTAL COST | | | | | | | | | | | | | | | | | | | | | | |

**International Drilling Fluids Corporation** — DAILY PRODUCT COST & LOCATION INVENTORY SUMMARY — REPORT NO. 3

WELL COLGAS d-d KOTANELEE OPERATOR COLUMBIA GAS DEVEL. STOCK POINT FT. ST. JOHN

| | | DATE 06-24 DEPTH 3915 | | | DATE 06-25 DEPTH 3915 | | | DATE 06-26/27 DEPTH 3915 | | | DATE DEPTH | | | DATE DEPTH | | | DATE DEPTH | | | DATE DEPTH | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | # | | | # | | | # | | | # | | | # | | | # | | | # | | |
| PRODUCT | UNIT KG | ON HAND | REC'D | USED | ON HAND | REC'D | USED | ON HAND | REC'D | USED | ON HAND | REC'D | USED | ON HAND | REC'D | USED | ON HAND | REC'D | USED | ON HAND | REC'D | USED | BALANCE FORWARD |
| GEL | | 310 | | | 310 | | | 310 | | 10 | 300 | | | | | | | | | | | | |
| BARITE | | 2388 | | 35 | 2353 | | 35 | 2318 | | 10 | 2308 | | | | | | | | | | | | |
| CAUSTIC | | 173 | | 6 | 167 | | 1 | 166 | | | 166 | | | | | | | | | | | | |
| SODA ASH | | 18 | | | 18 | | | 18 | | | 18 | | | | | | | | | | | | |
| SULBAN | | 82 | | | 82 | | | 82 | | | 82 | | | | | | | | | | | | |
| BICARB. | | 55 | | | 55 | | | 55 | | | 55 | | | | | | | | | | | | |
| FLR | | 35 | | | 35 | | | 35 | | | 35 | | | | | | | | | | | | |
| ASP-721 | | 25 | | 4 | 21 | | | 21 | | | 21 | | | | | | | | | | | | |
| IDIS D | | 45 | | 5 | 40 | | | 40 | | | 40 | | | | | | | | | | | | |
| PTS-200 | | 112 | | 8 | 102 | | 8 | 96 | | 5 | 91 | | | | | | | | | | | | |
| X-CIDE | | 12 | | 4 | 12 | | 2 | 10 | | 3 | 7 | | | | | | | | | | | | |
| SULFITE | | 9 | | | 9 | | | 9 | | | 9 | | | | | | | | | | | | |
| DEFOAMER | | 6 | | | 6 | | | 6 | | 1 | 5 | | | | | | | | | | | | |
| SAWDUST | | 130 | | | 130 | | | 130 | | 30 | 100 | | | | | | | | | | | | |
| DRISPAC LO | | 27 | | 8 | 19 | | | 19 | | | 19 | | | | | | | | | | | | |
| LIME | | 16 | | 5 | 11 | | | 11 | | | 11 | | | | | | | | | | | | |
| DFCL | | 3 | | | 3 | | | 3 | | | 3 | | | | | | | | | | | | |
| BEADS | | 32 | | | 32 | | | 32 | | | 32 | | | | | | | | | | | | |
| FCL | | 60 | | | 60 | | | 60 | | | 60 | | | | | | | | | | | | |
| POLYTEMP | | 50 | | | 50 | | | 50 | | | 50 | | | | | | | | | | | | |
| DAILY MUD COST | | | | | | | | | | | | | | | | | | | | | | | |
| ENGINEERING COST | | | | | | | | | | | | | | | | | | | | | | | |
| TRUCKING COST | | | | | | | | | | | | | | | | | | | | | | | |
| TOTAL DAILY COST | | | | | | | | | | | | | | | | | | | | | | | |
| CUMULATIVE TOTAL COST | | | | | | | | | | | | | | | | | | | | | | | |

**International Drilling Fluids Corporation** DAILY PRODUCT COST & LOCATION INVENTORY SUMMARY REPORT NO. 3

WELL COLGAS et al KOTANELEE OPERATOR COLUMBIA GAS STOCK POINT FT. ST. JOHN

| PRODUCT | UNIT KG | DATE 06-18 DEPTH 3695 # ON HAND | REC'D | USED | DATE 06-22 DEPTH 3820 # ON HAND | REC'D | USED | DATE 06/26/27 DEPTH 3915 # ON HAND | REC'D | USED | DATE DEPTH # ON HAND | REC'D | USED | DATE DEPTH # ON HAND | REC'D | USED | DATE DEPTH # ON HAND | REC'D | USED | DATE DEPTH # ON HAND | REC'D | USED | BALANCE FORWARD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| K. SEAL | | 150 | | 50 | 100 | | | 100 | | 11 | 89 | | | | | | | | | | | |
| F. FREE | | 4 | | | 4 | | | 4 | | | 4 | | | | | | | | | | | |
| VISPLEX | | 10 | | | 10 | | | 10 | | 2 | 8 | | | | | | | | | | | |
| CaCo | | 112 | | 10 | 102 | | | 102 | | | 102 | | | | | | | | | | | |
| CELLOFLAKE | | 40 | | 20 | 20 | | | 20 | | 8 | 12 | | | | | | | | | | | |
| MICA | | 20 | | 20 | — | | | — | | | — | | | | | | | | | | | |
| WALNUT | | 20 | | | 20 | | | 20 | | | 20 | | | | | | | | | | | |
| PALLETS | | 187 | | | | | | | | | | | | | | | | | | | | |
| FLOPLEX | | | 56 | | 56 | | 22 | 34 | | | 34 | | | | | | | | | | | |
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| DAILY MUD COST | | | | | | | | | | | | | | | | | | | | | | |
| ENGINEERING COST | | | | | | | | | | | | | | | | | | | | | | |
| TRUCKING COST | | | | | | | | | | | | | | | | | | | | | | |
| TOTAL DAILY COST | | | | | | | | | | | | | | | | | | | | | | |
| CUMULATIVE TOTAL COST | | | | | | | | | | | | | | | | | | | | | | |

(1)

# International Drilling Fluids Corporation

Drilling Mud Properties Record

WELL NAME COLUMBIA ET AL AREA KOTANELEE

STOCK POINT ET ST JOHN Contractor KENTING #7

MUD SYSTEM WEIGHTED GEL CAUSTIC - SOLOAD ENGINEERS RICK REINHART

| Day No. | DATE 1991 | DEPTH M | WEIGHT ppg | VISCOSITY sec/L | A.V. cps | P.V. cps | Y.P. Pa | GEL 0/10 | FLUID LOSS 30 Min cc's | CAKE mm | H.T.H.P. cc's | pH | Filtrate Analysis Cl ppm | Ca ppm | PI | RETORT % OIL | % SOLIDS | % SAND | BENTONITE kg/m³ | H2S-MG/L SOLCAS kg/m³ | N | K | OPERATION REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 03-05 | 3545 | 1210 | 49 | 24 | 19 | 5 | 3/6 | 11.5 | 1.5 | - | 10.5 | 350 | 30 | .3 | - .078 | No | 50 | 0 | | | | ARR. 30 NIPPLE UP. |
| | 03-05 | 3545 | 1190 | 44 | 24 | 20 | 4.5 | 2/3 | 14 | 2.0 | - | 11.0 | 800 | 20 | .8 | - .07 | No | 50 | 0 | | | | MAY-01 PRESSURE TEST. |
| | | | | | | | | | | | | | | | | | | | | | | | MAY-02 PRESS. TEST. |
| 7 | 05-05 | 3556 | 1205 | 49 | 28 | 25 | 3.5 | 1/2 | 9.0 | 1.5 | - | 10.7 | 600 | 20 | .8 | - .078 | No | 65 | 0 | | | | MIX KILL MUD TO |
| | 05-05 | 3734 | 1200 | 60 | 33 | 26 | 7.5 | 2/3 | 10.0 | 1.5 | - | 10.7 | 700 | 20 | .9 | - .075 | .002 | 90 | 0 | .6 | | | 1200 KG/M³. VISCOSITY |
| | | | | | | | | | | | | | | | | | | | | | | | @ 48 SEC/L (90M³) |
| 8 | 06-05 | 3735 | 1195 | 80 | 42 | 30 | 12 | 2/4 | 10.5 | 1.5 | - | 10.5 | 800 | 30 | .7 | - .073 | .002 | 80 | 0 | .6 | | | MAY-03 FINISH MIXING |
| | | | | | | | | | | | | | | | | | | | | | | | KILL MUD. CIRCULATE |
| 9 | 07-05 | 3735 | 1210 | 65 | 34 | 29 | 5 | 2/7 | 10 | 1.5 | - | 10.7 | 800 | 30 | .9 | - .078 | .002 | 75 | 0 | .5 | | | TUBING AND DISPLACE |
| | | | | | | | | | | | | | | | | | | | | | | | HOLE W/ KILL MUD. |
| 11 | 09-05 | 3515 | 1200 | 68 | 32 | 27 | 5.5 | 3/4 | 10 | 1.5 | - | 10.5 | 850 | 40 | .8 | - .075 | .002 | 75 | 0 | .5 | | | LAY DOWN TUBING. |
| | | | | | | | | | | | | | | | | | | | | | | | MAY-04 LAY DOWN |
| | | | | | | | | | | | | | | | | | | | | | | | TUBING. MAKE UP AND |
| | | | | | | | | | | | | | | | | | | | | | | | RUN IN W/ MILL. |

REMARKS: - MAY-05 CIRCULATE AND MILL OUT BRIDGE PLUG. CIRC. OUT AIR. (NO GAS) WASH PACKER TO BOTTOM. CIRC. BOTTOMS UP. NO GAS. RAISED PH TO 11.0 + PRE-MIXED 5 KG SOLOAD MAY-06 HOIST MILL. RUN IN WITH OVERSHOT. WORK OVER SHOT @ 3515 M. WOULD NOT GO PAST WHERE CASING PARTED. HOIST OVER SHOT.

MAY-07 RUN IN WITH SPEAR AND LATCH ONTO FISH. CHAIN OUT + RECOVER TAIL PIPE.

MAY-08 RUN IN W/ TAPERED MILL. WORK OFF EDGES ON BOTTOM PART OF CASING WHERE IT PARTED @ 3515 METERS HOIST MILL AND RUN IN W/ WASH OVER PIPE IT REQUIRES 35 TO 40 SXS BARITE FOR PILLS PRIOR TO TRIPPING.

D.F.C.-012

# International Drilling Fluids Corporation

Drilling Mud Properties Record

WELL NAME COLUMBIA ET AL AREA KOTANELEE

STOCK POINT FT. ST. JOHN Contractor KEG TWIN 607

MUD SYSTEM WEIGHTED GEL - CAUSTIC - SOLTEX ENGINEERS RICK REINHART

| Day No. | DATE 1991 | DEPTH M | MUD PROPERTIES: WEIGHT ppg | VISCOSITY: sec/L | A.V. cps | P.V. cps | Y.P. Pa | GEL: 0/10 | FLUID LOSS 30 Min cc's | CAKE mm | H.T.H.P. cc's | pH | Filtrate Analysis: Cl ppm | Ca ppm | PI | RETORT: % OIL | % SOLIDS | % SAND | BENTONITE kg/m³ | H2S ml/L | SOLTEX kg/m³ | N' | K' | OPERATION REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 | 10-05 | 3515 | 1190 | 65 | 31 | 25 | 6.5 | 2/5 | 10.5 | 1.5 | - | 10.5 | 800 | 40 | 1.0 | - | .07 | .002 | 70 | 0 | .4 | | | MAY-09 WORK WASHPIPE @3515 M. WHERE CASING PARTED. MILL ON CASING |
| 13 | 11-05 | 3740 | 1200 | 90 | 45 | 33 | 12 | 2/6 | 10.5 | 1.8 | - | 10.7 | 700 | 40 | .9 | - | .075 | .002 | 65 | 0 | .4 | | | HOIST WASH PIPE RUN IN W/ TAPERED MILL |
| 14 | 12-05 | 3740 | 1195 | 120 | 57 | 40 | 17 | 3/6 | 11.5 | 1.8 | - | 10.7 | 800 | 40 | 1.1 | - | .075 | .002 | 75 | 0 | .4 | | | WORK OFF EDGES ON CASING @ 3515 M. |
| 14 | 12-05 | 3740 | 1215 | 135 | 52 | 38 | 14 | 3/6 | 12 | 1.8 | - | 10.7 | 800 | 40 | 1.1 | - | .08 | .002 | 70 | 0 | .4 | | | MAY-10 MILL CASING. |
| 15 | 13-05 | 3740 | 1197 | 56 | 30 | 26 | 4 | 1/3 | 11.5 | 1.8 | - | 10.7 | 800 | 30 | 1.1 | - | .07 | .002 | 68 | 0 | .3 | | | CLEAN TO TOP OF FISH. |
| 16 | 14-05 | 3740 | 1190 | 55 | 30 | 25 | 5 | 1/3 | 11.0 | 1.8 | - | 11.0 | 800 | 30 | 1.2 | - | .07 | .002 | 70 | 0 | .3 | | | HOIST MILL AND RUN IN WITH WASH PIPE. |
| 17 | 15-05 | 3300 | 1190 | 58 | 28 | 23 | 5 | 2/6 | 14 | 2.0 | - | 11.0 | 800 | 30 | 1.2 | - | .07 | .002 | 75 | 0 | .3 | | | MAY-11 RUN IN W/ WASH PIPE WASH OVER FISH @3735 METERS. |

REMARKS: - TRIP OUT WASH PIPE. MAKE UP NEW MILL. RUN IN W/ WASH PIPE #2
MAY-12 WASH OVER FISH. HOIST WASH PIPE RUN IN W/ FLAT BOTTOM MILL + MILL FISH.
GETTING SHALE SAMPLES COULD BE MILLING OUT THE SIDE OF THE CASING.
MAY-13 CIRCULATE ON BOTTOM W/ MILL, WAIT ON ORDERS.
MAY-14 W.O.O. TRIP OUT AND RUN IN OPEN ENDED PRE-TREAT W/ 5 DI-CARB.
MAY-15 RUN CEMENT PLUG @3750 TO 3300M. CIRC. OUT CONTAMINATED CEMENT
SQUEEZE PLUG.

(3)

# International Drilling Fluids Corporation

Drilling Mud Properties Record

WELL NAME Columbia et al Kotaneelee AREA Y-J-I-48

STOCK POINT Ft. St. John Contractor Kenting #7

MUD SYSTEM LIT. GEL CAUSTIC ENGINEERS Jim Wheler

| Day No. | DATE 1991 | DEPTH M | MUD PROPERTIES: WEIGHT ppg | VISCOSITY: sec/L | A.V. cps | P.V. cps | Y.P. Pa | GEL: 0/10 | FLUID LOSS 30 Min cc's | CAKE mm | H.T.H.P. cc's | pH | Filtrate Analysis: Cl ppm | Ca ++ ppm | PI | RETORT: % OIL | % SOLIDS | % SAND | BENTONITE kg/m³ | POTASH kg/m³ | ID BOND kg/m³ | 'N' | 'K' | OPERATION REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 18 | 05-16 | 3300 | 1190 | 56 | 25 | 20 | 5 | 2/6 | 10.5 | 2.0 | — | 10.7 | 750 | TR. | 1.4 | — | .07 | .002 | 70 | | | | | PRESSURE TEST CEMENT |
| 19 | 05-17 | 3274 | 1185 | 48 | 26 | 22 | 4 | 1/2 | 12.4 | 2.0 | | 10.5 | 750 | TR. | 1.4 | | .07 | TR. | 66 | | | | | LOGGING & RAN IN TO MILL |
| 20 | 05-18 | 3274 | 1190 | 62 | 36 | 28 | 8 | 2/3 | 9.6 | 2.0 | | 11.0 | 750 | TR. | 1.4 | | .07 | TR. | 70 | | | | | C.I.R. |
| 21 | 05-19 | 3274 | 1195 | 62 | 39 | 30 | 9 | 2/3 | 10.6 | 2.0 | | 11.0 | 750 | TR. | 1.3 | | .07 | TR. | 70 | | | | | MILLING WINDOW |
| 22 | 05-20 | 3276 | 1190 | 53 | 35 | 28 | 7 | 1/3 | 13.0 | 2.0 | | 11.0 | 750 | TR. | 1.3 | | .07 | TR. | 70 | | | | | MILLING |
| 23 | 05-21 | 3277 | 1190 | 53 | 35 | 28 | 7 | 1/3 | 13.0 | 2.0 | | 11.0 | 750 | TR. | 1.3 | | .07 | .001 | 70 | | | | | " |
| 24 | 05-22 | 3277 | 1195 | 53 | 35 | 28 | 7 | 1/3 | 10.8 | 2.0 | | 10.5 | 700 | TR. | 1.0 | | .075 | .001 | 70 | | | | | " |
| 25 | 05-23 | 3279 | 1205 | 57 | 41 | 32 | 9 | 2/3 | 12.0 | 2.0 | | 11.0 | 650 | TR. | 1.1 | | .08 | .002 | 75 | | | | | " |
| 26 | 05-24 | 3290 | 1210 | 60 | 44 | 34 | 10 | 2/3 | 10.4 | 2.0 | | 10.5 | 600 | TR. | 1.0 | | .085 | TR. | 75 | | | | | DRLG 152 mm HOLE. DISPLACED |
| 27 | 05-25 | 3308 | 1185 | 40 | 16 | 10 | 6 | 2/3 | 11.0 | .05 | | 10.0 | 150 | TR. | 1.50 | | .045 | .001 | — | | .50 | | | HOLE TO A POLYMER SYSTEM |
| 28 | 05-26 | 3334 | 1190 | 39 | 20 | 10 | 10 | 2/3 | 8.0 | .05 | | 10.0 | 150 | TR. | .40 | | .06 | .002 | — | | .75 | | | DRLG 152 mm HOLE. |
| 29 | 05-27 | 3354 | 1190 | 37 | 20 | 10 | 10 | 2/3 | 8.0 | .05 | | 10.5 | 150 | TR. | .45 | | .07 | .003 | — | | 1.1 | | | " " " |
| 30 | 05-28 | 3400 | 1185 | 37 | 20 | 10 | 10 | 2/3 | 8.0 | .05 | | 10.5 | 150 | TR. | .45 | | .065 | .003 | — | | 1.2 | | | DRLG 152 mm HOLE |

REMARKS: — 05-16 PRESSURE TEST 05-17/18 SET BRIDGE PLUG AT 3331 m SET WHIPSTOCK PACKER AT 3277 m LOGGED & RAN IN WITH MILL. AFTER MILLING WAS COMPLETED, DRILLED 152 mm HOLE TO 3290 m, AND THE HOLE WAS DISPLACED TO A LIT. POLYMER SYSTEM. DENSITY 1180 - 1200 kg/m³. THE YIELD PT WAS RAISED TO 8-10 (Pa) USING IDVIS D + ASP-721. VIS - 35-40 s/L. pH - 10-10.5. FLUIDLOSS BELOW 15 ml.

I.D.F.C.-012

# International Drilling Fluids Corporation

Drilling Mud Properties Record

WELL NAME COLUMBIA ET AL AREA KOTANELEE

STOCK POINT ET ST. JOHN Contractor KENTING #07

MUD SYSTEM WEIGHTED POLYMER SYSTEM. ENGINEERS RICK REINHART.

| Day No. | DATE | DEPTH | MUD PROPERTIES: WEIGHT ppg | VISCOSITY sec/L | A.V. cps | P.V. cps | Y.P. Pa | GEL 0/10 | FLUID LOSS 30 Min cc's | CAKE mm | H.T.H.P. cc's | pH | Filtrate Analysis Cl ppm | Ca ppm | PI | RETORT % OIL | % SOLIDS | % SAND | BENTONITE kg/m³ | POTASH kg/m³ | ID BOND kg/m³ | H₂S IN SAMPLE | SULPHITE? | OPERATION REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1991 | M | | | | | | | | | | | | | | | | | | | | | | |
| 31 | 05-29 | 3465 | 1180 | 38 | 20 | 10 | 10 | 3/4 | 9.0 | .05 | - | 10.5 | 200 | 20 | .5 | TRC | .065 | .001 | 10 | - | .6 | 0 | 190 | MAY-29 RUN IN W/BIT #3 CLEAN 18 M. TO BOTTOM. |
| 32 | 05-30 | 3414 | 1178 | 39 | 21 | 11 | 10.5 | 3/4 | 9.0 | .05 | - | 10 | 200 | 20 | .4 | TRC | .065 | .001 | 10 | - | .5 | 0 | 190 | DRILL TO 3414 M. RIG UP WIRE LINE. |
| 33 | 05-31 | 3420 | 1185 | 38 | 22 | 11 | 11 | 3/4 | 15 | .15 | - | 10 | 200 | 20 | .4 | NO | .07 | .001 | 10 | - | .5 | 0 | 180 | MAY-30 RUN IN WITH |
| | 05-31 | 3425 | 1180 | 38 | 22 | 12 | 10 | 2.5/3 | 9.6 | .1 | - | 10.3 | 200 | 20 | .6 | NO | .068 | .0015 | 8 | - | .6 | 0 | 175 | STEARING TOOL. RUN SINGLE SHOT SURVEYS |
| 34 | 06-01 | 3435 | 1187 | 43 | 29 | 15 | 14 | 3/5 | 9.0 | .1 | - | 10.3 | 200 | 20 | .6 | NO | .073 | .001 | 9 | - | .8 | 0 | 160 | HOIST BIT FOR JARS. RUN IN BIT RR #2. |
| 36 | 06-03 | 3451 | 1195 | 41 | 26 | 15 | 11 | 2/3 | 9.5 | .1 | - | 10.5 | 200 | 20 | .9 | NO | .075 | .001 | 10 | - | .7 | 0 | 180 | MAY-31 RUN IN STEARING TOOL. TURN TOOL FACE |
| 37 | 06-04 | 3459 | 1190 | 41 | 26.5 | 15 | 11.5 | 2/3 | 14 | .5 | - | 10 | 200 | 20 | .7 | NO | .072 | .001 | 11 | - | .6 | 1 | 150 | DRILL AHEAD + COND. MUD. HOIST BIT RR #2 |
| 38 | 06-05 | 3468 | 1180 | 41 | 26 | 15 | 11 | 2/2.5 | 10.5 | 1 | - | 10.5 | 200 | 20 | .8 | NO | .068 | .001 | 10 | - | .5 | - | 135 | |

REMARKS: - JUNE-01 RUN IN BIT #3 DRILL W/ STEARING TOOL. MIX GLASS BEADS TO REDUCE DRAG.
JUNE-02 HOIST BIT #3. RUN IN BIT #4. REAM @ 3435-3440 M. RUN WATER TO LOWER YEILD POINT.
JUNE-03 HOIST BIT #4. (SOME IRON IN HOLE) RUN IN BIT #5 W/ JUNK SUB. MIXED GRAPHITE TO REDUCE DRAG.
REAM FROM 3417 TO 3455 M. HARD REAMING @ 3417 TO 3426 M
JUNE-04 HOIST BIT #5 RUN IN BIT #6 (STRATA) MIXING 4 PTS-200 PRIOR TO TRIPS. DUE TO MUD GOING BAD ON BOTTOMS UP!

# International Drilling Fluids Corporation

Drilling Mud Properties Record

WELL NAME COLUMBIA ET AL AREA KOTANELEE

STOCK POINT FT. ST. JOHN Contractor KENTING #07

MUD SYSTEM WEIGHTED POLYMER SYSTEM. ENGINEERS RICK REINHART

| Day No. | DATE 1991 | DEPTH M | MUD PROPERTIES: WEIGHT ppg | VISCOSITY: sec/L | A.V. cps | P.V. cps | Y.P. Pa | GEL: 0/10 | FLUID LOSS 30 Min cc's | CAKE mm | H.T.H.P. cc's | pH | Filtrate Analysis: Cl ppm | Ca ppm | PI | RETORT: % OIL | % SOLIDS | % SAND | BENTONITE kg/m³ | POTASH kg/m³ | ID BOND kg/m³ | H2S/MG/L "N" | SULPHITES "K" | OPERATION REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 38 | 06-05 | 3481 | 1175 | 41 | 26 | 15 | 11 | 2/2.5 | 12.0 | 1.0 | - | 10.5 | 2800 | 20 | .85 | - | .065 | .001 | 10 | | .5 | 0 | 120 | JUNE-05 DRILL AHEAD. |
| | 06-05 | 3492 | 1175 | 41 | 25 | 15 | 10 | 2/2.5 | 10.5 | 1.0 | - | 10.5 | 2800 | 20 | .9 | - | .065 | .001 | 10 | | .6 | 0 | 120 | CONDITION MUD. |
| | | | | | | | | | | | | | | | | | | | | | | | | JUNE-06 DRILL W/MUD |
| 39 | 06-06 | 3494 | 1180 | 42 | 26 | 15 | 11 | 2/3 | 12.0 | 1.0 | - | 10.5 | 2800 | 20 | .85 | - | .068 | .001 | 11 | | .7 | 0 | 120 | MOTOR, TO 3495 M. |
| | | 3495 | 1180 | 42 | 27 | 16 | 11 | 2/2.5 | 11.5 | 1.0 | - | 10.5 | 3500 | 25 | .85 | - | .068 | .002 | 11 | | .8 | 0 | 150 | CONDITION MUD, WORK |
| | | | | | | | | | | | | | | | | | | | | | | | | ON FLUID LOSS. MIXING |
| 40 | 06-07 | 3497 | 1180 | 45 | 32 | 20 | 12.5 | 2.5/3 | 15.5 | 1.5 | - | 10.5 | 2500 | 20 | .9 | - | .068 | .002 | 10 | | .8 | 0 | 160 | DRISPAC. LOWIS. FILTER |
| | 06-07 | 3510 | 1180 | 43 | 28.5 | 18 | 14.5 | 2/3 | 13 | 1.5 | - | 10.5 | 2500 | 20 | 1.0 | - | .068 | .002 | 10 | | .8 | 0 | 150 | CAKE IS MUCH FIRMER. |
| | 06-07 | 3524 | 1175 | 43 | 29 | 18 | 11 | 2/3 | 12 | 1.0 | - | 10.5 | 2500 | 20 | .85 | - | .066 | .065 | 10 | | .8 | 0 | 150 | NOT JUST SOLIDS. |
| | | | | | | | | | | | | | | | | | | | | | | | | HOIST BIT #6 FOR |
| 41 | 06-08 | 3544 | 1175 | 42 | 27 | 17 | 10 | 2/2.5 | 12.5 | .5 | | 10.5 | 2500 | 20 | .85 | - | .066 | .001 | 10 | | .7 | 0 | 130 | NEW MUD MOTOR. |
| | | | | | | | | | | | | | | | | | | | | | | | | MIXING DRISPAC-LOW. |
| 42 | 06-09 | 3552 | 1170 | 45 | 30 | 19 | 11 | 2/3 | 13 | 1.0 | - | 11.0 | 3000 | 30 | 1.3 | - | .065 | .001 | 10 | | .7 | 0 | 165 | FLUID LOSS IS STAYING |
| | | | | | | | | | | | | | | | | | | | | | | | | @ 12 TO 13 CM³ |

REMARKS: JUNE-07 RUN IN BIT #7. GAS ON BOTTOMS UP IS @ 9,000 UNITS+ AFTER TRIP. THE VISCOSITY IS UP TO 45 SEC/L YEILD @ 12.5 PA. FLUID LOSS @ 15.5 CM³. THESE UNSTABLE PROPERTIES ARE LIKELY DUE TO EXTRA ADDITIONS OF ASP. 721 STOP ASP. 721. MIXING D.F.C.L @ .5 KG/M³. AFTER MIXING DFCL. RUN WATER @ 20 L/MIN. JUNE-08 DRILL AHEAD W/ STEARING TOOL @ 2½ M/HR. HOIST BIT # 7 @ 3550 M. JUNE-09 RUN IN BIT # 8 W/ STABILIZERS. REAM FROM 3420 TO 3550 METERS. MIXED 3 BAGS OF DRISPAC-LOWIS. THIS RAISED THE VISCOSITY FROM 43 TO 46 SEC/L+ ALSO RAISED THE FLUID LOSS. LIKELY DUE TO THE HIGH CONCENTRATION OF POLYMERS. CONTINUE TO RUN WATER AS THE MUD IS DEHYDRATED. DUE TO THE HIGH CONC. OF POLYMERS.

D.F.C.-012

# International Drilling Fluids Corporation

Drilling Mud Properties Record

WELL NAME COLUMBIA ET AL AREA KOTANEELEE

STOCK POINT FT. ST. JOHN Contractor KENTING #07

MUD SYSTEM WEIGHTED POLYMER ENGINEERS RICK REINHART

| Day No. | DATE 1991 | DEPTH m | MUD PROPERTIES: WEIGHT ppg | VISCOSITY: sec/L | A.V. cps | P.V. cps | Y.P. Pa | GEL: 0 / 10 | FLUID LOSS 30 Min cc's | CAKE mm | H.T.H.P. cc's | pH | Filtrate Analysis: Cl ppm | Ca ppm | PI | RETORT: % OIL | % SOLIDS | % SAND | BENTONITE kg/m³ | POTASH kg/m³ | ID BOND kg/m³ | H2S - MG/L | Sulphites | OPERATION REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 42 | 06-09 | 3559 | 1180 | 43 | 28 | 18 | 10 | 2 / 2.5 | 15 | 1.0 | - | 10.7 | 250 | 30 | 1.1 | - | .07 | .001 | 10 | | .7 | 0 | 170 | JUNE 09 STOP ADDITIONS |
| | | | | | | | | | | | | | | | | | | | | | | | | OF ASP-721 AND DRISPAC |
| 43 | 06-10 | 3580 | 1190 | 42 | 26 | 17 | 9 | 1.5 / 2 | 16 | 1.0 | - | 10.7 | 300 | 30 | 1.0 | - | .075 | .001 | 10 | | .7 | 0 | 150 | UNTIL RHEOLOGY COMES |
| | 06-10 | 3587 | 1195 | 42 | 27 | 18 | 9 | 1.5 / 2 | 15.5 | 1.0 | - | 10.7 | 300 | 40 | 1.0 | - | .078 | .001 | 10 | | .7 | 0 | 150 | BACK INTO LINE. THE |
| | | | | | | | | | | | | | | | | | | | | | | | | PH IS UP TO 11.0 DUE |
| 44 | 06-11 | 3598 | 1195 | 44 | 28 | 19 | 9 | 1.5 / 2 | 15.2 | .5 | - | 10.5 | 300 | 60 | .9 | - | .075 | .001 | 10 | - | .6 | 0 | 130 | TO ADDITIONS OF PTS- |
| | 06-11 | 3609 | 1190 | 42 | 24 | 17 | 7.5 | 1.5 / 2 | 16.5 | 1.0 | | 10.5 | 300 | 50 | .9 | - | .075 | .002 | 10 | - | .6 | 0 | 130 | 200. DUE TO LOWER |
| | | | | | | | | | | | | | | | | | | | | | | | | BOTTOM HOLE TEMP. |
| 45 | 06-12 | 3623 | 1185 | 43 | 26 | 18 | 8 | 0.5 / 2 | 16 | .8 | | 10.3 | 300 | 80 | .8 | - | .073 | .002 | 10 | - | .6 | 0 | 100 | THAN EXPECTED. THERE |
| | 06-12 | 3630 | 1195 | 44 | 27.5 | 19 | 8.5 | 1.5 / 2 | 15.8 | .5 | | 10.5 | 300 | 80 | .85 | - | .08 | .002 | 10 | - | .6 | 0 | 100 | IS A GOOD CONCENTRATION |
| | | | | | | | | | | | | | | | | | | | | | | | | OF PTS-200 IN THE |
| | | | | | | | | | | | | | | | | | | | | | | | | MUD SYSTEM. WILL |
| | | | | | | | | | | | | | | | | | | | | | | | | INCREASE ADDITIONS |
| | | | | | | | | | | | | | | | | | | | | | | | | OF X-CIDE 207 TO |

REMARKS: -PREVENT BACTERIA IN THE MUD. AS YOU CAN SMELL THE MUD ON BOTTOMS UP AFTER TRIPPING. AFTER THE T.D. THERE WAS A LARGE AMOUNT OF GAS TO SURFACE RAISING MUD DENSITY TO 1190 KG/M³ FROM 1175 KG/M³. WILL START TO CONTROL THE FLUID LOSS + RHEOLOGY W/ DECL AS REQ'D.

JUNE-10 DRILL TO APP. 3592M. HOIST BIT #8

JUNE-11 RUN IN BIT #9. CONDITION MUD. YELD POINT IS DOWN TO 7.5 PA. MUD IS IN GOOD CONDITION.

JUNE-12 KEEP MUD DENSITY @ 1190 KG/M³ FLUID LOSS BELOW 16 CM³. YELD POINT @ 8-10 PA.

DRILL TO 3630 METERS MIX PTS-200 + X-CIDE. HOIST BIT #9 AND PRESSURE TEST.

# International Drilling Fluids Corporation

Drilling Mud Properties Record

WELL NAME COLUMBIA ET AL AREA KOTANELEE

STOCK POINT FT. ST. JOHN Contractor KENTINE #07

MUD SYSTEM WEIGHTED POLYMER ENGINEERS RICK REINHART

| Day No. | DATE 1991 | DEPTH M | WEIGHT ppg | VISCOSITY sec/L | A.V. cps | P.V. cps | Y.P. Pa | GEL 0 | GEL 10 | FLUID LOSS 30 Min cc's | CAKE mm | H.T.H.P. cc's | pH | Filtrate Analysis Cl ppm | Filtrate Analysis $Ca^{++}$ ppm | Filtrate Analysis PI | RETORT % OIL | RETORT % SOLIDS | % SAND | BENTONITE kg/m³ | POTASH kg/m³ SUPERLITE 5 | ID BOND kg/m³ TOTAL Polymer | $H_2S$ MG/L | N K SOLDAN | OPERATION REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 46 | 06-13 | 3636 | 1200 | 45 | 30 | 21 | 9 | 1.5 | 2 | 20 | 1.0 | - | 10.5 | 300 | 100 | 1.0 | TRC | .083 | .002 | 10 | 125 | 4.5 | 0 | 0 | JUNE-13 PRESSURE TEST. RUN IN BIT #10 |
| 47 | 06-14 | 3654 | 1205 | 43 | 27 | 20 | 7.5 | 1.5 | 2 | 17 | 1.2 | - | 10.5 | 300 | 80 | 1.3 | TRC | .085 | .002 | 10 | 125 | 4.8 | 5 | 1.4 | (SHELL $H_2S$) C/O DTMS. CP |
| | 06-14 | 3565 | 1210 | 44 | 28 | 20 | 8 | 1.5 | 2 | 18 | 1.0 | - | 10.5 | 300 | 40 | 1.8 | TRC | .09 | .002 | 10 | 100 | 5.0 | 0 | 1.4 | MIX 1.4 KG/M³ SOLDAN. |
| 48 | 06-15 | 3664 | 1215 | 44 | 29 | 21 | 8 | 1.5 | 2 | 18.5 | 1.2 | - | 10.5 | 300 | 50 | 1.6 | TRC | .093 | .002 | 10 | 120 | 5.0 | 0 | 1.4 | FLUID LOSS WENT UP TO 20 CM³. TREAT OUT 180 |
| | 06-15 | 3667 | 1215 | 43 | 28.5 | 22 | 7.5 | 1.5 | 2 | 22 | 1.0 | - | 10.5 | 300 | 60 | 1.5 | TRC | .093 | .002 | 10 | 130 | 5.0 | 0 | 1.4 | MGEL (ALUM W/SODA ASH (PRE-MIX L.C.M. MUD IN |
| 49 | 06-16 | 3677 | 1200 | 43 | 28.5 | 20 | 12.5 | 1.5 | 2 | 26 | 1.0 | - | 10.5 | 350 | 40 | 1.5 | TRC | .085 | .002 | 12 | 130 | 4.5 | 0 | 1.2 | PRE-MIX TANK.) VISCOSIT 50 SEC/L. W/L.A. DIS-D |
| 50 | 06-17 | 3681 | 1190 | 45 | 29 | 22 | 7 | 1.5 | 2 | 28 | 1.2 | - | 10.5 | 350 | 40 | 1.5 | TRC | .075 | .002 | 12 | 130 | 5.0 | 0 | 1.2 | + FLR-REG. ADD 1.5 M³ |
| | 06-17 | 3685 | 1195 | 43 | 26 | 20 | 6 | 1.5 | 2 | 33 | 1.5 | - | 10.5 | 400 | 40 | 1.5 | - | .08 | .002 | 15 | 130 | 6.0 | 0 | 1.0 | FROM ACTIVE SYSTEM TO LOWER MAIN TANK VOLUME. |

REMARKS: — JUNE 14 RAISE MUD DENSITY IN PRE-MIX TANK TO 1210 KG/M³. HOIST BIT #10 @ 3664 METERS. LOST 3 CONES. RUN IN + MILL ON CONES. HOIST MILL. JUNE-15 RUN IN BIT #11. CLEAN TO BTM. WORK JUNK SUB. HOIST BIT #11 @ 3667 M. THE FLUID LOSS IS STILL CLIMBING, LIKELY DUE TO ASP-721 USED UP. HIGH FLUID LOSS MAY BE NORMAL FOR THIS SYSTEM WHEN MIXING PTS-200 COATING POLYMERS. FILTER CAKE IS FIRM. JUNE-16 RUN IN BIT #12 DRILL TO 3677 M. REAM + WORK STABILIZER. HOIST BIT #12 RUN IN BIT #13 JUNE-17 CONDITION MUD. HOIST BIT @ 3681 M. RUN IN W/ BIT #14. REAM 10 M. TO BTM. MIXING ASP-721 TO LOWER FLUID LOSS.

# International Drilling Fluids Corporation

Drilling Mud Properties Record

WELL NAME COLOMBIA ETAL AREA KOTANELEE

STOCK POINT FT. ST. JOHN Contractor KENTING #7

MUD SYSTEM WEIGHTED POLYMER ENGINEERS RICK REINHART / JIM WIELER

| Day No. | DATE 1991 | DEPTH M | MUD PROPERTIES: WEIGHT ppg | VISCOSITY: sec/L | A.V. cps | P.V. cps | Y.P. Pa | GEL: 0 | GEL: 10 | FLUID LOSS 30 Min cc's | CAKE mm | H.T.H.P. cc's | pH | Filtrate Analysis: Cl ppm | Ca ppm | PI | RETORT: % OIL | % SOLIDS | % SAND | BENTONITE kg/m³ | POTASH kg/m³ SOLUBILITIES | ID BOND kg/m³ TOTAL BALANCED | H2S/MG/L IN | K SEWAGE KOH | OPERATION REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 51 | 06-18 | 3693 | 1190 | 40 | 23.5 | 19 | 4.5 | 1 | 1.5 | 37 | 1.5 | - | 10.5 | 400 | 40 | 1.5 | - | .078 | .002 | 15 | 130 | 6 | 0 | 1.0 | JUNE-18 DRILL TO 3695 |
| " | | 3695 | 1195 | 41 | 24 | 19 | 5 | 1 | 1.5 | 35 | 1.5 | Sof | 10.5 | 350 | 40 | 1.5 | - | .08 | .002 | 15 | 130 | 7 | 0 | 1.0 | HOIST BIT #15. LOST |
| " | | 3695 | 1193 | 43 | 25.5 | 20 | 5.5 | 1 | 1.5 | 20 | .8 | - | 10.3 | 350 | 30 | 1.4 | - | .08 | .002 | 13 | 100 | 7.5 | 0 | 1.0 | CONES ON BOTTOM. |
| 52 | 06-19 | 3705 | 1200 | 43 | 24 | 19 | 5 | 1 | 1.5 | 25 | 1.0 | - | 10.3 | 350 | 30 | 1.4 | - | .085 | .003 | 14 | 110 | 7.5 | - | 1.0 | RUN IN W/ MAGNET |
| " | 06-19 | 3733 | 1195 | 43 | 26 | 20 | 6 | 1 | 1.5 | 15.0 | .8 | - | 10.5 | 350 | TR. | 1.4 | - | .085 | .003 | - | 100 | 9.0 | NEG. | - | WORK MAGNET + HOIST. |
| 53 | 06-20 | 3772 | 1210 | 43 | 26 | 20 | 6 | 1 | 2 | 19.4 | .8 | | 10.5 | 350 | TR. | 1.4 | | .09 | .004 | - | 110 | 9.5 | +1 | - | THE FLUID LOSS IS |
| 54 | 06-21 | 3790 | 1210 | 44 | 30 | 24 | 6 | 1 | 2 | 24.0 | .8 | | 10.5 | 350 | TR. | 1.3 | | .09 | .004 | | 115 | 9.5 | " | - | STARTING TO COME |
| | 06-21 | 3803 | 1175 | 44 | 30 | 24 | 6 | 1 | 2 | 17.0 | 8 | | 11.0 | 350 | TR. | 1.5 | | .08 | .003 | | 120 | 9.5 | " | | DOWN AND FILTER CAKE |
| 55 | 06-22 | 3843 | 1195 | 46 | 28 | 22 | 6 | 1 | 2 | 7.6 | .5 | | 10.5 | 350 | TR | 1.4 | | .08 | 003 | | 130 | 10 | " | | IS TIGHT DUE TO |
| 56 | 06-23 | 3850 | 1205 | 46 | 30 | 24 | 6 | 1 | 2 | 7.0 | .5 | | 10.5 | 350 | TR. | 1.4 | | .08 | 004 | | 120 | 9.5 | " | | ADDITIONS OF ASP. 721 |
| 57 | 06-24 | 3915 | 1205 | 44 | 26 | 20 | 6 | 1 | 2 | 6.6 | .5 | | 10.5 | 350 | TR. | 1.5 | | .08 | .004 | | 120 | 10.0 | " | | FLUID LOSS DROPPED FROM |
| 58 | 06-25 | 3915 | 1210 | 46 | 29 | 22 | 7 | 1 | 2 | 7.6 | .5 | | 11.0 | 350 | TR. | 1.8 | | .08 | 002 | | 120 | 10.0 | " | | 24 ml TO BELOW 8 ml AFT |
| 59 | 06-26/27 | 3915 | 1210 | 46 | 25 | 20 | 5 | 1 | 2 | 11.0 | .8 | | 11.0 | 350 | TR. | 1.8 | | .08 | / | | 120 | 9.0 | " | | 1.3 lb/BBL. FLO PLEX WAS ADDED TO SYSTEM. |

REMARKS: - LOST APPROX. 8 m³ FLUID TO HOLE WHILE DRLG. FROM 3784 - 3822 M. PRIOR TO TRIP OUT FOR B.I #17. A 14 m³ L.C.M. PILL WAS SPOTED IN ANNULUS NO FURTHUR LOSSES WERE ENCOUNTERED. DRILLED 152 mm HOLE TO 3915 m (T.D.) & LOGGED. RAN 127 mm LINER TO 3915 m. LOST APPROX. 21 m³ MUD TO HOLE WHILE RUNNING LINER. PUMPED L.C.M. & BYPASSED SHAKER WHILE C.B PRIOR TO CEMENTING.

D.F.C.012

**International Drilling Fluids Corporation**

# DRILLING FLUID REPORT

DATE [illegible] 07, 1991
REPORT No. #01
SPUD DATE [illegible]

WELL NAME [illegible] LOCATION [illegible]
OPERATOR [illegible] CONTRACTOR [illegible]
REPORT FOR Mr. [illegible] REPORT FOR Mr. [illegible]

| ASSEMBLY | CASING | MUD Vol. (m³) | PUMP OUTPUT | ANNULAR VEL. m./min. |
|---|---|---|---|---|
| BIT SIZE / # 1 1/16 | COND. | TANKS [illegible] | PUMP SIZE 11/4 [illegible] | OPPOSITE D.P. [illegible] |
| DRILL PIPE [illegible] mm | SURFACE | HOLE [illegible] | m³/STK. [illegible] | OPPOSITE D.C. |
| DRILL COLLARS mm | INTER. [illegible] | TOTAL [illegible] | S.P.M. 50 | PUMP PRESS. |
| OTHER | OTHER | STANDBY | m³/min. [illegible] | CIRC. TIME [illegible] |

| HOLE DATA | DESANDER/DESTILTER | | DRILLING FLUID SPECIFICATIONS | |
|---|---|---|---|---|
| MUD TYPE [illegible] | FLOWLINE WT. | kg/m³ | MUD WT. 1190 | kg/m³ |
| HOLE COND. | UNDERFLOW WT. | kg/m³ | VISCOSITY [illegible] | s/L |
| DEVIATION | OVERFLOW WT. | kg/m³ | FILTRATE | cm³/30 min. |
| CURRENT OP. [illegible] | UNDERFLOW RATE | m³/min. | pH [illegible] | |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

SAMPLE FROM FL. ☐ PIT ☐ [illegible]

| MUD PROPERTIES | | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | 06:00 | | |
| PRESENT DEPTH (m) | [illegible] | | |
| FLOWLINE TEMPERATURE (°C) | - | | |
| DENSITY (kg/m³) | 1110 | | |
| FUNNEL VISCOSITY (s/L) | 49 | | |
| APPARENT VISCOSITY (mPa.s) | [illegible] | | |
| PLASTIC VISCOSITY (mPa.s) | 19 | | |
| YIELD POINT (Pa) | 5 | | |
| GELS 0/10 min. (Pa) | 3/6 | | |
| pH STRIP ☐ METER ☐ | [illegible] | | |
| FILTRATE ☐ API ☐ HT HP (cm³) | [illegible] | | |
| FILTER CAKE (mm) | [illegible] | | |
| ALK ☐ (PF/MF) ☐ (PM/LIME) | [illegible] | | |
| TOTAL HARDNESS ☐ Ca. ☐ (mg/L) | [illegible] | | |
| SAL. ☐ NACI ☐ CL ☐ (mg/L) | [illegible] | | |
| SAND CONTENT (%) ☐ (Ø) ☐ | [illegible] | | |
| SOLIDS CONTENT (%) ☐ (Ø) ☐ | [illegible] | | |
| OIL/WATER CONT. (%) ☐ (Ø) ☐ | - | | |
| MBT (Kg/m³) ☐ /% ☐ OIL RET ☐ | | | |
| ELECTRICAL STABILITY (V) | - | | |
| OIL/WATER RATIO | - | | |
| $CaCl_2$ w/w% | - | | |
| "n"/"k" [illegible] | [illegible] | | |

| MATERIALS INVENTORY & COST | | | | | |
|---|---|---|---|---|---|
| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
| [illegible] | [illegible] | | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | | [illegible] | [illegible] | [illegible] |

| | | | |
|---|---|---|---|
| PREVIOUS COST | [illegible] | STARTING VOLUME | |
| DAILY COST | | VOL. BUILT | [illegible] |
| CUM. COST | | VOL. LOST on SURFACE | |
| CUM. ENG. COST | [illegible] | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS:

[illegible]

STOCK POINT [illegible] I.D.F. ENGINEER [illegible]
PHONE PHONE [illegible] MOBILE # [illegible]

**International Drilling Fluids Corporation**

# DRILLING FLUID REPORT

DATE [illegible]
REPORT No. [illegible]
SPUD DATE [illegible]

WELL NAME [illegible] LOCATION [illegible]

| | |
|---|---|
| OPERATOR [illegible] | CONTRACTOR [illegible] |
| REPORT FOR Mr. [illegible] | REPORT FOR Mr. [illegible] |

| ASSEMBLY | | CASING | | MUD Vol. (m³) | | PUMP OUTPUT | | ANNULAR VEL. m./min. | |
|---|---|---|---|---|---|---|---|---|---|
| BIT SIZE / # | [illegible] | COND. | | TANKS | [illegible] | PUMP SIZE | [illegible] | OPPOSITE D.P. | [illegible] |
| DRILL PIPE | [illegible] mm | SURFACE | | HOLE | [illegible] | m³/STK. | [illegible] | OPPOSITE D.C. | |
| DRILL COLLARS | mm | INTER. | [illegible] | TOTAL | [illegible] | S.P.M. | [illegible] | PUMP PRESS. | [illegible] |
| OTHER | | OTHER | | STANDBY | | m³/min. | [illegible] | CIRC. TIME | [illegible] |

| HOLE DATA | | DESANDER/DESTILTER | | DRILLING FLUID SPECIFICATIONS | |
|---|---|---|---|---|---|
| MUD TYPE | [illegible] | FLOWLINE WT. | kg/m³ | MUD WT. | [illegible] kg/m³ |
| HOLE COND. | [illegible] | UNDERFLOW WT. | kg/m³ | VISCOSITY | [illegible] s/L |
| DEVIATION | | OVERFLOW WT. | kg/m³ | FILTRATE | – cm³/30 min. |
| CURRENT OP. | [illegible] | UNDERFLOW RATE | m³/min. | pH | [illegible] |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

| SAMPLE FROM FL. ☐ PIT ☐ | MUD PROPERTIES | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | [illegible] | | |
| PRESENT DEPTH (m) | [illegible] | | |
| FLOWLINE TEMPERATURE (°C) | [illegible] | | |
| DENSITY (kg/m³) | [illegible] | | |
| FUNNEL VISCOSITY (s/L) | 44 | | |
| APPARENT VISCOSITY (mPa.s) | [illegible] | | |
| PLASTIC VISCOSITY (mPa.s) | [illegible] | | |
| YIELD POINT (Pa) | [illegible] | | |
| GELS 0/10 min. (Pa) | [illegible] | | |
| pH STRIP ☐ METER ☐ | [illegible] | | |
| FILTRATE ☐ API ☐ HT HP (cm³) | [illegible] | | |
| FILTER CAKE (mm) | [illegible] | | |
| ALK ☐ (PF/MF) ☐ (PM/LIME) | [illegible] | | |
| TOTAL HARDNESS ☐ Ca. ☐ (mg/L) | [illegible] | | |
| SAL. ☐ NACl ☐ CL ☐ (mg/L) | [illegible] | | |
| SAND CONTENT (%) ☐ (Ø) ☐ | [illegible] | | |
| SOLIDS CONTENT (%) ☐ (Ø) ☐ | [illegible] | | |
| OIL/WATER CONT. (%) ☐ (Ø) ☐ | [illegible] | | |
| MBT (Kg/m³) ☐ /% ☐ OIL RET ☐ | [illegible] | | |
| ELECTRICAL STABILITY (V) | – | | |
| OIL/WATER RATIO | – | | |
| $CaCl_2$ w/w% | – | | |
| "n"/"k" [illegible] | [illegible] | | |

MATERIALS INVENTORY & COST

| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
|---|---|---|---|---|---|
| [illegible] | [illegible] | | [illegible] | [illegible] | [illegible] |
| GEL | [illegible] | | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | | 1 | [illegible] | [illegible] |

| | | | |
|---|---|---|---|
| PREVIOUS COST | [illegible] | STARTING VOLUME | |
| DAILY COST | [illegible] | VOL. BUILT | [illegible] |
| CUM. COST | [illegible] | VOL. LOST on SURFACE | |
| CUM. ENG. COST | [illegible] | VOL. LOST SUB SURFACE | |
| | | END VOLUME | [illegible] |
| | | CUM. VOL. BUILT | |

COMMENTS:

[illegible]

[illegible]

[illegible]

[illegible]

STOCK POINT [illegible] I.D.F. ENGINEER [illegible]
PHONE PHONE [illegible] MOBILE # [illegible]

I.D.F.C.-015 (2)

**International Drilling Fluids Corporation**

# DRILLING FLUID REPORT

DATE [illegible]
REPORT No. [illegible]
SPUD DATE [illegible]

WELL NAME [illegible] LOCATION [illegible]
OPERATOR [illegible] CONTRACTOR [illegible]
REPORT FOR Mr. [illegible] REPORT FOR Mr. [illegible]

| ASSEMBLY | CASING | MUD Vol. (m³) | PUMP OUTPUT | ANNULAR VEL. m./min. |
|---|---|---|---|---|
| BIT SIZE / # [illegible] | COND. | TANKS [illegible] | PUMP SIZE [illegible] | OPPOSITE D.P. [illegible] |
| DRILL PIPE [illegible] mm | SURFACE | HOLE [illegible] | m³/STK. [illegible] | OPPOSITE D.C. [illegible] |
| DRILL COLLARS [illegible] mm | INTER. [illegible] | TOTAL [illegible] | S.P.M. [illegible] | PUMP PRESS. |
| OTHER | OTHER | STANDBY | m³/min. [illegible] | CIRC. TIME [illegible] |

| HOLE DATA | DESANDER/DESTILTER | | DRILLING FLUID SPECIFICATIONS | |
|---|---|---|---|---|
| MUD TYPE [illegible] | FLOWLINE WT. | kg/m³ | MUD WT. [illegible] | kg/m³ |
| HOLE COND. [illegible] | UNDERFLOW WT. | kg/m³ | VISCOSITY [illegible] | s/L |
| DEVIATION | OVERFLOW WT. | kg/m³ | FILTRATE [illegible] | cm³/30 min. |
| CURRENT OP. [illegible] | UNDERFLOW RATE | m³/min. | pH [illegible] | |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

| SAMPLE FROM FL. ☐ PIT ☐ | MUD PROPERTIES | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | [illegible] | | |
| PRESENT DEPTH (m) | [illegible] | | |
| FLOWLINE TEMPERATURE (°C) | [illegible] | | |
| DENSITY (kg/m³) | [illegible] | | |
| FUNNEL VISCOSITY (s/L) | [illegible] | | |
| APPARENT VISCOSITY (mPa.s) | [illegible] | | |
| PLASTIC VISCOSITY (mPa.s) | [illegible] | | |
| YIELD POINT (Pa) | [illegible] | | |
| GELS 0/10 min. (Pa) | [illegible] | | |
| pH STRIP ☐ METER ☐ | [illegible] | | |
| FILTRATE ☐ API ☐ HT HP (cm³) | [illegible] | | |
| FILTER CAKE (mm) | [illegible] | | |
| ALK ☐ (PF/MF) ☐ (PM/LIME) | [illegible] | | |
| TOTAL HARDNESS ☐ Ca. ☐ (mg/L) | [illegible] | | |
| SAL. ☐ NACI ☐ CL ☐ (mg/L) | [illegible] | | |
| SAND CONTENT (%) ☐ (Ø) ☐ | [illegible] | | |
| SOLIDS CONTENT (%) ☐ (Ø) ☐ | [illegible] | | |
| OIL/WATER CONT. (%) ☐ (Ø) ☐ | [illegible] | | |
| MBT (Kg/m³) ☐ /% ☐ OIL RET ☐ | [illegible] | | |
| ELECTRICAL STABILITY (V) | [illegible] | | |
| OIL/WATER RATIO | [illegible] | | |
| $CaCl_2$ w/w% | [illegible] | | |
| "n"/"k" [illegible] | [illegible] | | |

| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
|---|---|---|---|---|---|
| [illegible] | [illegible] | | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | | [illegible] | [illegible] | [illegible] |

| | | | |
|---|---|---|---|
| PREVIOUS COST | [illegible] | STARTING VOLUME | |
| DAILY COST | [illegible] | VOL. BUILT | [illegible] |
| CUM. COST | [illegible] | VOL. LOST on SURFACE | |
| CUM. ENG. COST | [illegible] | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS:

[illegible]

STOCK POINT [illegible] I.D.F. ENGINEER [illegible]
PHONE PHONE [illegible] MOBILE #: [illegible]

**International Drilling Fluids Corporation**

# DRILLING FLUID REPORT

DATE [illegible]
REPORT No. [illegible]
SPUD DATE [illegible]

WELL NAME [illegible] LOCATION [illegible]

| | | | |
|---|---|---|---|
| OPERATOR [illegible] | | CONTRACTOR [illegible] | |
| REPORT FOR Mr. [illegible] | | REPORT FOR Mr. [illegible] | |

| ASSEMBLY | CASING | MUD Vol. (m³) | PUMP OUTPUT | ANNULAR VEL. m./min. |
|---|---|---|---|---|
| BIT SIZE / # [illegible] | COND. | TANKS [illegible] | PUMP SIZE [illegible] | OPPOSITE D.P. 55 |
| DRILL PIPE [illegible] mm | SURFACE | HOLE [illegible] | m³/STK. [illegible] | OPPOSITE D.C. [illegible] |
| DRILL COLLARS [illegible] mm | INTER. [illegible] | TOTAL [illegible] | S.P.M. [illegible] | PUMP PRESS. |
| OTHER | OTHER | STANDBY | m³/min. [illegible] | CIRC. TIME [illegible] |

| HOLE DATA | DESANDER/DESTILTER | | DRILLING FLUID SPECIFICATIONS |
|---|---|---|---|
| MUD TYPE [illegible] | FLOWLINE WT. [illegible] | [illegible] kg/m³ | MUD WT. [illegible] kg/m³ |
| HOLE COND. [illegible] | UNDERFLOW WT. [illegible] | [illegible] kg/m³ | VISCOSITY [illegible] s/L |
| DEVIATION [illegible] | OVERFLOW WT. | kg/m³ | FILTRATE [illegible] cm³/30 min. |
| CURRENT OP. [illegible] | UNDERFLOW RATE | m³/min. | pH [illegible] |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

| SAMPLE FROM FL. ☐ PIT ☐ | MUD PROPERTIES | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | [illegible] | | |
| PRESENT DEPTH (m) | [illegible] | | |
| FLOWLINE TEMPERATURE (°C) | [illegible] | | |
| DENSITY (kg/m³) | [illegible] | | |
| FUNNEL VISCOSITY (s/L) | 60 | | |
| APPARENT VISCOSITY (mPa.s) | [illegible] | | |
| PLASTIC VISCOSITY (mPa.s) | [illegible] | | |
| YIELD POINT (Pa) | [illegible] | | |
| GELS 0/10 min. (Pa) | [illegible] | | |
| pH STRIP ☐ METER ☐ | [illegible] | | |
| FILTRATE ☐ API ☐ HT HP (cm³) | [illegible] | | |
| FILTER CAKE (mm) | [illegible] | | |
| ALK ☐ (PF/MF) ☐ (PM/LIME) | [illegible] | | |
| TOTAL HARDNESS ☐ Ca. ☐ (mg/L) | [illegible] | | |
| SAL. ☐ NACl ☐ CL ☐ (mg/L) | [illegible] | | |
| SAND CONTENT (%) ☐ (∅) ☐ | [illegible] | | |
| SOLIDS CONTENT (%) ☐ (∅) ☐ | [illegible] | | |
| OIL/WATER CONT. (%) ☐ (∅) ☐ | [illegible] | | |
| MBT (Kg/m³) ☐ /% ☐ OIL RET ☐ | [illegible] | | |
| ELECTRICAL STABILITY (V) | | | |
| OIL/WATER RATIO [illegible] | [illegible] | | |
| $CaCl_2$ w/w% [illegible] | [illegible] | | |
| "n"/"k" [illegible] | [illegible] | | |

MATERIALS INVENTORY & COST

| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
|---|---|---|---|---|---|
| [illegible] | [illegible] | | 55 | [illegible] | [illegible] |
| [illegible] | [illegible] | | 4 | [illegible] | [illegible] |
| [illegible] | 100 | | 4 | 96 | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

| | | | |
|---|---|---|---|
| PREVIOUS COST | [illegible] | STARTING VOLUME | |
| DAILY COST | [illegible] | VOL. BUILT | [illegible] |
| CUM. COST | [illegible] | VOL. LOST on SURFACE | |
| CUM. ENG. COST | [illegible] | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS: [illegible]

STOCK POINT [illegible] I.D.F. ENGINEER [illegible]
PHONE PHONE [illegible] MOBILE # [illegible]

**International Drilling Fluids Corporation**

# DRILLING FLUID REPORT

DATE [illegible]
REPORT No. [illegible]
SPUD DATE [illegible]

WELL NAME [illegible] LOCATION [illegible]
OPERATOR [illegible] CONTRACTOR [illegible]
REPORT FOR Mr. [illegible] REPORT FOR Mr. [illegible]

| ASSEMBLY | CASING | MUD Vol. (m³) | PUMP OUTPUT | ANNULAR VEL. m./min. |
|---|---|---|---|---|
| BIT SIZE / # [illegible] | COND. | TANKS [illegible] | PUMP SIZE [illegible] | OPPOSITE D.P. [illegible] |
| DRILL PIPE [illegible] mm | SURFACE | HOLE [illegible] | m³/STK. [illegible] | OPPOSITE D.C. [illegible] |
| DRILL COLLARS [illegible] mm | INTER. [illegible] | TOTAL [illegible] | S.P.M. [illegible] | PUMP PRESS. [illegible] |
| OTHER | OTHER | STANDBY | m³/min. [illegible] | CIRC. TIME [illegible] |

| HOLE DATA | DESANDER/DESTILTER | | DRILLING FLUID SPECIFICATIONS | |
|---|---|---|---|---|
| MUD TYPE [illegible] | FLOWLINE WT. | kg/m³ | MUD WT. [illegible] | kg/m³ |
| HOLE COND. [illegible] | UNDERFLOW WT. | kg/m³ | VISCOSITY [illegible] | s/L |
| DEVIATION [illegible] | OVERFLOW WT. | kg/m³ | FILTRATE [illegible] | cm³/30 min. |
| CURRENT OP. [illegible] | UNDERFLOW RATE | m³/min. | pH [illegible] | |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

| SAMPLE FROM FL. ☐ PIT ☐ | MUD PROPERTIES | | | MATERIALS INVENTORY & COST | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
| TIME SAMPLE TAKEN | [illegible] | | | [illegible] | [illegible] | | | | |
| PRESENT DEPTH (m) | [illegible] | | | [illegible] | [illegible] | | | | |
| FLOWLINE TEMPERATURE (°C) | [illegible] | | | [illegible] | [illegible] | | | | |
| DENSITY (kg/m³) | [illegible] | | | [illegible] | [illegible] | | | | |
| FUNNEL VISCOSITY (s/L) | [illegible] | | | | | | | | |
| APPARENT VISCOSITY (mPa.s) | [illegible] | | | | | | | | |
| PLASTIC VISCOSITY (mPa.s) | [illegible] | | | | | | | | |
| YIELD POINT (Pa) [illegible] | [illegible] | | | | | | | | |
| GELS 0/10 min. (Pa) | [illegible] | | | | | | | | |
| pH STRIP ☐ METER ☐ | [illegible] | | | | | | | | |
| FILTRATE ☐ API ☐ HT HP (cm³) | [illegible] | | | | | | | | |
| FILTER CAKE (mm) | [illegible] | | | | | | | | |
| ALK ☐ (PF/MF) ☐ (PM/LIME) | [illegible] | | | | | | | | |
| TOTAL HARDNESS ☐ Ca. ☐ (mg/L) | [illegible] | | | | | | | | |
| SAL. ☐ NACI ☐ CL ☐ (mg/L) | [illegible] | | | | | | | | |
| SAND CONTENT (%) ☐ (Ø) ☐ | [illegible] | | | | | | | | |
| SOLIDS CONTENT (%) ☐ (Ø) ☐ | [illegible] | | | | | | | | |
| OIL/WATER CONT. (%) ☐ (Ø) ☐ | [illegible] | | | PREVIOUS COST | [illegible] | STARTING VOLUME | | | |
| MBT (Kg/m³) ☐ /% ☐ OIL RET ☐ | [illegible] | | | DAILY COST | [illegible] | VOL. BUILT | | | |
| ELECTRICAL STABILITY (V) | [illegible] | | | CUM. COST | [illegible] | VOL. LOST on SURFACE | | | |
| OIL/WATER RATIO [illegible] | [illegible] | | | CUM. ENG. COST | [illegible] | VOL. LOST SUB SURFACE | | | |
| $CaCl_2$ w/w% [illegible] | [illegible] | | | | | END VOLUME | | | |
| "n"/"k" [illegible] | [illegible] | | | | | CUM. VOL. BUILT | | | |

COMMENTS: [illegible]

STOCK POINT [illegible] I.D.F. ENGINEER [illegible]
PHONE [illegible] PHONE [illegible] MOBILE # [illegible]

**International Drilling Fluids Corporation**

# DRILLING FLUID REPORT

DATE
REPORT No.
SPUD DATE

WELL NAME LOCATION

OPERATOR CONTRACTOR

REPORT FOR Mr. REPORT FOR Mr.

| ASSEMBLY | CASING | MUD Vol. (m³) | PUMP OUTPUT | ANNULAR VEL. m./min. |
|---|---|---|---|---|
| BIT SIZE / # | COND. | TANKS | PUMP SIZE | OPPOSITE D.P. |
| DRILL PIPE mm | SURFACE | HOLE | m³/STK. | OPPOSITE D.C. |
| DRILL COLLARS mm | INTER. | TOTAL | S.P.M. | PUMP PRESS. |
| OTHER | OTHER | STANDBY | m³/min. | CIRC. TIME |

| HOLE DATA | DESANDER/DESTILTER | | DRILLING FLUID SPECIFICATIONS |
|---|---|---|---|
| MUD TYPE | FLOWLINE WT. | kg/m³ | MUD WT. kg/m³ |
| HOLE COND. | UNDERFLOW WT. | kg/m³ | VISCOSITY s/L |
| DEVIATION | OVERFLOW WT. | kg/m³ | FILTRATE cm³/30 min. |
| CURRENT OP. | UNDERFLOW RATE | m³/min. | pH |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

| SAMPLE FROM FL. ☐ PIT ☐ | MUD PROPERTIES | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | | | |
| PRESENT DEPTH (m) | | | |
| FLOWLINE TEMPERATURE (°C) | | | |
| DENSITY (kg/m³) | | | |
| FUNNEL VISCOSITY (s/L) | | | |
| APPARENT VISCOSITY (mPa.s) | | | |
| PLASTIC VISCOSITY (mPa.s) | | | |
| YIELD POINT (Pa) | | | |
| GELS 0/10 min. (Pa) | | | |
| pH STRIP ☐ METER ☐ | | | |
| FILTRATE ☐ API ☐ HT HP (cm³) | | | |
| FILTER CAKE (mm) | | | |
| ALK ☐ (PF/MF) ☐ (PM/LIME) | | | |
| TOTAL HARDNESS ☐ Ca. ☐ (mg/L) | | | |
| SAL. ☐ NACI ☐ CL ☐ (mg/L) | | | |
| SAND CONTENT (%) ☐ (Ø) ☐ | | | |
| SOLIDS CONTENT (%) ☐ (Ø) ☐ | | | |
| OIL/WATER CONT. (%) ☐ (Ø) ☐ | | | |
| MBT (Kg/m³) ☐ /% ☐ OIL RET ☐ | | | |
| ELECTRICAL STABILITY (V) | | | |
| OIL/WATER RATIO | | | |
| $CaCl_2$ w/w% | | | |
| "n"/"k" | | | |

MATERIALS INVENTORY & COST

| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
|---|---|---|---|---|---|
| BARITE | | | 42 | | |

| | | | |
|---|---|---|---|
| PREVIOUS COST | | STARTING VOLUME | |
| DAILY COST | | VOL. BUILT | |
| CUM. COST | | VOL. LOST on SURFACE | |
| CUM. ENG. COST | | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS:

STOCK POINT I.D.F. ENGINEER

PHONE PHONE MOBILE #

**International Drilling Fluids Corporation**

# DRILLING FLUID REPORT

DATE [illegible]
REPORT No. [illegible]
SPUD DATE [illegible]

WELL NAME [illegible] LOCATION [illegible]
OPERATOR [illegible] CONTRACTOR [illegible]
REPORT FOR Mr. [illegible] REPORT FOR Mr. [illegible]

| ASSEMBLY | CASING | MUD Vol. (m³) | PUMP OUTPUT | ANNULAR VEL. m./min. |
|---|---|---|---|---|
| BIT SIZE / # [illegible] | COND. | TANKS [illegible] | PUMP SIZE [illegible] | OPPOSITE D.P. [illegible] |
| DRILL PIPE [illegible] mm | SURFACE | HOLE [illegible] | m³/STK. [illegible] | OPPOSITE D.C. [illegible] |
| DRILL COLLARS [illegible] mm | INTER. [illegible] | TOTAL [illegible] | S.P.M. [illegible] | PUMP PRESS. [illegible] |
| OTHER | OTHER | STANDBY | m³/min. [illegible] | CIRC. TIME [illegible] |

| HOLE DATA | DESANDER/DESTILTER | | DRILLING FLUID SPECIFICATIONS | |
|---|---|---|---|---|
| MUD TYPE [illegible] | FLOWLINE WT. [illegible] | kg/m³ | MUD WT. [illegible] | kg/m³ |
| HOLE COND. [illegible] | UNDERFLOW WT. | kg/m³ | VISCOSITY [illegible] | s/L |
| DEVIATION [illegible] | OVERFLOW WT. | kg/m³ | FILTRATE [illegible] | cm³/30 min. |
| CURRENT OP. [illegible] | UNDERFLOW RATE | m³/min. | pH [illegible] | |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

SAMPLE FROM FL. ☐ PIT ☐ [illegible] MUD PROPERTIES [illegible]

| MATERIALS & COST | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TIME SAMPLE TAKEN | [illegible] | | [illegible] | MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
| PRESENT DEPTH (m) | [illegible] | | [illegible] | [illegible] | [illegible] | | | | |
| FLOWLINE TEMPERATURE (°C) | [illegible] | | [illegible] | [illegible] | [illegible] | | [illegible] | [illegible] | [illegible] |
| DENSITY (kg/m³) | [illegible] | | [illegible] | | | | | | |
| FUNNEL VISCOSITY (s/L) | [illegible] | | [illegible] | | | | | | |
| APPARENT VISCOSITY (mPa.s) | [illegible] | | | | | | | | |
| PLASTIC VISCOSITY (mPa.s) | [illegible] | | | | | | | | |
| YIELD POINT (Pa) [illegible] | [illegible] | | | | | | | | |
| GELS 0/10 min. (Pa) | [illegible] | | | | | | | | |
| pH STRIP ☐ METER ☐ | [illegible] | | [illegible] | | | | | | |
| FILTRATE ☐ API ☐ HT HP (cm³) | [illegible] | | | | | | | | |
| FILTER CAKE (mm) | [illegible] | | | | | | | | |
| ALK ☐ (PF/MF) ☐ (PM/LIME) | [illegible] | | | | | | | | |
| TOTAL HARDNESS ☐ Ca. ☐ (mg/L) | [illegible] | | | | | | | | |
| SAL. ☐ NACI ☐ CL ☐ (mg/L) | [illegible] | | | | | | | | |
| SAND CONTENT (%) ☐ (Ø) ☐ | [illegible] | | | | | | | | |
| SOLIDS CONTENT (%) ☐ (Ø) ☐ | [illegible] | | | | | | | | |
| OIL/WATER CONT. (%) ☐ (Ø) ☐ | [illegible] | | | PREVIOUS COST | [illegible] | STARTING VOLUME | | | |
| MBT (Kg/m³) ☐ /% ☐ OIL RET ☐ | [illegible] | | | DAILY COST | [illegible] | VOL. BUILT | | | |
| ELECTRICAL STABILITY (V) | [illegible] | | | CUM. COST | [illegible] | VOL. LOST on SURFACE | | | |
| OIL/WATER RATIO [illegible] | [illegible] | | | CUM. ENG. COST | [illegible] | VOL. LOST SUB SURFACE | | | |
| $CaCl_2$ w/w% [illegible] | [illegible] | | | | | END VOLUME | | | |
| "n"/"k" [illegible] | [illegible] | | | | | CUM. VOL. BUILT | | | |

COMMENTS: [illegible]

STOCK POINT [illegible] I.D.F. ENGINEER [illegible]
PHONE [illegible] PHONE [illegible] MOBILE # [illegible]

**International Drilling Fluids Corporation**

# DRILLING FLUID REPORT

DATE [illegible]
REPORT No. [illegible]
SPUD DATE [illegible]

WELL NAME [illegible]
LOCATION [illegible]

| | |
|---|---|
| OPERATOR [illegible] | CONTRACTOR [illegible] |
| REPORT FOR Mr. | REPORT FOR Mr. [illegible] |

| ASSEMBLY | CASING | MUD Vol. (m³) | PUMP OUTPUT | ANNULAR VEL. m./min. |
|---|---|---|---|---|
| BIT SIZE / # [illegible] | COND. | TANKS [illegible] | PUMP SIZE [illegible] | OPPOSITE D.P. [illegible] |
| DRILL PIPE [illegible] mm | SURFACE | HOLE [illegible] | m³/STK. [illegible] | OPPOSITE D.C. [illegible] |
| DRILL COLLARS [illegible] mm | INTER. [illegible] | TOTAL [illegible] | S.P.M. [illegible] | PUMP PRESS. [illegible] |
| OTHER | OTHER | STANDBY | m³/min. [illegible] | CIRC. TIME 120 |

| HOLE DATA | DESANDER/DESTILTER | | DRILLING FLUID SPECIFICATIONS |
|---|---|---|---|
| MUD TYPE [illegible] | FLOWLINE WT. [illegible] | [illegible] kg/m³ | MUD WT. [illegible] kg/m³ |
| HOLE COND. [illegible] | UNDERFLOW WT. | kg/m³ | VISCOSITY [illegible] s/L |
| DEVIATION [illegible] | OVERFLOW WT. | kg/m³ | FILTRATE [illegible] cm³/30 min. |
| CURRENT OP. [illegible] | UNDERFLOW RATE | m³/min. | pH [illegible] |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

| SAMPLE FROM FL. ☐ PIT ☐ | MUD PROPERTIES | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | [illegible] | | |
| PRESENT DEPTH (m) | [illegible] | | |
| FLOWLINE TEMPERATURE (°C) | [illegible] | | |
| DENSITY (kg/m³) | 1190 | | |
| FUNNEL VISCOSITY (s/L) | 45 | | |
| APPARENT VISCOSITY (mPa.s) | [illegible] | | |
| PLASTIC VISCOSITY (mPa.s) | [illegible] | | |
| YIELD POINT (Pa) [illegible] | [illegible] | | |
| GELS 0/10 min. (Pa) | [illegible] | | |
| pH STRIP ☐-METER ☐ | [illegible] | | |
| FILTRATE ☐ API ☐ HT HP (cm³) | [illegible] | | |
| FILTER CAKE (mm) | [illegible] | | |
| ALK ☐ (PF/MF) ☐ (PM/LIME) | [illegible] | | |
| TOTAL HARDNESS ☐ Ca. ☐ (mg/L) | [illegible] | | |
| SAL. ☐ NACI ☐ CL ☐ (mg/L) | [illegible] | | |
| SAND CONTENT (%) ☐ (Ø) ☐ | [illegible] | | |
| SOLIDS CONTENT (%) ☐ (Ø) ☐ | [illegible] | | |
| OIL/WATER CONT. (%) ☐ (Ø) ☐ | [illegible] | | |
| MBT (Kg/m³) ☐ /% ☐ OIL RET ☐ | [illegible] | | |
| ELECTRICAL STABILITY (V) | — | | |
| OIL/WATER RATIO [illegible] | [illegible] | | |
| $CaCl_2$ w/w% [illegible] | [illegible] | | |
| "n"/"k" [illegible] | [illegible] | | |

MATERIALS INVENTORY & COST

| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
|---|---|---|---|---|---|
| [illegible] | [illegible] | | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | | [illegible] | [illegible] | [illegible] |

| | | | |
|---|---|---|---|
| PREVIOUS COST | [illegible] | STARTING VOLUME | |
| DAILY COST | [illegible] | VOL. BUILT | [illegible] |
| CUM. COST | [illegible] | VOL. LOST on SURFACE | |
| CUM. ENG. COST | [illegible] | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS:

[illegible]

[illegible]

STOCK POINT [illegible]
I.D.F. ENGINEER [illegible]
PHONE
PHONE [illegible] MOBILE # [illegible]

**International Drilling Fluids Corporation**

# DRILLING FLUID REPORT

DATE [illegible] 11, 1991
REPORT No. # [illegible]
SPUD DATE [illegible]

WELL NAME [illegible] LOCATION [illegible]

| | |
|---|---|
| OPERATOR [illegible] | CONTRACTOR [illegible] |
| REPORT FOR Mr. [illegible] | REPORT FOR Mr. [illegible] |

| ASSEMBLY | | CASING | MUD Vol. (m³) | PUMP OUTPUT | ANNULAR.VEL. m./min. |
|---|---|---|---|---|---|
| BIT SIZE / # [illegible] | | COND. | TANKS [illegible] | PUMP SIZE [illegible] | OPPOSITE D.P. 45 |
| DRILL PIPE [illegible] | mm | SURFACE | HOLE [illegible] | m³/STK. [illegible] | OPPOSITE D.C. [illegible] |
| DRILL COLLARS [illegible] | mm | INTER. [illegible] | TOTAL [illegible] | S.P.M. [illegible] | PUMP PRESS. [illegible] |
| OTHER | | OTHER | STANDBY | m³/min. [illegible] | CIRC. TIME [illegible] |

| HOLE DATA | DESANDER/DESTILTER | | DRILLING FLUID SPECIFICATIONS | |
|---|---|---|---|---|
| MUD TYPE [illegible] | FLOWLINE WT. [illegible] | [illegible] kg/m³ | MUD WT. [illegible] | kg/m³ |
| HOLE COND. [illegible] | UNDERFLOW WT. | kg/m³ | VISCOSITY [illegible] | s/L |
| DEVIATION [illegible] | OVERFLOW WT. | kg/m³ | FILTRATE [illegible] | cm³/30 min. |
| CURRENT OP. [illegible] | UNDERFLOW RATE | m³/min. | pH [illegible] | |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

| SAMPLE FROM FL. ☐ PIT ☐ | MUD PROPERTIES | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | [illegible] | | |
| PRESENT DEPTH (m) | [illegible] | | |
| FLOWLINE TEMPERATURE (°C) | [illegible] | | |
| DENSITY (kg/m³) | [illegible] | | |
| FUNNEL VISCOSITY (s/L) | [illegible] | | |
| APPARENT VISCOSITY (mPa.s) | 45 | | |
| PLASTIC VISCOSITY (mPa.s) | [illegible] | | |
| YIELD POINT (Pa) | [illegible] | | |
| GELS 0/10 min. (Pa) | [illegible] | | |
| pH STRIP ☐ METER ☐ | [illegible] | | |
| FILTRATE ☐ API ☐ HT HP (cm³) | [illegible] | | |
| FILTER CAKE (mm) | [illegible] | | |
| ALK ☐ (PF/MF) ☐ (PM/LIME) | [illegible] | | |
| TOTAL HARDNESS ☐ Ca. ☐ (mg/L) | [illegible] | | |
| SAL. ☐ NACI ☐ CL ☐ (mg/L) | [illegible] | | |
| SAND CONTENT (%) ☐ (∅) ☐ | [illegible] | | |
| SOLIDS CONTENT (%) ☐ (∅) ☐ | [illegible] | | |
| OIL/WATER CONT. (%) ☐ (∅) ☐ | [illegible] | | |
| MBT (Kg/m³) ☐ /% ☐ OIL RET ☐ | [illegible] | | |
| ELECTRICAL STABILITY (V) | - | | |
| OIL/WATER RATIO [illegible] | [illegible] | | |
| CaCl₂ w/w% [illegible] | [illegible] | | |
| "n"/"k" [illegible] | [illegible] | | |

| MATERIALS INVENTORY & COST | | | | | |
|---|---|---|---|---|---|
| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
| BARITE | [illegible] | | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | | [illegible] | [illegible] | [illegible] |

| | | | |
|---|---|---|---|
| PREVIOUS COST | [illegible] | STARTING VOLUME | |
| DAILY COST | [illegible] | VOL. BUILT | [illegible] |
| CUM. COST | [illegible] | VOL. LOST on SURFACE | |
| CUM. ENG. COST | [illegible] | VOL. LOST SUB SURFACE | |
| | | END VOLUME | [illegible] |
| | | CUM. VOL. BUILT | |

COMMENTS:

[illegible]

[illegible]

[illegible]

[illegible]

STOCK POINT [illegible] I.D.F. ENGINEER [illegible]
PHONE PHONE [illegible] MOBILE # [illegible]

**International Drilling Fluids Corporation**

# DRILLING FLUID REPORT

DATE
REPORT No.
SPUD DATE

WELL NAME LOCATION

OPERATOR CONTRACTOR

REPORT FOR Mr. REPORT FOR Mr.

| ASSEMBLY | CASING | MUD Vol. (m³) | PUMP OUTPUT | ANNULAR VEL. m./min. |
|---|---|---|---|---|
| BIT SIZE / # | COND. | TANKS | PUMP SIZE | OPPOSITE D.P. |
| DRILL PIPE mm | SURFACE | HOLE | m³/STK. | OPPOSITE D.C. |
| DRILL COLLARS mm | INTER. | TOTAL | S.P.M. | PUMP PRESS. |
| OTHER | OTHER | STANDBY | m³/min. | CIRC. TIME |

| HOLE DATA | DESANDER/DESTILTER | | DRILLING FLUID SPECIFICATIONS |
|---|---|---|---|
| MUD TYPE | FLOWLINE WT. | kg/m³ | MUD WT. kg/m³ |
| HOLE COND. | UNDERFLOW WT. | kg/m³ | VISCOSITY s/L |
| DEVIATION | OVERFLOW WT. | kg/m³ | FILTRATE cm³/30 min. |
| CURRENT OP. | UNDERFLOW RATE | m³/min. | pH |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

| SAMPLE FROM FL. ☐ PIT ☐ | MUD PROPERTIES | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | | | |
| PRESENT DEPTH (m) | | | |
| FLOWLINE TEMPERATURE (°C) | | | |
| DENSITY (kg/m³) | | | |
| FUNNEL VISCOSITY (s/L) | | | |
| APPARENT VISCOSITY (mPa.s) | | | |
| PLASTIC VISCOSITY (mPa.s) | | | |
| YIELD POINT (Pa) | | | |
| GELS 0/10 min. (Pa) | | | |
| pH STRIP ☐ METER ☐ | | | |
| FILTRATE ☐ API ☐ HT HP (cm³) | | | |
| FILTER CAKE (mm) | | | |
| ALK ☐ (PF/MF) ☐ (PM/LIME) | | | |
| TOTAL HARDNESS ☐ Ca. ☐ (mg/L) | | | |
| SAL. ☑ NACI ☐ CL ☐ (mg/L) | | | |
| SAND CONTENT (%) ☐ (Ø) ☐ | | | |
| SOLIDS CONTENT (%) ☐ (Ø) ☐ | | | |
| OIL/WATER CONT. (%) ☐ (Ø) ☐ | | | |
| MBT (Kg/m³) ☐ /% ☐ OIL RET ☐ | | | |
| ELECTRICAL STABILITY (V) | | | |
| OIL/WATER RATIO | | | |
| $CaCl_2$ w/w% | | | |
| "n"/"k" | | | |

| MATERIALS INVENTORY & COST | | | | | |
|---|---|---|---|---|---|
| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
| | | | | | |

| | | | |
|---|---|---|---|
| PREVIOUS COST | | STARTING VOLUME | |
| DAILY COST | | VOL. BUILT | |
| CUM. COST | | VOL. LOST on SURFACE | |
| CUM. ENG. COST | | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS:

STOCK POINT I.D.F. ENGINEER

PHONE PHONE MOBILE #

**International Drilling Fluids Corporation**

# DRILLING FLUID REPORT

DATE
REPORT No.
SPUD DATE

WELL NAME LOCATION
OPERATOR CONTRACTOR
REPORT FOR Mr. REPORT FOR Mr.

| ASSEMBLY | CASING | MUD Vol. (m³) | PUMP OUTPUT | ANNULAR VEL. m./min. |
|---|---|---|---|---|
| BIT SIZE / # | COND. | TANKS | PUMP SIZE | OPPOSITE D.P. |
| DRILL PIPE mm | SURFACE | HOLE | m³/STK. | OPPOSITE D.C. |
| DRILL COLLARS mm | INTER. | TOTAL | S.P.M. | PUMP PRESS. |
| OTHER | OTHER | STANDBY | m³/min. | CIRC. TIME |

| HOLE DATA | DESANDER/DESTILTER | | DRILLING FLUID SPECIFICATIONS |
|---|---|---|---|
| MUD TYPE | FLOWLINE WT. | kg/m³ | MUD WT. kg/m³ |
| HOLE COND. | UNDERFLOW WT. | kg/m³ | VISCOSITY s/L |
| DEVIATION | OVERFLOW WT. | kg/m³ | FILTRATE cm³/30 min. |
| CURRENT OP. | UNDERFLOW RATE | m³/min. | pH |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

SAMPLE FROM FL. ☐ PIT ☐

| MUD PROPERTIES | | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | | | |
| PRESENT DEPTH (m) | | | |
| FLOWLINE TEMPERATURE (°C) | | | |
| DENSITY (kg/m³) | | | |
| FUNNEL VISCOSITY (s/L) | | | |
| APPARENT VISCOSITY (mPa.s) | | | |
| PLASTIC VISCOSITY (mPa.s) | | | |
| YIELD POINT (Pa) | | | |
| GELS 0/10 min. (Pa) | | | |
| pH STRIP ☐ METER ☐ | | | |
| FILTRATE ☐ API ☐ HT HP (cm³) | | | |
| FILTER CAKE (mm) | | | |
| ALK ☐ (PF/MF) ☐ (PM/LIME) | | | |
| TOTAL HARDNESS ☐ Ca. ☐ (mg/L) | | | |
| SAL. ☐ NACI ☐ CL ☐ (mg/L) | | | |
| SAND CONTENT (%) ☐ (Ø) ☐ | | | |
| SOLIDS CONTENT (%) ☐ (Ø) ☐ | | | |
| OIL/WATER CONT. (%) ☐ (Ø) ☐ | | | |
| MBT (Kg/m³) ☐ -/% ☐ OIL RET ☐ | | | |
| ELECTRICAL STABILITY (V) | | | |
| OIL/WATER RATIO | | | |
| $CaCl_2$ w/w% | | | |
| "n"/"k" | | | |

MATERIALS INVENTORY & COST

| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
|---|---|---|---|---|---|
| | | | | | |

| | | | |
|---|---|---|---|
| PREVIOUS COST | | STARTING VOLUME | |
| DAILY COST | | VOL. BUILT | |
| CUM. COST | | VOL. LOST on SURFACE | |
| CUM. ENG. COST | | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS:

STOCK POINT I.D.F. ENGINEER

PHONE PHONE MOBILE #

**International Drilling Fluids Corporation**

# DRILLING FLUID REPORT

DATE APR. 12, 1991
REPORT No. #11
SPUD DATE APR. 09.91

WELL NAME [illegible] LOCATION [illegible]
OPERATOR [illegible] CONTRACTOR KENTING RIG
REPORT FOR Mr. [illegible] REPORT FOR Mr. [illegible]

| ASSEMBLY | CASING | MUD Vol. (m³) | PUMP OUTPUT | ANNULAR VEL. m./min. |
|---|---|---|---|---|
| BIT SIZE / # 15 7/8 | COND. | TANKS 175 m³ | PUMP SIZE 14 x 406 | OPPOSITE D.P. 49 |
| DRILL PIPE 89 mm | SURFACE | HOLE 40 m³ | m³/STK. .0135 | OPPOSITE D.C. 95 |
| DRILL COLLARS 178 mm | INTER 15 x 2800 | TOTAL 135 m³ | S.P.M. 47 | PUMP PRESS. 7000 |
| OTHER | OTHER | STANDBY | m³/min. .634 | CIRC. TIME 330 |

| HOLE DATA | DESANDER/DESTILTER | | DRILLING FLUID SPECIFICATIONS |
|---|---|---|---|
| MUD TYPE [illegible] | FLOWLINE WT. [illegible] | 75 kg/m³ | MUD WT. 1190 - 1200 kg/m³ |
| HOLE COND. [illegible] | UNDERFLOW WT. [illegible] | 105 kg/m³ | VISCOSITY 50 - 60 s/L |
| DEVIATION [illegible] | OVERFLOW WT. | kg/m³ | FILTRATE 12 - 14 cm³/30 min. |
| CURRENT OP. | UNDERFLOW RATE | m³/min. | pH 11.5 |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

SAMPLE FROM FL. ☐ PIT ☐ → [illegible]

| MUD PROPERTIES [illegible] | | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | 1000 | | |
| PRESENT DEPTH (m) | 2944 | | |
| FLOWLINE TEMPERATURE (°C) | 30°C | 40°C | |
| DENSITY (kg/m³) | 1190 | 1190 | |
| FUNNEL VISCOSITY (s/L) | 54 | 55 | |
| APPARENT VISCOSITY (mPa.s) | 32 | | |
| PLASTIC VISCOSITY (mPa.s) | 26 | | |
| YIELD POINT (Pa) | 6 | | |
| GELS 0/10 min. (Pa) | 1/3 | | |
| pH STRIP ☐ METER ☐ | 11.7 | 11.5 | |
| FILTRATE ☐ API ☐ HT HP (cm³) | 11.5 | | |
| FILTER CAKE (mm) | 1.5 | | |
| ALK ☐ (PF/MF) ☐ (PM/LIME) | 1.1/1.7 | | |
| TOTAL HARDNESS ☐ Ca. ☐ (mg/L) | 20 | | |
| SAL. ☐ NACI ☐ CL ☐ (mg/L) | 500 | | |
| SAND CONTENT (%) ☐ (Ø) ☐ | 0.5 | | |
| SOLIDS CONTENT (%) ☐ (Ø) ☐ | 6.7 | | |
| OIL/WATER CONT. (%) ☐ (Ø) ☐ | 9/2 | | |
| MBT (Kg/m³) ☐ /% ☐ OIL RET ☐ | 17 | | |
| ELECTRICAL STABILITY (V) | - | | |
| OIL/WATER RATIO [illegible] | 0 | | |
| $CaCl_2$ w/w% [illegible] | 0 | | |
| "n"/"k" [illegible] | 0.734 | | |

MATERIALS INVENTORY & COST

| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
|---|---|---|---|---|---|
| GEL | 445 | | 220 | 225 | 2200.00 |
| BARITE | 1191 | | 1500 | 4974 | 149220.00 |
| CAUSTIC | 210 | | 12 | 198 | 540.00 |
| LIGNITE | 100 | | 4 | 96 | 540.00 |
| LIGNOSULF | 225 | | 28 | 196 | 1274.00 |
| BARITE CONTRACTOR (1978) | | | | | |

| | | | |
|---|---|---|---|
| PREVIOUS COST | 71,662 | STARTING VOLUME | |
| DAILY COST | 7,214 | VOL. BUILT | |
| CUM. COST | 78,876 | VOL. LOST on SURFACE | |
| CUM. ENG. COST | 45,600 | VOL. LOST SUB SURFACE | |
| [illegible] | 124,476 | END VOLUME | |
| [illegible] | [illegible] | CUM. VOL. BUILT | |

COMMENTS:

WELL A LOST WATER CO. CA. 5 OF LOSSES

ONCE CONTROL IS GAINED TRIP

AT 2700 m LOST [illegible]

THANKS

STOCK POINT FT ST JOHN B.C. I.D.F. ENGINEER [illegible]
PHONE PHONE [illegible] MOBILE #

**International Drilling Fluids Corporation**

# DRILLING FLUID REPORT

DATE [illegible]
REPORT No. [illegible]
SPUD DATE [illegible]

WELL NAME [illegible] LOCATION [illegible]
OPERATOR [illegible] CONTRACTOR [illegible]
REPORT FOR Mr. [illegible] REPORT FOR Mr. [illegible]

| ASSEMBLY | CASING | MUD Vol. (m³) | PUMP OUTPUT | ANNULAR VEL. m./min. |
|---|---|---|---|---|
| BIT SIZE / # [illegible] | COND. | TANKS [illegible] | PUMP SIZE [illegible] | OPPOSITE D.P. [illegible] |
| DRILL PIPE [illegible] mm | SURFACE | HOLE [illegible] | m³/STK. [illegible] | OPPOSITE D.C. [illegible] |
| DRILL COLLARS [illegible] mm | INTER. [illegible] | TOTAL [illegible] | S.P.M. [illegible] | PUMP PRESS. [illegible] |
| OTHER | OTHER | STANDBY | m³/min. [illegible] | CIRC. TIME [illegible] |

| HOLE DATA | DESANDER/DESTILTER | | DRILLING FLUID SPECIFICATIONS |
|---|---|---|---|
| MUD TYPE [illegible] | FLOWLINE WT. [illegible] | kg/m³ | MUD WT. [illegible] kg/m³ |
| HOLE COND. [illegible] | UNDERFLOW WT. [illegible] | kg/m³ | VISCOSITY [illegible] s/L |
| DEVIATION [illegible] | OVERFLOW WT. | kg/m³ | FILTRATE [illegible] cm³/30 min. |
| CURRENT OP. | UNDERFLOW RATE | m³/min. | pH [illegible] |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

SAMPLE FROM FL. ☐ PIT ☐ [illegible]

| MUD PROPERTIES [illegible] | | | MATERIALS INVENTORY & COST | | | | | |
|---|---|---|---|---|---|---|---|---|
| TIME SAMPLE TAKEN | [illegible] | | MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
| PRESENT DEPTH (m) | [illegible] | | [illegible] | [illegible] | | [illegible] | [illegible] | [illegible] |
| FLOWLINE TEMPERATURE (°C) | [illegible] | [illegible] | [illegible] | [illegible] | | [illegible] | [illegible] | [illegible] |
| DENSITY (kg/m³) | [illegible] | [illegible] | [illegible] | [illegible] | | [illegible] | [illegible] | [illegible] |
| FUNNEL VISCOSITY (s/L) | [illegible] | [illegible] | [illegible] | [illegible] | | [illegible] | [illegible] | [illegible] |
| APPARENT VISCOSITY (mPa.s) | [illegible] | | [illegible] | [illegible] | | [illegible] | [illegible] | [illegible] |
| PLASTIC VISCOSITY (mPa.s) | [illegible] | | | | | | | |
| YIELD POINT (Pa) | [illegible] | | [illegible] | [illegible] | | [illegible] | [illegible] | [illegible] |
| GELS 0/10 min. (Pa) | [illegible] | | | | | | | |
| pH STRIP ☐-METER ☐ | [illegible] | | | | | | | |
| FILTRATE ☐-API ☐ HT HP (cm³) | [illegible] | | | | | | | |
| FILTER CAKE (mm) | [illegible] | | | | | | | |
| ALK ☐-(PF/MF) ☐ (PM/LIME) | [illegible] | | | | | | | |
| TOTAL HARDNESS ☐ Ca. ☐-(mg/L) | [illegible] | | | | | | | |
| SAL. ☐ NACI ☐ CL ☐-(mg/L) | [illegible] | | | | | | | |
| SAND CONTENT (%) ☐ (Ø) ☐ | [illegible] | | | | | | | |
| SOLIDS CONTENT (%) ☐ (Ø) ☐ | [illegible] | | | | | | | |
| OIL/WATER CONT. (%) ☐ (Ø) ☐ | [illegible] | | PREVIOUS COST | [illegible] | | STARTING VOLUME | | |
| MBT (Kg/m³) ☐-/% ☐ OIL RET ☐ | [illegible] | | DAILY COST | [illegible] | | VOL. BUILT | | |
| ELECTRICAL STABILITY (V) | - | | CUM. COST | [illegible] | | VOL. LOST on SURFACE | | |
| OIL/WATER RATIO [illegible] | [illegible] | | CUM. ENG. COST | [illegible] | | VOL. LOST SUB SURFACE | | |
| $CaCl_2$ w/w%- [illegible] | [illegible] | | | | | END VOLUME | | |
| "n"/"k" [illegible] | [illegible] | | | | | CUM. VOL. BUILT | | |

COMMENTS:

[illegible]

STOCK POINT [illegible] I.D.F. ENGINEER [illegible]
PHONE PHONE [illegible] MOBILE #

**International Drilling Fluids Corporation**

# DRILLING FLUID REPORT

DATE [illegible]
REPORT No. [illegible]
SPUD DATE [illegible]

WELL NAME [illegible] LOCATION [illegible]
OPERATOR [illegible] CONTRACTOR [illegible]
REPORT FOR Mr. [illegible] REPORT FOR Mr. [illegible]

| ASSEMBLY | CASING | MUD Vol. (m³) | PUMP OUTPUT | ANNULAR VEL. m./min. |
|---|---|---|---|---|
| BIT SIZE / # [illegible] | COND. | TANKS [illegible] | PUMP SIZE [illegible] | OPPOSITE D.P. [illegible] |
| DRILL PIPE [illegible] mm | SURFACE | HOLE [illegible] | m³/STK. [illegible] | OPPOSITE D.C. [illegible] |
| DRILL COLLARS [illegible] mm | INTER. [illegible] | TOTAL [illegible] | S.P.M. [illegible] | PUMP PRESS. [illegible] |
| OTHER | OTHER | STANDBY | m³/min. [illegible] | CIRC. TIME [illegible] |

| HOLE DATA | DESANDER/DESTILTER | | DRILLING FLUID SPECIFICATIONS |
|---|---|---|---|
| MUD TYPE [illegible] | FLOWLINE WT. [illegible] | kg/m³ | MUD WT. [illegible] kg/m³ |
| HOLE COND. [illegible] | UNDERFLOW WT. [illegible] | kg/m³ | VISCOSITY [illegible] s/L |
| DEVIATION [illegible] | OVERFLOW WT. | kg/m³ | FILTRATE [illegible] cm³/30 min. |
| CURRENT OP. [illegible] | UNDERFLOW RATE | m³/min. | pH [illegible] |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

SAMPLE FROM FL. ☐ PIT ☐ [illegible]

| MUD PROPERTIES | | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | [illegible] | | |
| PRESENT DEPTH (m) | [illegible] | | |
| FLOWLINE TEMPERATURE (°C) | [illegible] | | [illegible] |
| DENSITY (kg/m³) | [illegible] | | |
| FUNNEL VISCOSITY (s/L) | [illegible] | | |
| APPARENT VISCOSITY (mPa.s) | [illegible] | | |
| PLASTIC VISCOSITY (mPa.s) | [illegible] | | |
| YIELD POINT (Pa) | [illegible] | | |
| GELS 0/10 min. (Pa) | [illegible] | | |
| pH STRIP ☐ METER ☐ | [illegible] | | |
| FILTRATE ☐ API ☐ HT HP (cm³) | [illegible] | | |
| FILTER CAKE (mm) | [illegible] | | |
| ALK ☐ (PF/MF) ☐ (PM/LIME) | [illegible] | | |
| TOTAL HARDNESS ☐ Ca. ☐ (mg/L) | [illegible] | | |
| SAL. ☐ NACI ☐ CL ☐ (mg/L) | [illegible] | | |
| SAND CONTENT (%) ☐ (Ø) ☐ | [illegible] | | |
| SOLIDS CONTENT (%) ☐ (Ø) ☐ | [illegible] | | |
| OIL/WATER CONT. (%) ☐ (Ø) ☐ | [illegible] | | |
| MBT (Kg/m³) ☐ /% ☐ OIL RET ☐ | [illegible] | | |
| ELECTRICAL STABILITY (V) | [illegible] | | |
| OIL/WATER RATIO [illegible] | [illegible] | | |
| $CaCl_2$ w/w% [illegible] | [illegible] | | |
| "n"/"k" [illegible] | [illegible] | | |

MATERIALS INVENTORY & COST

| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
|---|---|---|---|---|---|
| BARITE | [illegible] | | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | | [illegible] | [illegible] | [illegible] |
| [illegible] | | | | | |
| [illegible] | | | | | |
| [illegible] | | | | | |
| [illegible] | | | | | |
| [illegible] | | | | | |
| [illegible] | | | | | |
| [illegible] | | | | | |
| [illegible] | | | | | |
| [illegible] | | | | | |
| [illegible] | | | | | |
| [illegible] | | | | | |
| [illegible] | | | | | |
| [illegible] | | | | | |
| [illegible] | | | | | |

| | | | |
|---|---|---|---|
| PREVIOUS COST | [illegible] | STARTING VOLUME | |
| DAILY COST | [illegible] | VOL. BUILT | [illegible] |
| CUM. COST | [illegible] | VOL. LOST on SURFACE | |
| CUM. ENG. COST | [illegible] | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS: [illegible]

STOCK POINT [illegible] I.D.F. ENGINEER [illegible]
PHONE [illegible] PHONE [illegible] MOBILE # [illegible]

**International Drilling Fluids Corporation**

# DRILLING FLUID REPORT

DATE [illegible]
REPORT No. [illegible]
SPUD DATE [illegible]

WELL NAME [illegible] LOCATION [illegible]
OPERATOR [illegible] CONTRACTOR [illegible]
REPORT FOR Mr. [illegible] REPORT FOR Mr. [illegible]

| ASSEMBLY | CASING | MUD Vol. (m³) | PUMP OUTPUT | ANNULAR VEL. m./min. |
|---|---|---|---|---|
| BIT SIZE / # [illegible] | COND. | TANKS [illegible] | PUMP SIZE [illegible] | OPPOSITE D.P. [illegible] |
| DRILL PIPE [illegible] mm | SURFACE | HOLE [illegible] | m³/STK. [illegible] | OPPOSITE D.C. [illegible] |
| DRILL COLLARS [illegible] mm | INTER. [illegible] | TOTAL [illegible] | S.P.M. [illegible] | PUMP PRESS. [illegible] |
| OTHER | OTHER | STANDBY | m³/min. [illegible] | CIRC. TIME [illegible] |

| HOLE DATA | DESANDER/DESTILTER | | DRILLING FLUID SPECIFICATIONS |
|---|---|---|---|
| MUD TYPE [illegible] | FLOWLINE WT. [illegible] | kg/m³ | MUD WT. [illegible] kg/m³ |
| HOLE COND. [illegible] | UNDERFLOW WT. [illegible] | kg/m³ | VISCOSITY [illegible] s/L |
| DEVIATION [illegible] | OVERFLOW WT. | kg/m³ | FILTRATE [illegible] cm³/30 min. |
| CURRENT OP. [illegible] | UNDERFLOW RATE | m³/min. | pH [illegible] |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

| SAMPLE FROM FL. ☐ PIT ☐ [illegible] | MUD PROPERTIES [illegible] | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | [illegible] | | |
| PRESENT DEPTH (m) | [illegible] | | |
| FLOWLINE TEMPERATURE (°C) | [illegible] | | [illegible] |
| DENSITY (kg/m³) | [illegible] | | [illegible] |
| FUNNEL VISCOSITY (s/L) | [illegible] | | [illegible] |
| APPARENT VISCOSITY (mPa.s) | [illegible] | | |
| PLASTIC VISCOSITY (mPa.s) | [illegible] | | |
| YIELD POINT (Pa) | [illegible] | | |
| GELS 0/10 min. (Pa) | [illegible] | | |
| pH STRIP ☐ METER ☐ | [illegible] | | [illegible] |
| FILTRATE ☐ API ☐ HT HP (cm³) | [illegible] | | |
| FILTER CAKE (mm) | [illegible] | | |
| ALK ☐ (PF/MF) ☐ (PM/LIME) | [illegible] | | |
| TOTAL HARDNESS ☐ Ca. ☐ (mg/L) | [illegible] | | |
| SAL. ☐ NACI ☐ CL ☐ (mg/L) | [illegible] | | |
| SAND CONTENT (%) ☐ (Ø) ☐ | [illegible] | | |
| SOLIDS CONTENT (%) ☐ (Ø) ☐ | [illegible] | | |
| OIL/WATER CONT. (%) ☐ (Ø) ☐ | [illegible] | | |
| MBT (Kg/m³) ☐ /% ☐ OIL RET ☐ | [illegible] | | |
| ELECTRICAL STABILITY (V) | [illegible] | | |
| OIL/WATER RATIO [illegible] | [illegible] | | |
| $CaCl_2$ w/w% [illegible] | [illegible] | | |
| "n"/"k" [illegible] | [illegible] | | |

| MATERIALS INVENTORY & COST | | | | | |
|---|---|---|---|---|---|
| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
| [illegible] | [illegible] | | [illegible] | [illegible] | [illegible] |

| | | | |
|---|---|---|---|
| PREVIOUS COST | [illegible] | STARTING VOLUME | |
| DAILY COST | [illegible] | VOL. BUILT | |
| CUM. COST | [illegible] | VOL. LOST on SURFACE | |
| CUM. ENG. COST | [illegible] | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS:

[illegible]

STOCK POINT [illegible] I.D.F. ENGINEER [illegible]
PHONE PHONE [illegible] MOBILE # [illegible]

**International Drilling Fluids Corporation**

# DRILLING FLUID REPORT

DATE 91-05-17
REPORT No. 15
SPUD DATE 91-04-29

| | | | |
|---|---|---|---|
| WELL NAME | COLUMBIA et al KATENELEE | LOCATION | Y-T-T-LD |
| OPERATOR | COLUMBIA GAS DEVELOPMENT | CONTRACTOR | KENTING #7 |
| REPORT FOR Mr. | HAROLD RICE / SAB TOOLE | REPORT FOR Mr. | KELLY DESJARDINS |

| ASSEMBLY | CASING | MUD Vol. (m³) | PUMP OUTPUT | ANNULAR VEL. m./min. |
|---|---|---|---|---|
| BIT SIZE / # 311 / 150 | COND. | TANKS | PUMP SIZE 114 x 406 | OPPOSITE D.P. 45 |
| DRILL PIPE 139 mm | SURFACE | HOLE | m³/STK. 0.158 | OPPOSITE D.C. 75 |
| DRILL COLLARS 120 mm | INTER. 177.8 / 339.7 | TOTAL | S.P.M. 45 | PUMP PRESS. |
| OTHER | OTHER | STANDBY | m³/min. 7.5 | CIRC. TIME 380 |

| HOLE DATA | DESANDER/DESILTER | | DRILLING FLUID SPECIFICATIONS | |
|---|---|---|---|---|
| MUD TYPE GEL CHEM. | FLOWLINE WT. | kg/m³ | MUD WT. 1190 | kg/m³ |
| HOLE COND. | UNDERFLOW WT. | kg/m³ | VISCOSITY 50-55 | s/L |
| DEVIATION | OVERFLOW WT. | kg/m³ | FILTRATE 10-12 | cm³/30 min. |
| CURRENT OP. | UNDERFLOW RATE | m³/min. | pH 10.5 | |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

| SAMPLE FROM FL. ☐ PIT ☑ | MUD PROPERTIES | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | 23:00 | | |
| PRESENT DEPTH (m) | | | |
| FLOWLINE TEMPERATURE (°C) | -- | | |
| DENSITY (kg/m³) | 1185 | | |
| FUNNEL VISCOSITY (s/L) | 48 | | |
| APPARENT VISCOSITY (mPa.s) | 24 | | |
| PLASTIC VISCOSITY (mPa.s) | 22 | | |
| YIELD POINT (Pa) | 4 | | |
| GELS 0/10 min. (Pa) | 1/2 | | |
| pH STRIP ☐ METER ☐ | 10.5 | | |
| FILTRATE ☐ API ☐ HT HP (cm³) | 10.4 | | |
| FILTER CAKE (mm) | 2.0 | | |
| ALK ☐ (PF/MF) ☐ (PM/LIME) | 1.4/3.2 | | |
| TOTAL HARDNESS ☐ Ca. ☐ (mg/L) | TR. | | |
| SAL. ☐ NACl ☐ CL ☐ (mg/L) | 750 | | |
| SAND CONTENT (%) ☐ (Ø) ☑ | TR. | | |
| SOLIDS CONTENT (%) ☐ (Ø) ☑ | 19 | | |
| OIL/WATER CONT. (%) ☐ (Ø) ☐ | 73 | | |
| MBT (Kg/m³) ☐ /% ☐ OIL RET ☐ | 65 | | |
| ELECTRICAL STABILITY (V) | | | |
| OIL/WATER RATIO 75/5 | NEG. | | |
| $CaCl_2$ w/w% | | | |
| "n"/"k" | | | |

| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
|---|---|---|---|---|---|
| | | | | | |

| | | | |
|---|---|---|---|
| PREVIOUS COST | 21 504 | STARTING VOLUME | |
| DAILY COST | | VOL. BUILT | |
| CUM. COST | | VOL. LOST on SURFACE | |
| CUM. ENG. COST | 6000 | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS:

CONTROL WEIGHT AT 1190 kg/m³ W/BARITE.

MAINTAIN PH AT 10.5 USING CAUSTIC.

KEEP Pc LOSS AS PER P.M.

KEEP V.S. AT 50-55 s/L USING GEL.

STOCK POINT FT ST. JOHN — TANKS
PHONE 785-4422

I.D.F. ENGINEER TIM WHELER
PHONE ON LOCATION MOBILE #

# IDF

INTERNATIONAL DRILLING FLUIDS

## DRILLING FLUID REPORT

DATE 91-05-18
REPORT No. 16
SPUD DATE 91-04-29

WELL NAME COLUMBIA OIL KOTANEELEE | LOCATION Y-J-I-48
OPERATOR COLUMBIA GAS DEVEL. | CONTRACTOR KENTING #7
REPORT FOR Mr. D.P. TOOLE | REPORT FOR Mr. PHIL BOSMWORTH

| ASSEMBLY | | CASING | MUD Vol. (m³) | | PUMP OUTPUT | ANNULAR VEL. m./min. |
|---|---|---|---|---|---|---|
| BIT SIZE / # | / 152 | COND. | TANKS | 70 | PUMP SIZE 114 x 406 | OPPOSITE D.P. |
| DRILL PIPE | 99 mm | SURFACE | HOLE | 52 | m³/STK. .0118 | OPPOSITE D.C. |
| DRILL COLLARS | 120 mm | INTER 177.8 | TOTAL | 120 | S.P.M. 37 | PUMP PRESS. |
| OTHER | | OTHER | STANDBY | | m³/min. .436 | CIRC. TIME 280 |

| HOLE DATA | | DESANDER/DESTILTER | | DRILLING FLUID SPECIFICATIONS | |
|---|---|---|---|---|---|
| MUD TYPE | GEL CAUSTIC | FLOWLINE WT. | kg/m³ | MUD WT. | 1190 kg/m³ |
| HOLE COND. | OK. | UNDERFLOW WT. | kg/m³ | VISCOSITY | 50-55 s/L |
| DEVIATION | | OVERFLOW WT. | kg/m³ | FILTRATE | < 12 cm³/30 min. |
| CURRENT OP. | C.R. | UNDERFLOW RATE | m³/min. | pH | 10.5 |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

SAMPLE FROM FL. ☐ PIT ☐

| MUD PROPERTIES | | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | 15:00 | | |
| PRESENT DEPTH (m) | 3274 | | |
| FLOWLINE TEMPERATURE (°C) | 30 | | |
| DENSITY (kg/m³) | 1190 | | |
| FUNNEL VISCOSITY (s/L) | 62 | | |
| APPARENT VISCOSITY (mPa.s) | 36 | | |
| PLASTIC VISCOSITY (mPa.s) | 28 | | |
| YIELD POINT (Pa) | 8 | | |
| GELS 0/10 min. (Pa) | 3/3 | | |
| pH STRIP ☐ METER ☐ | 11.0 | | |
| FILTRATE ☐ API ☐ HT HP (cm³) | 12.6 | | |
| FILTER CAKE (mm) | 2.0 | | |
| ALK ☐ (PF/MF) ☐ (PM/LIME) | 1.4/2.3 | | |
| TOTAL HARDNESS ☐ Ca ☐ (mg/L) | TR. | | |
| SAL. ☐ NACI ☐ CL ☐ (mg/L) | 750 | | |
| SAND CONTENT (%) ☐ (Ø) ☐ | TR. | | |
| SOLIDS CONTENT (%) ☐ (Ø) ☐ | 7 | | |
| OIL/WATER CONT. (%) ☐ (Ø) ☐ | .93 | | |
| MBT (Kg/m³) ☐ /% ☐ OIL RET ☐ | 70 | | |
| ELECTRICAL STABILITY (V) | - | | |
| OIL/WATER RATIO H₂S | NIL. | | |
| CaCl₂ w/w% | | | |
| "n"/"k" | | | |

MATERIALS INVENTORY & COST

| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
|---|---|---|---|---|---|
| BARITE | | | 35 | | 438 |

| | | | |
|---|---|---|---|
| PREVIOUS COST | 21,554 | STARTING VOLUME | |
| DAILY COST | 438 | VOL. BUILT | |
| CUM. COST | 21,992 | VOL. LOST on SURFACE | |
| CUM. ENG. COST | 6,375 | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS: SET BRIDGE PLUG AT 3331 m
SET WHIPSTOCK PACKER - 3277 m
LOGGED - RAN IN TO MILL!

1) HOLD DENSITY AT 1190 kg/m³ WITH BARITE.
2) PH AT 10.5 WITH CAUSTIC.
3) KEEP V.S. AT 50-55 S/L USING GEL.
4) RUN 20 LOADS HI-VIS PER RUN.

STOCK POINT FT. ST. JOHN | I.D.F. ENGINEER JIM WIELER
PHONE 785-4222 | PHONE/LOCATION | MOBILE #

IDF

INTERNATIONAL DRILLING FLUIDS

# DRILLING FLUID REPORT

DATE 91-05-19
REPORT No. 17
SPUD DATE 91-04-27

WELL NAME COLUMBIA ET AL KATANETELEE LOCATION 4-J-I-48
OPERATOR COLUMBIA GAS DEVEL. CONTRACTOR KENTING #7
REPORT FOR Mr. BOB TOOLE REPORT FOR Mr. PHIL ROSMILLORTH

| ASSEMBLY | | CASING | MUD Vol. (m³) | | PUMP OUTPUT | | ANNULAR VEL. m./min. |
|---|---|---|---|---|---|---|---|
| BIT SIZE / # | / | COND. | TANKS | 75 | PUMP SIZE | 114 x 406 | OPPOSITE D.P. |
| DRILL PIPE | 89 mm | SURFACE | HOLE | 52 | m³/STK. | .0118 | OPPOSITE D.C. |
| DRILL COLLARS | 120 mm | INTER. 177.8 | TOTAL | 127 | S.P.M. | 50 | PUMP PRESS BTMS UP 90 |
| OTHER | | OTHER | STANDBY | | m³/min. | .59 | CIRC. TIME 215 ± |

| HOLE DATA | | DESANDER/DESTILTER | | DRILLING FLUID SPECIFICATIONS | |
|---|---|---|---|---|---|
| MUD TYPE | GEL CAUSTIC | FLOWLINE WT. | kg/m³ | MUD WT. | 1190 kg/m³ |
| HOLE COND. | CASED | UNDERFLOW WT. | kg/m³ | VISCOSITY | 50-60 s/L |
| DEVIATION | | OVERFLOW WT. | kg/m³ | FILTRATE | 12 cm³/30 min. |
| CURRENT OP. | MILL | UNDERFLOW RATE | m³/min. | pH | 11.0 |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☑ DOUBLE DECK OR HIGH SPEED SHAKER

SAMPLE FROM FL. ☑ PIT ☐

| MUD PROPERTIES | | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | 05:00 | | 23:30 |
| PRESENT DEPTH (m) | 3274 | | 3274 |
| FLOWLINE TEMPERATURE (°C) | 35 | | 37 |
| DENSITY (kg/m³) | 1195 | | 1190 |
| FUNNEL VISCOSITY (s/L) | 60 | | 53 |
| APPARENT VISCOSITY (mPa.s) | 39 | | 35 |
| PLASTIC VISCOSITY (mPa.s) | 30 | | 28 |
| YIELD POINT (Pa) | 9 | | 7 |
| GELS 0/10 min. (Pa) | 3/7 | | 1/3 |
| pH STRIP ☑ METER ☐ | 11.0 | | 11.0 |
| FILTRATE ☑ API ☐ HT HP (cm³) | 13.6 | | 13.0 |
| FILTER CAKE (mm) | 2.0 | | 2.0 |
| ALK ☑ (PF/MF) ☐ (PM/LIME) | 1.3/2.3 | | 1.3/2.4 |
| TOTAL HARDNESS ☐ Ca. ☐ (mg/L) | TR. | | TR. |
| SAL. ☐ NACI ☐ CL ☑ (mg/L) | 750 | | 750 |
| SAND CONTENT (%) ☐ (Ø) ☑ | TR. | | TR. |
| SOLIDS CONTENT (%) ☐ (Ø) ☑ | 07 | | .07 |
| OIL/WATER CONT. (%) ☐ (Ø) ☑ | .93 | | 93 |
| MBT (Kg/m³) ☑ /% ☐ OIL RET ☐ | 70 | | 70 |
| ELECTRICAL STABILITY (V) | — | | - |
| OIL/WATER RATIO $H_2S$ | NEG. | | NEG. |
| $CaCl_2$ w/w% | | | |
| "n"/"k" | | | |

MATERIALS INVENTORY & COST

| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
|---|---|---|---|---|---|
| BARITE | | | 70 | | 875 |

| | | | |
|---|---|---|---|
| PREVIOUS COST | 21,792 | STARTING VOLUME | |
| DAILY COST | 875 | VOL. BUILT | |
| CUM. COST | 22,667 | VOL. LOST on SURFACE | |
| CUM. ENG. COST | 6750 | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS: MILLING WINDOW

CONTROL DENSITY AT 1190 kg/m³ USING BARITE.

KEEP PH AT 11.0 WITH CAUSTIC.

HOLD VIS. AT 50-55 SEC W/ GEL.

NOTE: IF W/C CLOSES RUN WATER.

STOCK POINT FT. ST. JOHN I.D.F. ENGINEER JIM WILLER
PHONE 785-4222 PHONE ON LOCATION MOBILE #

IDF

INTERNATIONAL DRILLING FLUIDS

# DRILLING FLUID REPORT

DATE 91-05-20
REPORT No. 18
SPUD DATE 91-05-29

WELL NAME COLUMBIA 2 of KOTANELEE | LOCATION Y-J-E-48
OPERATOR COLUMBIA GAS DEVEL. | CONTRACTOR KENTING #7
REPORT FOR Mr. BOB TOOLE | REPORT FOR Mr. PHIL BOSOMWORTH

| ASSEMBLY | | CASING | MUD Vol. (m³) | | PUMP OUTPUT | ANNULAR VEL. m./min. |
|---|---|---|---|---|---|---|
| BIT SIZE / # | / 152 | COND. | TANKS | 70 | PUMP SIZE 114 x 406 | OPPOSITE D.P. |
| DRILL PIPE | 89 mm | SURFACE | HOLE | 52 | m³/STK. .0118 | OPPOSITE D.C. |
| DRILL COLLARS | 120 mm | INTER. 177.8/3274 | TOTAL | 122 | S.P.M. 90 | PUMP PRESS. |
| OTHER | | OTHER | STANDBY | | m³/min. .472 | CIRC. TIME |

| HOLE DATA | | DESANDER/DESTILTER | | DRILLING FLUID SPECIFICATIONS | |
|---|---|---|---|---|---|
| MUD TYPE | WT. GEL/CAUSTIC | FLOWLINE WT. | kg/m³ | MUD WT. | 1190 kg/m³ |
| HOLE COND. | CASED | UNDERFLOW WT. | kg/m³ | VISCOSITY | 50-55 s/L |
| DEVIATION | | OVERFLOW WT. | kg/m³ | FILTRATE | 12 cm³/30 min. |
| CURRENT OP. | MILLING | UNDERFLOW RATE | m³/min. | pH | 10.5-11.0 |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

| SAMPLE FROM FL. ☑ PIT ☐ | MUD PROPERTIES | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | 03:30 | | |
| PRESENT DEPTH (m) | 3276 | | |
| FLOWLINE TEMPERATURE (°C) | 38 | | |
| DENSITY (kg/m³) | 1190 | | |
| FUNNEL VISCOSITY (s/L) | 53 | | |
| APPARENT VISCOSITY (mPa.s) | 35 | | |
| PLASTIC VISCOSITY (mPa.s) | 28 | | |
| YIELD POINT (Pa) | 7 | | |
| GELS 0/10 min. (Pa) | 1\|3 | | |
| pH STRIP ☑ METER ☐ | 11.0 | | |
| FILTRATE ☑ API ☐ HT HP (cm³) | 12.0 | | |
| FILTER CAKE (mm) | 2.0 | | |
| ALK ☑ (PF/MF) ☐ (PM/LIME) | 1.3\|2.4 | | |
| TOTAL HARDNESS ☑ Ca. ☐ (mg/L) | TR. | | |
| SAL. ☐ NACI ☐ CL ☑ (mg/L) | 750 | | |
| SAND CONTENT (%) ☐ (Ø) ☑ | .001 | | |
| SOLIDS CONTENT (%) ☐ (Ø) ☑ | .07 | | |
| OIL/WATER CONT. (%) ☐ (Ø) ☑ | .93 | | |
| MBT (Kg/m³) ☑ /% ☐ OIL RET ☐ | 70 | | |
| ELECTRICAL STABILITY (V) | | | |
| OIL/WATER RATIO | N.S. | N.G. | |
| $CaCl_2$ w/w% | | | |
| "n"/"k" | | | |

| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
|---|---|---|---|---|---|
| | | | | | |

| | | | |
|---|---|---|---|
| PREVIOUS COST | 20,867 | STARTING VOLUME | |
| DAILY COST | -- | VOL. BUILT | |
| CUM. COST | 20,867 | VOL. LOST on SURFACE | |
| CUM. ENG. COST | 7125 | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS: MILLING

CONTROL DENSITY AT 1190 kg/m³ WITH BARITE.

PH AT 11.0 WITH CAUSTIC.

HOLD VIS AT 50-55 s/L WITH GEL.

NOTE: IF VIS. CLIMBS RUN H₂O

STOCK POINT FT. ST. JOHN | I.D.F. ENGINEER JIM WIGLER
PHONE 785-4222 | PHONE ON LOCATION | MOBILE #

IDF

INTERNATIONAL DRILLING FLUIDS

# DRILLING FLUID REPORT

DATE 91-05-21
REPORT No. 19
SPUD DATE 91-04-29

WELL NAME COLUMBIA et al KOTANELEE — LOCATION Y-J-I-48
OPERATOR COLUMBIA GAS DEVEL. — CONTRACTOR KENTING H.T. # 7
REPORT FOR Mr. BOB TODLE — REPORT FOR Mr. PHIL BOSWORTH

| ASSEMBLY | | CASING | MUD Vol. (m³) | PUMP OUTPUT | ANNULAR VEL. m./min. |
|---|---|---|---|---|---|
| BIT SIZE / # | / | COND. | TANKS 70 | PUMP SIZE 14 x 406 | OPPOSITE D.P. |
| DRILL PIPE | 89 mm | SURFACE | HOLE 52 | m³/STK. .018 | OPPOSITE D.C. |
| DRILL COLLARS | 130 mm | INTER. 178@3274 | TOTAL 122 | S.P.M. 40 | PUMP PRESS. STK. = 110 |
| OTHER | | OTHER | STANDBY | m³/min. .472 | CIRC. TIME 260 |

| HOLE DATA | DESANDER/DESILTER | | DRILLING FLUID SPECIFICATIONS | |
|---|---|---|---|---|
| MUD TYPE WT. GEL/CAUSTIC | FLOWLINE WT. | kg/m³ | MUD WT. 1190 | kg/m³ |
| HOLE COND. | UNDERFLOW WT. | kg/m³ | VISCOSITY 50-55 | s/L |
| DEVIATION | OVERFLOW WT. | kg/m³ | FILTRATE 12 | cm³/30 min. |
| CURRENT OP. MILLING | UNDERFLOW RATE | m³/min. | pH 10.5-11.0 | |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

| SAMPLE FROM FL. ☐ PIT ☐ | MUD PROPERTIES | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | 02:30 | | |
| PRESENT DEPTH (m) | 3277 | | |
| FLOWLINE TEMPERATURE (°C) | 37 | | |
| DENSITY (kg/m³) | 1190 | | |
| FUNNEL VISCOSITY (s/L) | 53 | | |
| APPARENT VISCOSITY (mPa.s) | 35 | | |
| PLASTIC VISCOSITY (mPa.s) | 28 | | |
| YIELD POINT (Pa) | 7 | | |
| GELS 0/10 min. (Pa) | 1\|2 | | |
| pH STRIP ☐ METER ☐ | 11.0 | | |
| FILTRATE ☐ API ☐ HT HP (cm³) | 13.0 | | |
| FILTER CAKE (mm) | 2.0 | | |
| ALK ☐ (PF/MF) ☐ (PM/LIME) | 1.3\|2.3 | | |
| TOTAL HARDNESS ☐ Ca. ☐ (mg/L) | TR. | | |
| SAL. ☐ NACI ☐ CL ☐ (mg/L) | 750 | | |
| SAND CONTENT (%) ☐ (Ø) ☐ | .001 | | |
| SOLIDS CONTENT (%) ☐ (Ø) ☐ | 7 | | |
| OIL/WATER CONT. (%) ☐ (Ø) ☐ | 93 | | |
| MBT (Kg/m³) ☐ /% ☐ OIL RET ☐ | 70 | | |
| ELECTRICAL STABILITY (V) | — | | |
| OIL/WATER RATIO $H_2S$ | NEG. | | |
| $CaCl_2$ w/w% | | | |
| "n"/"k" | | | |

| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
|---|---|---|---|---|---|
| BARITE | | | 35 | | 438 |

| | | | |
|---|---|---|---|
| PREVIOUS COST | 22,867 | STARTING VOLUME | |
| DAILY COST | 438 | VOL. BUILT | |
| CUM. COST | 23,305 | VOL. LOST on SURFACE | |
| CUM. ENG. COST | 7500 | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS: MILLING.

1) CONTROL DENSITY AT 1190 Kg/m3 USING BARITE.
2) KEEP PH AT 11.0 WITH CAUSTIC.
3) HOLD VIS. AT 50-60 S/L USING GEL.
4) IF VIS. CLIMBS OVER 60 S/L RUN $H_2O$

STOCK POINT FT. ST. JOHN — I.D.F. ENGINEER JIM WEIER
PHONE 785-4282 — PHONE ON LOCATION — MOBILE #

IDF

INTERNATIONAL DRILLING FLUIDS

# DRILLING FLUID REPORT

DATE 91-05-22
REPORT No. 20
SPUD DATE 91-04-29

WELL NAME COLUMBIA et al KOTENELEE — LOCATION Y J I -48
OPERATOR COLUMBIA GAS DEVEL. — CONTRACTOR KENTING HI-TOWER #7
REPORT FOR Mr. BOB TOOLE — REPORT FOR Mr. PHIL BOSWORTH

| ASSEMBLY | | CASING | | MUD Vol. (m³) | | PUMP OUTPUT | | ANNULAR VEL. m./min. | |
|---|---|---|---|---|---|---|---|---|---|
| BIT SIZE / # | / | COND. | | TANKS | 70 | PUMP SIZE | 114 x 406 | OPPOSITE D.P. | 40 |
| DRILL PIPE | 89 mm | SURFACE | | HOLE | 52 | m³/STK. | .0118 | OPPOSITE D.C. | |
| DRILL COLLARS | 120 mm | INTER | 178/3274 | TOTAL | 122 | S.P.M. | 43 | PUMP PRESS. | 10,000 |
| OTHER | | OTHER | | STANDBY | | m³/min. | .507 | CIRC. TIME | 240 |

| HOLE DATA | | DESANDER/DESTILTER | | DRILLING FLUID SPECIFICATIONS | |
|---|---|---|---|---|---|
| MUD TYPE | WT. GEL/CAUSTIC | FLOWLINE WT. | kg/m³ | MUD WT. | 1190 kg/m³ |
| HOLE COND. | CAGED | UNDERFLOW WT. | kg/m³ | VISCOSITY | 50-55 s/L |
| DEVIATION | | OVERFLOW WT. | kg/m³ | FILTRATE | 12 cm³/30 min. |
| CURRENT OP. | MILLING | UNDERFLOW RATE | m³/min. | pH | 10.5-11.0 |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

| SAMPLE FROM FL. ☑ PIT ☐ | MUD PROPERTIES | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | 09:30 | | |
| PRESENT DEPTH (m) | 3277 | | |
| FLOWLINE TEMPERATURE (°C) | 37 | | |
| DENSITY (kg/m³) | 1195 | | |
| FUNNEL VISCOSITY (s/L) | 53 | | |
| APPARENT VISCOSITY (mPa.s) | 35 | | |
| PLASTIC VISCOSITY (mPa.s) | 28 | | |
| YIELD POINT (Pa) | 7 | | |
| GELS 0/10 min. (Pa) | 1/3 | | |
| pH STRIP ☐ METER ☐ | 10.5 | | |
| FILTRATE ☐ API ☐ HT HP (cm³) | 12.8 | | |
| FILTER CAKE (mm) | 2.0 | | |
| ALK ☐ (PF/MF) ☐ (PM/LIME) | 1.0/2.0 | | |
| TOTAL HARDNESS ☐ Ca. ☐ (mg/L) | TR. | | |
| SAL. ☐ NACl ☐ CL ☐ (mg/L) | 700 | | |
| SAND CONTENT (%) ☐ (⌀) ☐ | .001 | | |
| SOLIDS CONTENT (%) ☐ (⌀) ☐ | 9.75 | | |
| OIL/WATER CONT. (%) ☐ (⌀) ☐ | 9.25 | | |
| MBT (Kg/m³) ☐ /% ☐ OIL RET ☐ | 70 | | |
| ELECTRICAL STABILITY (V) | — | | |
| OIL/WATER RATIO $H_2S$ | N.G. | | |
| $CaCl_2$ w/w% | | | |
| "n"/"k" | | | |

| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
|---|---|---|---|---|---|
| BARITE | | | 70 | | 875 |

| | | | |
|---|---|---|---|
| PREVIOUS COST | 23,305 | STARTING VOLUME | |
| DAILY COST | 875 | VOL. BUILT | |
| CUM. COST | 24,180 | VOL. LOST on SURFACE | |
| CUM. ENG. COST | 7875 | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS: MILLING BHPS. UP 100 MIN.

1) HOLD DENSITY AT 1190 Kg/m3 WITH BARITE.
2) KEEP PH AT 10.5-11.0 USING CAUSTIC.
3) CONTROL VIS. AT 50-55 s/L W/ GEL.
4) NOTE: IF VIS. CLIMBS OVER 60 s/L RUN $H_2O$.

STOCK POINT FT. ST. JOHN — I.D.F. ENGINEER JIM WELLER
PHONE 785-4425 — PHONE ON LOCATION — MOBILE #

IDF

INTERNATIONAL DRILLING FLUIDS

# DRILLING FLUID REPORT

DATE 91-05-23
REPORT No. 21
SPUD DATE 91-04-29

WELL NAME COLUMBIA et al KOTANEELEE | LOCATION 4 J I - 48
OPERATOR COLUMBIA GAS DEVEL. | CONTRACTOR KENTING HI-TOWER #7
REPORT FOR Mr. BOB TOOLE | REPORT FOR Mr. PHIL BOSOMWORTH

| ASSEMBLY | | CASING | MUD Vol. (m³) | | PUMP OUTPUT | ANNULAR VEL. m./min. |
|---|---|---|---|---|---|---|
| BIT SIZE / # | / | COND. | TANKS 75 | | PUMP SIZE 114 x 406 | OPPOSITE D.P. 44 |
| DRILL PIPE 89 | mm | SURFACE | HOLE 52 | | m³/STK. .0118 | OPPOSITE D.C. |
| DRILL COLLARS 120 | mm | INTER 178/3274 | TOTAL 127 | | S.P.M. 45 | PUMP PRESS. 10.000 |
| OTHER | | OTHER | STANDBY | | m³/min. .531 | CIRC. TIME 240 |

| HOLE DATA | | DESANDER/DESTILTER | | DRILLING FLUID SPECIFICATIONS | |
|---|---|---|---|---|---|
| MUD TYPE WT. GEL - CAUSTIC | | FLOWLINE WT. | kg/m³ | MUD WT. 1190 | kg/m³ |
| HOLE COND. OK. | | UNDERFLOW WT. | kg/m³ | VISCOSITY 50-55 | s/L |
| DEVIATION | | OVERFLOW WT. | kg/m³ | FILTRATE 12 | cm³/30 min. |
| CURRENT OP. MILLING | | UNDERFLOW RATE | m³/min. | pH 10.5-11.0 | |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☑ DOUBLE DECK OR HIGH SPEED SHAKER

| SAMPLE FROM FL. ☑ PIT ☐ | MUD PROPERTIES | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | 07:00 | | |
| PRESENT DEPTH (m) | 3279 | | |
| FLOWLINE TEMPERATURE (°C) | 38 | | |
| DENSITY (kg/m³) | 1205 | | |
| FUNNEL VISCOSITY (s/L) | 57 | | |
| APPARENT VISCOSITY (mPa.s) | 41 | | |
| PLASTIC VISCOSITY (mPa.s) | 32 | | |
| YIELD POINT (Pa) | 9 | | |
| GELS 0/10 min. (Pa) | 2/3 | | |
| pH STRIP ☑ METER ☐ | 11.0 | | |
| FILTRATE ☑ API ☐ HT HP (cm³) | 12.0 | | |
| FILTER CAKE (mm) | 2.0 | | |
| ALK ☑ (PF/MF) ☐ (PM/LIME) | 1.1/2.2 | | |
| TOTAL HARDNESS ☑ Ca. ☐ (mg/L) | TR. | | |
| SAL. ☐ NACI ☐ CL ☑ (mg/L) | 650 | | |
| SAND CONTENT (%) ☐ (Ø) ☑ | .000 | | |
| SOLIDS CONTENT (%) ☐ (Ø) ☑ | .08 | | |
| OIL/WATER CONT. (%) ☐ (Ø) ☐ | .92 | | |
| MBT (Kg/m³) ☑ /% ☐ OIL RET ☐ | 75 | | |
| ELECTRICAL STABILITY (V) | — | | |
| OIL/WATER RATIO H.S | NEG. | | |
| $CaCl_2$ w/w% | | | |
| "n"/"k" | | | |

| MATERIALS INVENTORY & COST | | | | | |
|---|---|---|---|---|---|
| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
| BARITE | | | 70 | | 875 |
| GEL | | | 25 | | 250 |
| CAUSTIC | | | 1 | | 30 |

| | | | |
|---|---|---|---|
| PREVIOUS COST | 24,180 | STARTING VOLUME | |
| DAILY COST | 1155 | VOL. BUILT | |
| CUM. COST | 25,335 | VOL. LOST on SURFACE | |
| CUM. ENG. COST | 8,250 | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS: MILLING. BTMS. UP - 100 MIN.

1) CONTROL DENSITY AT 1190 kg/m³ USING BARITE.
2) KEEP PH AT 10.5 - 11.0 WITH CAUSTIC.
3) HOLD VIS. AT 50-55 S/L W/ GEL.
4) RUN 15 LITRES H₂O PER MIN. IF VIS. OVER 60 S/L.

STOCK POINT FT. ST. JOHN | I.D.F. ENGINEER JIM WIELER
PHONE 785-4222 | PHONE ON LOCATION | MOBILE #

**International Drilling Fluids Corporation**

# DRILLING FLUID REPORT

DATE 91-05-24
REPORT No. 22
SPUD DATE 91-04-29

WELL NAME COLUMBIA Bal KATANGLIER LOCATION N.T.T.-42
OPERATOR COLUMBIA GAS DEVEL. CONTRACTOR KENTING - N.T. #7
REPORT FOR Mr. [illegible] TOOLE REPORT FOR Mr. [illegible] MCILRATH

| ASSEMBLY | CASING | MUD Vol. (m³) | PUMP OUTPUT | ANNULAR VEL. m./min. |
|---|---|---|---|---|
| BIT SIZE / # 15R / 15J | COND. | TANKS | PUMP SIZE 11U x 10L | OPPOSITE D.P. |
| DRILL PIPE 89 mm | SURFACE | HOLE | m³/STK. 0.118 | OPPOSITE D.C. |
| DRILL COLLARS 120 mm | INTER. 178/3274 | TOTAL | S.P.M. | PUMP PRESS. |
| OTHER | OTHER | STANDBY | m³/min. | CIRC. TIME |

| HOLE DATA | DESANDER/DESTILTER | | DRILLING FLUID SPECIFICATIONS | |
|---|---|---|---|---|
| MUD TYPE LIT. GEL/CAUSTIC | FLOWLINE WT. | kg/m³ | MUD WT. 1190 | kg/m³ |
| HOLE COND. | UNDERFLOW WT. | kg/m³ | VISCOSITY 45-50 | s/L |
| DEVIATION | OVERFLOW WT. | kg/m³ | FILTRATE <10 | cm³/30 min. |
| CURRENT OP. DRLG. | UNDERFLOW RATE | m³/min. | pH 10. | |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

| SAMPLE FROM FL. ☐-PIT ☐ | MUD PROPERTIES (05-25) | | | MATERIALS INVENTORY & COST | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TIME SAMPLE TAKEN | 16:30 | | 04:30 | MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
| PRESENT DEPTH (m) | 3290 | | 3290 | BARITE | | | 25 | | 300 |
| FLOWLINE TEMPERATURE (°C) | 37 | | — | CAUS. | | | 10 | | 190 |
| DENSITY (kg/m³) | 1210 | | 1010 | | | | | | |
| FUNNEL VISCOSITY (s/L) | 60 | | 42 | | | | | | |
| APPARENT VISCOSITY (mPa.s) | 44 | | 24 | | | | | | |
| PLASTIC VISCOSITY (mPa.s) | 34 | | 9 | | | | | | |
| YIELD POINT (Pa) | 10 | | 6 | | | | | | |
| GELS 0/10 min. (Pa) | 2/3 | | 1/2 | | | | | | |
| pH STRIP ☐-METER ☐ | 9.5 | | 10.0 | | | | | | |
| FILTRATE ☐-API ☐ HT HP (cm³) | 13.4 | | 10.0 | | | | | | |
| FILTER CAKE (mm) | 2.0 | | .05 | | | | | | |
| ALK ☐-(PF/MF) ☐ (PM/LIME) | 1.0/2.1 | | .55/.85 | | | | | | |
| TOTAL HARDNESS ☐-Ca. ☐ (mg/L) | 96 | | — | | | | | | |
| SAL. ☐ NACI ☐ CL ☐-(mg/L) | 600 | | 300 | | | | | | |
| SAND CONTENT (%) ☐ (Ø) ☐ | TR. | | — | | | | | | |
| SOLIDS CONTENT (%) ☐ (Ø) ☐ | 8.8 | | — | | | | | | |
| OIL/WATER CONT. (%) ☐ (Ø) ☐ | 91.5 | | — | PREVIOUS COST | 25,236 | | STARTING VOLUME | | |
| MBT (Kg/m³) ☐/% ☐ OIL RET ☐ | 9.5 | | — | DAILY COST | 400 | | VOL. BUILT | | |
| ELECTRICAL STABILITY (V) | 1 | | — | CUM. COST | 25,636 | | VOL. LOST on SURFACE | | |
| OIL/WATER RATIO 91/9 | 91/9 | | — | CUM. ENG. COST | 8,135 | | VOL. LOST SUB SURFACE | | |
| $CaCl_2$ w/w% | | | | | | | END VOLUME | | |
| "n"/"k" | | | | | | | CUM. VOL. BUILT | | |

COMMENTS: DRILLED 15J IN HOLE TO 3290 m.
RAN LEAK OFF TEST DUMPED TANKS TO MIX POLYMER SYSTEM.
ADD 2 SX. SOD ASH + MIX TOOLS AT 15 MIN. SX TO DRAIN MIX
@ 45.50 SX.
ADD 3 BULK LOADS AT 30 m³/HAUL.
MIX BARITE TO RAISE DENSITY TO 1200 kg/m³ IN 3 CIRC. MIN.

STOCK POINT ST. ST. JOHN D.F. ENGINEER TIM WHITE
PHONE 735-4222 PHONE (at location) MOBILE #

**International Drilling Fluids Corporation**

# DRILLING FLUID REPORT

DATE 91-05-25
REPORT No. 23
SPUD DATE 91-04-29

WELL NAME COLUMBIA ET AL KOTAKOTELEE LOCATION 4-T-5-W6
OPERATOR COLUMBIA GAS DEVEL. CONTRACTOR KENTING H.T. #7
REPORT FOR Mr. BOB TODD REPORT FOR Mr. PHIL [illegible] NORTH

| ASSEMBLY | | CASING | | MUD Vol. (m³) | | PUMP OUTPUT | | ANNULAR VEL. m./min. | |
|---|---|---|---|---|---|---|---|---|---|
| BIT SIZE / # | 188 / 1C1 | COND. | | TANKS | 50 | PUMP SIZE | 7" x 406 | OPPOSITE D.P. | 49 |
| DRILL PIPE | 89 mm | SURFACE | 244.5 @ 374 | HOLE | 45 | m³/STK. | .0119 | OPPOSITE D.C. | UP: 60 |
| DRILL COLLARS | 120 mm | INTER. | | TOTAL | 95 | S.P.M. | 50 | PUMP PRESS. | 10,000 |
| OTHER | | OTHER | | STANDBY | | m³/min. | 59 | CIRC. TIME | 165 |

| HOLE DATA | | DESANDER/DESTILTER | | DRILLING FLUID SPECIFICATIONS | |
|---|---|---|---|---|---|
| MUD TYPE | POLYMER | FLOWLINE WT. | kg/m³ | MUD WT. | 1170 - 1200 kg/m³ |
| HOLE COND. | | UNDERFLOW WT. | kg/m³ | VISCOSITY | 45 - 50 s/L |
| DEVIATION | | OVERFLOW WT. | kg/m³ | FILTRATE | <10 cm³/30 min. |
| CURRENT OP. | DRLG. | UNDERFLOW RATE | m³/min. | pH | 10 - 10.5 |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☑ DOUBLE DECK OR HIGH SPEED SHAKER

SAMPLE FROM FL. ☑ PIT ☐

| MUD PROPERTIES | | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | 23:00 | | |
| PRESENT DEPTH (m) | 3368 | | |
| FLOWLINE TEMPERATURE (°C) | 22 | | |
| DENSITY (kg/m³) | 1185 | | |
| FUNNEL VISCOSITY (s/L) | 40 | | |
| APPARENT VISCOSITY (mPa.s) | 16 | | |
| PLASTIC VISCOSITY (mPa.s) | 10 | | |
| YIELD POINT (Pa) | 6 | | |
| GELS 0/10 min. (Pa) | 3/3 | | |
| pH STRIP ☐ METER ☐ | 10.5 | | |
| FILTRATE ☐ API ☐ HT HP (cm³) | 11.0 | | |
| FILTER CAKE (mm) | .05 | | |
| ALK ☑ (PF/MF) ☐ (PM/LIME) | .50/.80 | | |
| TOTAL HARDNESS ☐ Ca. ☐ (mg/L) | TR. | | |
| SAL. ☐ NACl ☐ CL ☑ (mg/L) | 150 | | |
| SAND CONTENT (%) ☐ (Ø) ☑ | .001 | | |
| SOLIDS CONTENT (%) ☐ (Ø) ☑ | 14.5 | | |
| OIL/WATER CONT. (%) ☐ (Ø) ☑ | 85/15 | | |
| MBT (Kg/m³) ☐ /% ☐ OIL RET ☐ | — | | |
| ELECTRICAL STABILITY (V) | | | |
| OIL/WATER RATIO | 11/3 | NEG. | |
| $CaCl_2$ w/w% | POLYMER | 50 | |
| "n"/"k" | | | |

| MATERIALS INVENTORY & COST | | | | | |
|---|---|---|---|---|---|
| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
| BARITE | 4560 | | 200 | 3866 | 8750 |
| GEL | 305 | | | 305 | |
| CAUSTIC | 100 | | 3 | 197 | 90 |
| BICARB | 55 | | | 55 | |
| DRISPAC | 260 | | 10 | 250 | 49 |
| SILICON | 96 | | | 96 | |
| SODA ASH | 36 | | 2 | 34 | 78 |
| XCAP | 42 | | 2 | 40 | 390 |
| ADD. 701 | 80 | | 8 | 72 | 800 |
| SOD. SULF | 30 | | | 30 | |
| ELR | 80 | | 4 | 76 | 184 |
| IDVIS | 80 | | 13 | 67 | 5460 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| PREVIOUS COST | 25,735 | | STARTING VOLUME | | |
| DAILY COST | 15,435 | | VOL. BUILT | | |
| CUM. COST | 41,370 | | VOL. LOST on SURFACE | | |
| CUM. ENG. COST | 3,000 | | VOL. LOST SUB SURFACE | | |
| | | | END VOLUME | | |
| | | | CUM. VOL. BUILT | | |

COMMENTS: DRLD. 152 m. HOLE DISPLACED HOLE TO POLYMER SYSTEM AT 3200 m.

CONTROL DENSITY AT 1180 kg/m³ USING BARITE. (2 - 3 MT/SK.)

R.P. 14 AT 4 HRS WITH CAUSTIC. (2 lbs. / C.R.)

HOLE VIS. AT 4:45 SLOWLY INCR. IDVIS D, RSP-721 + ELR.
TO 45 VIS. DRESS PITS WITH GEL AND 4 SX. IDVIS D
AND 2 - 3 GAL. RSP-721 EVERY 12 HRS.
CONTROL FLUID LOSS INCR. TO 11 WITH ELR. 4 SX/CIR.

R.W. 10-15 LITRES H. 1 MIN.

STOCK POINT FT. ST. JOHN I.D.F. ENGINEER TIM WEIER
PHONE 785-4002 PHONE ON LOCAT. MOBILE #

IDF

INTERNATIONAL DRILLING FLUIDS

# DRILLING FLUID REPORT

DATE 91-05-26
REPORT No. 24
SPUD DATE 91-04-29

WELL NAME COLUMBIA et al KOTANELEE | LOCATION V.T. I-48
OPERATOR COLUMBIA GAS DEVEL. | CONTRACTOR KENTING H.T. # 7
REPORT FOR Mr. ERIC TOOLE | REPORT FOR Mr. PHIL JOHNWORTH

| ASSEMBLY | | CASING | | MUD Vol. (m³) | | PUMP OUTPUT | | ANNULAR VEL. m./min. | |
|---|---|---|---|---|---|---|---|---|---|
| BIT SIZE / # | / 152 | COND. | | TANKS | 64 | PUMP SIZE | 114 x 406 | OPPOSITE D.P. | 49 |
| DRILL PIPE | 89 mm | SURFACE | | HOLE | 46 | m³/STK. | .0118 | OPPOSITE D.C. | VP=75 |
| DRILL COLLARS | 120 mm | INTER 178/3273 | | TOTAL | 110 | S.P.M. | | PUMP PRESS. | 10 000 |
| OTHER | | OTHER | | STANDBY | | m³/min. | .59 | CIRC. TIME | 180 ± |

| HOLE DATA | | DESANDER/DESTILTER | | DRILLING FLUID SPECIFICATIONS | |
|---|---|---|---|---|---|
| MUD TYPE | POLYMER | FLOWLINE WT. | kg/m³ | MUD WT. | 1150 - 1180 kg/m³ |
| HOLE COND. | OK. | UNDERFLOW WT. | kg/m³ | VISCOSITY | 36 - 45 s/L |
| DEVIATION | | OVERFLOW WT. | kg/m³ | FILTRATE | < 12 cm³/30 min. |
| CURRENT OP. | DRLG. | UNDERFLOW RATE | m³/min. | pH | 10 - 10.5 |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☑ DOUBLE DECK OR HIGH SPEED SHAKER

| SAMPLE FROM FL. ☑ PIT ☐ | MUD PROPERTIES | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | 14:30 | | |
| PRESENT DEPTH (m) | 3398 | | |
| FLOWLINE TEMPERATURE (°C) | 44 | | |
| DENSITY (kg/m³) | 1190 | | |
| FUNNEL VISCOSITY (s/L) | 39 | | |
| APPARENT VISCOSITY (mPa.s) | 20 | | |
| PLASTIC VISCOSITY (mPa.s) | 10 | | |
| YIELD POINT (Pa) | 10 | | |
| GELS 0/10 min (Pa) | 2/3 | | |
| pH STRIP ☑ METER ☐ | 10.0 | | |
| FILTRATE ☐ API ☐ HT HP (cm³) | 8.0 | | |
| FILTER CAKE (mm) | .05 | | |
| ALK ☑ (PF/MF) ☐ (PM/LIME) | .40/.70 | | |
| TOTAL HARDNESS ☑ Ca. ☐ (mg/L) | TR. | | |
| SAL. ☐ NACI ☐ CL ☑ (mg/L) | 150 | | |
| SAND CONTENT (%) ☐ (Ø) ☑ | .002 | | |
| SOLIDS CONTENT (%) ☐ (Ø) ☑ | .06 | | |
| ~~OIL~~/WATER CONT. (%) ☐ (Ø) ☑ | .94 | | |
| MBT (Kg/m³) ☐ /% ☐ OIL RET ☐ | — | | |
| ELECTRICAL STABILITY (V) $H_2S$ | NEG. | | |
| ASP OIL/WATER RATIO POLYMER | .75 | | |
| $CaCl_2$ w/w% | — | | |
| "n"/"k" | — | | |

| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
|---|---|---|---|---|---|
| BARITE | 3868 | | 205 | 3663 | 2560 |
| GEL | 305 | | | 305 | |
| CAUSTIC | 187 | | | 187 | |
| DUST | 250 | | | 250 | |
| ASP-721 | 72 | | 3 | 69 | 300 |
| XC-DE | 40 | | | 40 | |
| FLR | 76 | | 4 | 72 | |
| EDVIS D | 67 | | 11 | 56 | 4620 |
| SOD. SUL. | 30 | | 2 | 28 | 100 |
| DEFOAMER | 20 | | 2 | 18 | 213 |
| PTS-200 | 64 | | 1 | 63 | 260 |

| | | | |
|---|---|---|---|
| PREVIOUS COST | 41,370 | STARTING VOLUME | |
| DAILY COST | 8115 | VOL. BUILT | |
| CUM. COST | 49,485 | VOL. LOST on SURFACE | |
| CUM. ENG. COST | 4375 | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS: DRLG. 152 mm HOLE.

1) ALLOW DENSITY TO DROP BACK TO 1150 kg/m³.
2) KEEP PH AT 10-10.5 USING CAUSTIC. 2 SX. / CIR.
3) CONTROL V.S. AT 36-42 S/L WITH XCDE + ASP-721. ADD 2 PAILS ASP-721 EVERY 12 HRS. WHILE DRLG. ADD SLOWLY.
4) RUN 10-15 LITRES $H_2O$ PER MIN.
5) MIX 2 SX. SOD. SULFITE DAILY. ADD TO $H_2O$ IN CHEM. BBL + TOP W/ DIESEL.

STOCK POINT FT. ST. JOHN | I.D.F. ENGINEER TIM WIEGER
PHONE 785-4230 | PHONE ON LOCATION | MOBILE #

IDF

INTERNATIONAL DRILLING FLUIDS

# DRILLING FLUID REPORT

DATE 91-05-27
REPORT No. 25
SPUD DATE 91-04-29

WELL NAME COLUMBIA et al KOTANEELEE | LOCATION Y.T. I-48
OPERATOR COLUMBIA GAS DEVEL. | CONTRACTOR KENTING H.T. #7
REPORT FOR Mr. BOB TOOLE | REPORT FOR Mr. PHIL FOSOM WORTH

| ASSEMBLY | | CASING | | MUD VOL. (m³) | | PUMP OUTPUT | | ANNULAR VEL. m./min. | |
|---|---|---|---|---|---|---|---|---|---|
| BIT SIZE / # | /152 | COND. | | TANKS | 70 | PUMP SIZE | 114 x 406 | OPPOSITE D.P. | 51 |
| DRILL PIPE | 89 mm | SURFACE | 178/3273 | HOLE | 47 | m³/STK. | .0118 | OPPOSITE D.C. | DRMI. #P 75 ± |
| DRILL COLLARS | 120 mm | INTER. | | TOTAL | 117 | S.P.M. | 53 | PUMP PRESS. | 11,000 |
| OTHER | | OTHER | | STANDBY | | m³/min. | .62 | CIRC. TIME | 195 |

| HOLE DATA | | DESANDER/DESTILTER | | DRILLING FLUID SPECIFICATIONS | |
|---|---|---|---|---|---|
| MUD TYPE | POLYMER | FLOWLINE WT. | kg/m³ | MUD WT. | 1180 kg/m³ |
| HOLE COND. | OK. | UNDERFLOW WT. | kg/m³ | VISCOSITY | 35-40 s/L |
| DEVIATION | | OVERFLOW WT. | kg/m³ | FILTRATE | <12 cm³/30 min. |
| CURRENT OP. | DRLG. | UNDERFLOW RATE | m³/min. | pH | 10-10.5 |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☒ DOUBLE DECK OR HIGH SPEED SHAKER

SAMPLE FROM FL. ☒ PIT ☐

| MUD PROPERTIES | | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | 23:30 | | |
| PRESENT DEPTH (m) | 3354 | | |
| FLOWLINE TEMPERATURE (°C) | 44 | | |
| DENSITY (kg/m³) | 1190 | | |
| FUNNEL VISCOSITY (s/L) | 37 | | |
| APPARENT VISCOSITY (mPa.s) | 20 | | |
| PLASTIC VISCOSITY (mPa.s) | 10 | | |
| YIELD POINT (Pa) | 10 | | |
| GELS 0/10 min. (Pa) | 2/3 | | |
| pH STRIP ☒ METER ☐ | 10.5 | | |
| FILTRATE ☒ API ☐ HT HP (cm³) | 8.0 | | |
| FILTER CAKE (mm) | .05 | | |
| ALK ☐ (PF/MF) ☐ (PM/LIME) | .45/1.95 | | |
| TOTAL HARDNESS ☐ Ca. ☐ (mg/L) | TR. | | |
| SAL. ☐ NACI ☐ CL ☒ (mg/L) | 150 | | |
| SAND CONTENT (%) ☐ (Ø) ☐ | .003 | | |
| SOLIDS CONTENT (%) ☐ (Ø) ☐ | .07 | | |
| ~~OIL~~/WATER CONT. (%) ☐ (Ø) ☐ | .93 | | |
| MBT (Kg/m³) ☐ /% ☐ OIL RET ☐ | — | | |
| ELECTRICAL STABILITY (V) $H_2S$ | NEG. | | |
| OIL/WATER RATIO | — | | |
| $CaCl_2$ w/w% ASP POLYMER | 1.1 | | |
| "n"/"K" | | | |

MATERIALS INVENTORY & COST

| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
|---|---|---|---|---|---|
| BARITE | 3663 | | | 3663 | |
| CAUSTIC | 187 | | 2 | 185 | 60 |
| ASP 721 | 69 | | 1 | 68 | 100 |
| SOD. SUL. | 28 | | 2 | 26 | 100 |

| | | | |
|---|---|---|---|
| PREVIOUS COST | 49,485 | STARTING VOLUME | |
| DAILY COST | 260 | VOL. BUILT | |
| CUM. COST | 49,745 | VOL. LOST on SURFACE | |
| CUM. ENG. COST | 9750 | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS: DRLG. 152 mm HOLE.

CONTROL DENSITY AT 1180 Kg/m³.

KEEP PH AT 10-10.5 USING CAUSTIC. 2 SX./CIR.

MAINTAIN VIS. AT 35-40 S/L WITH IDVIS + NSP-721. ADD 2 PAILS ASP-721 EVERY 12 HRS.

ADD 1 SX. SOD. SULFITE DAILY. ADD TO $H_2O$ IN CHEM. PIL * TOP W/DIESEL.

RUN 5-6 LITRES $H_2O$ PER MIN.

STOCK POINT FT. ST. JOHN | I.D.F. ENGINEER J.A. WIELER
PHONE 785-4222 | PHONE ON LOCATION | MOBILE #

IDF

INTERNATIONAL DRILLING FLUIDS

# DRILLING FLUID REPORT

DATE 91-05-28
REPORT No. 26
SPUD DATE 91-04-29

| | | | |
|---|---|---|---|
| WELL NAME | COLUMBIA et al KOTANELEE | LOCATION | Y.T. -I-48 |
| OPERATOR | COLUMBIA GAS DEVEL. | CONTRACTOR | KENTING H.T. #7 |
| REPORT FOR Mr. | BOB TOOLE | REPORT FOR Mr. | PHIL BOSMWORTH |

| ASSEMBLY | | CASING | MUD Vol. (m³) | | PUMP OUTPUT | | ANNULAR VEL. m./min. | |
|---|---|---|---|---|---|---|---|---|
| BIT SIZE / # | 152 | COND. | TANKS | 72 | PUMP SIZE | 114 x 406 | OPPOSITE D.P. | 51 |
| DRILL PIPE | 89 mm | SURFACE | HOLE | 48 | m³/STK. | .0118 | OPPOSITE D.C. | 6" = 80 |
| DRILL COLLARS | 120 mm | INTER 178/3273 | TOTAL | 120 | S.P.M. | 53 | PUMP PRESS. | 12,500 |
| OTHER | | OTHER | STANDBY | | m³/min. | .63 | CIRC. TIME | 185 + |

| HOLE DATA | | DESANDER/DESTILTER | | DRILLING FLUID SPECIFICATIONS | |
|---|---|---|---|---|---|
| MUD TYPE | WT. POLYMER | FLOWLINE WT. | kg/m³ | MUD WT. | 1180 kg/m³ |
| HOLE COND. | OK. | UNDERFLOW WT. | kg/m³ | VISCOSITY | 35-40 s/L |
| DEVIATION | | OVERFLOW WT. | kg/m³ | FILTRATE | <12 cm³/30 min. |
| CURRENT OP. | DRLG. | UNDERFLOW RATE | m³/min. | pH | 10-10.5 |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☒ DOUBLE DECK OR HIGH SPEED SHAKER

| SAMPLE FROM FL. ☒ PIT ☐ | MUD PROPERTIES | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | 23:30 | | |
| PRESENT DEPTH (m) | 3400 | | |
| FLOWLINE TEMPERATURE (°C) | 45 | | |
| DENSITY (kg/m³) | 1185 | | |
| FUNNEL VISCOSITY (s/L) | 37 | | |
| APPARENT VISCOSITY (mPa.s) | 20 | | |
| PLASTIC VISCOSITY (mPa.s) | 10 | | |
| YIELD POINT (Pa) | 10 | | |
| GELS 0/10 min. (Pa) | 2/3 | | |
| pH STRIP ☒ METER ☐ | 10.5 | | |
| FILTRATE ☒ API ☐ HT HP (cm³) | 8.0 | | |
| FILTER CAKE (mm) | .05 | | |
| ALK ☒ (PF/MF) ☐ (PM/LIME) | .45/1.1 | | |
| TOTAL HARDNESS ☒ Ca. ☐ (mg/L) | TR. | | |
| SAL. ☐ NACI ☐ CL ☒ (mg/L) | 150 | | |
| SAND CONTENT (%) ☐ (Ø) ☒ | .003 | | |
| SOLIDS CONTENT (%) ☐ (Ø) ☒ | .065 | | |
| OIL/WATER CONT. (%) ☐ (Ø) ☒ | .935 | | |
| MBT (Kg/m³) ☐ /% ☐ OIL RET ☐ | — | | |
| ELECTRICAL STABILITY (V) $H_2S$ | NEG. | | |
| OIL/WATER RATIO ASP-721 | 1.2 | | |
| $CaCl_2$ w/w% 600/300 | 40/30 | | |
| "n"/"k" | | | |

| MATERIALS INVENTORY & COST | | | | | |
|---|---|---|---|---|---|
| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
| ASP-721 | 68 | | 3 | 65 | 300 |
| SOD. SUL. | 26 | | 1 | 25 | 50 |
| XCIDE | 40 | | 1 | 39 | 140 |
| PTC-200 | 63 | | 2 | 61 | 520 |

| | | | |
|---|---|---|---|
| PREVIOUS COST | 49,745 | STARTING VOLUME | |
| DAILY COST | 1010 | VOL. BUILT | |
| CUM. COST | 50,755 | VOL. LOST on SURFACE | |
| CUM. ENG. COST | 10,125 | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS: DRLG. 152 mm HOLE.

1) HOLD DENSITY IN THE 1180 kg/m³ RANGE.

2) KEEP PH AT 10-10.5 USING CAUSTIC. 2 sx/cir.

3) MAINTAIN V.S. AT 35-40 S/L WITH IDVIS + ASP-721. ADD 1-2 ASP-721 EVERY 12 HRS.

4) ADD 1 sx. SOD. SULFITE + 1 GAL XCIDE DAILY.

5) RUN 5-6 LITRES $H_2O$ PER MIN.

STOCK POINT FT. ST. JOHN (FSJ) I.D.F. ENGINEER JIM WHELER
PHONE 785-4322 PHONE ON LOCATION MOBILE #

INTERNATIONAL DRILLING FLUIDS

# DRILLING FLUID REPORT

DATE MAY. 29. 91
REPORT No. # 27
SPUD DATE APR. 29. 91

WELL NAME COLUMBIA ET AL KOTANEFFEE LOCATION YT. I. 48
OPERATOR COLUMBIA GAS DEVELOPMENT CONTRACTOR KENTING H.T. #07
REPORT FOR Mr. POP TOOLE REPORT FOR Mr. TIM SIGNER

| ASSEMBLY | CASING | MUD Vol. (m³) | PUMP OUTPUT | ANNULAR VEL. m./min. |
|---|---|---|---|---|
| BIT SIZE / # 311mm | COND. | TANKS 72m³ | PUMP SIZE/ 177x406 | OPPOSITE D.P. 56 |
| DRILL PIPE 89 mm | SURFACE | HOLE 52m³ | m³/STK. .0167 | OPPOSITE D.C. 98 |
| DRILL COLLARS 170 mm | INTER/178x273 | TOTAL 125m³ | S.P.M. 40 | PUMP PRESS/ 2.000 |
| OTHER ENG. 207m. | OTHER | STANDBY | m³/min. .668 | CIRC. TIME 190 |

| HOLE DATA | DESANDER/DESTILTER | DRILLING FLUID SPECIFICATIONS |
|---|---|---|
| MUD TYPE GEL. POLYMER | FLOWLINE WT. [illegible] kg/m³ | MUD WT. 1180 kg/m³ |
| HOLE COND. CLEAN 18m. | UNDERFLOW WT. T.H. OF = 60 MIN. kg/m³ | VISCOSITY 35-40 s/L |
| DEVIATION TO ET-2. | OVERFLOW WT. kg/m³ | FILTRATE EFLOW 10 cm³/30 min. |
| CURRENT OP DRILLING. | UNDERFLOW RATE m³/min. | pH 10.0 |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

| SAMPLE FROM FL. ☐ PIT ☒ SUCTION | MUD PROPERTIES | SHAKER |
|---|---|---|
| TIME SAMPLE TAKEN | 15:00 | 15:00 |
| PRESENT DEPTH (m) | 2405 | 2405 |
| FLOWLINE TEMPERATURE (°C) | 24°C | 25°C |
| DENSITY (kg/m³) | 1180 | 1185 |
| FUNNEL VISCOSITY (s/L) | 38 | 41 |
| APPARENT VISCOSITY (mPa.s) | 20 | |
| PLASTIC VISCOSITY (mPa.s) | 10 | |
| YIELD POINT (Pa) | 10 | |
| GELS 0/10 min. (Pa) | 2/4 | |
| pH STRIP ☒ METER ☐ | 10.5 | |
| FILTRATE ☒ API ☐ HT HP (cm³) | 9.0 | |
| FILTER CAKE (mm) | .05 SOFT. | |
| ALK ☒ (PF/MF) ☐ (PM/LIME) | .5/1.8 | |
| TOTAL HARDNESS ☐ Ca. ☒ (mg/L) | 20 | |
| SAL. ☐ NACI ☐ CL ☒ (mg/L) | 200 | |
| SAND CONTENT (%) ☒ (Ø) ☒ | .001 | |
| SOLIDS CONTENT (%) ☐ (Ø) ☒ | .065 | |
| OIL/WATER CONT. (%) ☐ (Ø) ☒ | .975 | |
| MBT (Kg/m³) ☒ /% ☐ OIL RET ☐ | 10 | |
| ELECTRICAL STABILITY (V) H.S. | 0 | |
| OIL/WATER RATIO SEE BELOW | .6 1/6 m³ | |
| $CaCl_2$ w/w% SULFITE | 190 | |
| "n"/"k" LOG/LOG | 40/30 | |

→ 10 PUMP TANKS TO TRIPPING S.S. AS YOU START MIXING THE E.O. MIX 2 PAILS OF PTS-200 1. SUCTION TANK 2. MIX 1 PAIL OF PTS-200 IN PILL TANK.

MATERIALS INVENTORY & COST

| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
|---|---|---|---|---|---|
| BARITE | 2663 | | 25 | 2638 | 317.50 |
| ASP-771 | 65 | | 1 | 64 | 100.00 |
| X-CIDE | 39 | | 1 | 38 | 140.00 |
| SULFITE | 25 | | 1 | 24 | 49.70 |

| | | | |
|---|---|---|---|
| PREVIOUS COST | 50,755 | STARTING VOLUME | |
| DAILY COST | 607.39 | VOL. BUILT | |
| CUM. COST | 51,257.39 | VOL. LOST on SURFACE | 9-1/5 |
| CUM. ENG. COST | 10,500 | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS: MAINTAIN SYSTEM AS FOLLOWS:

1. DENSITY = 1180 KG/M³ NOT EFLOW 1170 KG/M³.
2. VISCOSITY = 35-40 SEC/L NOT BELOW 35 SEC/L IF NEED. MIX 1 BAG IDOIS-1 = 100 L/BAG.
3. PH = 10.0 - 10.5 CAUSTIC SODA = 1 BAG A CIRC. WHEN NEED.
4. SLUG ALL 1-2 PAILS ASP-771 EVERY 12 HRS WHEN TRIPPING SHALE.
5. MIX 1 JUG X-CIDE DAILY + EVERY 2 DAYS MIX 1 SACK SULPHITE
6. ADD WATER = 5-6 LITRES/MIN WHEN CIRCULATING.

STOCK POINT FT. ST JOHN I.D.F. ENGINEER RICK REINHART
PHONE 785-4772 PHONE FAR BOOM OUTSIDE MOBILE #1

IDF

INTERNATIONAL DRILLING FLUIDS

# DRILLING FLUID REPORT

DATE MAY 30 1991
REPORT No. 35
SPUD DATE APR 29 91

WELL NAME COLUMBIA A-14 ANNAHEE LEE | LOCATION YT - T 48
OPERATOR COLUMBIA GAS DEVELOPMENT | CONTRACTOR KEATING H.T. #07
REPORT FOR Mr. PAT TOLE | REPORT FOR Mr. JIM CLINE

| ASSEMBLY | CASING | MUD Vol. (m³) | PUMP OUTPUT | ANNULAR VEL. m./min. |
|---|---|---|---|---|
| BIT SIZE / # 7 15/16 mm | COND. | TANKS 77 | PUMP SIZE 7" x 4 1/2 | OPPOSITE D.P. 54 |
| DRILL PIPE 89 mm | SURFACE | HOLE 52 m³ | m³/STK. .0167 | OPPOSITE D.C. 98 |
| DRILL COLLARS / 20 mm | INTER / 8 3/4" | TOTAL 125 | S.P.M. 110 | PUMP PRESS. / 2400 |
| OTHER TH.O. 2024 | OTHER | STANDBY | m³/min. 1.68 | CIRC. TIME 190 |

| HOLE DATA | DESANDER/DESTILTER | DRILLING FLUID SPECIFICATIONS |
|---|---|---|
| MUD TYPE L.T. POLYMER | FLOWLINE WT. AM. VOL. 39.1 kg/m³ | MUD WT. 1180 kg/m³ |
| HOLE COND. GOOD | UNDERFLOW WT. T.I. UF 60 1180 kg/m³ | VISCOSITY 35-40 s/L |
| DEVIATION 14° @ 3397.1 | OVERFLOW WT. kg/m³ | FILTRATE / 10 cm³ cm³/30 min. |
| CURRENT OP. HOLE @ TD | UNDERFLOW RATE m³/min. | pH 10.0 |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

SAMPLE FROM FL. ☒ PIT ☐ SHAKER

| MUD PROPERTIES | | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | 11:00 | | |
| PRESENT DEPTH (m) | 3414 | | |
| FLOWLINE TEMPERATURE (°C) | 25 oC | | |
| DENSITY (kg/m³) | 1178 | | |
| FUNNEL VISCOSITY (s/L) | 39 | | |
| APPARENT VISCOSITY (mPa.s) | 21.5 | | |
| PLASTIC VISCOSITY (mPa.s) | 11 | | |
| YIELD POINT (Pa) | 10.5 | | |
| GELS 0/10 min. (Pa) | 3/4 | | |
| pH STRIP ☒ METER ☐ | 10.0 | | |
| FILTRATE ☒ API ☐ HT HP (cm³) | 9.0 | | |
| FILTER CAKE (mm) | .05 SOFT | | |
| ALK ☒ (PF/MF) ☐ (PM/LIME) | .4/1.6 | | |
| TOTAL HARDNESS ☐ Ca. ☒ (mg/L) | 20 | | |
| SAL. ☐ NACI ☐ CL ☒ (mg/L) | 700 | | |
| SAND CONTENT (%) ☐ (Ø) ☒ | .001 | (READINGS) | |
| SOLIDS CONTENT (%) ☐ (Ø) ☒ | 6.5 | | |
| OIL/WATER CONT. (%) ☒ (Ø) ☒ | .925 | | |
| MBT (Kg/m³) ☒ /% ☐ OIL RET ☐ | 10 | | |
| ELECTRICAL STABILITY (V) HOT | 0 | | |
| OIL/WATER RATIO A.P. 991 | .5 | | |
| $CaCl_2$ w/w% WHITES | 190 | | |
| "n"/"k" | | | |

| MATERIALS INVENTORY & COST | | | | | |
|---|---|---|---|---|---|
| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
| BARITE | 2628 | | 35 | 2612 | 717.50 |
| PTS-200 | 61 | | 3 | 58 | 780.00 |
| DEFOAM | 18 | | 1 | 17 | 136.50 |
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| | | | | | |
| Lost: 42 | | Lost: 32 | | Lost: 27 | |
| Lost: 19 - 60 = 4 | | 28 = 2 | | | |

| | | | |
|---|---|---|---|
| PREVIOUS COST | 51,357 | STARTING VOLUME | |
| DAILY COST | 1229.00 | VOL. BUILT | 1 HAUL |
| CUM. COST | 52,586 | VOL. LOST on SURFACE | 2 |
| CUM. ENG. COST | 10,805 | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS: 1 MUD DENSITY = 1170 - 1180 KG/M³. NET FLOW = 1170 KG/M³
2 DISCUSSED = 35 SEC SPEC. NET FLOW = 35 SPEC.
3 PH = 10 W/ CAUSTIC SODA = 2 LBS A. CIDE A. AT 9 A.
4 SLOWLY BUILD 1 PAIL OF ASP. 731 FLUID 5 HOLE.
5 MIX 1 JUG OF X-CIDE 102 CHEMICAL EVERY 190 min. DAILY.
6 EVERY TWO DAYS MIX IN 1 BAG OF SODIUM SULPHITE.
7 PUMP WATER + SWEEPS IN HOLE WHEN CIRCULATING.
8 PRIOR TO TRIPPING ISOLATE SUCTION TANK. MIX IN
2 PAILS OF PTS-200. PUMP THIS DOWN THE HOLE AND
REPLACE IT WITH MUD FROM 15 MINUTES. THEN
TRIP OUT.

STOCK POINT FT. ST. JOHN | I.D.F. ENGINEER Rick REINHART
PHONE 785-4772 | PHONE FAX Room OUT MOBILE # 1

IDF

INTERNATIONAL DRILLING FLUIDS

# DRILLING FLUID REPORT

DATE MAY. 21. 1996
REPORT No. # 29
SPUD DATE APR. 29. 91

WELL NAME COLUMBIA ET AL KOTAJEELEE LOCATION Y.T. I - 48
OPERATOR COLUMBIA GAS DEVELOPMENT CONTRACTOR KENTING #07
REPORT FOR Mr. POP TOOLE REPORT FOR Mr.

| ASSEMBLY | | CASING | MUD Vol. (m³) | | PUMP OUTPUT | | ANNULAR VEL. m./min. | |
|---|---|---|---|---|---|---|---|---|
| BIT SIZE 311 mm / 12 1/4" | | COND. | TANKS 72 m³ | | PUMP SIZE 7" x 6" | | OPPOSITE D.P. 57 | |
| DRILL PIPE 89 | mm | SURFACE | HOLE 52 m³ | | m³/STK. .0167 | | OPPOSITE D.C. 100 | |
| DRILL COLLARS 170 | mm | INTER 178 - 2773 | TOTAL 124 m³ | | S.P.M. 41 | | PUMP PRESS. 14,500 | |
| OTHER THA - 1914. | | OTHER | STANDBY | | m³/min. .6847 | | CIRC. TIME 180 | |

| HOLE DATA | DESANDER/DESILTER | | DRILLING FLUID SPECIFICATIONS | |
|---|---|---|---|---|
| MUD TYPE GEL POLYMER | FLOWLINE WT. 1.06 | 39 m³ kg/m³ | MUD WT. 1180 | kg/m³ |
| HOLE COND. | UNDERFLOW WT. 1.3 | 40 m³ kg/m³ | VISCOSITY 35-40 | s/L |
| DEVIATION 1/4° @ 1ST CASE | OVERFLOW WT. | kg/m³ | FILTRATE 4.10 | cm³/30 min. |
| CURRENT OP. DRILL AHEAD | UNDERFLOW RATE | m³/min. | pH 10.0 | |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

SAMPLE FROM FL. ☑ PIT ☐ SHAKER

| MUD PROPERTIES | | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | 10:00 | | |
| PRESENT DEPTH (m) | 2470 | | |
| FLOWLINE TEMPERATURE (°C) | 47°C | | |
| DENSITY (kg/m³) | 1185 | | |
| FUNNEL VISCOSITY (s/L) | 38 | | |
| APPARENT VISCOSITY (mPa.s) | 37 | | |
| PLASTIC VISCOSITY (mPa.s) | 11 | | |
| YIELD POINT (Pa) | 11 | | |
| GELS 0/10 min. (Pa) | 3/4 | | |
| pH STRIP ☑ METER ☐ | 10 | | |
| FILTRATE ☑ API ☐ HT HP (cm³) | 15 | | |
| FILTER CAKE (mm) | .15 GOOD | | |
| ALK ☑ (PF/MF) ☐ (PM/LIME) | .4/1.6 | | |
| TOTAL HARDNESS ☐ Ca. ☑ (mg/L) | 70 | | |
| SAL. ☐ NACI ☐ CL ☑ (mg/L) | 700 | | |
| SAND CONTENT (%) ☑ (Ø) ☐ | .001 | | |
| SOLIDS CONTENT (%) ☐ (Ø) ☑ | 7.07 | | |
| OIL/WATER CONT. (%) ☐ (Ø) ☑ | .97 | | |
| MBT (Kg/m³) ☑ /% ☐ OIL RET ☐ | 10 | | |
| ELECTRICAL STABILITY (V) HI < | 0 | | |
| OIL/WATER RATIO WHITE | 180 | | |
| $CaCl_2$ w/w% A.P.721 | .5 KG/M³ | | |
| "n"/"k" | | | |

INVENTORY MATERIALS INVENTORY & COST 16:00 HRS.

| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
|---|---|---|---|---|---|
| GEL | 465 | | 255 | 210 | 2550.00 |
| BARITE | 6196 | | 2582 | 3614 | 33,787.50 |
| CAUSTIC | 210 | (7) | 29 | 181 | 870.00 |
| SODA ASH | 40 | | 5 | 35 | 100.00 |
| SOLTEX | 100 | | 4 | 96 | 540.00 |
| DI-CARB | 60 | | 5 | 55 | 200.00 |
| FIL-LO | 80 | (3) | 7 | 73 | 1170.00 |
| A.P.721 | 80 | | 15 | 65 | 1500.00 |
| IDVIS-D | 80 | | 28 | 52 | 11.760.00 |
| PTS-200 | 64 | | 8 | 56 | 3080.00 |
| X-CIDE | 47 | (1) | 35 | 7 | 980.00 |
| MP-SWEET | 20 | | 6 | 14 | 798.25 |
| DEFOAM | 20 | | 3 | 17 | 409.50 |
| SAND/GT | 788 | (12) | 50 | 738 | 345.00 |
| 600R = 44 | 300R = 33 | | 200R = 28 | | |
| 100R = 20 | 6R = 4 | | 3R = 3 | | |

| | | | |
|---|---|---|---|
| PREVIOUS COST | 52,584.00 | STARTING VOLUME | |
| DAILY COST | 2654.50 | VOL. BUILT | T.H.A. HS |
| CUM. COST | 56,240.50 | VOL. LOST on SURFACE | |
| CUM. ENG. COST | 11,250.00 | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS:

1. MIX 4 BAGS OF FIL-LO X-LOG = 45 min. / BAG.
2. THIN W/ CAUSTIC SODA AS REQ'D.
3. SLOWLY ADD 1 PAIL OF A.P.721 EVERY 8 HOURS.

STOCK POINT FT. ST. JOHN I.D.F. ENGINEER RICK REINHART
PHONE 785-4777 PHONE FOR LOCAL MOBILE #, DF 21

IDF

INTERNATIONAL DRILLING FLUIDS

# DRILLING FLUID REPORT

DATE MAY. 31. 1991
REPORT No. # 29A
SPUD DATE APR. 29. 91

WELL NAME COLUMBIA ET AL KOTANEELEE LOCATION YT. I-48
OPERATOR COLUMBIA GAS DEVELOPMENT CONTRACTOR KENTING #07
REPORT FOR Mr. PAT TOOLE REPORT FOR Mr. JIM SIGNER

| ASSEMBLY | | CASING | MUD Vol. (m³) | | PUMP OUTPUT | | ANNULAR VEL. m./min. |
|---|---|---|---|---|---|---|---|
| BIT SIZE | 1/8 2.15/16" | COND. | TANKS | 70 m³ | PUMP SIZE | 14 x 406 | OPPOSITE D.P. 59 |
| DRILL PIPE | 89 mm | SURFACE | HOLE | 52 m³ | m³/STK. | .0115 | OPPOSITE D.C. 107 |
| DRILL COLLARS | 120 mm | INTER 178 @ 2773 | TOTAL | 122 m³ | S.P.M. | 60 | PUMP PRESS. 12,400 |
| OTHER | FHA @ 194 | OTHER | STANDBY | | m³/min. | .708 | CIRC. TIME 175-180 |

| HOLE DATA | DESANDER/DESTILTER | | DRILLING FLUID SPECIFICATIONS | |
|---|---|---|---|---|
| MUD TYPE | 7 POLYMER | FLOWLINE WT. | kg/m³ | MUD WT. 1180 kg/m³ |
| HOLE COND. | HOLE WASHED OUT | UNDERFLOW WT. | kg/m³ | VISCOSITY 37:40 s/L |
| DEVIATION | MIX LEADS | OVERFLOW WT. | kg/m³ | FILTRATE 16.0 cm³/30 min. |
| CURRENT OP. | DRILLING. | UNDERFLOW RATE | m³/min. | pH 10.0 |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

SAMPLE FROM FL. ☐ PIT ☐ SHAKER

| MUD PROPERTIES | |
|---|---|
| TIME SAMPLE TAKEN | 19:30 |
| PRESENT DEPTH (m) | 2425 |
| FLOWLINE TEMPERATURE (°C) | 4 |
| DENSITY (kg/m³) | 1180 |
| FUNNEL VISCOSITY (s/L) | 38 |
| APPARENT VISCOSITY (mPa.s) | 22 |
| PLASTIC VISCOSITY (mPa.s) | 12 |
| YIELD POINT (Pa) | 10 |
| GELS 0/10 min. (Pa) | 2.5/7 |
| pH STRIP ☑ METER ☐ | 10.7 |
| FILTRATE ☑ API ☐ HT HP (cm³) | 9.6 |
| FILTER CAKE (mm) | .1 FAIR! |
| ALK ☑ (PF/MF) ☐ (PM/LIME) | .6/1.9 |
| TOTAL HARDNESS ☐ Ca. ☑ (mg/L) | 20 |
| SAL. ☐ NACI ☐ CL ☑ (mg/L) | 200 |
| SAND CONTENT (%) ☐ (Ø) ☑ | .0015 |
| SOLIDS CONTENT (%) ☐ (Ø) ☑ | .068 |
| OIL/WATER CONT. (%) ☐ (Ø) ☑ | .932 |
| MBT (Kg/m³) ☑ /% ☐ OIL RET ☐ | 8 |
| ELECTRICAL STABILITY (V) | 0 |
| OIL/WATER RATIO | 94:1 |
| $CaCl_2$ w/w% | .6 |
| "n"/"k" | |

MATERIALS INVENTORY & COST

| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
|---|---|---|---|---|---|
| BARITE | 2648 | | 35 | 2613 | 437.50 |
| CAUSTIC | 184 | | 2 | 182 | 60.00 |
| ASP 721 | 65 | | 3 | 62 | 300.00 |
| SODA ASH | 36 | | 1 | 35 | 20.00 |
| L.D. VIS-D | 56 | | 4 | 52 | 1180.00 |
| PTS-200 | 58 | | 2 | 56 | 520.00 |
| X-CIDE | 28 | | 3 | 25 | 420.00 |
| FIB-LO | 72 | | 3 | 69 | 480.00 |
| DRISP-LO | 80 | | 1 | 79 | 167.40 |
| SAWDUST | 260 | | 22 | 238 | 107.80 |
| | | | | | |
| DEADS @ 80.00 | | | | | |
| GILSONITE @ 80.00 | | | | | |
| | | | | | |
| PL: 2 | LR: 4 | KCR: 18 | | | |
| ECD: 75 | ECR: 72 | KCR: 44 | | | |

| | | | |
|---|---|---|---|
| PREVIOUS COST | 52,824. | STARTING VOLUME | |
| DAILY COST | 4182.70 | VOL. BUILT | |
| CUM. COST | 57,017. | VOL. LOST on SURFACE | TANKS |
| CUM. ENG. COST | 11,750. | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS: AS SOON AS THE GLASS BEADS GET HERE! MIX 10 BAGS AT 18 MINUTES A BAG. ALSO MIX 2 BAGS OF DRISPAC-LO @ 90 min./BAG. AND MIX 2 BAGS L.D. VIS-D @ 90 min./BAG.
- MIX 2 PAILS OF ASP 721 @ 4 HOURS A PAIL. THEN 1 PAIL EVERY 8 HRS.
- PH @ 10 W/ 1 BAG CAUSTIC SODA OVER 1 CIRC. OR AS REQ'D.
- MIX 1 JUG X-CIDE ONCE A DAY.
- MIX 1 BAG SODIUM SULPHITE EVERY TWO DAYS
- PRIOR TO TRIPPING: ISOLATE SUCTION TANK, MIX 2 PAILS OF PTS-200 @ 5 MIN/PAIL + PUMP DOWN THE HOLE AND DISPLACE W/ MUD FOR 15 MINUTES.
- WHEN MIXING PILL IN PILL TANK: ADD 1/2 - 1/2 PAIL OF DEFOAMER PRIOR TO MIXING BARITE.
- MUD DENSITY @ 1180 KG/M³. LOTS OF GOOS AROUND ALL THE TIME!

STOCK POINT FT ST. JOHN I.D.F. ENGINEER RICK REINHART
PHONE 785-4773 PHONE EAR Road MOBILE# SIDE.

IDF

INTERNATIONAL DRILLING FLUIDS

# DRILLING FLUID REPORT

DATE JUNE 01 1991
REPORT No. #30
SPUD DATE APR. 29.91

WELL NAME COLUMBIA ET AL KOTANEELEE | LOCATION 4-T-48
OPERATOR COLUMBIA GAS DEVELOPMENT | CONTRACTOR KENTING H.T. #07
REPORT FOR Mr. PAT TOOLE | REPORT FOR Mr. JIM SIGNED

| ASSEMBLY | CASING | MUD Vol. (m³) | PUMP OUTPUT | ANNULAR VEL. m./min. |
|---|---|---|---|---|
| BIT SIZE / # 7.875 / 1 | COND. | TANKS 69.0 | PUMP SIZE 14 X 406 | OPPOSITE D.P. 45 |
| DRILL PIPE 89 mm | SURFACE | HOLE 42.5 | m³/STK. .0118 | OPPOSITE D.C. 78 |
| DRILL COLLARS 120 mm | INTER 178.2 | TOTAL 131.5 | S.P.M. 45 | PUMP PRESS. 10,000 |
| OTHER THA 195 | OTHER | STANDBY | m³/min. .531 | CIRC. TIME 720 |

| HOLE DATA | DESANDER/DESILTER | | DRILLING FLUID SPECIFICATIONS | |
|---|---|---|---|---|
| MUD TYPE W.T. RIVER | FLOWLINE WT. | kg/m³ | MUD WT. 1180-1185 | kg/m³ |
| HOLE COND. | UNDERFLOW WT. | kg/m³ | VISCOSITY 38.40 | s/L |
| DEVIATION 1 HOLE W/STEAR | OVERFLOW WT. | kg/m³ | FILTRATE 4.10 | cm³/30 min. |
| CURRENT OP. TOOL | UNDERFLOW RATE | m³/min. | pH 10.0 | |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER / ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

SAMPLE FROM FL. ☐ PIT ☐ SHAKER

| MUD PROPERTIES | | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | 19:00 | | |
| PRESENT DEPTH (m) | 2435 | | |
| FLOWLINE TEMPERATURE (°C) | 40.0°C | | |
| DENSITY (kg/m³) | 1187 | | |
| FUNNEL VISCOSITY (s/L) | 43 | | |
| APPARENT VISCOSITY (mPa.s) | 29 | | |
| PLASTIC VISCOSITY (mPa.s) | 15 | | |
| YIELD POINT (Pa) | 14 | | |
| GELS 0/10 min. (Pa) | 2/5 | | |
| pH STRIP ☑ METER ☐ | 10.2 | | |
| FILTRATE ☑API ☐ HT HP (cm³) | 9.0 | | |
| FILTER CAKE (mm) | .1 GOOD | | |
| ALK ☑(PF/MF) ☐ (PM/LIME) | .61.9 | | |
| TOTAL HARDNESS ☐ Ca. ☑(mg/L) | 20 | | |
| SAL. ☐ NACI ☐ CL ☑ (mg/L) | 250 | | |
| SAND CONTENT (%) ☐ (Ø) ☑ | .001 | | |
| SOLIDS CONTENT (%) ☐ (Ø) ☑ | .073 | | |
| OIL/WATER CONT. (%) ☐ (Ø) ☑ | .927 | | |
| MBT (Kg/m³) ☑/% ☐ OIL RET ☐ | 9 | | |
| ELECTRICAL STABILITY (V) H2S | 0 | | |
| OIL/WATER RATIO ASP 721 | .8 | | |
| $CaCl_2$ w/w% SULPHITE | 160 | | |
| "n"/"k" | | | |

MATERIALS INVENTORY & COST

| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
|---|---|---|---|---|---|
| GEL | 210 | | 1 | 209 | 10.00 |
| BARITE | 2613 | | 25 | 2588 | 212.50 |
| CAUSTIC | 182 | | 1 | 181 | 30.00 |
| ASP. 721 | 67 | | 2 | 59 | 200.00 |
| X-CIDE | 25 | | 1 | 24 | 140.00 |
| DISPERSE | 79 | | 2 | 77 | 274.80 |
| IL. GIS-D | 57 | | 2 | 50 | 240.00 |
| DEFOAM | 17 | | 1 | 16 | 136.50 |
| PTS-200 | 56 | | 2 | 52 | 780.00 |
| PEARL | | | 10 | | 800.00 |
| | | | | | |
| | | | | | |
| | | | | | |
| 2R=4 | 6R=6 | 100R=36 | | | |
| 300=35 | 200=42 | 6=58 | | | |
| | | | | | |

| | | | |
|---|---|---|---|
| PREVIOUS COST | 57,617 | STARTING VOLUME | |
| DAILY COST | 2772.85 | VOL. BUILT | 7 HANKS |
| CUM. COST | 60,684 | VOL. LOST on SURFACE | |
| CUM. ENG. COST | 12,775 | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS 1 DENSITY = 1180-1190 KG/M³. HOLE CLEAN (EXCEPT SHAKER)
2 RAN WATER @ 5 LITRES/MIN. FOR 1 CIRC. FLOW 12 HOURS.
3 VISCOSITY = 38-40 SEC/L.
4 ENG. TO DO 1 CAUSTIC SOLA. ONCE 1 FULL CIRC. WHEN REQ'D.
5 SLOWLY BUILD 1 PAIL OF ASP 721 EVERY 8 HOURS.
6 MIX 1 JUG OF X-CIDE ONCE A DAY.
7 MIX 1 BAG OF SODIUM SULPHITE EVERY TWO DAYS.
8 PRIOR TO TRIPPING: ISOLATE SUCTION TANK, MIX 2 PAILS OF PTS-200 & 5 PAILS PUMP DOWN HOLE & DISPLACE W/ MUD FOR 15 MINUTES.
9 WHEN MIXING MUD IN PIT TANK: ADD ½ TO ½ PAIL OF DEFOAM. PRIOR TO MIXING BARITE

STOCK POINT FT. ST. JOHN | I.D.F. ENGINEER RICK REINHART
PHONE 785-4772 | PHONE FAX 262-1 CELL/MOBILE #1

# IDF

INTERNATIONAL DRILLING FLUIDS

## DRILLING FLUID REPORT

DATE JUNE-07-1991
REPORT No. #31
SPUD DATE APR-29-91

WELL NAME COLUMBIA ET AL KOTANEELEE LOCATION 4T-I-48
OPERATOR COLUMBIA GAS DEVELOPMENT CONTRACTOR KENTING H.T. #07
REPORT FOR Mr. POP TOOLE REPORT FOR Mr. JIM SIGNER

| ASSEMBLY | CASING | MUD Vol. (m³) | PUMP OUTPUT | ANNULAR VEL. m./min. |
|---|---|---|---|---|
| BIT SIZE / # 4-15.7/mm | COND. | TANKS 69 m³ | PUMP SIZE 114X406 | OPPOSITE D.P. 50 |
| DRILL PIPE 89 mm | SURFACE | HOLE 57 m³ | m³/STK. .0118 | OPPOSITE D.C. 86 |
| DRILL COLLARS 120 mm | INTER 178.2377 | TOTAL 177m³ | S.P.M. 50 | PUMP PRESS. 9.000 |
| OTHER THA-195 | OTHER | STANDBY | m³/min. .59 | CIRC. TIME 210 |

| HOLE DATA | DESANDER/DESTILTER | | DRILLING FLUID SPECIFICATIONS |
|---|---|---|---|
| MUD TYPE WT. POLYMER | FLOWLINE WT. Approx 40 m³ | kg/m³ | MUD WT. 1180-1185 kg/m³ |
| HOLE COND. | UNDERFLOW WT. C.T.U. Approx 68 m³ | kg/m³ | VISCOSITY 38-40 s/L |
| DEVIATION | OVERFLOW WT. | kg/m³ | FILTRATE 4.10 cm³/30 min. |
| CURRENT OP. DRILLING | UNDERFLOW RATE | m³/min. | pH 10.0 |

EQUIPMENT: ☐ DEGASSER ☑ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

SAMPLE FROM FL. ☐ PIT ☐ SHAKER

| MUD PROPERTIES | | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | 04:00 | 06:00 | 20:00 |
| PRESENT DEPTH (m) | 2451 | 2454 | 2444 |
| FLOWLINE TEMPERATURE (°C) | 42°C | | 29°C |
| DENSITY (kg/m³) | 1195 | 1195 | 1195 |
| FUNNEL VISCOSITY (s/L) | 41 | 41 | 42 |
| APPARENT VISCOSITY (mPa.s) | 26.5 | 26 | (78) GIAS |
| PLASTIC VISCOSITY (mPa.s) | 15 | 15 | 15 |
| YIELD POINT (Pa) | 11.5 | 11 | 13.5 |
| GELS 0/10 min. (Pa) | 2/2.5 | 2/3 | 3/4 |
| pH STRIP ☑ METER ☐ | 10.5 | | |
| FILTRATE ☑ API ☐ HT HP (cm³) | 9 < | | |
| FILTER CAKE (mm) | .1 GOOD | | |
| ALK ☑ (PF/MF) ☐ (PM/LIME) | .9/1.4 | | |
| TOTAL HARDNESS ☐ Ca. ☑ (mg/L) | 20 | | |
| SAL. ☐ NACI ☐ CL ☑ (mg/L) | 250 | | |
| SAND CONTENT (%) ☐ (Ø) ☑ | .001 | | |
| SOLIDS CONTENT (%) ☐ (Ø) ☑ | .075 | | |
| OIL/WATER CONT. (%) ☐ (Ø) ☑ | .925 | | |
| MBT (Kg/m³) ☑ /% ☐ OIL RET ☐ | 10 | | |
| ELECTRICAL STABILITY (V) H2S | 0 | | |
| OIL/WATER RATIO SP. 2.21 | .7 | | |
| $CaCl_2$ w/w% SULPHITES | 180 | | |
| "n"/"k" | | | |

MATERIALS INVENTORY & COST

| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
|---|---|---|---|---|---|
| BARITE | 2588 | | 30 | 2558 | 375.00 |
| PTS-200 | 53 | | 3 | 50 | 780.00 |
| SULPHATE | 24 | | 1 | 23 | 49.70 |
| DEFOAM-1 | 16 | | 1 | 15 | 126.50 |
| CLEANS | 55 | | 10 | 45 | 800.00 |

3R=3 6R=5 100R=24
200R=32 300R=37 600R=52

PD-3 LD-5 100R-22
200R-32 300R-38 600R-52

| | | | |
|---|---|---|---|
| PREVIOUS COST | 60,686.40 | STARTING VOLUME | |
| DAILY COST | 2141.70 | VOL. BUILT | THA-195 |
| CUM. COST | 62,827.60 | VOL. LOST on SURFACE | |
| CUM. ENG. COST | 127,750.38 | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS: DENSITY 1180-1190 KG/M³. MOVE MUD CLEANERS EXCEPT SHAKER TANK.
RUN WATER 5 LITRES/MIN FOR 1 CIRC. FLUSH 12 HOURS.
VISCOSITY 38 TO 40 SEC/L.
PH 10 W/ CAUSTIC SODA OVER 1 FULL CIRC. WHEN NEED.
FLOW LINE 10 1 PAIL OF DEFOAM 12 HOURS.
MIX 1 JUG OF X-CIDE ONCE A DAY.
PRIOR TO TUBING: ISOLATE SUCTION TANK, MIX 2 PAILS OF PTS-200 & 5 MIN PAIL PUMP DOWN HOLE & DISPLACE W/ MUD FOR 15 MINUTES.
WHEN MIXING PILL IN PILL TANK, ADD ½ PAIL OF DEFOAM FROM TOP MIXING BARITE.

STOCK POINT FT. ST. JOHN I.D.F. ENGINEER RICK REINHART
PHONE 785-4727 PHONE FAR ROOM OUTSIDE # 1 MOBILE #

IDF

INTERNATIONAL DRILLING FLUIDS

# DRILLING FLUID REPORT

DATE JUNE-04-1991
REPORT No. # 22
SPUD DATE APR-29-91

WELL NAME COLUMBIA ET AL KOTANEELEE LOCATION YT-I-48
OPERATOR COLUMBIA GAS DEVELOPMENT CONTRACTOR KENTING H.T. 07
REPORT FOR Mr. BOB TOOLE REPORT FOR Mr. JIM SIGNER

| ASSEMBLY | CASING | MUD Vol. (m³) | PUMP OUTPUT | ANNULAR VEL. m./min. |
|---|---|---|---|---|
| BIT SIZE / # 5-15.3mm | COND. | TANKS 75 m³ | PUMP SIZE 11 4/X 4 of 4 | OPPOSITE D.P. 54.5 |
| DRILL PIPE 89 mm | SURFACE | HOLE 53 m³ | m³/STK. .0118 | OPPOSITE D.C. 100 |
| DRILL COLLARS 120 mm | INTER 177.8 x 273 | TOTAL 128 m³ | S.P.M. 55 | PUMP PRESS. 8500 |
| OTHER | OTHER | STANDBY | m³/min. .649 | CIRC. TIME 200 |

| HOLE DATA | DESANDER/DESILTER | | DRILLING FLUID SPECIFICATIONS | |
|---|---|---|---|---|
| MUD TYPE LT. POLYMER | FLOWLINE WT. | 40 kg/m³ | MUD WT. 1180-1190 | kg/m³ |
| HOLE COND. HARD REAMING | UNDERFLOW WT. | 62 kg/m³ | VISCOSITY 38-40 | s/L |
| DEVIATION @ 2417-2476 m. | OVERFLOW WT. | kg/m³ | FILTRATE 7.10 | cm³/30 min. |
| CURRENT OP. DRILLING. | UNDERFLOW RATE | m³/min. | pH 10.0-10.5 | |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

| SAMPLE FROM FL. ☐ PIT ☐ | MUD PROPERTIES | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | 07:30 | | |
| PRESENT DEPTH (m) | 2459 | | |
| FLOWLINE TEMPERATURE (°C) | 42°C | | |
| DENSITY (kg/m³) | 1190 | | |
| FUNNEL VISCOSITY (s/L) | 41 | | |
| APPARENT VISCOSITY (mPa.s) | 24.5 | | |
| PLASTIC VISCOSITY (mPa.s) | 15 | | |
| YIELD POINT (Pa) | 11.5 | | |
| GELS 0/10 min. (Pa) | 2/3 | | |
| pH STRIP ☑ METER ☐ | 10.3 | | |
| FILTRATE ☑ API ☐ HT HP (cm³) | 14.0 | | |
| FILTER CAKE (mm) | .5 FAIR | | |
| ALK ☑ (PF/MF) ☐ (PM/LIME) | .7/1.9 | | |
| TOTAL HARDNESS ☐ Ca. ☐ (mg/L) | 20 | | |
| SAL. ☐ NACI ☐ CL ☐ (mg/L) | 250 | | |
| SAND CONTENT (%) ☐ (Ø) ☑ | .001 | | |
| SOLIDS CONTENT (%) ☐ (Ø) ☑ | .077 | | |
| OIL/WATER CONT. (%) ☐ (Ø) ☐ | .928 | | |
| MBT (Kg/m³) ☑ /% ☐ OIL RET ☐ | 11 | | |
| ELECTRICAL STABILITY (V) HI: (UNCAL) | CUTTS. UP! | | |
| OIL/WATER RATIO SP. 321 | .6 | | |
| $CaCl_2$ w/w% SULPHITE | 150 | | |
| "n"/"k" | | | |

MATERIALS INVENTORY & COST

| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
|---|---|---|---|---|---|
| BARITE | 2558 | | 20 | 2538 | 275.00 |
| PTS-200 | 50 | | 3 | 47 | 780.00 |
| X-CIDE | 24 | | 1 | 23 | 140.00 |
| DEFOAM | 15 | | 1 | 14 | 136.50 |

PR=3 6R=5 100R=23
200R=31 300R=38 600R=52

| | | | |
|---|---|---|---|
| PREVIOUS COST | $28,327.68 | STARTING VOLUME | |
| DAILY COST | 1431.50 | VOL. BUILT | THAWIS |
| CUM. COST | $4,259. | VOL. LOST on SURFACE | |
| CUM. ENG. COST | 13,125. | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS: DENSITY @ 1180-1190 KG/M³, MOVE GOOD EXCEPT SHAKER TANK
RUN WATER + 20 LITRES/MIN. O.T.IL VISCOSITY IS BELOW 40
FILTRATE = 22-23 SECS.
4 PH = 10.5 W/ CAUSTIC SODA + 1 BAG A CIRC. WHEN REQ'D.
5 SLOWLY ROUND W/ 1 PAIL OF DEFOAM 12 HOURS.
1 MIX + 1 JUG OF X-CIDE, ONCE A DAY.
7 PRIOR TO MIXING PILL IN PILL TANK, MIX 1/2 PAIL + OF DEFOAM
8 PRIOR TO TRIPPING ISOLATE LAST TWO TANKS, MIX 2 PAILS
OF PTS-200 + 5 M.L/PAIL TO EACH TANK (4 PAILS TOTAL)
RUN-REAM HOLE FOR 30 MIN. + DISPLACE ANNUL FUL 10 MIN.
OR SOON AS YOU GET BACK ON BOTTOM W/ CIRC.
1 RUN WATER + 20 ML/LITRE, MIX 2 BAGS OF DISPAC-LO +
15 ML/L BAG. MIX 1 BAG OF SODIUM SULPHITE!

STOCK POINT FT. ST. JOHN I.D.F. ENGINEER NICK REINHARDT
PHONE 785-4272 PHONE FAR POOR OR MOBILE # F1

**IDF**
**INTERNATIONAL DRILLING FLUIDS**

# DRILLING FLUID REPORT

DATE JUNE-05-91
REPORT No. # 33
SPUD DATE APR-29-91

WELL NAME COLUMBIA ET AL KOTANEELEE LOCATION YT-I-48

| | | | |
|---|---|---|---|
| OPERATOR | COLUMBIA GAS DEVELOPMENT | CONTRACTOR | KENTING H.T. #07 |
| REPORT FOR Mr. | POP TOOLE | REPORT FOR Mr. | JIM SIGNER |

| ASSEMBLY | | CASING | | MUD Vol. (m³) | | PUMP OUTPUT | | ANNULAR VEL. m./min. | |
|---|---|---|---|---|---|---|---|---|---|
| BIT SIZE / # | 6.157mm | COND. | | TANKS | 75 m³ | PUMP SIZE | 114x406 | OPPOSITE D.P. | 54.5 |
| DRILL PIPE | 89 mm | SURFACE | | HOLE | 53 m³ | m³/STK. | .0118 | OPPOSITE D.C. | 100 |
| DRILL COLLARS | 120 mm | INTER | 178-2270 | TOTAL | 128 m³ | S.P.M. | 55 | PUMP PRESS. | 13,500 |
| OTHER | TMAC 193 | OTHER | | STANDBY | | m³/min. | .649 | CIRC. TIME | 200 |

| HOLE DATA | | DESANDER/DESTILTER | | DRILLING FLUID SPECIFICATIONS | |
|---|---|---|---|---|---|
| MUD TYPE | LT. POLYMER | FLOWLINE WT | [illegible] 40 m³ kg/m³ | MUD WT. | 1180 kg/m³ |
| HOLE COND | (X 15.8 SETS) | UNDERFLOW WT. | [illegible] 67 m³ kg/m³ | VISCOSITY | 38-40 s/L |
| DEVIATION | | OVERFLOW WT | CENT OFS 1040 (45 L/ kg/m³ | FILTRATE | <10 cm³/30 min. |
| CURRENT OP | DRILLING | UNDERFLOW RATE | UF 2810 (2 L/ m³/min. | pH | 10-10.5 |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

| SAMPLE FROM FL. ☐ PIT ☐ | MUD PROPERTIES | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | 04:00 | | |
| PRESENT DEPTH (m) | 2468 | | |
| FLOWLINE TEMPERATURE (°C) | 42°C | | |
| DENSITY (kg/m³) | 1180 | | |
| FUNNEL VISCOSITY (s/L) | 41 | | |
| APPARENT VISCOSITY (mPa.s) | 26 | | |
| PLASTIC VISCOSITY (mPa.s) | 15 | | |
| YIELD POINT (Pa) | 11 | | |
| GELS 0/10 min. (Pa) | 2/2.5 | | |
| pH STRIP ☑ METER ☐ | 10.5 | | |
| FILTRATE ☑ API ☐ HT HP (cm³) | 10.5 | | |
| FILTER CAKE (mm) | 1.0 GOOD! | | |
| ALK ☑ (PF/MF) ☐ (PM/LIME) | .8/1.1 | | |
| TOTAL HARDNESS ☐ Ca. ☑ (mg/L) | 20 | | |
| SAL. ☐ NACl ☐ CL ☑ (mg/L) | 750 | | |
| SAND CONTENT (%) ☐ (Ø) ☑ | .001 | | |
| SOLIDS CONTENT (%) ☐ (Ø) ☑ | .065 | | |
| OIL/WATER CONT. (%) ☐ (Ø) ☑ | .922 | | |
| MBT (Kg/m³) ☑ /% ☐ OIL RET ☐ | 10 | | |
| ELECTRICAL STABILITY (V) H₂S | 0 | | |
| OIL/WATER RATIO ASP-771 | .5 | | |
| CaCl₂ w/w% SULPHITES | 125 | | |
| "n"/"k" | | | |

MATERIALS INVENTORY & COST

| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
|---|---|---|---|---|---|
| BARITE | 2528 | | 30 | 2498 | 275.00 |
| FTS-200 | 47 | | 4 | 43 | 1040.00 |
| X-CIDE | 23 | | 1 | 22 | 140.00 |
| CAUSTIC | 181 | | 1 | 180 | 30.00 |
| DEFOAM | 14 | | 1 | 13 | 126.50 |

3R = 2  6R = 4  100R = 22
200R = 30  300R = 37  600R = 52

| | | | |
|---|---|---|---|
| PREVIOUS COST | 4,259.1 | STARTING VOLUME | |
| DAILY COST | 1721.5 | VOL. BUILT | THANKS |
| CUM. COST | 15,980.58 | VOL. LOST on SURFACE | |
| CUM. ENG. COST | 12,500 | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS: 1 DENSITY - 1150 KG/M³ MAKE NO CHG EXCEPT IN SHAKER TANK
2 VISCOSITY - 38-40 SEC/L. RUN WATER AT 5 LITRES/MIN.
3 PH - 10.5 - 11 CAUSTIC SODA - ALLOW F CIRC. WHEN REQ'D.
4 Slowly Run 1 PAIL OF ASP-771 EVERY 12 HOURS.
5 MIX 1 JUG OF X-CIDE ONCE A DAY!
6 Prior To mixing PILL in PILL TANK, MIX ½ PAIL OF DEFOAMER.
7 Prior To TRIPPING: ISOLATE LAST TWO TANKS, MIX 2 PAILS OF FTS-200 [illegible] PAIL IN EACH TANK. (4 PAILS TOTAL)
PUMP DOWN HOLE FOR 30 MIN., + DISPLACE [illegible] FOR 10 MINUTES!

| | | | |
|---|---|---|---|
| STOCK POINT | FT ST JOHN | I.D.F. ENGINEER | RICK REINHART |
| PHONE | 785-4222 | PHONE | FAR POOL [illegible] MOBILE #1 |

IDF

INTERNATIONAL DRILLING FLUIDS

# DRILLING FLUID REPORT

DATE JUNE-05-91
REPORT No. # 24
SPUD DATE APR-29-91

WELL NAME COLUMBIA ET AL KOTANELEE LOCATION YT-I-48
OPERATOR COLUMBIA GAS DEVELOPMENT CONTRACTOR KENTING H.T. #107
REPORT FOR Mr. PAT TOOLE-NEIL RUSS-JOHN A. REPORT FOR Mr JIM SIGNER

| ASSEMBLY | CASING | MUD Vol. (m³) | PUMP OUTPUT | ANNULAR VEL. m./min. |
|---|---|---|---|---|
| BIT SIZE / # 6.157/M.1 | COND. | TANKS 75.5 | PUMP SIZE 114 x 406 | OPPOSITE D.P. 54.5 |
| DRILL PIPE 89 mm | SURFACE - | HOLE 52.5 | m³/STK. .0188 | OPPOSITE D.C. 100 |
| DRILL COLLARS 120 mm | INTER 178@2772 | TOTAL 179 M³ | S.P.M. 55 | PUMP PRESS. 11,000 |
| OTHER THA. 197M. | OTHER | STANDBY | m³/min. .649 | CIRC. TIME 300 |

| HOLE DATA | DESANDER/DESILTER | DRILLING FLUID SPECIFICATIONS |
|---|---|---|
| MUD TYPE LOT. POLYMER | FLOWLINE WT. MIN. 1006 @ 40.5 M kg/m³ | MUD WT. 1175-1180 kg/m³ |
| HOLE COND (7 x 15.8 JETS) | UNDERFLOW WT. CT. 1.6 P. 1.65 M kg/m³ | VISCOSITY 38-40 s/L |
| DEVIATION 10 3/4° @ 2474 | OVERFLOW WT. kg/m³ | FILTRATE 7.10 cm³/30 min. |
| CURRENT OP. DRILLING. | UNDERFLOW RATE m³/min. | pH 10.5 |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

SAMPLE FROM FL. ☑ PIT ☐

| MUD PROPERTIES | | |
|---|---|---|
| TIME SAMPLE TAKEN | 22:30 | 15:00 |
| PRESENT DEPTH (m) | 2492 | 2481 |
| FLOWLINE TEMPERATURE (°C) | 46°C | 42°C |
| DENSITY (kg/m³) | 1175 | 1175 |
| FUNNEL VISCOSITY (s/L) | 41 | 41 |
| APPARENT VISCOSITY (mPa.s) | 25 | 26 |
| PLASTIC VISCOSITY (mPa.s) | 15 | 15 |
| YIELD POINT (Pa) | 10 | 11 |
| GELS 0/10 min. (Pa) | 7/2.5 | 7/2.5 |
| pH STRIP ☑ METER ☐ | 10.5 | 10.5 |
| FILTRATE ☑ API ☐ HT HP (cm³) | 10.5 | 12.0 |
| FILTER CAKE (mm) | 1.0 | 1.0 |
| ALK ☑ (PF/MF) ☐ (PM/LIME) | .9/1.2 | .85/1.2 |
| TOTAL HARDNESS ☐ Ca. ☑ (mg/L) | 20 | 20 |
| SAL. ☐ NACI ☐ CL ☑ (mg/L) | 250 | 250 |
| SAND CONTENT (%) ☐ (Ø) ☑ | .001 | .001 |
| SOLIDS CONTENT (%) ☐ (Ø) ☑ | .065 | .065 |
| OIL/WATER CONT. (%) ☐ (Ø) ☑ | .935 | .935 |
| MBT (Kg/m³) ☑ /% ☐ OIL RET ☐ | 10 | 10 |
| ELECTRICAL STABILITY (V) H:S | 0 | 0 |
| OIL/WATER RATIO SP. 771 | .6 | .5 |
| $CaCl_2$ w/w% SULPHITES | 120 | 120 |
| "n"/"k" | | |

| MATERIALS INVENTORY & COST | | | | | |
|---|---|---|---|---|---|
| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
| DISPAC-10 | 77 | | 7 | 70 | 1176.80 |
| SULPHITE | 73 | | 1 | 28 | 49.70 |
| ASP-771 | 59 | | 3 | 56 | 300.00 |
| X-CIDE | 77 | | 1 | 21 | 140.00 |

| | | | |
|---|---|---|---|
| PREVIOUS COST | 65,980.45 | STARTING VOLUME | |
| DAILY COST | 1176.59 | VOL. BUILT | 7 TANKS |
| CUM. COST | 67,607.10 | VOL. LOST on SURFACE | |
| CUM. ENG. COST | 13,500.00 | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS: 1. DENSITY @ 1150 KG/M³. MUD GOOD EXCEPT IN SHAKER TANK
2. VISCOSITY @ 38-40 SEC/L. RUN WATER @ 5 L/MIN. CIRC. EVERY 12 HRS.
3. PH 10.5 W/ CAUSTIC SODA. 1 BAG A CIRC. WHEN NEED.
4. SLOWLY ADD 1 PAIL OF ASP 771 EVERY 12 HOURS.
5. MIX 1 JUG OF X-CIDE ONCE A DAY.
6. PUMP TO MIXING PIT IN PIT TANK: MIX 1/2 PAIL + DEFOAMER.
7. PUMP TO TRIPPING: ISOLATE LAST TWO TANKS: MIX 3 PAILS OF PTS-200 + SWG. 1 PAIL TO EACH TANK. (4 PAILS TOTAL)
PUMP DOWN HOLE FOR 30 MIN. AND DISPLACE W/ MUD FOR 10 MINUTES.
8. IF MUD DENSITY DROPS BELOW 1170 KG/M³ MIX 50 SXS BARITE AT 4 MINUTES/BAG.

STOCK POINT FT. ST. JOHN I.D.F. ENGINEER RICK REINHART
PHONE 785-4722 PHONE FAR 600-0 MOBILE # 1

IDF

INTERNATIONAL DRILLING FLUIDS

# DRILLING FLUID REPORT

DATE JUNE-06-1991
REPORT No. # 35
SPUD DATE APR-29-91

WELL NAME COLUMBIA FTAL KOTANELEE | LOCATION YT-I-48
OPERATOR COLUMBIA GAS DEVELOPMENT | CONTRACTOR KENTING H.T. #07
REPORT FOR Mr. NEIL BLISS | REPORT FOR Mr. JIM SIGNER

| ASSEMBLY | CASING | MUD Vol. (m³) | PUMP OUTPUT | ANNULAR VEL. m./min. |
|---|---|---|---|---|
| BIT SIZE / # 1-153 mm | COND. | TANKS 77 m³ | PUMP SIZE 114 x 406 | OPPOSITE D.P. 55 |
| DRILL PIPE 89 mm | SURFACE | HOLE 54 m³ | m³/STK. .0118 | OPPOSITE D.C. 95 |
| DRILL COLLARS 170 mm | INTER 175.2mm | TOTAL 131 m³ | S.P.M. 55 | PUMP PRESS. 12,500 |
| OTHER CHA-194 m. | OTHER | STANDBY | m³/min. .649 | CIRC. TIME 200 |

| HOLE DATA | DESANDER/DESTILTER | | DRILLING FLUID SPECIFICATIONS |
|---|---|---|---|
| MUD TYPE GEL. POLYMER | FLOWLINE WT. 200 | 41 m³ kg/m³ | MUD WT. 1175-1180 kg/m³ |
| HOLE COND. | UNDERFLOW WT. ETA 200 | 65 m³ kg/m³ | VISCOSITY 38-40 s/L |
| DEVIATION | OVERFLOW WT. | kg/m³ | FILTRATE 4.0 cm³/30 min. |
| CURRENT OP DRILLING. | UNDERFLOW RATE | m³/min. | pH 10.5 |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

| SAMPLE FROM FL. ☒ PIT ☐ | MUD PROPERTIES | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | 16:30 | | 11:00 |
| PRESENT DEPTH (m) | 3495 | | 3494 |
| FLOWLINE TEMPERATURE (°C) | 45°C | | 45°C |
| DENSITY (kg/m³) | 1180 | | 1180 |
| FUNNEL VISCOSITY (s/L) | 42 | | 42 |
| APPARENT VISCOSITY (mPa.s) | 27 | | 26 |
| PLASTIC VISCOSITY (mPa.s) | 16 | | 15 |
| YIELD POINT (Pa) | 11 | | 11 |
| GELS 0/10 min. (Pa) | 7/8.5 | | 7/8 |
| pH STRIP ☒ METER ☐ | 10.5 | | 10.5 |
| FILTRATE ☒ API ☐ HT HP (cm³) | 11.5 | | 12.0 |
| FILTER CAKE (mm) | 1.0 TIGHT | | 1.0 |
| ALK ☑ (PF/MF) ☐ (PM/LIME) | .85/1.2 | | .85/1.2 |
| TOTAL HARDNESS ☐ Ca. ☑ (mg/L) | 20 | | 20 |
| SAL. ☐ NACI ☐ CL ☒ (mg/L) | 250 | | 200 |
| SAND CONTENT (%) ☐ (Ø) ☒ | .002 | | .001 |
| SOLIDS CONTENT (%) ☐ (Ø) ☒ | .068 | | .068 |
| OIL/WATER CONT. (%) ☐ (Ø) ☒ | .932 | | .932 |
| MBT (Kg/m³) ☐ /% ☐ OIL RET ☐ | 11 | | 11 |
| ELECTRICAL STABILITY (V) HI'S | 0 | | 0 |
| OIL/WATER RATIO 75:25 = 3:1 | .75 | | .7 |
| $CaCl_2$ w/w% WHITES | 150 | | 170 |
| "n"/"k" TOTAL POLYMER | 2.5 KG/m³ | | |

| MATERIALS INVENTORY & COST | | | | | |
|---|---|---|---|---|---|
| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
| BARITE | 3498 | | 32 | 3466 | 462.50 |
| ASP-721 | 56 | | 1 | 55 | 100.00 |
| X-CIDE | 31 | | 1 | 30 | 140.00 |
| SULPHITE | 22 | | 1 | 21 | 49.70 |
| PTS-200 | 43 | | 4 | 39 | 1040.00 |
| DISPAC-10 | 70 | | 4 | 66 | 649.60 |
| GRAPHITE | - | | 2 | - | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| 2R=2 | 6R=4 | 100R=21 | | | |
| 200R=21 | 300R=37 | 600R=54 | | | |

| | | | |
|---|---|---|---|
| PREVIOUS COST | 47,607. | STARTING VOLUME | 174.171 |
| DAILY COST | 2441.80 | VOL. BUILT | |
| CUM. COST | 50,048.80 | VOL. LOST on SURFACE | |
| CUM. ENG. COST | 13,875. | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS: 1 DENSITY = 1175-1180 KG/m³, MOVE MUD FROM EXCEPT IN SHAKER TANK, IF DENSITY GOES BELOW 1170 KG/m³ MIX 50 SXS OF BARITE + 4 LITRES A PAC.
2 VISCOSITY = 38-40 SEC/L. ADD WATER + SUPER COLLOID 12 HRS.
3 PH = 10.5 ADD CAUSTIC SODA FLAKES CIRC. WHEN REQ'D.
4 ADD 1 PAIL OF ASP-721 EVERY 12 HOURS.
5 MIX 1 JUG OF X-CIDE, ONCE A DAY.
6 PRIOR TO MIXING PILL IN PILL TANK: MIX 1/2 PAIL + DEFOAMER
7 PRIOR TO TRIPPING: ISOLATE LAST TWO TANKS: MIX 3 PAILS OF PTS-200 IN EACH TANK + 5 L DEFOAM. (4 PAILS TOTAL)
PUMP DOWN HOLE FOR 20 MINUTES BEFORE DISPLACEMENT AND LET SIT FOR 10 MINUTES.

STOCK POINT FT. ST. JOHN | I.D.F. ENGINEER RICK REINHART
PHONE 785-4777 | PHONE FAR ROOM 0 MOBILE # IDF #1

IDF

INTERNATIONAL DRILLING FLUIDS

# DRILLING FLUID REPORT

DATE JUNE 07 91
REPORT No. # 26
SPUD DATE APR 29 91

WELL NAME COLUMBIA ET AL KOTANEELEE LOCATION VT. I - 48
OPERATOR COLUMBIA GAS DEVELOPMENT CONTRACTOR KENTING H.T. #07
REPORT FOR Mr. NEIL PLISS REPORT FOR Mr. JIM SIGNER

| ASSEMBLY | CASING | MUD Vol. (m³) | PUMP OUTPUT | ANNULAR VEL. m./min. |
|---|---|---|---|---|
| BIT SIZE / # 7 7/8 HUGHES | COND. | TANKS 77 m³ | PUMP SIZE 7" x 4 1/2 | OPPOSITE D.P. 56 |
| DRILL PIPE 88 mm | SURFACE | HOLE 54 m³ | m³/STK. .016 | OPPOSITE D.C. 98 |
| DRILL COLLARS 17 mm | INTER 178.2 mm | TOTAL 131 m³ | S.P.M. 40 | PUMP PRESS. 11,500 |
| OTHER THD 194 mm | OTHER | STANDBY | m³/min. .648 | CIRC. TIME 200 |

| HOLE DATA | DESANDER/DESTILTER | | DRILLING FLUID SPECIFICATIONS |
|---|---|---|---|
| MUD TYPE W.T. POLYMER | FLOWLINE WT. 1200.00 | .41 m³ kg/m³ | MUD WT. 1175 - 1180 kg/m³ |
| HOLE COND. GOOD! | UNDERFLOW WT. 1741.0 | .67 MIN kg/m³ | VISCOSITY 38 - 40 s/L |
| DEVIATION | OVERFLOW WT. BOTTOM HOLE | kg/m³ | FILTRATE 10 - 12 cm³/30 min. |
| CURRENT OP. DRILLING | UNDERFLOW RATE 1/2 PUMP | 215 ± 15 m³/min. | pH 10.5 |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

SAMPLE FROM FL. ☑ PIT ☐

| MUD PROPERTIES | | | MATERIALS INVENTORY & COST | | | | | |
|---|---|---|---|---|---|---|---|---|
| TIME SAMPLE TAKEN | 23:30 | 19:00 | 11:00 | MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
| PRESENT DEPTH (m) | 3574 | 3510 | 3497 | X-CIDE | 30 | | 1 | 29 | 140.00 |
| FLOWLINE TEMPERATURE (°C) | 43°C | 43°C | 41°C | SULPHITE | 21 | | 1 | 20 | 49.70 |
| DENSITY (kg/m³) | 1175 | 1180 | 1180 | DFCL | 30 | | 12 | 18 | 2124.00 |
| FUNNEL VISCOSITY (s/L) | 43 | 43 | 45 | DISPACTE | 66 | | 3 | 63 | 487.20 |
| APPARENT VISCOSITY (mPa.s) | 29 | 29.5 | 32.5 | BIOS | | | | | |
| PLASTIC VISCOSITY (mPa.s) | 18 | 18 | 20 | DEALS | 45 | | 5 | 40 | 400.00 |
| YIELD POINT (Pa) | 11 | 11.5 | 12.5 | | | | | | |
| GELS 0/10 min. (Pa) | 2/3 | 2/3 | 2.5/3 | | | | | | |
| pH STRIP ☑ METER ☐ | 10.5 | 10.5 | 10.5 | | | | | | |
| FILTRATE ☑ API ☐ HT HP (cm³) | 12.0 | 12 | 15.5 | | | | | | |
| FILTER CAKE (mm) | 1.0 TIGHT | 1.5 | 1.5 | | | | | | |
| ALK ☑ (PF/MF) ☐ (PM/LIME) | .85/1.2 | 1.0/1.4 | .9/1.4 | | | | | | |
| TOTAL HARDNESS ☐ Ca. ☑ (mg/L) | 20 | 20 | 20 | | | | | | |
| SAL. ☐ NACI ☐ CL ☑ (mg/L) | 750 | 750 | 750 | 3R=3 | 6R=4 | 100R= | 23 | | |
| SAND CONTENT (%) ☐ (Ø) ☑ | .0015 | .0015 | .0015 | 300R=32 | 300R= | 40 | 600R= | 58 | |
| SOLIDS CONTENT (%) ☐ (Ø) ☑ | .066 | .068 | .068 | | | | | | |
| OIL/WATER CONT. (%) ☐ (Ø) ☑ | .934 | .932 | .932 | PREVIOUS COST | 70,648.78 | STARTING VOLUME | | | |
| MBT (Kg/m³) ☑ /% ☐ OIL RET ☐ | 10 | 10 | 10 | DAILY COST | 2212.90 | VOL. BUILT | | THANKS | |
| ELECTRICAL STABILITY (V) | 0 | 0 | 0 | CUM. COST | 72,761.68 | VOL. LOST on SURFACE | | | |
| OIL/WATER RATIO C.F. 721 | .8 | .5 | .5 | CUM. ENG. COST | 14,250 | VOL. LOST SUB SURFACE | | | |
| $CaCl_2$ w/w% SULPHITE'S | 150 | 150 | 160 | | | END VOLUME | | | |
| "n"/"k" TOTAL POLYMER | 3.0 | 3.0 | 3.0 | | | CUM. VOL. BUILT | | | |

COMMENTS: D.E. SITE - 1175-1180 KG/M³. MUD WT. GOOD EXCEPT IN SHAKER TANK IF DENSITY GOES UP TO 1180 KG/M³. ADD SOME DILUTE AT 4 MINUTES A DAY.
2 SACKS OF 38-40 SEC. PAC WATER - 5 LITRES/MIN.
2 PAILS OF CAUSTIC SODA / DAY A CIRC. WHEN REQ'D.
4 STOP DILUTIONS OF A.P.F.L.
MIX 1 JUG X-CIDE PAIL / DAY NA+ SULPHITE ONCE A DAY!
2 PRIOR TO MIXING PILL IN PILL TANK. MIX ½ PAIL OF FC DEALS!
5 PRIOR TO TRIPPING 2 DILUTE LAST TWO TANKS. MIX 2 PAILS OF FTS - 300 IN EACH TANK 45 MIN. 1 PAIL PUMP DOWN HOLE FOR 40 MINUTES. ALL THE PITS FULL.

STOCK POINT FT. ST. JOHN I.D.F. ENGINEER RICK REINHART
PHONE 785-4228 PHONE FAR POOL MOBILE # E71

IDF

INTERNATIONAL DRILLING FLUIDS

# DRILLING FLUID REPORT

DATE JUNE-08-1991
REPORT No. #37
SPUD DATE APR-29-91

WELL NAME COLUMBIA ET AL KOTANELEE LOCATION YT-I-48
OPERATOR COLUMBIA GAS DEVELOPMENT CONTRACTOR KENTING H.T. #107
REPORT FOR Mr. NEIL PLISS REPORT FOR Mr. JIM SIGNER

| ASSEMBLY | | CASING | | MUD Vol. (m³) | | PUMP OUTPUT | | ANNULAR VEL. m./min. | |
|---|---|---|---|---|---|---|---|---|---|
| BIT SIZE / # | 7.15 mm | COND. | | TANKS | 85 m³ | PUMP SIZE | 7 x 406 | OPPOSITE D.P. | 50.5 |
| DRILL PIPE | 89 mm | SURFACE | | HOLE | 55 m³ | m³/STK. | .0167 | OPPOSITE D.C. | 88 |
| DRILL COLLARS | 120 mm | INTER | 177.8 | TOTAL | 140 m³ | S.P.M. | 76 | PUMP PRESS. | 12,000 |
| OTHER | CHP: 194 m. | OTHER | | STANDBY | | m³/min. | .6013 | CIRC. TIME | 230 |

| HOLE DATA | DESANDER/DESILTER | DRILLING FLUID SPECIFICATIONS |
|---|---|---|
| MUD TYPE: GEL CHEM. POLYMER | FLOWLINE WT. (Vol.) 45 m³ kg/m³ | MUD WT. 1175-1180 kg/m³ |
| HOLE COND. | UNDERFLOW WT. (T.M. Cyclone) 74 m³ kg/m³ | VISCOSITY 40 SEC/L s/L |
| DEVIATION 10 1/4° | OVERFLOW WT. (T.M. Hole Tank) kg/m³ | FILTRATE 10-12 cm³/30 min. |
| CURRENT OP. DRILLING | UNDERFLOW RATE (Vol.) 215 GPM m³/min. | pH 10.5 |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

| SAMPLE FROM FL. ☐ PIT ☐ | MUD PROPERTIES | | | MATERIALS INVENTORY & COST | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
| TIME SAMPLE TAKEN | 11:00 | | | BARITE | 2461 | | 25 | 2436 | 477.50 |
| PRESENT DEPTH (m) | 2544 | | | X-CIDE | 29 | | 1 | 28 | 140.00 |
| FLOWLINE TEMPERATURE (°C) | 47°C | | | DEFOAM | 13 | | 1 | 12 | 136.50 |
| DENSITY (kg/m³) | 1175 | | | SULPHITE | 20 | | 1 | 19 | 49.70 |
| FUNNEL VISCOSITY (s/L) | 47 | | | BTS-200 | 39 | | 4 | 35 | 1040.00 |
| APPARENT VISCOSITY (mPa.s) | 27 | | | | | | | | |
| PLASTIC VISCOSITY (mPa.s) | 17 | | | | | | | | |
| YIELD POINT (Pa) | 10 | | | | | | | | |
| GELS 0/10 min. (Pa) | 2/7.5 | | | | | | | | |
| pH STRIP ☐ METER ☐ | 10.5 | | | | | | | | |
| FILTRATE ☐ API ☐ HT HP (cm³) | 13.5 | | | | | | | | |
| FILTER CAKE (mm) | .5 THICK! | | | | | | | | |
| ALK ☐ (PF/MF) ☐ (PM/LIME) | .85/1.01 | | | | | | | | |
| TOTAL HARDNESS ☐ Ca. ☐ (mg/L) | 20 | | | | | | | | |
| SAL. ☐ NACL ☐ CL ☐ (mg/L) | 250 | | | 3R=2 | 6R=2 | 100R=20 | | | |
| SAND CONTENT (%) ☐ (Ø) ☐ | .001 | | | 300R=30 | 200R=22 | 600R=54 | | | |
| SOLIDS CONTENT (%) ☐ (Ø) ☐ | .066 | | | | | | | | |
| OIL/WATER CONT. (%) ☐ (Ø) ☐ | .994 | | | PREVIOUS COST | 73,241.30 | STARTING VOLUME | | | |
| MBT (Kg/m³) ☐ /% ☐ OIL RET ☐ | 10 | | | DAILY COST | 1802.70 | VOL. BUILT | | THANK | |
| ELECTRICAL STABILITY (V) μs | 0 | | | CUM. COST | 75,065.00 | VOL. LOST on SURFACE | | | |
| OIL/WATER RATIO (SP-7221) | .7 | | | CUM. ENG. COST | 14,675.00 | VOL. LOST SUB SURFACE | | | |
| $CaCl_2$ w/w% SULPHITES | 120 | | | | | END VOLUME | | | |
| "n"/"K" TOTAL POLYMER | 2.5 KG/M³ | | | | | CUM. VOL. BUILT | | | |

COMMENTS:

AT SOON AS YOU GET BACK ON BOTTOM W/ BIT #8!

1. RUN WATER @ 20 LITRES/MIN. FOR 1 CIRCULATION. THEN SLOW THE WATER DOWN TO 5 LITRES/MINUTE.

2. MIX 1 JUG OF X-CIDE AND THEN 1 BAG OF SODIUM SULPHITE.

3. AFTER 1 FULL CIRCULATION MIX 2 BAGS OF DEFOAM-LOSS AT 20 MINUTES A BAG!

STOCK POINT FT. ST. JOHN I.D.F. ENGINEER RICK REINHART
PHONE 785-4222 PHONE EAR ROOM 0 MOBILE DE #1

IDF

INTERNATIONAL DRILLING FLUIDS

# DRILLING FLUID REPORT

DATE JUNE 09 1991
REPORT No. # 28
SPUD DATE APR 29 91

WELL NAME COLUMBIA ETAL KOTANEELEE LOCATION NT-I-48
OPERATOR COLUMBIA GAS DEVELOPMENT CONTRACTOR KENTING H.T. #07
REPORT FOR Mr. NEIL PLISS REPORT FOR Mr. JIM SIGNED

| ASSEMBLY | CASING | MUD Vol. (m³) | PUMP OUTPUT | ANNULAR VEL. m./min. |
|---|---|---|---|---|
| BIT SIZE / # 8.15 #1 | COND. | TANKS 80 m³ | PUMP SIZE 177 x 406 | OPPOSITE D.P. 60 |
| DRILL PIPE 89 mm | SURFACE | HOLE 55 m³ | m³/STK. .0167 | OPPOSITE D.C. 105 |
| DRILL COLLARS 178 mm | INTER 178.2273 | TOTAL 135 m³ | S.P.M. 43 | PUMP PRESS. 10,000 |
| OTHER STAB | OTHER | STANDBY | m³/min. .7181 | CIRC. TIME 190 |

| HOLE DATA | DESANDER/DESILTER | DRILLING FLUID SPECIFICATIONS |
|---|---|---|
| MUD TYPE: GEL POLYMER | FLOWLINE WT. AVG. 1.45 kg/m³ | MUD WT. 1190 KG/M³ kg/m³ |
| HOLE COND. | UNDERFLOW WT. 1.45 kg/m³ | VISCOSITY 40 SEC/L s/L |
| DEVIATION | OVERFLOW WT. 1.40 kg/m³ | FILTRATE 10-12 cm³/30 min. |
| CURRENT OP: DRILLING | UNDERFLOW RATE 215 m³/min. | pH 10.5 |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

| SAMPLE FROM FL. ☑ PIT ☐ | MUD PROPERTIES | | | MATERIALS INVENTORY & COST | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TIME SAMPLE TAKEN | 20:00 | | 13:00 | MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
| PRESENT DEPTH (m) | 3559 | | 3557 | BARITE | 247t | | 100 | 227t | 1750.00 |
| FLOWLINE TEMPERATURE (°C) | 44°C | | 47°C | SULPHITE | 19 | | 1 | 18 | 49.70 |
| DENSITY (kg/m³) | 1180 | | 1170 | DFCL | 18 | | 6 | 12 | 1068.00 |
| FUNNEL VISCOSITY (s/L) | 43 | | 45 | DISPAC | 13 | | 7 | 60 | 487.20 |
| APPARENT VISCOSITY (mPa.s) | 28 | | 30 | | | | | | |
| PLASTIC VISCOSITY (mPa.s) | 18 | | 19 | | | | | | |
| YIELD POINT (Pa) | 10 | | 11 | | | | | | |
| GELS 0/10 min. (Pa) | 7/25 | | 7/13 | | | | | | |
| pH STRIP ☑ METER ☐ | 10.7 | | 11.0 | | | | | | |
| FILTRATE ☑ API ☐ HT HP (cm³) | 15 | | 13.0 | | | | | | |
| FILTER CAKE (mm) | 1.0 FIRM. | | 1.0 | | | | | | |
| ALK ☐ (PF/MF) ☐ (PM/LIME) | 1.1/1.4 | | 1.2/2.1 | | | | | | |
| TOTAL HARDNESS ☐ Ca. ☐ (mg/L) | 20 | | 20 | | | | | | |
| SAL. ☐ NACl ☐ CL ☐ (mg/L) | 350 | | 300 | DR=2 | LR=4 | 100R=20 | | | |
| SAND CONTENT (%) ☐ (Ø) ☐ | .001 | | .001 | 200R=30 | 300R=38 | 600R=56 | | | |
| SOLIDS CONTENT (%) ☐ (Ø) ☑ | .07 | | .065 | | | | | | |
| OIL/WATER CONT. (%) ☐ (Ø) ☐ | .93 | | .935 | PREVIOUS COST | 75,065. | STARTING VOLUME | | | |
| MBT (Kg/m³) ☑ /% ☐ OIL RET ☐ | 10 | | 10 | DAILY COST | 854.90 | VOL. BUILT | 7M³ | MIX | |
| ELECTRICAL STABILITY (V) | 0 | | 0 | CUM. COST | 77,920. | LOST on SURFACE | 4M³ | / | |
| OIL/WATER RATIO | .7 | | .7 | CUM. ENG. COST | 15,000. | VOL. LOST SUB SURFACE | | | |
| $CaCl_2$ w/w% | 170 | | 175 | | | END VOLUME | | | |
| "n"/"k" | 4 | KG/M³ | 4 | | | CUM. VOL. BUILT | | | |

COMMENTS: DENSITY = 1190 KG/M³ MOVE ALL CUTS EXCEPT 1 SHAKER TANK. IF DENSITY GOES BELOW 1185 KG/M³ MIX 5 SX BARITE AT 4 MINUTES A BAG.
VISCOSITY = 40 SEC/L ADD WATER = 5 LITRES/MIN.
PH = 10.5 DO NOT ADD ANY MORE CAUSTIC FOR NOW.
4 STAGE ADDITIONS OF ASP 731 AND DISPAC LO.
5 STAGE ADDITIONS OF FTS-300 FOR NOW.
MIX 1 JUG OF X-CIDE A DAY. ALSO ALL 1 JUG OF X-CIDE BACK TO TRIPPING.
ADD TO MIXING PILL TO PILL TANK. MIX ½ BAG OF DEFOAMER.

STOCK POINT FT. ST JOHN I.D.F. ENGINEER
PHONE 787-4733 PHONE MOBILE #

**IDF**
**INTERNATIONAL DRILLING FLUIDS**

# DRILLING FLUID REPORT

DATE JUNE-10-1991
REPORT No. #29
SPUD DATE APR.-29-91

WELL NAME COLUMBIA ET AL KOTANEELEE
LOCATION YT I-48

| | |
|---|---|
| OPERATOR COLUMBIA GAS DEVELOPMENT | CONTRACTOR KENTING H.T. #07 |
| REPORT FOR Mr. NEIL BLISS | REPORT FOR Mr. TIM SIGNER |

| ASSEMBLY | CASING | MUD Vol. (m³) | PUMP OUTPUT | ANNULAR VEL. m./min. |
|---|---|---|---|---|
| BIT SIZE / # 8.152mm | COND. | TANKS 85 m³ | PUMP SIZE 114 x 406 | OPPOSITE D.P. 50 |
| DRILL PIPE 89 mm | SURFACE | HOLE 55.5 | m³/STK. .0119 | OPPOSITE D.C. 86 |
| DRILL COLLARS 120 mm | INTER 178-2275 | TOTAL 140.5 | S.P.M. 50 | PUMP PRESS. 2500 |
| OTHER CHAS 196.1 | OTHER | STANDBY | m³/min. .59 | CIRC. TIME 220 |

| HOLE DATA | DESANDER/DESTILTER | DRILLING FLUID SPECIFICATIONS |
|---|---|---|
| MUD TYPE CAT. POLYMER | FLOWLINE WT AVG. OUT 1145.5 kg/m³ | MUD WT. 1190-1195 kg/m³ |
| HOLE COND. | UNDERFLOW WT ETM. UP @ 80 MIN kg/m³ | VISCOSITY 40-42 s/L |
| DEVIATION 7 1/4 @ 2561 | OVERFLOW WT ETM. HOLE TEMP 2h kg/m³ | FILTRATE FIRM CAKE cm³/30 min. |
| CURRENT OP. DRILLING. | UNDERFLOW RATE 225°F-107°C m³/min. | pH 10.5 |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

| SAMPLE FROM FL. ☑ PIT ☐ | MUD PROPERTIES | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | 16:00 | | 09:20 |
| PRESENT DEPTH (m) | 2587 | | 2580 |
| FLOWLINE TEMPERATURE (°C) | 45°C | | 44°C |
| DENSITY (kg/m³) | 1195 | | 1190 |
| FUNNEL VISCOSITY (s/L) | 42 | | 42 |
| APPARENT VISCOSITY (mPa.s) | 27 | | 26 |
| PLASTIC VISCOSITY (mPa.s) | 18 | | 17 |
| YIELD POINT (Pa) | 9 | | 9 |
| GELS 0/10 min. (Pa) | 1.5/3 | | 1.5/3 |
| pH STRIP ☑ METER ☐ | 10.7 | | 10.7 |
| FILTRATE ☑ API ☐ HT HP (cm³) | 15.5 | | 16 |
| FILTER CAKE (mm) | 1.0 TIGHT | | 1.0 |
| ALK ☑ (PF/MF) ☐ (PM/LIME) | 1.0/1.2 | | 1.0/1.2 |
| TOTAL HARDNESS ☐ Ca. ☑ (mg/L) | 40 | | 20 |
| SAL. ☐ NACl ☐ CL ☑ (mg/L) | 300 | | 300 |
| SAND CONTENT (%) ☑ (∅) ☑ | .0015 | | .0015 |
| SOLIDS CONTENT (%) ☑ (∅) ☑ | .078 | | .075 |
| OIL/WATER CONT. (%) ☐ (∅) ☑ | .922 | | .925 |
| MBT (Kg/m³) ☑ /% ☐ OIL RET ☐ | 10 | | 10 |
| ELECTRICAL STABILITY (V) H2S | 0 | | 0 |
| OIL/WATER RATIO ASP-721 | .7 | | .7 |
| CaCl₂ w/w% SULPHITES | 150 | | 150 |
| "n"/"K" TOTAL POLYMER | 4.0 | KG/M³ | 4.0 |

MATERIALS INVENTORY & COST

| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
|---|---|---|---|---|---|
| BARITE | 2326 | | 85 | 2241 | 1062.50 |
| DFLC | 12 | | 7 | 5 | 1746.00 |
| X-CIDE | 28 | | 1 | 27 | 140.00 |
| DRISFLO | 60 | | 3 | 57 | 487.20 |

3R=2 6R=3 100R=19
200R=28 300R=36 600R=54

| | | | |
|---|---|---|---|
| PREVIOUS COST | 77,920.40 | STARTING VOLUME | |
| DAILY COST | 2935.78 | VOL. BUILT | 1 HAULS |
| CUM. COST | 80,856.18 | VOL. LOST on SURFACE | |
| CUM. ENG. COST | 15,275.98 | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS: 1 MUD DENSITY @ 1190-1195 KG/M³: IF DENSITY GOES BELOW 1185 KG/M³ MIX 50 SXS BARITE @ 4 MIN./BAG. ✗
→ RAISE DENSITY TO 1220 KG/M³ PRIOR TO 2650 M. CHECK W/ ENG.!
2 VISCOSITY @ 40-42 SEC/L ADD WATER @ 5 LITRES/MIN.
3 PH @ 10.5, DO NOT ADD CAUSTIC FOR NOW!
4 STOP ADDITIONS OF ASP-721!
5 ONCE A DAY: MIX 1 JUG OF X-CIDE: ALSO 1 X-CIDE PRIOR TO TRIP!
6 CONTROL FLUID LOSS @ 15-17 CM³ W/ 2 DRISPAC-LO @ 75 MIN/BAG!
7 PRIOR TO MIXING PILL IN PILL TANK, MIX 1/2 PAIL DEFOAMER.

→ 8 PRIOR TO TRIP: IF YOU ARE GOING TO PRESSURE TEST: MIX 4 PAILS OF PTS-200, ISOLATE LAST TWO TANKS, MIX 2 PAILS IN EACH TANK! PUMP FOR 40 MINUTES THEN PUMP PILL!

STOCK POINT FT. ST. JOHN — I.D.F. ENGINEER RICK REINHART
PHONE 785-4222 — PHONE CAR ROOM MOBILE # IDF #1

IDF

INTERNATIONAL DRILLING FLUIDS

# DRILLING FLUID REPORT

DATE JUNE-11-1991
REPORT No. # 40
SPUD DATE APR-29-91

WELL NAME COLUMBIA ET AL KOTANEE LEE LOCATION YT-I-48
OPERATOR COLUMBIA GAS DEVELOPMENT CONTRACTOR KEITING H.T. #07
REPORT FOR Mr. REPORT FOR Mr. JIM SIGNER

| ASSEMBLY | | CASING | | MUD Vol. (m³) | | PUMP OUTPUT | | ANNULAR VEL. m./min. | |
|---|---|---|---|---|---|---|---|---|---|
| BIT SIZE / # | 9.15/8 MM | COND. | | TANKS | 85 M³ | PUMP SIZE | 11 1/4 x 4 CK | OPPOSITE D.P. | 50 |
| DRILL PIPE | 89 mm | SURFACE | | HOLE | 56 M³ | m³/STK. | .0118 | OPPOSITE D.C. | 96 |
| DRILL COLLARS | 120 mm | INTER | 178-2703 | TOTAL | 141 M³ | S.P.M. | 56 | PUMP PRESS. | 9500 |
| OTHER | THA @ 1961 M. | OTHER | | STANDBY | | m³/min. | .59 | CIRC. TIME | 330 |

| HOLE DATA | DESANDER/DESTILTER | DRILLING FLUID SPECIFICATIONS |
|---|---|---|
| MUD TYPE GEL. POLYMER | FLOWLINE WT. AVG. 46 M³ kg/m³ | MUD WT. 1190-1195 kg/m³ |
| HOLE COND. GOOL | UNDERFLOW WT. [T/A. UP. 80 M³ kg/m³ | VISCOSITY 40-45 s/L |
| DEVIATION JETS-2X16.3 | OVERFLOW WT. [T/A. HOLE TRIP kg/m³ | FILTRATE 15-17 cm³/30 min. |
| CURRENT OP. DRILLING | UNDERFLOW RATE F.T. 775 GPM m³/min. | pH 10.5 |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

| SAMPLE FROM FL. ☐ PIT ☐ | MUD PROPERTIES | | | MATERIALS INVENTORY & COST | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TIME SAMPLE TAKEN | 21:00 | | 09:30 | MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
| PRESENT DEPTH (m) | 3609 | | 3598 | SULPHITE | 18 | | 1 | 17 | 49.70 |
| FLOWLINE TEMPERATURE (°C) | 44°C | | 40°C | X-CIDE | 27 | | 1 | 26 | 140.00 |
| DENSITY (kg/m³) | 1190 | | 1195 | | | | | | |
| FUNNEL VISCOSITY (s/L) | 42 | | 44 | | | | | | |
| APPARENT VISCOSITY (mPa.s) | 34.5 | | 38 | | | | | | |
| PLASTIC VISCOSITY (mPa.s) | 17 | | 19 | | | | | | |
| YIELD POINT (Pa) | 7.5 | | 9 | | | | | | |
| GELS 0/10 min. (Pa) | 1.5/7 | | 1.5/7 | | | | | | |
| pH STRIP ☑ METER ☐ | 10.5 | | 10.5 | | | | | | |
| FILTRATE ☑ API ☐ HT HP (cm³) | 16.5 | | 15.2 | | | | | | |
| FILTER CAKE (mm) | 1.0 TIGHT | | .5 | | | | | | |
| ALK ☑ (PF/MF) ☐ (PM/LIME) | .9/1.2 | | .9/1.2 | | | | | | |
| TOTAL HARDNESS ☐ Ca. ☑ (mg/L) | 50 | | 60 | | | | | | |
| SAL. ☐ NACI ☐ CL ☑ (mg/L) | 200 | | 200 | FR: 1 LR: 3 LOSS: 16 | | | | | |
| SAND CONTENT (%) ☐ (Ø) ☑ | .007 | | .0015 | FOR: 25 FOR: 27 FOR: 49 | | | | | |
| SOLIDS CONTENT (%) ☐ (Ø) ☑ | .075 | TRACE | .075 | | | | | | |
| OIL/WATER CONT. (%) ☐ (Ø) ☐ | .925 | (OIL) | .925 | PREVIOUS COST | 80,854.46 | STARTING VOLUME | | | |
| MBT (Kg/m³) ☐ /% ☐ OIL RET ☐ | 10 | | 10 | DAILY COST | 189.70 | VOL. BUILT | THANKS | | |
| ELECTRICAL STABILITY (V) H2S | 0 | | 0 | CUM. COST | 81,045.16 | VOL. LOST on SURFACE | | | |
| OIL/WATER RATIO A.F. 731 | .6 | | .6 | CUM. ENG. COST | 15,750 | VOL. LOST SUB SURFACE | | | |
| $CaCl_2$ w/w% SULPHITE | 120 | | 120 | | | END VOLUME | | | |
| "n"/"K" KELZAN POLYMER | 4.0 | KG/M³ | 4.0 | | | CUM. VOL. BUILT | | | |

COMMENTS: 1 MUD DENSITY = 1190-1195 KG/M³ IF DENSITY GOES BELOW 1155 KG/M³ MIX 50 SXS BARITE = 4 MIN. 1 BAG.
2 VISCOSITY = 42-45 SEC/L RUN WATER = 5 LITRES/MIN.
3 PH = 10.5 : DO NOT ADD CAUSTIC FOR NOW!
4 STOP ADDITIONS OF A.F. 731
5 MIX 1 JUG OF X-CIDE ONCE A DAY!
6 CONTROL FLUID LOSS - 15-17 C.C. 7 = DISPAC-LO OUT 1 CIRC.
8 BACK TO MIXING PILL IN PILL TANKS MIX 1/2 PAIL DEFOAMER.
9 BACK TO TRIP: IF YOU ARE GOING TO PRESSURE TEST.
MIX 4 PAILS OF PTS-200 + 1 JUG X-CIDE: ISOLATE LAST TWO TANKS. MIX 2 PAILS PTS-200 IN EACH TANK. MIX 1/2 JUG X-CIDE IN EACH TANK. PUMP FOR 40 MIN. THEN PUMP PILL!

| STOCK POINT | FT. ST. JOHN | I.D.F. ENGINEER | RICK REINHART |
|---|---|---|---|
| PHONE | 785-4777 | PHONE | FAR ROCK MOBILE SIDE #1 |

**IDF**
**INTERNATIONAL DRILLING FLUIDS**

# DRILLING FLUID REPORT

DATE JUNE-17-1991
REPORT No. #41
SPUD DATE APR-29.91

WELL NAME COLUMBIA ET AL KOTANEELEE LOCATION YT-I-48

| | | | |
|---|---|---|---|
| OPERATOR COLUMBIA GAS DEVELOPMENT | | CONTRACTOR KENTING H.T. #7 | |
| REPORT FOR Mr. BOB TOOLE - NEIL BLISS | | REPORT FOR Mr. PHIL BOSOMWORTH | |

| ASSEMBLY | CASING | MUD Vol. (m³) | PUMP OUTPUT | ANNULAR VEL. m/min. |
|---|---|---|---|---|
| BIT SIZE / # 9.152 MM | COND. | TANKS 84 M3 | PUMP SIZE 114 x 406 | OPPOSITE D.P. 50 |
| DRILL PIPE 89 mm | SURFACE | HOLE 56 M3 | m³/STK. .0118 | OPPOSITE D.C. 86 |
| DRILL COLLARS 120 mm | INTER 178 - 2773 | TOTAL 140 M3 | S.P.M. 50 | PUMP PRESS. 9,000 |
| OTHER BHA - 196 M. | OTHER | STANDBY | m³/min. .59 | CIRC. TIME 230 |

| HOLE DATA | DESANDER/DESTILTER | DRILLING FLUID SPECIFICATIONS |
|---|---|---|
| MUD TYPE WT. POLYMER | FLOWLINE WT [illegible] ~ 4 HRS kg/m³ | MUD WT. 1190-1195 kg/m³ |
| HOLE COND. GOOD. | UNDERFLOW WT BIT I. W/P ~ 80 MIN kg/m³ | VISCOSITY 45 SEC/L. s/L |
| DEVIATION 8° @ 3610 M. | OVERFLOW WT EST. B.H. TEMP ~ kg/m³ | FILTRATE 15-17 cm³/30 min. |
| CURRENT OP. DRILLING | UNDERFLOW RATE 225°F m³/min. | pH 10.5 |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

| SAMPLE FROM FL. ☑ PIT ☐ | MUD PROPERTIES | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | 14:00 | | 08:00 |
| PRESENT DEPTH (m) | 3620 | | 3623 |
| FLOWLINE TEMPERATURE (°C) | 42°C | | 41°C |
| DENSITY (kg/m³) | 1195 | | 1185 |
| FUNNEL VISCOSITY (s/L) | 44 | | 43 |
| APPARENT VISCOSITY (mPa.s) | 27.5 | | 26 |
| PLASTIC VISCOSITY (mPa.s) | 19 | | 18 |
| YIELD POINT (Pa) | 8.5 | | 8 |
| GELS 0/10 min. (Pa) | 1.5/2 | | 1.5/2 |
| pH STRIP ☑ METER ☐ | 10. | | 10.3 |
| FILTRATE ☑ API ☐ HT HP (cm³) | 15.8 | | 16.0 |
| FILTER CAKE (mm) | .5 | | .8 |
| ALK ☑ (PF/MF) ☐ (PM/LIME) | .85/1.2 | | .8/1.3 |
| TOTAL HARDNESS ☐ Ca. ☑ (mg/L) | 80 | | 80 |
| SAL. ☐ NACI ☐ CL ☑ (mg/L) | 300 | | 300 |
| SAND CONTENT (%) ☐ (Ø) ☑ | .003 | | .002 |
| SOLIDS CONTENT (%) ☐ (Ø) ☑ | .08 | | .072 |
| OIL/WATER CONT. (%) ☐ (Ø) ☐ | .92 | | .922 |
| MBT (Kg/m³) ☑ % ☐ OIL RET ☐ | 10 | | 10 |
| ELECTRICAL STABILITY (V) H2S | 0 | | 0 |
| OIL/WATER RATIO ASP. 721 | .6 | | .6 |
| CaCl₂ w/w% SULPHITES | 100 | | 100 |
| "n"/"k" TOTAL POLYMER | 4.3 | | 4.3 |

MATERIALS INVENTORY & COST

| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
|---|---|---|---|---|---|
| BARITE | 2241 | | 90 | 351 | 1125.00 |
| DRISPAC | 57 | | 8 | 49 | 1799.20 |
| PTS-200 | 35 | | 4 | 31 | 1040.00 |
| X-CIDE | 26 | | 2 | 24 | 780.00 |

3R=1 6R=2 100R=12
300R=37 200R=26 600R=55

| | | | |
|---|---|---|---|
| PREVIOUS COST | 81,045.88 | STARTING VOLUME | |
| DAILY COST | 3744.50 | VOL. BUILT | THANKS |
| CUM. COST | 84,790.38 | VOL. LOST on SURFACE | |
| CUM. ENG. COST | 16,125.00 | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS:

AS SOON AS YOU GET BACK ON BOTTOM W/ BIT #10

1) RUN WATER @ 10 LITRES/MINUTE FOR 1 CIRCULATION!

2) RUN IN 1 BAG OF SODIUM SULPHITE OVER 1 CIRCULATION!

STOCK POINT FT. ST. JOHN I.D.F. ENGINEER RICK REINHART
PHONE 785-4322 PHONE BAR ROOM OUTSIDE #1 MOBILE

IDF

INTERNATIONAL DRILLING FLUIDS

# DRILLING FLUID REPORT

DATE JUNE 12-1991
REPORT No. # 43
SPUD DATE APR. 29.91

WELL NAME COLGAS ET AL WESTINGHOUSE LOCATION WT-I-48
OPERATOR COLGAS DEVELOPMENT CONTRACTOR KENTING H.T. #7
REPORT FOR Mr. BOB TOOLE - NEIL RUSS REPORT FOR Mr. PHIL [illegible]

| ASSEMBLY | CASING | MUD Vol. (m³) | PUMP OUTPUT | ANNULAR VEL. m./min. |
|---|---|---|---|---|
| BIT SIZE / # 16.15/16 | COND. | TANKS 70 M³ | PUMP SIZE 14 X 406 | OPPOSITE D.P. 53.5 |
| DRILL PIPE 89 mm | SURFACE | HOLE 56 M³ | m³/STK. .0115 | OPPOSITE D.C. 93 |
| DRILL COLLARS 170 mm | INTER 13 3/8 @ 2773 | TOTAL 126 M³ | S.P.M. 54 | PUMP PRESS. 11,000 |
| OTHER CHA = 200 M. | OTHER | STANDBY | m³/min. .6228 | CIRC. TIME 200 |

| HOLE DATA | DESANDER/DESTILTER | | DRILLING FLUID SPECIFICATIONS |
|---|---|---|---|
| MUD TYPE L.T. POLYMER | FLOWLINE WT. DES. 46 M³ | kg/m³ | MUD WT. 1195-1200 kg/m³ |
| HOLE COND. GOOD | UNDERFLOW WT. CT. 70 M³ | kg/m³ | VISCOSITY 45 SEC/L s/L |
| DEVIATION | OVERFLOW WT. | kg/m³ | FILTRATE 15.17 cm³/30 min. |
| CURRENT OP. DRILLING | UNDERFLOW RATE | m³/min. | pH 10.5 |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

SAMPLE FROM FL. ☑ PIT ☐

| MUD PROPERTIES | | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | JUNE 14 05:00 | | 19:30 |
| PRESENT DEPTH (m) | 2654 | | 2636 |
| FLOWLINE TEMPERATURE (°C) | 41°C | | 38°C |
| DENSITY (kg/m³) | 1205 | | 1200 |
| FUNNEL VISCOSITY (s/L) | 47 | | 45 |
| APPARENT VISCOSITY (mPa.s) | 27.5 | | 30 |
| PLASTIC VISCOSITY (mPa.s) | 20 | | 21 |
| YIELD POINT (Pa) | 7.5 | | 9 |
| GELS 0/10 min. (Pa) | 1.5/7 | | 1.5/7 |
| pH STRIP ☑ METER ☐ | 10.5 | | 10.5 |
| FILTRATE ☑ API ☐ HT HP (cm³) | 17 | | 20 |
| FILTER CAKE (mm) | 1.7 | | 1.0 |
| ALK ☑ (PF/MF) ☐ (PM/LIME) | 1.2/1.7 | | 1.0/1.2 |
| TOTAL HARDNESS ☐ Ca. ☑ (mg/L) | 80 | | 100 |
| SAL. ☐ NACI ☐ CL ☑ (mg/L) | 200 | | 200 |
| SAND CONTENT (%) ☐ (Ø) ☑ | .007 | | .007 |
| SOLIDS CONTENT (%) ☐ (Ø) ☑ | .085 | (OIL TRACE) | .083 |
| OIL/WATER CONT. (%) ☐ (Ø) ☑ | .915 | | .917 |
| MBT (Kg/m³) ☑ /% ☐ OIL RET ☐ . | 10 | | 10 |
| ELECTRICAL STABILITY (V) HIGH | (SHOW ON CTG OF) | | |
| OIL/WATER RATIO SUDAN IV | 1.4 KG/M³. | | |
| $CaCl_2$ w/w% SULPHITE | 1.25 | | 1.25 |
| "n"/"k" TOTAL POLYMER | 4.8 | | 4.5 |

| MATERIALS INVENTORY & COST | | | | | |
|---|---|---|---|---|---|
| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
| F.L.R. | 79 | | 4 | 75 | 640.00 |
| L.L. VIS | 50 | | 3 | 47 | 1760.00 |
| SULPHITE | 17 | | 1 | 16 | 49.70 |
| SODA ASH | 75 | | 1 | 74 | 20.00 |

| | | | |
|---|---|---|---|
| PREVIOUS COST | 84,790. | STARTING VOLUME | |
| DAILY COST | 1969.70 | VOL. BUILT | THANKS |
| CUM. COST | 86,759.70 | VOL. LOST on SURFACE | |
| CUM. ENG. COST | 16,500. | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS: 1 MIX DENSITY = 1190-1195 KG/M³ KEEP MIXING MUD GUNS!
IF DENSITY GOES BELOW 1190 KG/M³ MIX 50 BARITE = 4 MIN/BAG!
2 VISCOSITY = 45 SEC/L ADD WATER = 5 LITRES/MIN. WHEN CIRC.
3 MIX 1 JUG OF X-CIDE ONCE A DAY MIX 1 SULPHITE A DAY!
4 HAVE PRE-MIX TANK 3/4 FULL, RAISE DENSITY TO 1270 KG/M³
MIX 200 TO 250 SX BARITE = ½ HOUR TO A DAY!

SLUG MAIN SYSTEM MIX TONIGHT 10 PAILS OF SUDAN = 20 MIN/PAIL 2 BAGS SODA ASH + 2 BAGS OF DISPAC-LO.

6 KEEP VISCOSITY LOW PRE-MIX = 55 SEC/L = 1 BAG F.L.R. ONLY IF REQ'D. DO NOT ADD ANY WATER TO PRE-MIX.

STOCK POINT FT. ST. JOHN I.D.F. ENGINEER KICK REINHART
PHONE 785-4722 PHONE FAR RADIO OR MOBILE # 01

INTERNATIONAL DRILLING FLUIDS

# DRILLING FLUID REPORT

DATE JUNE · 14 · 1991
REPORT No. # 42
SPUD DATE APR · 29 · 91

WELL NAME COLGAS ETAL KOTANEE LEE | LOCATION 4T · I · 48
OPERATOR COLUMBIA GAS DEVELOPMENT | CONTRACTOR KENTING HT. 7
REPORT FOR Mr. BOB TOOLE · NEIL PLISS | REPORT FOR Mr PHIL COSCILWORTH

| ASSEMBLY | CASING | MUD Vol: (m³) | PUMP OUTPUT | ANNULAR VEL. m./min. |
|---|---|---|---|---|
| BIT SIZE / # 10 · 15 TRI | COND. | TANKS 70, 1> | PUMP SIZE 14 x 406 | OPPOSITE D.P. 50 |
| DRILL PIPE 89 mm | SURFACE | HOLE 57M³ | m³/STK. .0118 | OPPOSITE D.C. 86 |
| DRILL COLLARS 120 mm | INTER 178 · 2373 | TOTAL 177M³ | S.P.M. 50 | PUMP PRESS. 10.000 |
| OTHER PHA · 20C. | OTHER | STANDBY | m³/min. .59 | CIRC. TIME 715 |

| HOLE DATA | DESANDER/DESTILTER | | DRILLING FLUID SPECIFICATIONS |
|---|---|---|---|
| MUD TYPE LT. POLYMER | FLOWLINE WT. [illegible] .46 M³ kg/m³ | | MUD WT. 1705 · 1710 kg/m³ |
| HOLE COND. GOOD | UNDERFLOW WT. DTA UP · 78 MIN. kg/m³ | | VISCOSITY 45 s/L |
| DEVIATION | OVERFLOW WT. HOLE DIAG. kg/m³ | | FILTRATE 15 · 18 cm³/30 min. |
| CURRENT OP. HOIST BIT #10 | UNDERFLOW RATE 11.000 m³/min. | | pH 10.5 |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

| SAMPLE FROM FL. ☑ PIT ☐ SHALER | MUD PROPERTIES | | PRE-MIX |
|---|---|---|---|
| TIME SAMPLE TAKEN | 13:30 | | 13:30 |
| PRESENT DEPTH (m) | 2664 | | |
| FLOWLINE TEMPERATURE (°C) | 28°C | | |
| DENSITY (kg/m³) | 1710 | | 1710 |
| FUNNEL VISCOSITY (s/L) | 44 | | 51 |
| APPARENT VISCOSITY (mPa.s) | 28 | 24 | 28 |
| PLASTIC VISCOSITY (mPa.s) | 20 | 20 | 13.5 |
| YIELD POINT (Pa) | 8 | | 14.5 |
| GELS 0/10 min. (Pa) | 1.5/2 | | 3/4 |
| pH STRIP ☑ METER ☐ | 10.5 | | 10 |
| FILTRATE ☑ API ☐ HT HP (cm³) | 18 | | 8.5 |
| FILTER CAKE (mm) | 1.0 TIGHT | | 1.0 |
| ALK ☑ (PF/MF) ☐ (PM/LIME) | 1.8/2.3 | | |
| TOTAL HARDNESS ☐ Ca. ☑ (mg/L) | 40 | | |
| SAL. ☐ NACI ☐ CL ☑ (mg/L) | 300 | | |
| SAND CONTENT (%) ☐ (Ø) ☑ | .007 | | |
| SOLIDS CONTENT (%) ☐ (Ø) ☑ | .09 | | |
| OIL/WATER CONT. (%) ☐ (Ø) ☑ | .91 | | |
| MBT (Kg/m³) ☑ /% ☐ OIL RET ☐ | 10 | | |
| ELECTRICAL STABILITY (V) HI'S | 0 | | |
| OIL/WATER RATIO SULPHITE | 1.4 KG/M³ | | |
| $CaCl_2$ w/w% SULPHITE | 100 KG/L. | | |
| "n"/"k" TOTAL POLYMER | 5 KG/M³ | | |

MATERIALS INVENTORY & COST

| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
|---|---|---|---|---|---|
| BARITE | 3151 | | 435 | 2716 | 5437.50 |
| F.L.R. | 65 | | 3 | 62 | 480.00 |
| DRISPAC | 49 | | 7 | 42 | 1176.80 |
| TORQ-TRIM | 24 | | 6 | 18 | 120.00 |
| SULFAN | 96 | | 10 | 86 | 2100.00 |
| PR: 1 LT: 3 ICC: 17 | | | | | |
| 2000: 27 3000: 24 4000: 56 | | | | | |

| | | | |
|---|---|---|---|
| PREVIOUS COST | 86,759 | STARTING VOLUME | 1,100 M³ |
| DAILY COST | 9774.00 | VOL. BUILT | |
| CUM. COST | 96,074.00 | VOL. LOST on SURFACE | 12 |
| CUM. ENG. COST | 16,875 | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS: 1 MUD DENSITY @ 1705 KG/M³. KEEP MUD GUNS MOVING!
IF DENSITY GOES BELOW 1700 KG/M³: MIX 50 BARITE + 4 DRISPAC / BAG.

AS SOON AS YOU GET BACK ON BOTTOM W/ BIT #11!
1 RUN WATER + 10 LITRE F.L.R. F.J. 1 CIRCULATION.
2 RUN 1X. CIDE OVER 1 FULL CIRC. THEN RUN 1 SULPHITE.
3 AFTER BOTTOMS UP: MIX 4 BAGS DRISPAC-LC + 55 MIN. / BAG.

4 KEEP VISCOSITY IN PRE-MIX @ 55 SEC/L. MIX 1/2 BAG OF F.L.R. EVERY REG'D.

STOCK POINT FT. ST. JOHN | I.D.F. ENGINEER RICK REINHART
PHONE 785-4222 | PHONE FAR BACK OUT MOBILE # 1

**IDF**

**INTERNATIONAL DRILLING FLUIDS**

# DRILLING FLUID REPORT

DATE JUNE-15-1991
REPORT No. # 44
SPUD DATE APR-29-91

WELL NAME COLGAS ETAL KOTANEELEE    LOCATION YT-I-48

| | |
|---|---|
| OPERATOR COLUMBIA GAS DEVELOPMENT | CONTRACTOR KENTING HI-TOWER |
| REPORT FOR Mr. BOB TOOLE-NEIL BLISS | REPORT FOR Mr. PHIL BOSOMWORTH |

| ASSEMBLY | | CASING | | MUD Vol. (m³) | | PUMP OUTPUT | | ANNULAR VEL. m./min. | |
|---|---|---|---|---|---|---|---|---|---|
| BIT SIZE / # | 11-MILL | COND. | | TANKS | 73 | PUMP SIZE | 114 x 406 | OPPOSITE D.P. | 50 |
| DRILL PIPE | 89 mm | SURFACE | | HOLE | 57 | m³/STK. | .0118 | OPPOSITE D.C. | 86 |
| DRILL COLLARS | 120 mm | INTER | 178-2272 | TOTAL | 130m³ | S.P.M. | 50 | PUMP PRESS. | 10.000 |
| OTHER | BHA - 200 | OTHER | | STANDBY | | m³/min. | .59 | CIRC. TIME | 215 |

| HOLE DATA | | DESANDER/DESTILTER | | DRILLING FLUID SPECIFICATIONS | |
|---|---|---|---|---|---|
| MUD TYPE | LOT. POLYMER | FLOWLINE WT | ANN. VOL ~ 46m³ kg/m³ | MUD WT. | 1205-1210 kg/m³ |
| HOLE COND. | GOOD | UNDERFLOW WT | CTRL. VOL ~ 28 m³ kg/m³ | VISCOSITY | 45 s/L |
| DEVIATION | | OVERFLOW WT. | PRE-MIX ~ 5.5 m³ kg/m³ | FILTRATE | 15-17 cm³/30 min. |
| CURRENT OP | MILL ON CONES | UNDERFLOW RATE | m³/min. | pH | 10.5 |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

| SAMPLE FROM FL. ☑ PIT ☐ | MUD PROPERTIES | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | 01:30 | | |
| PRESENT DEPTH (m) | 3664 | | |
| FLOWLINE TEMPERATURE (°C) | 27°C | | |
| DENSITY (kg/m³) | 1215 | | |
| FUNNEL VISCOSITY (s/L) | 44 | | |
| APPARENT VISCOSITY (mPa.s) | 29 | | |
| PLASTIC VISCOSITY (mPa.s) | 21 | | |
| YIELD POINT (Pa) | 8 | | |
| GELS 0/10 min. (Pa) | 1.5/7 | | |
| pH STRIP ☑ METER ☐ | 10.5 | | |
| FILTRATE ☑ API ☐ HT HP (cm³) | 18.5 | | |
| FILTER CAKE (mm) | 1.3 FIRM. | | |
| ALK ☑ (PF/MF) ☐ (PM/LIME) | 1.6/2.0 | | |
| TOTAL HARDNESS ☐ Ca. ☑ (mg/L) | 50 | | |
| SAL. ☐ NACl ☐ CL ☑ (mg/L) | 300 | | |
| SAND CONTENT (%) ☐ (∅) ☑ | .002 | | |
| SOLIDS CONTENT (%) ☐ (∅) ☑ | .093 | | |
| OIL/WATER CONT. (%) ☐ (∅) ☐ | .907 | | |
| MBT (Kg/m³) ☑ /% ☐ OIL RET ☐ | 10 | | |
| ELECTRICAL STABILITY (V) H₂S | 0 | | |
| OIL/WATER RATIO SULFAN | 1.4 KG/m³ | | |
| CaCl₂ w/w% SULFITES | 120 | | |
| "n"/"k" TOTAL POLYMER | 5 KG/m³. | | |

MATERIALS INVENTORY & COST

| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
|---|---|---|---|---|---|
| | | | | | |

3R=1 6R=3 100R=18
200R=28 300R=37 600R=58

| | | | |
|---|---|---|---|
| PREVIOUS COST | 96,034.80 | STARTING VOLUME | |
| DAILY COST | | VOL. BUILT | THANKS |
| CUM. COST | | VOL. LOST on SURFACE | |
| CUM. ENG. COST | 17,250.00 | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS:

AS SOON AS YOU GET BACK ON BOTTOM W/ BIT #11

1 RUN WATER @ 10 LITRES/MIN. FOR 1 CIRCULATION."

2 RUN IN 1 BAG OF SODIUM SULFITE OVER 1 FULL CIRCULATION

3 AFTER BOTTOMS UP? MIX 4 BAGS OF DRISPAC-LOW
@ 55 MINUTES/BAG.

4 KEEP VISCOSITY IN PRE-MIX ~ 55 SEC/L. MIX ½ BAG
OF F.L.R. REGULAR IF REQ'D.

STOCK POINT FT. ST. JOHN    I.D.F. ENGINEER KIRK REINHART
PHONE 785-4222    PHONE FAX ROOM @ MOBILE LIE #1

# IDF

INTERNATIONAL DRILLING FLUIDS

## DRILLING FLUID REPORT

DATE JUNE-15-1991
REPORT No. #44A
SPUD DATE APR-29-91

WELL NAME COLGAS ETAL KOTANEELEE LOCATION YT-I-48
OPERATOR COLUMBIA GAS DEVELOPMENT CONTRACTOR KENTING HI TOWER 7
REPORT FOR Mr. TOP TOOLE-NEIL PLISS REPORT FOR Mr. PHIL RASMUSSEN

| ASSEMBLY | | CASING | MUD Vol. (m³) | | PUMP OUTPUT | ANNULAR VEL. m./min. |
|---|---|---|---|---|---|---|
| BIT SIZE / # | 11-15.3mm | COND. | TANKS | 72 m³ | PUMP SIZE | 14x406 | OPPOSITE D.P. | 50 |
| DRILL PIPE | 89 mm | SURFACE | HOLE | 57 m³ | m³/STK. | .0018 | OPPOSITE D.C. | 86 |
| DRILL COLLARS | 120 mm | INTER 178-2777 | TOTAL | 129 m³ | S.P.M. | 50 | PUMP PRESS. | 9700 |
| OTHER | TWP-- | OTHER | STANDBY | | m³/min. | .59 | CIRC. TIME | 215 |

| HOLE DATA | DESANDER/DESTILTER | DRILLING FLUID SPECIFICATIONS |
|---|---|---|
| MUD TYPE LT. POLYMER | FLOWLINE WT. AMN. VOL. 46 m³ kg/m³ | MUD WT. 1205-1210 KG. kg/m³ |
| HOLE COND. GOOL | UNDERFLOW WT. TM. VOL. 78 m³ kg/m³ | VISCOSITY 45 s/L |
| DEVIATION | OVERFLOW WT. kg/m³ | FILTRATE 15-17 cm³/30 min. |
| CURRENT OP. DRILLING. | UNDERFLOW RATE m³/min. | pH 10.5 |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

| SAMPLE FROM FL. ☑PIT ☐ | MUD PROPERTIES |
|---|---|
| TIME SAMPLE TAKEN | 19:00 |
| PRESENT DEPTH (m) | 2667 |
| FLOWLINE TEMPERATURE (°C) | 36°C |
| DENSITY (kg/m³) | 1215 |
| FUNNEL VISCOSITY (s/L) | 43 |
| APPARENT VISCOSITY (mPa.s) | 39.5 |
| PLASTIC VISCOSITY (mPa.s) | 32 |
| YIELD POINT (Pa) | 7.5 |
| GELS 0/10 min. (Pa) | 1.5/2 |
| pH STRIP ☑ METER ☐ | 10.5 |
| FILTRATE ☑API ☐ HT HP (cm³) | 22 |
| FILTER CAKE (mm) | 1.0 THICK! |
| ALK ☑(PF/MF) ☐ (PM/LIME) | 1.5/1.9 |
| TOTAL HARDNESS ☐ Ca. ☑(mg/L) | 60 |
| SAL. ☐ NACI ☐ CL ☑(mg/L) | 200 |
| SAND CONTENT (%) ☐ (Ø) ☑ | .002 |
| SOLIDS CONTENT (%) ☐ (Ø) ☑ | .097 |
| OIL/WATER CONT. (%) ☐ (Ø) ☑ | .907 |
| MBT (Kg/m³) ☑/% ☐ OIL RET ☐ | 10 |
| ELECTRICAL STABILITY (V) | 0 |
| OIL/WATER RATIO | 1.4 KG/m³ |
| $CaCl_2$ w/w% SULPHITE | 120 |
| "n"/"k" TOTAL POLYMER | 5 KG/m³ |

| MATERIALS INVENTORY & COST | | | | | |
|---|---|---|---|---|---|
| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
| BARITE | 2716 | | 70 | 2646 | 875.00 |
| X-CIDE | 24 | | 2 | 22 | 280.00 |
| SULPHITE | 16 | | 2 | 14 | 99.40 |
| DUSPAC | 42 | | 3 | 39 | 487.20 |
| FLR-REG | 42 | | 1 | 41 | 160.00 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| 2R=1 | 6D=2 | 100L=17 | | | |
| 200L=78 | 200L=37 | 600L=59 | | | |

| | | | |
|---|---|---|---|
| PREVIOUS COST | 96,034. | STARTING VOLUME | |
| DAILY COST | 1901.60 | VOL. BUILT | THANKS |
| CUM. COST | 97,935.60 | VOL. LOST on SURFACE | " |
| CUM. ENG. COST | 17,750. | VOL. LOST SUB SURFACE | " |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS:

AS SOON AS YOU GET CIRCULATION W/ BIT #1 !

1 RUN THE CENTRIFUGE FOR 1 FULL CIRCULATION!

2 MIX 5 BAGS DUSPAC-LO AT 45 MINUTES A BAG!

3 MIX 1 JUG OF X-CIDE EVERY 1 FULL CIRCULATION!

STOCK POINT FT. ST. JOHN I.D.F. ENGINEER NICK REINHART
PHONE 785-4222 PHONE FOR ROOM OR MOBILE # F #1

IDF

INTERNATIONAL DRILLING FLUIDS

# DRILLING FLUID REPORT

DATE JUNE-16-1991
REPORT No. # 45
SPUD DATE APR-29-91

WELL NAME COLGAS ET AL KOTANEELEE LOCATION 7-I-48
OPERATOR COLUMBIA GAS DEVELOPMENT CONTRACTOR KENTING HI TOWER 7
REPORT FOR Mr. BOB TOOLE-NEIL PLISS REPORT FOR Mr. PHIL LOSCHNOTH

| ASSEMBLY | | CASING | MUD Vol. (m³) | | PUMP OUTPUT | ANNULAR VEL. m./min. |
|---|---|---|---|---|---|---|
| BIT SIZE / # | 7.15 mm | COND. | TANKS | 72 m³ | PUMP SIZE | 114 x 406 | OPPOSITE D.P. | 51.5 |
| DRILL PIPE | 89 mm | SURFACE | HOLE | 57 m³ | m³/STK. | .018 | OPPOSITE D.C. | 90 |
| DRILL COLLARS | 120 mm | INTER/PROD. 3777 | TOTAL | 130 m³ | S.P.M. | 52 | PUMP PRESS. | 9200 |
| OTHER | THA-200 M. | OTHER | STANDBY | | m³/min. | .6136 | CIRC. TIME | 210 |

| HOLE DATA | CENTRIFUGE/DESANDER/DESILTER | | DRILLING FLUID SPECIFICATIONS |
|---|---|---|---|
| MUD TYPE GEL. POLYMER | FLOWLINE WT. 1215 TO 1200 kg/m³ | | MUD WT. 1700 kg/m³ |
| HOLE COND. GOOD | UNDERFLOW WT. 2730 | 20 L/M. kg/m³ | VISCOSITY 45 s/L |
| DEVIATION | OVERFLOW WT. | kg/m³ | FILTRATE 6.2C cm³/30 min. |
| CURRENT OP. DRILLING | UNDERFLOW RATE | m³/min. | pH 10.5 |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

| SAMPLE FROM FL. ☒PIT ☐ SHAKER | MUD PROPERTIES | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | 10:00 | | |
| PRESENT DEPTH (m) | ~~3777~~ | 3672 | |
| FLOWLINE TEMPERATURE (°C) | 27.0C | | |
| DENSITY (kg/m³) | 1700 | | |
| FUNNEL VISCOSITY (s/L) | 43 | | |
| APPARENT VISCOSITY (mPa.s) | ~~ ~~ | 27.5 | |
| PLASTIC VISCOSITY (mPa.s) | ~~ ~~ | 20 | |
| YIELD POINT (Pa) | ~~ ~~ | 7.5 | |
| GELS 0/10 min. (Pa) | 1.5/2 | | |
| pH STRIP ☑ METER ☐ | 10.5 | | |
| FILTRATE ☒API ☐ HT HP (cm³) | 26 | | |
| FILTER CAKE (mm) | 1.C FIR.M. | | |
| ALK ☒(PF/MF) ☐ (PM/LIME) | 1.5/1.9 | | |
| TOTAL HARDNESS ☐ Ca. ☒(mg/L) | 40 | | |
| SAL. ☐ NACl ☐ CL ☒(mg/L) | 250. | | |
| SAND CONTENT (%) ☐ (Ø) ☒ | .002 | | |
| SOLIDS CONTENT (%) ☐ (Ø) ☑ | .085 | | |
| OIL/WATER CONT. (%) ☐ (Ø) ☑ | .915 | | |
| MBT (Kg/m³) ☒ /% ☐ OIL RET ☐ | 17 | | |
| ELECTRICAL STABILITY (V) | 0 | | |
| OIL/WATER RATIO | 1.7 KCL | | |
| $CaCl_2$ w/w% | 1.20 | | |
| "n"/"k" | 4.5 | | |

| MATERIALS INVENTORY & COST | | | | | |
|---|---|---|---|---|---|
| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
| BARITE | 2646 | | 35 | 2611 | 437.50 |
| DISPAC | 29 | | 5 | 24 | 817.00 |
| X-CIDE | 22 | | 1 | 21 | 140.00 |
| PTS-200 | 21 | | 4 | | 1040.00 |
| | | | | | |
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| | | | | | |
| 20=1 40=2 100=15 | | | | | |
| 200=25 300=25 400=55 | | | | | |
| | | | | | |

| | | | |
|---|---|---|---|
| PREVIOUS COST | 97,925. | STARTING VOLUME | |
| DAILY COST | 2429.50 | VOL. BUILT | THA-115 |
| CUM. COST | 100,245 | VOL. LOST on SURFACE | 10 |
| CUM. ENG. COST | 17,625 | VOL. LOST SUB SURFACE | 0 |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS:

AT SOON AS YOU GET ON BOTTOM W/ BIT # 12!

1. RUN WATER @ 5 LITRES/MIN. FOR 1 CIRCULATION!

2 MIX 5 BAGS DISPAC-10 AT 45 MINUTES A BAG!

3 MIX 1 PAIL OF ASP. 721 OVER 1 FULL CIRCULATION!

STOCK POINT FT. ST. JOHN I.D.F. ENGINEER RICK REINHART
PHONE 785-4222 PHONE FAR Local Call MOBILE # #1

# IDF

INTERNATIONAL DRILLING FLUIDS

## DRILLING FLUID REPORT

DATE JUNE-17-91
REPORT No. # 46
SPUD DATE APR-29-91

WELL NAME COLGAS ET AL KOTANEELEE LOCATION YT-I-15
OPERATOR COLUMBIA GAS DEVELOPMENT CONTRACTOR KENTING HI-TOWER #7
REPORT FOR Mr. BOB TICKLE-NEIL PLICE REPORT FOR Mr PHIL DESCHENOTH

| ASSEMBLY | CASING | MUD Vol. (m³) | PUMP OUTPUT | ANNULAR VEL. m./min. |
|---|---|---|---|---|
| BIT SIZE / # 12.25 mm | COND. | TANKS 220 | PUMP SIZE 14 X 406 | OPPOSITE D.P. 50 |
| DRILL PIPE 89 mm | SURFACE | HOLE 57 | m³/STK. .0118 | OPPOSITE D.C. 86 |
| DRILL COLLARS 120 mm | INTER 155-2373 | TOTAL 120 | S.P.M. 50 | PUMP PRESS. 9500 |
| OTHER SHAC 200 | OTHER | STANDBY | m³/min. .59 | CIRC. TIME 215 |

| HOLE DATA | DESANDER/DESILTER | | DRILLING FLUID SPECIFICATIONS | |
|---|---|---|---|---|
| MUD TYPE L.T. POLYMER | FLOWLINE WT. | kg/m³ | MUD WT. 1200 | kg/m³ |
| HOLE COND. GOOD | UNDERFLOW WT. | kg/m³ | VISCOSITY 45 | s/L |
| DEVIATION | OVERFLOW WT. | kg/m³ | FILTRATE 4.2 | cm³/30 min. |
| CURRENT OP HOLE DITCH 12 | UNDERFLOW RATE | m³/min. | pH 10.5 | |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

SAMPLE FROM FL. ☑ PIT ☐ SHAKER

| MUD PROPERTIES | | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | 04:00 | | |
| PRESENT DEPTH (m) | 2681 | | |
| FLOWLINE TEMPERATURE (°C) | 25oC | | |
| DENSITY (kg/m³) | 1190 | | |
| FUNNEL VISCOSITY (s/L) | 45 | | |
| APPARENT VISCOSITY (mPa.s) | 29 | | |
| PLASTIC VISCOSITY (mPa.s) | 22 | | |
| YIELD POINT (Pa) | 7 | | |
| GELS 0/10 min. (Pa) | 1.5/7 | | |
| pH STRIP ☑ METER ☐ | 10.5 | | |
| FILTRATE ☑ API ☐ HT HP (cm³) | 28 | | |
| FILTER CAKE (mm) | 1.2 FIRM. | | |
| ALK ☑ (PF/MF) ☐ (PM/LIME) | 1.5/1.9 | | |
| TOTAL HARDNESS ☐ Ca. ☑ (mg/L) | 40 | | |
| SAL. ☐ NACI ☐ CL ☑ (mg/L) | 250 | | |
| SAND CONTENT (%) ☐ (Ø) ☑ | .007 | | |
| SOLIDS CONTENT (%) ☐ (Ø) ☑ | 6.75 | | |
| OIL/WATER CONT. (%) ☐ (Ø) ☐ | 9/75 | | |
| MBT (Kg/m³) ☑ /% ☐ OIL RET ☐ | 17 | | |
| ELECTRICAL STABILITY (V) H:S | 0 | | |
| OIL/WATER RATIO SUCCAN | 1.2 | | |
| $CaCl_2$ w/w% SULPHITE | 120 | | |
| "n"/"K" TOTAL RHEOLOGY | 5.0 KG/M² | | |

MATERIALS INVENTORY & COST

| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
|---|---|---|---|---|---|
| INVENTORY JUNE-16 | | | | 200 SKS. | |
| SODA ASH | 28 | | 4 | 24 | 80.00 |
| ASP-721 | 55 | | 1 | 54 | 100.00 |
| FTS-200 | 27 | | 2 | 25 | 520.00 |
| X-CIDE | 21 | | 1 | 20 | 140.00 |
| SULPHITE | 14 | | 1 | 13 | 49.70 |
| DEFOAM | 12 | | 3 | 9 | 409.50 |
| DRISPAC | 34 | | 2 | 32 | 374.80 |
| DFIC | 5 | | 2 | 3 | 256.00 |
| SALT MUD | 238 | | 38 | 200 | 186.20 |
| LIME | 20 | | 4 | 16 | 24.40 |
| | | | | | |
| DRISPAC 1 SK = 12 | | | | | |
| ASP 721 1 SK = 27 FTS 1 SK = 24 ECC 1 SK = 55 | | | | | |

| | | | |
|---|---|---|---|
| PREVIOUS COST | 100,365.00 | STARTING VOLUME | |
| DAILY COST | 2490.60 | VOL. BUILT | 114 M³ |
| CUM. COST | 102,855.60 | VOL. LOST on SURFACE | |
| CUM. ENG. COST | 18,000.00 | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS:

AS SOON AS YOU GET ON BOTTOM WITH BIT # 14!

1 KG WATER = 10 LITRES / 1 M³ FOR 1 CIRCULATION!

2 MIX 4 BAGS OF DRISPAC TO 55 M³ MUD EACH!

3 MIX 1 - 1 PAIL OF ASP-721 OVER 1 FULL CIRCULATION!

STOCK POINT FT. ST. JOHN I.D.F. ENGINEER ALEX KELLNER

PHONE 785-4222 PHONE FAX 262-0 MOBILE # 1

# IDF
INTERNATIONAL DRILLING FLUIDS

## DRILLING FLUID REPORT

DATE JUNE-17-1991
REPORT No. # 46A
SPUD DATE APR-29-91

WELL NAME COLCAS ET AL KOTANEELEE LOCATION YT-I-48
OPERATOR COLUMBIA GAS DEVELOPMENT CONTRACTOR KENTING HI TOWER 7
REPORT FOR Mr. DOC TOOLE-NEIL ELLIS REPORT FOR Mr. PHIL ROSMUSSATH

| ASSEMBLY | | CASING | MUD Vol. (m³) | | PUMP OUTPUT | | ANNULAR VEL. m./min. | |
|---|---|---|---|---|---|---|---|---|
| BIT SIZE / # | 14.15 mm | COND. | TANKS | 69.5 | PUMP SIZE | 14X406 | OPPOSITE D.P. | 51.5 |
| DRILL PIPE | 89 mm | SURFACE | HOLE | 57.5 | m³/STK. | .0118 | OPPOSITE D.C. | 90 |
| DRILL COLLARS | 120 mm | INTER 178.2373 | TOTAL | 127.1? | S.P.M. | 57 | PUMP PRESS. | 9500 |
| OTHER | FLIA-200M. | OTHER | STANDBY | | m³/min. | .6736 | CIRC. TIME | 210 |

| HOLE DATA | DESANDER/DESTILTER | DRILLING FLUID SPECIFICATIONS |
|---|---|---|
| MUD TYPE WT POLYMER | FLOWLINE WT. (m. VOL - 46.5 M³ kg/m³ | MUD WT. 1190-1200 kg/m³ |
| HOLE COND. GOOD | UNDERFLOW WT. TOT. VOL - 76 M³ kg/m³ | VISCOSITY 45 s/L |
| DEVIATION | OVERFLOW WT. kg/m³ | FILTRATE cm³/30 min. |
| CURRENT OP. DRILLING. | UNDERFLOW RATE m³/min. | pH 10.5 |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

SAMPLE FROM FL. ☑PIT ☐ MUD PROPERTIES

| TIME SAMPLE TAKEN | 04:00 | 01:00 | 20:00 |
|---|---|---|---|
| PRESENT DEPTH (m) | 2695 | 2693 | 2685 |
| FLOWLINE TEMPERATURE (°C) | 40°C | 40°C | 39°C |
| DENSITY (kg/m³) | 1195 | 1190 | 1195 |
| FUNNEL VISCOSITY (s/L) | 41 | 40 | 43 |
| APPARENT VISCOSITY (mPa.s) | 74 | 73.5 | 76 |
| PLASTIC VISCOSITY (mPa.s) | 19 | 19 | 20 |
| YIELD POINT (Pa) | 5 | 4.5 | 6 |
| GELS 0/10 min. (Pa) | 1/1.5 | 1/1.5 | 1.5/2 |
| pH STRIP ☑ METER ☐ | 10.5 | 10.5 | 10.5 |
| FILTRATE ☑API ☐ HT HP (cm³) | 25 | 27 | 23 |
| FILTER CAKE (mm) | 1.5 SOFT | 1.5 | 1.5 |
| ALK ☑(PF/MF) ☐ (PM/LIME) | 1.5/2.0 | 1.5/2.0 | 1.5/2.1 |
| TOTAL HARDNESS ☐ Ca. ☑(mg/L) | 40 | 40 | 40 |
| SAL. ☐ NACl ☐ CL ☑(mg/L) | 350 | 400 | 400 |
| SAND CONTENT (%) ☐ (Ø) ☑ | .007 | .007 | .007 |
| SOLIDS CONTENT (%) ☐ (Ø) ☑ | .078 | .079 | .08 |
| OIL/WATER CONT. (%) ☐ (Ø) ☑ | .92 | .923 | .92 |
| MBT (Kg/m³) ☑/% ☐ OIL RET ☐ | 15 | 15 | 15 |
| ELECTRICAL STABILITY (V) H.S | 0 | 0 | 0 |
| OIL/WATER RATIO SULFAN | 1.0 | 1.0 | 1.0 |
| $CaCl_2$ w/w% SULPHITE | 130 | 130 | 130 |
| "n"/"K" TOTAL POLYMER | 2 KG/M³ 6.5 | | 2 KG/M³ |

MATERIALS INVENTORY & COST

| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
|---|---|---|---|---|---|
| BARITE | 7611 | | 35 | 7576 | 437.50 |
| X-CIDE | 20 | | 3 | 17 | 420.00 |
| DRISPAC | 32 | | 8 | 24 | 1799.70 |
| ASP-272 | 54 | | 3 | 51 | 300.00 |
| F.L.R | 61 | | 1 | 60 | 160.00 |
| | | | | | |
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| | | | | | |
| | | | | | |
| 3M=1 6M=1 100M=12 | | | | | |
| 200M=31 300M=39 600M=48 | | | | | |
| | | | | | |

| | | | |
|---|---|---|---|
| PREVIOUS COST | 27,855. | STARTING VOLUME | |
| DAILY COST | 2616.70 | VOL. BUILT | THANKS |
| CUM. COST | 105,472. | VOL. LOST on SURFACE | |
| CUM. ENG. COST | 18,000. | VOL. LOST SUB SURFACE. | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS:

AS SOON AS YOU GET BACK ON BOTTOM W/ BIT #5 !

① FINISH RUNNING IN THE ASP-272 IN CHEMICAL CUT. 70 M³.

② RUN IN THE LAST BAG OF F.L.R. REG. CUT. 70 M³.

③ RUN IN WATER AT 5 LITRES/MINUTE.

④ RUN IN 2 PAILS OF ASP-272 @ 70 M³ PAIL.

STOCK POINT FT. ST. JOHN I.D.F. ENGINEER RICK REINHART
PHONE 785-4777 PHONE EA: 0604 MOBILE KIAE #1

**IDF**

**INTERNATIONAL DRILLING FLUIDS**

# DRILLING FLUID REPORT

DATE JUNE-19-1991
REPORT No. # 48
SPUD DATE APR. 29.91

WELL NAME COLGAS ETAL KOTANEELEE
LOCATION YT - I - 48

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| OPERATOR | COLUMBIA GAS DEVELOPMENT | | | | CONTRACTOR | KENTING HI TOWER 7 | | | |
| REPORT FOR Mr. | BOB TOOLE - NEIL PLISS | | | | REPORT FOR Mr. | PHIL BOSWORTH | | | |
| ASSEMBLY | | CASING | | MUD Vol. (m³) | | PUMP OUTPUT | | ANNULAR VEL. m./min. | |
| BIT SIZE / # | #15 - 152 mm | COND. | | TANKS | 72 | PUMP SIZE | 114 x 406 | OPPOSITE D.P. | 51.5 |
| DRILL PIPE | 89 mm | SURFACE | | HOLE | 58 | m³/STK. | .0118 | OPPOSITE D.C. | 90 |
| DRILL COLLARS | 120 mm | INTER | 273-2773 | TOTAL | 130 | S.P.M. | 52 | PUMP PRESS. | |
| OTHER | CHA. 200 | OTHER | | STANDBY | | m³/min. | .6136 | CIRC. TIME | 210 |

| HOLE DATA | | DESANDER/DESTILTER | | DRILLING FLUID SPECIFICATIONS | |
|---|---|---|---|---|---|
| MUD TYPE | WT. POLYMER | FLOWLINE WT | AVAIL. VOL 46.5 kg/m³ | MUD WT. | 1190 - 1200 kg/m³ |
| HOLE COND. | GOOD | UNDERFLOW WT | [illegible] 26 [illegible] kg/m³ | VISCOSITY | 45 s/L |
| DEVIATION | | OVERFLOW WT. | kg/m³ | FILTRATE | <15 cm³/30 min. |
| CURRENT OP. | DRILLING | UNDERFLOW RATE | m³/min. | pH | 10.5 |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

| SAMPLE FROM FL. ☐ PIT ☐ | MUD PROPERTIES | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | 08:00 | | |
| PRESENT DEPTH (m) | 3705 | | |
| FLOWLINE TEMPERATURE (°C) | 36°C | | |
| DENSITY (kg/m³) | 1200 | | |
| FUNNEL VISCOSITY (s/L) | 43 | | |
| APPARENT VISCOSITY (mPa.s) | 24 | | |
| PLASTIC VISCOSITY (mPa.s) | 19 | | |
| YIELD POINT (Pa) | 5 | | |
| GELS 0/10 min. (Pa) | 1/1.5 | | |
| pH STRIP ☑ METER ☐ | 10.2 | | |
| FILTRATE ☑ API ☐ HT HP (cm³) | 25 | | |
| FILTER CAKE (mm) | 1.0 FIRM. | | |
| ALK ☑ (PF/MF) ☐ (PM/LIME) | 1.4/2.0 | | |
| TOTAL HARDNESS ☐ Ca. ☑ (mg/L) | 20 | | |
| SAL. ☐ NACl ☐ CL ☑ (mg/L) | 250 | | |
| SAND CONTENT (%) ☐ (∅) ☑ | .002 | | |
| SOLIDS CONTENT (%) ☐ (∅) ☑ | .085 | | |
| OIL/WATER CONT. (%) ☐ (∅) ☑ | .915 | | |
| MBT (Kg/m³) ☑ % ☐ OIL RET ☐ | 14 | | |
| ELECTRICAL STABILITY (V) HEC | 0 | MG/L | |
| OIL/WATER RATIO DRISPAC | 1.0 | KG/m³ | |
| CaCl₂ w/w% SULFONATE | 110 | MG/L | |
| "n"/"k" TOTAL POLYMER | 7.5 | KG/m³ | |

MATERIALS INVENTORY & COST

| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
|---|---|---|---|---|---|
| 3R = 1 | 6R = 1.5 | 100R = 13 | | | |
| 200R = 21 | 300R = 29 | 600R = 48. | | | |

| | | | |
|---|---|---|---|
| PREVIOUS COST | 169,783 | STARTING VOLUME | |
| DAILY COST | | VOL. BUILT | |
| CUM. COST | | VOL. LOST on SURFACE | |
| CUM. ENG. COST | 18,750 | VOL. LOST SUB. SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS:

1. RAW WATER - 5 LITRES/MIN.

2. AFTER MIXING THE NEXT 3 ASP 771'S IF THE VISCOSITY IS 45 SEC/L OR LESS, MIX 2 MORE PAILS.

3. PRIOR TO NEXT TRIP: ISOLATE LAST TWO TANKS MIX 4 PAILS OF PTS-200. 2 PAILS IN EACH TANK. LET PLACE FOR 40 MINUTES AND PUMP PILL.

STOCK POINT FT. ST. JOHN
PHONE 785-4777
I.D.F. ENGINEER RICK REINHART
PHONE [illegible] MOBILE [illegible] #1

IDF

INTERNATIONAL DRILLING FLUIDS

# DRILLING FLUID REPORT

DATE 91-06-19
REPORT No. 49
SPUD DATE 91-04-29

WELL NAME COLCAS et al KOTANELEE | LOCATION YT-I-48
OPERATOR COLUMBIA GAS DEVELOP. | CONTRACTOR KENTING H.T. #7
REPORT FOR Mr. ROB TOOLE / NEIL BLISS | REPORT FOR Mr. PHIL BOSOMWORTH

| ASSEMBLY | | CASING | MUD Vol. (m³) | | PUMP OUTPUT | | ANNULAR VEL. m./min. | |
|---|---|---|---|---|---|---|---|---|
| BIT SIZE / # | 15 / 152 | COND. | TANKS | 72 | PUMP SIZE | 14 x 406 | OPPOSITE D.P. | 51 |
| DRILL PIPE | 89 mm | SURFACE | HOLE | 58 | m³/STK. | 0118 | OPPOSITE D.C. | 88 |
| DRILL COLLARS | 120 mm | INTER 178/3273 | TOTAL | 130 | S.P.M. | 50 | PUMP PRESS. | 9,000 |
| OTHER | | OTHER | STANDBY | | m³/min. | .6 | CIRC. TIME | 215 ± |

| HOLE DATA | | DESANDER/DESILTER | | DRILLING FLUID SPECIFICATIONS | |
|---|---|---|---|---|---|
| MUD TYPE | WT. POLYMER | FLOWLINE WT. | BTMS UP = 80 kg/m³ | MUD WT. | 1190 - 1200 kg/m³ |
| HOLE COND. | OK. | UNDERFLOW WT. | kg/m³ | VISCOSITY | 40 - 45 s/L |
| DEVIATION | | OVERFLOW WT. | kg/m³ | FILTRATE | ±15 cm³/30 min. |
| CURRENT OP. | CIR | UNDERFLOW RATE | m³/min. | pH | 10.5 |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☒ DOUBLE DECK OR HIGH SPEED SHAKER

| SAMPLE FROM FL. ☒ PIT ☐ | MUD PROPERTIES | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | 22:30 | | |
| PRESENT DEPTH (m) | 3733 | | |
| FLOWLINE TEMPERATURE (°C) | 40 | | |
| DENSITY (kg/m³) | 1195 | | |
| FUNNEL VISCOSITY (s/L) | 43 | | |
| APPARENT VISCOSITY (mPa.s) | 26 | | |
| PLASTIC VISCOSITY (mPa.s) | 20 | | |
| YIELD POINT (Pa) | 6 | | |
| GELS 0/10 min. (Pa) | 1/1.5 | | |
| pH STRIP ☐ METER ☐ | 10.5 | | |
| FILTRATE ☒ API ☐ HT HP (cm³) | 15.0 | | |
| FILTER CAKE (mm) | .8 | | |
| ALK ☐ (PF/MF) ☐ (PM/LIME) | 1.4/5.0 | | |
| TOTAL HARDNESS ☐ Ca. ☐ (mg/L) | TR. | | |
| SAL. ☐ NACl ☐ CL ☒ (mg/L) | 350 | | |
| SAND CONTENT (%) ☐ (Ø) ☒ | .003 | | |
| SOLIDS CONTENT (%) ☐ (Ø) ☒ | .085 | | |
| OIL/WATER CONT. (%) ☐ (Ø) ☐ | .915 | | |
| MBT (Kg/m³) ☐ /% ☐ OIL RET ☐ | — | | |
| ELECTRICAL STABILITY (V) $H_2S$ | N+G. | | |
| OIL/WATER RATIO SULFITE | 100 | | |
| $CaCl_2$ w/w% TOTAL POLYMER | 9. Kg/m³ | | |
| "n"/"k" | | | |

MATERIALS INVENTORY & COST

| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
|---|---|---|---|---|---|
| BARITE | | | 35 | | 438 |
| ASP-721 | | | 10 | | 1000 |
| SOD. SUL. | | | 1 | | 50 |
| X-CIDE | | | 2 | | 280 |
| FLR | | | 6 | | 960 |
| PTS-200 | | | 4 | | 1040 |
| IDVIS | | | 2 | | 840 |
| K. SEAL | (FREIGHT) | | 10 | | 238 |
| 600/300 | 52/32 | | | | |
| 200/100 | 23/14 | | | | |
| 6/3 | 1.5/1 | | | | |

| | | | |
|---|---|---|---|
| PREVIOUS COST | 109,782 | STARTING VOLUME | |
| DAILY COST | 4846 | VOL. BUILT | |
| CUM. COST | 114,628 | VOL. LOST on SURFACE | |
| CUM. ENG. COST | 1[illegible].125 | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS: DRILLED TO 3733 m & TRIP FOR BIT.

1) CONTROL DENSITY AT 1195 - 1200 kg/m³. RUN 5 LITRES $H_2O$ PER MIN.
2) KEEP PH AT 10.5 USING CAUSTIC.
3) MAINTAIN VIS. AT 40-45 s/L USING ASP-721 + FLR. ADD 3 ASP-721 EVERY 12 HRS.
4) ADD 1 X-CIDE + 1 SK. SOD. SUL. DAILY.

STOCK POINT FT ST JOHN | D.F. ENGINEER J.M UHLER
PHONE 785-4227 | PHONE ON LOCATION | MOBILE #

IDF

INTERNATIONAL DRILLING FLUIDS

# DRILLING FLUID REPORT

DATE 91 · 06 · 20
REPORT No. 50
SPUD DATE 91 · 04 · 29

WELL NAME COLGAS et al KOTANELEE — LOCATION YT I·48
OPERATOR COLUMBIA GAS DEVEL. — CONTRACTOR KENTING H.T. #7
REPORT FOR Mr. BOB TROLE / NEIL BLISS — REPORT FOR Mr. PHIL ROSOMWORTH

| ASSEMBLY | | CASING | | MUD Vol. (m³) | | PUMP OUTPUT | | ANNULAR VEL. m./min. | |
|---|---|---|---|---|---|---|---|---|---|
| BIT SIZE / # | 16 / 152 | COND. | | TANKS | 76 | PUMP SIZE | 114 x 406 | OPPOSITE D.P. | 51 |
| DRILL PIPE | 89 mm | SURFACE | | HOLE | 59 | m³/STK. | .0118 | OPPOSITE D.C. | 88 |
| DRILL COLLARS | 120 mm | INTER. | 178 / 3273 | TOTAL | 135 | S.P.M. | 50 | PUMP PRESS. | 9,000 |
| OTHER | | OTHER | | STANDBY | | m³/min. | .6 | CIRC. TIME | 225 t |

| HOLE DATA | | DESANDER/DESTILTER | | DRILLING FLUID SPECIFICATIONS | |
|---|---|---|---|---|---|
| MUD TYPE | WT. POLYMER | FLOWLINE WT. | kg/m³ | MUD WT. | 1200 kg/m³ |
| HOLE COND. | OK | UNDERFLOW WT. | kg/m³ | VISCOSITY | 40-45 s/L |
| DEVIATION | | OVERFLOW WT. | kg/m³ | FILTRATE | <15 cm³/30 min. |
| CURRENT OP. | DRLG. | UNDERFLOW RATE | m³/min. | pH | 10.5 |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☑ DOUBLE DECK OR HIGH SPEED SHAKER

SAMPLE FROM FL. ☑ PIT ☐

| MUD PROPERTIES | |
|---|---|
| TIME SAMPLE TAKEN | 23:30 |
| PRESENT DEPTH (m) | 3772 |
| FLOWLINE TEMPERATURE (°C) | 42 |
| DENSITY (kg/m³) | 1210 |
| FUNNEL VISCOSITY (s/L) | 43 |
| APPARENT VISCOSITY (mPa.s) | 26 |
| PLASTIC VISCOSITY (mPa.s) | 20 |
| YIELD POINT (Pa) | 6 |
| GELS 0/10 min. (Pa) | 1/2 |
| pH STRIP ☑ METER ☐ | 10.5 |
| FILTRATE ☑ API ☐ HT HP (cm³) | 19.4 |
| FILTER CAKE (mm) | .8 |
| ALK ☑ (PF/MF) ☐ (PM/LIME) | 1.4 / 5.0 |
| TOTAL HARDNESS ☑ Ca. ☐ (mg/L) | TR. |
| SAL. ☐ NACI ☐ CL ☑ (mg/L) | 350 |
| SAND CONTENT (%) ☐ (Ø) ☑ | .004 |
| SOLIDS CONTENT (%) ☐ (Ø) ☑ | .09 |
| OIL/WATER CONT. (%) ☐ (Ø) ☑ | .91 |
| MBT (Kg/m³) ☐ /% ☐ OIL RET ☐ | — |
| ELECTRICAL STABILITY (V) $H_2S$ | NEG. |
| OIL/WATER RATIO SULFITE | 110 |
| $CaCl_2$ w/w% POLYMER | 9.5 Kg/m³ |
| "n"/"k" | |

MATERIALS INVENTORY & COST

| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
|---|---|---|---|---|---|
| DRISPAC | | | 5 | | 812 |
| X-CIDE | | | 1 | | 140 |
| ASP-721 | | | 3 | | 300 |
| SOD. SUL. | | | 1 | | 50 |
| | | | | | |
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| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| 600 / 300 | 52 / 32 | | | | |
| 200 / 100 | 24 / 14 | | | | |
| 6 / 3 | 3 / 1 | | | | |

| | | | |
|---|---|---|---|
| PREVIOUS COST | 114,390 | STARTING VOLUME | |
| DAILY COST | 1302 | VOL. BUILT | |
| CUM. COST | 115692 | VOL. LOST on SURFACE | |
| CUM. ENG. COST | 19,500 | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS: DRLG. 152 mm HOLE.

1) KEEP VISCOSITY AT 40-45 s/L USING ASP-721 + FLR. 3 ASP-721 EVERY 12 HRS.
2) HOLD DENSITY AT 1200 Kg/m³. RUN 5 LITRES $H_2O$ PER MIN.
3) ADD 1 X-CIDE + 1 SX. SOD. SULFITE DAILY.
4) ADD 3 PTS. 200 PRIOR TO TRIP.

STOCK POINT FT. ST. JOHN — I.D.F. ENGINEER JIM IJELER
PHONE 785-4222 — PHONE ON LOCATION — MOBILE #

IDF

INTERNATIONAL DRILLING FLUIDS

# DRILLING FLUID REPORT

DATE 91-06-21
REPORT No. 51
SPUD DATE 91-04-29

WELL NAME COLGAS et al KOTANELEE — LOCATION YT F-48
OPERATOR COLUMBIA GAS DEVEL. — CONTRACTOR KENTING H.T. #7
REPORT FOR Mr. BOB TOOLE / NEIL PLISS — REPORT FOR Mr. PHIL BOSOMWORTH

| ASSEMBLY | | CASING | | MUD Vol. (m³) | | PUMP OUTPUT | | ANNULAR VEL. m./min. | |
|---|---|---|---|---|---|---|---|---|---|
| BIT SIZE / # | 17 / | COND. | | TANKS | 74 | PUMP SIZE | 114 x 406 | OPPOSITE D.P. | 51 |
| DRILL PIPE | 89 mm | SURFACE | | HOLE | 60 | m³/STK. | .0116 | OPPOSITE D.C. | 88 |
| DRILL COLLARS | 120 mm | INTER. | 178/3373 | TOTAL | 134 | S.P.M. | 50 | PUMP PRESS. | 9700 |
| OTHER | | OTHER | | STANDBY | | m³/min. | .6 | CIRC. TIME | 225± |

| HOLE DATA | | DESANDER/DESILTER | | DRILLING FLUID SPECIFICATIONS | |
|---|---|---|---|---|---|
| MUD TYPE | WT. POLYMER | FLOWLINE WT. | kg/m³ | MUD WT. | 1190-1200 kg/m³ |
| HOLE COND. | | UNDERFLOW WT. | kg/m³ | VISCOSITY | 40-45 s/L |
| DEVIATION | 7 3/4 @ 3767 N11 1/4E | OVERFLOW WT. | kg/m³ | FILTRATE | < 15 cm³/30 min. |
| CURRENT OP. | DRLG. | UNDERFLOW RATE | m³/min. | pH | 10.5 |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☑ CENTRIFUGE ☑ DOUBLE DECK OR HIGH SPEED SHAKER

| SAMPLE FROM FL ☑ PIT ☐ | (06-21) | MUD PROPERTIES | (06-22) |
|---|---|---|---|
| TIME SAMPLE TAKEN | 22:00 | | 02:00 |
| PRESENT DEPTH (m) | 3190 | | 3802 |
| FLOWLINE TEMPERATURE (°C) | 40 | | 41 |
| DENSITY (kg/m³) | 1210 | | 1195 |
| FUNNEL VISCOSITY (s/L) | 44 | | 44 |
| APPARENT VISCOSITY (mPa.s) | 30 | | 30 |
| PLASTIC VISCOSITY (mPa.s) | 24 | | 24 |
| YIELD POINT (Pa) | 6 | | 6 |
| GELS 0/10 min. (Pa) | 1/2 | | 1/2 |
| pH STRIP ☑ METER ☐ | 10.5 | | 11.0 |
| FILTRATE ☑ API ☐ HT HP (cm³) | 24 | | 17.0 |
| FILTER CAKE (mm) | .8 | | .8 |
| ALK ☑ (PF/MF) ☐ (PM/LIME) | 1.3/5.0 | | 1.5/5.5 |
| TOTAL HARDNESS ☑ Ca. ☐ (mg/L) | TR. | | TR. |
| SAL. ☐ NACI ☐ CL ☐ (mg/L) | 350 | | 350 |
| SAND CONTENT (%) ☐ (Ø) ☑ | .004 | | .003 |
| SOLIDS CONTENT (%) ☐ (Ø) ☑ | .09 | | .08 |
| OIL/WATER CONT. (%) ☐ (Ø) ☑ | .91 | | 92 |
| MBT (Kg/m³) ☐ /% ☐ OIL RET ☐ | — | | — |
| ELECTRICAL STABILITY (V) $H_2S$ | NEG. | | NEG. |
| OIL/WATER RATIO SULF. TC | 115 | | 120 |
| $CaCl_2$ w/w% POLYMER (Kg/m³) | 9.5 | | 9.5 |
| "n"/"k" | | | |

MATERIALS INVENTORY & COST

| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
|---|---|---|---|---|---|
| ASP-721 | | | 2 | | 200 |
| FLR | | | 5 | | 800 |
| KTS-200 | | | 3 | | 780 |
| BARITE | | | 35 | | 438 |
| CAUSTIC | | | 2 | | 60 |

| | | | |
|---|---|---|---|
| PREVIOUS COST | 115,692 | STARTING VOLUME | |
| DAILY COST | 2278 | VOL. BUILT | |
| CUM. COST | 117,970 | VOL. LOST on SURFACE | |
| CUM. ENG. COST | 19,875 | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS: DRLG. 152 mm HOLE RAN CENTRIFUGE FOR 1 C.R.

1) MAINTAIN VIS. AT 40-45 S/L USING ASP-721 + FLR.

2) HOLD DENSITY AT 1190-1200 Kg/m³. RUN 5 LITRES $H_2O$ PER MIN.

3) ADD 1 x C.DF + 1 Sx. SOD. SULFITE DAILY.
ADD 2 ASP-721 EVERY 12 HRS.

4) KEEP PH AT 10.5 USING CAUSTIC.

5)

6)

STOCK POINT FT. ST. JOHN — F. ENGINEER JIM WHELER
PHONE 785-4321 — PHONE ON LOCATION — MOBILE #

IDF

INTERNATIONAL DRILLING FLUIDS

# DRILLING FLUID REPORT

DATE 91-06-22
REPORT No. 52
SPUD DATE 91-04-29

WELL NAME COLGAS et al KOTANELEE — LOCATION YT I 48
OPERATOR COLUMBIA GAS DEVEL. — CONTRACTOR KENTING H.T. #7
REPORT FOR Mr. BOB TOOLE / NEIL BLISS — REPORT FOR Mr. PHIL BOSOMWORTH

| ASSEMBLY | | CASING | | MUD Vol. (m³) | | PUMP OUTPUT | | ANNULAR VEL. m./min. | |
|---|---|---|---|---|---|---|---|---|---|
| BIT SIZE / # | 17 / 152 | COND. | | TANKS | 72 | PUMP SIZE | 114 x 406 | OPPOSITE D.P. | 51 |
| DRILL PIPE | 89 mm | SURFACE | | HOLE | 61 | m³/STK. | .0118 | OPPOSITE D.C. | 88 |
| DRILL COLLARS | 180 mm | INTER | 178 / 3273 | TOTAL | 133 | S.P.M. | 50 | PUMP PRESS. | 9600 |
| OTHER | | OTHER | | STANDBY | | m³/min. | .6 | CIRC. TIME | 550 ± |

| HOLE DATA | | DESANDER/DESILTER | | DRILLING FLUID SPECIFICATIONS | |
|---|---|---|---|---|---|
| MUD TYPE | WT. POLYMER | FLOWLINE WT. | BARS IR = 85 MIN kg/m³ | MUD WT. | 1190 - 1200 kg/m³ |
| HOLE COND. | OK. | UNDERFLOW WT. | kg/m³ | VISCOSITY | 40 - 45 s/L |
| DEVIATION | | OVERFLOW WT. | kg/m³ | FILTRATE | < 15 cm³/30 min. |
| CURRENT OP. | CIR. | UNDERFLOW RATE | m³/min. | pH | 10.5 |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☑ DOUBLE DECK OR HIGH SPEED SHAKER

SAMPLE FROM FL. ☑ PIT ☐

| MUD PROPERTIES | | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | 09:00 | | 19:00 |
| PRESENT DEPTH (m) | 3820 | | 3843 |
| FLOWLINE TEMPERATURE (°C) | 42 | | 43 |
| DENSITY (kg/m³) | 1195 | | 1195 |
| FUNNEL VISCOSITY (s/L) | 46 | | 46 |
| APPARENT VISCOSITY (mPa.s) | 28 | | 28 |
| PLASTIC VISCOSITY (mPa.s) | 22 | | 22 |
| YIELD POINT (Pa) | 6 | | 6 |
| GELS 0/10 min. (Pa) | 1/2 | | 1/2 |
| pH STRIP ☐ METER ☐ | 10.5 | | 10.5 |
| FILTRATE ☐ API ☐ HT HP (cm³) | 8.0 | | 7.6 |
| FILTER CAKE (mm) | .5 | | .5 |
| ALK ☐ (PF/MF) ☐ (PM/LIME) | 1.4/5.2 | | 1.4/5.4 |
| TOTAL HARDNESS ☐ Ca ☐ (mg/L) | TR. | | TR. |
| SAL. ☐ NACl ☐ CL ☐ (mg/L) | 350 | | 350 |
| SAND CONTENT (%) ☐ (Ø) ☐ | .003 | | .003 |
| SOLIDS CONTENT (%) ☐ (Ø) ☐ | .08 | | .08 |
| OIL/WATER CONT. (%) ☐ (Ø) ☐ | .92 | | .92 |
| MBT (Kg/m³) ☐ /% ☐ OIL RET ☐ | — | | — |
| ELECTRICAL STABILITY (V) $H_2S$ | NEG. | | NEG |
| OIL/WATER RATIO SULFITE | 130 | | 130 |
| $CaCl_2$ w/w% POLYMER | 10 | | 10 |
| "n"/"k" | | | |

MATERIALS INVENTORY & COST

| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
|---|---|---|---|---|---|
| BARITE | 2468 | | 35 | 2433 | 438 |
| FLO PLEX | 56 | | 22 | 34 | 2750 |
| FLR | 99 | | 6 | 38 | 960 |
| XCIDE | 13 | | 1 | 14 | 140 |
| ASP-721 | 32 | | 7 | 25 | 700 |
| SOD. SULF. | 11 | | 1 | 10 | 50 |
| SAWDUST | 200 | | 70 | 130 | 343 |
| PTS-200 | 18 | | | 18 | |
| CAUSTIC | 178 | | | 178 | |
| 600/300 | 56/34 | | | | |
| 200/100 | 26/14 | | | | |
| 6/3 | 3/2 | | | | |

| | | | |
|---|---|---|---|
| PREVIOUS COST | 115,698 | STARTING VOLUME | |
| DAILY COST | 5381 | VOL. BUILT | |
| CUM. COST | 121,079 | VOL. LOST on SURFACE | |
| CUM. ENG. COST | 19,875 | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS: CIR. PRIOR TO TRIP FOR BIT #17 LOST 8 m³ FROM 3822-3784 m
PUMPED 14 m³ L.C.M. PILL PRIOR TO TRIP
CONTROL DENSITY AT 1190 - 1200 kg/m³. RUN 5 LITRES $H_2O$ PER MIN.
MAINTAIN PH AT 10.5 WITH CAUSTIC.
HOLD V.I. AT 40-45 S/L USING ASP-721. ADD 3 PAILS EVERY 12 HRS.
ADD 1 SX. SOD. SULFITE + 1 XCIDE DAILY.
PRIOR TO TRIP OUT TO LOG, MIX 7 PAILS PTS-200 + 2 XCIDE.

STOCK POINT FT. ST. JOHN — I.D.F. ENGINEER JIM WHELER
PHONE 785-4222 — PHONE IN LOCATION — MOBILE #

IDF

INTERNATIONAL DRILLING FLUIDS

# DRILLING FLUID REPORT

DATE 91-06-24
REPORT No. 54
SPUD DATE 91-04-29

WELL NAME COLGAS d 01 KOTANEELEE | LOCATION YT-I 45
OPERATOR COLUMBIA GAS DEVEL. | CONTRACTOR KENTING H.T. # 7
REPORT FOR Mr. ROB TOOLE / NEIL BLISS | REPORT FOR Mr. PHIL GOSSMUTH

| ASSEMBLY | | CASING | MUD Vol. (m³) | | PUMP OUTPUT | ANNULAR VEL. m./min. |
|---|---|---|---|---|---|---|
| BIT SIZE / # | 18 / 152 | COND. | TANKS | 75 | PUMP SIZE 114 x 406 | OPPOSITE D.P. 51 |
| DRILL PIPE | 89 mm | SURFACE | HOLE | 62 | m³/STK. .0118 | OPPOSITE D.C. 88 |
| DRILL COLLARS | 120 mm | INTER. 178 / 3773 | TOTAL | 137 | S.P.M. 50 | PUMP PRESS. 9400 |
| OTHER | | OTHER | STANDBY | | m³/min. .6 | CIRC. TIME 2.30 ± |

| HOLE DATA | | DESANDER/DESILTER | | | DRILLING FLUID SPECIFICATIONS | |
|---|---|---|---|---|---|---|
| MUD TYPE | WT. POLYMER | FLOWLINE WT. | 600/2700 | 52/32 kg/m³ | MUD WT. | 1190-1200 kg/m³ |
| HOLE COND. | OK. | UNDERFLOW WT. | 2001/100 | 24/14 kg/m³ | VISCOSITY | 40-45 s/L |
| DEVIATION | 8° @ 3882 N34°E | OVERFLOW WT. | 613 | 3/2 kg/m³ | FILTRATE | < 15 cm³/30 min. |
| CURRENT OP. | C.I.R. | UNDERFLOW RATE | | m³/min. | pH | 10.5 |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☑ DOUBLE DECK OR HIGH SPEED SHAKER

| SAMPLE FROM FL. ☑ PIT ☐ | MUD PROPERTIES | | | MATERIALS INVENTORY & COST | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TIME SAMPLE TAKEN | 15:30 | | | MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
| PRESENT DEPTH (m) | 3915 | | | BARITE | 2988 | | 35 | 2353 | 438 |
| FLOWLINE TEMPERATURE (°C) | 44 | | | FLR | 35 | | | 35 | |
| DENSITY (kg/m³) | 1205 | | | X-CIDE | 13 | | 1 | 12 | 140 |
| FUNNEL VISCOSITY (s/L) | 44 | | | ASP. 721 | 25 | | 5 | 20 | 500 |
| APPARENT VISCOSITY (mPa.s) | 26 | | | SOD. SUL. | 9 | | | 9 | |
| PLASTIC VISCOSITY (mPa.s) | 20 | | | SAWDUST | 130 | | | 130 | |
| YIELD POINT (Pa) | 6 | | | HTS-200 | 18 | | 8 | 10 | 2080 |
| GELS 0/10 min. (Pa) | 1/2 | | | CAUSTIC | 173 | INV. ADJUST | 6 | 167 | 180 |
| pH STRIP ☑ METER ☐ | 10.5 | | | IDVIS 9 | 45 | | 5 | 40 | 2100 |
| FILTRATE ☑ API ☐ HT HP (cm³) | 6.6 | | | SULFAN | 82 | | | 82 | |
| FILTER CAKE (mm) | .5 | | | SEA GEL | 18 | | | 18 | |
| ALK ☑ (PF/MF) ☐ (PM/LIME) | 1.5/5.5 | | | LIME | 16 | " | 5 | 11 | 43 |
| TOTAL HARDNESS ☐ Ca. ☐ (mg/L) | TR. | | | DRISPAC | 27 | " | 8 | 19 | 1300 |
| SAL. ☐ NACl ☐ CL ☑ (mg/L) | 350 | | | DEFOAMER | 6 | | | 6 | |
| SAND CONTENT (%) ☐ (Ø) ☑ | .004 | | | GEL | 310 | | | 310 | |
| SOLIDS CONTENT (%) ☐ (Ø) ☑ | .08 | | | POLYMER | 50 | | | 50 | |
| OIL/WATER CONT. (%) ☐ (Ø) ☑ | .92 | | | PREVIOUS COST | 123,809 | STARTING VOLUME | | | |
| MBT (Kg/m³) ☐ /% ☐ OIL RET ☐ | — | | | DAILY COST | 6781 | VOL. BUILT | | | |
| ELECTRICAL STABILITY (V) | N.S. | N.G. | | CUM. COST | 130,590 | VOL. LOST on SURFACE | | | |
| OIL/WATER RATIO | SULFITE | 120 | mg/L | CUM. ENG. COST | 20,625 | VOL. LOST SUB SURFACE | | | |
| $CaCl_2$ w/w% | POLYMER | 10 | kg/m³ | | | END VOLUME | | | |
| "n"/"k" | | | | | | CUM. VOL. BUILT | | | |

COMMENTS: T.D. 3915 m C.I.R. PRIOR TO TRIP OUT TO LOG.

1) MAINTAIN PH AT 10.5 USING CAUSTIC.

2) CONTROL DENSITY AT 1190 - 1200 kg/m³. RUN 5 LOADS H₂O WHEN OK.

3) VIS 40 - 45 S/L.

NOTE: PRIOR TO TRIP OUT TO RUN LINER ADD 8 PAILS HTS-200 + 1 GAL X-CIDE.

STOCK POINT ST. JOHN | I.D.F. ENGINEER JIM WHELER
PHONE 785-4222 | PHONE ON LOCATION | MOBILE #

INTERNATIONAL DRILLING FLUIDS

# DRILLING FLUID REPORT

DATE 91-06-25
REPORT No. 55
SPUD DATE 91-04-29

WELL NAME COLGAS et al KOTANEE LEE | LOCATION YT I-48
OPERATOR COLUMBIA GAS DEVEL. | CONTRACTOR KENTING H.T. #7
REPORT FOR Mr. BOB TOOLE | REPORT FOR Mr. PHIL ROSMWORTH

| ASSEMBLY | | CASING | MUD Vol. (m³) | | PUMP OUTPUT | | ANNULAR VEL. m./min. | |
|---|---|---|---|---|---|---|---|---|
| BIT SIZE / # | 1 152 | COND. | TANKS | 74 | PUMP SIZE | 114 x 406 | OPPOSITE D.P. | 51 |
| DRILL PIPE | 89 mm | SURFACE | HOLE | 62 | m³/STK. | .0118 (.0167) | OPPOSITE D.C. | 88 |
| DRILL COLLARS | 120 mm | INTER. 1781 3272 | TOTAL | 136 | S.P.M. | 50 | PUMP PRESS. | 10.000 |
| OTHER | | OTHER | STANDBY | | m³/min. | .6 .6 | CIRC. TIME | 220± |

| HOLE DATA | | DESANDER/DESILTER | | | DRILLING FLUID SPECIFICATIONS | | |
|---|---|---|---|---|---|---|---|
| MUD TYPE | WT. POLYMER | FLOWLINE WT. | 600 300 | 58 36 kg/m³ | MUD WT. | 1190 - 1200 | kg/m³ |
| HOLE COND. | OK. | UNDERFLOW WT. | 200 100 | 27 16 kg/m³ | VISCOSITY | 40-45 | s/L |
| DEVIATION | | OVERFLOW WT. | 6 3 | 3 2 kg/m³ | FILTRATE | <15 | cm³/30 min. |
| CURRENT OP. | CIR. | UNDERFLOW RATE | | m³/min. | pH | 10.5 | |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☑ DOUBLE DECK OR HIGH SPEED SHAKER

SAMPLE FROM FLOW ☐ PIT ☐

| MUD PROPERTIES | |
|---|---|
| TIME SAMPLE TAKEN | 20:00 |
| PRESENT DEPTH (m) | 3915 |
| FLOWLINE TEMPERATURE (°C) | 41 |
| DENSITY (kg/m³) | 1210 |
| FUNNEL VISCOSITY (s/L) | 46 |
| APPARENT VISCOSITY (mPa.s) | 29 |
| PLASTIC VISCOSITY (mPa.s) | 22 |
| YIELD POINT (Pa) | 7 |
| GELS 0/10 min. (Pa) | 1/2 |
| pH STRIP ☑ METER ☐ | 11.0 |
| FILTRATE ☑ API ☐ HT HP (cm³) | 7.6 |
| FILTER CAKE (mm) | .5 |
| ALK ☑ (PF/MF) ☐ (PM/LIME) | 1.8/6.0 |
| TOTAL HARDNESS ☑ Ca. ☐ (mg/L) | TR. |
| SAL. ☐ NACI ☐ CL ☑ (mg/L) | 350 |
| SAND CONTENT (%) ☐ (Ø) ☑ | .002 |
| SOLIDS CONTENT (%) ☐ (Ø) ☑ | .05 |
| OIL/WATER CONT. (%) ☐ (Ø) ☑ | .92 |
| MBT (Kg/m³) ☐ /% ☐ OIL RET ☐ | — |
| ELECTRICAL STABILITY (V) $H_2S$ | N.G. |
| OIL/WATER RATIO SULFITE | 120 |
| $CaCl_2$ w/w% POLYMER | 10 |
| "n"/"K" | |

MATERIALS INVENTORY & COST

| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
|---|---|---|---|---|---|
| BARITE | 2353 | | 35 | 2318 | 438 |
| FLR | 35 | | | 35 | |
| XCIDE | 12 | | 2 | 10 | 280 |
| ASP. 721 | 20 | | | 20 | |
| SOD. SUL. | 9 | | | 9 | |
| SAWDUST | 130 | | | 130 | |
| ATS-200 | 102 | | 8 | 96 | 2080 |
| CAUSTIC | 167 | | 1 | 166 | 30 |
| IDVIS D | 40 | | | 40 | |
| SULFAN | 82 | | | 82 | |
| SODA ASH | 18 | | | 18 | |
| LIME | 11 | | | 11 | |
| DRISPAC | 19 | | | 19 | |
| DEFOAMER | 6 | | | 6 | |
| GEL | 310 | | | 310 | |
| POLYTEMP | 50 | | | 50 | |

| | | | |
|---|---|---|---|
| PREVIOUS COST | 129,290 | STARTING VOLUME | |
| DAILY COST | 2828 | VOL. BUILT | |
| CUM. COST | 132,118 | VOL. LOST on SURFACE | |
| CUM. ENG. COST | 21,000 | VOL. LOST SUB SURFACE | |
| | | END VOLUME | |
| | | CUM. VOL. BUILT | |

COMMENTS: T.D. 3915 m LOGGED. RAN CLEAN OUT TRIP TO RUN LINER.

STOCK POINT FT. ST. JOHN | I.D.F. ENGINEER JIM WIEGER
PHONE 785-4222 | PHONE ON LOCATION | MOBILE #

# IDF

INTERNATIONAL DRILLING FLUIDS

## DRILLING FLUID REPORT

DATE 91-06-26/27
REPORT No. 56
SPUD DATE 91-04-29

WELL NAME COLGAS et al KOTONEELEE — LOCATION YT I-48
OPERATOR COLUMBIA GAS DEVEL. — CONTRACTOR KENTING H.T. #7
REPORT FOR Mr. Joe TOOLE — REPORT FOR Mr. PHIL RAMSWORTH

| ASSEMBLY | CASING | MUD Vol. (m³) | PUMP OUTPUT | ANNULAR VEL. m./min. |
|---|---|---|---|---|
| BIT SIZE / # / | COND. | TANKS | PUMP SIZE 114 x 406 | OPPOSITE D.P. |
| DRILL PIPE mm | SURFACE | HOLE | m³/STK. .0118 | OPPOSITE D.C. |
| DRILL COLLARS mm | INTER 178/3273 | TOTAL | S.P.M. | PUMP PRESS. |
| OTHER | OTHER 127/3915 | STANDBY | m³/min. | CIRC. TIME |

| HOLE DATA | DESANDER/DESTILTER | | DRILLING FLUID SPECIFICATIONS | |
|---|---|---|---|---|
| MUD TYPE WT. POLYMER | FLOWLINE WT. | kg/m³ | MUD WT. | kg/m³ |
| HOLE COND. OK. | UNDERFLOW WT. | kg/m³ | VISCOSITY | s/L |
| DEVIATION | OVERFLOW WT. | kg/m³ | FILTRATE | cm³/30 min. |
| CURRENT OP. C.I.R. | UNDERFLOW RATE | m³/min. | pH | |

EQUIPMENT: ☐ DEGASSER ☐ DESILTER ☐ DESANDER ☐ CENTRIFUGE ☐ DOUBLE DECK OR HIGH SPEED SHAKER

SAMPLE FROM FL. ☐ PIT ☐

| MUD PROPERTIES | | | |
|---|---|---|---|
| TIME SAMPLE TAKEN | 09:30 | | |
| PRESENT DEPTH (m) | 3915 | | |
| FLOWLINE TEMPERATURE (°C) | 40 | | |
| DENSITY (kg/m³) | 1210 | | |
| FUNNEL VISCOSITY (s/L) | 46 | | |
| APPARENT VISCOSITY (mPa.s) | 25 | | |
| PLASTIC VISCOSITY (mPa.s) | 20 | | |
| YIELD POINT (Pa) | 5 | | |
| GELS 0/10 min. (Pa) | 1/2 | | |
| pH STRIP ☐ ✓ METER ☐ | 11.0 | | |
| FILTRATE ☐ ✓ API ☐ HT HP (cm³) | 11.0 | | |
| FILTER CAKE (mm) | .8 | | |
| ALK ☐ ✓ (PF/MF) ☐ (PM/LIME) | 1.8/6.4 | | |
| TOTAL HARDNESS ☐ ✓ Ca. ☐ (mg/L) | TR. | | |
| SAL. ☐ NACI ☐ CL ☐ ✓ (mg/L) | 350 | | |
| SAND CONTENT (%) ☐ (Ø) ☐ ✓ | — | | |
| SOLIDS CONTENT (%) ☐ (Ø) ☐ ✓ | .08 | | |
| ~~OIL~~/WATER CONT. (%) ☐ (Ø) ☐ ✓ | .92 | | |
| MBT (Kg/m³) ☐ /% ☐ OIL RET ☐ | — | | |
| ELECTRICAL STABILITY (V) $H_2S$ | NEG. | | |
| OIL/WATER RATIO SULFITE | 120 | | |
| $CaCl_2$ w/w% POLYMER | 9.0 | | |
| "n"/"k" | | | |

| MATERIALS | INITIAL | RECEIVED | USED | BALANCE | COST |
|---|---|---|---|---|---|
| BARITE | 2318 | | 10 | 2308 | 125 |
| FLR | 35 | | | 35 | |
| XCIDE | 10 | | 3 | 7 | 420 |
| ASP. 721 | 21 | | | 21 | |
| SOD. SUL. | 9 | | | 9 | |
| SAWDUST | 130 | | 30 | 100 | 147 |
| PTS-200 | 96 | | 5 | 91 | 1300 |
| CAUSTIC | 166 | | | 166 | |
| EDWD | 40 | | | 40 | |
| SULFAN | 82 | | | 82 | |
| SOD. ASH | 18 | | | 18 | |
| LIME | 11 | | | 11 | |
| IRSPAK | 19 | | | 19 | |
| DEFOAMER | 6 | | 1 | 5 | 136 |
| GEL | 310 | | 10 | 300 | 100 |
| POLYTEMP | 50 | | | 50 | |
| PREVIOUS COST | 132 118 | | STARTING VOLUME | | |
| DAILY COST | 3172 | | VOL. BUILT | | |
| CUM. COST | 135290 | | VOL. LOST on SURFACE | | |
| CUM. ENG. COST | 21750 | | VOL. LOST SUB SURFACE | | |
| | | | END VOLUME | | |
| | | | CUM. VOL. BUILT | | |
| BICARB | 55 | | | 55 | |
| ~~REVERSE~~ | ~~12~~ | | | — | |
| DFCL | 3 | | | 3 | |
| BEADS | 32 | | | 32 | |
| FCL | 60 | | | 60 | |
| POLYTEMP | 50 | | | 50 | |
| K-SEAL | 100 | | 11 | 89 | 262 |
| IDFREE | 4 | | | 4 | |
| VISPLEX | 10 | | 2 | 8 | 500 |
| CaCO₃ | 102 | | | 102 | |
| CELLOFLAKE | 20 | | 8 | 12 | 185 |
| WALNUT | 20 | | | 20 | |
| FLOPLEX | 34 | | | 34 | |

COMMENTS: RAN LINER (127 mm)
LOST APPROX. 21 m³ MUD TO HOLE WHILE RUNNING LINER. PUMPED L.C.M. & BYPASSED SHAKER WHILE CIR. PRIOR TO CEMENTING.

STOCK POINT FT. ST. JOHN — I.D.F. ENGINEER JIM WHEELER
PHONE 785-4222 — PHONE ON LOCATION — MOBILE #

Kotaneelee I-48

# THIN SECTION STUDY
# NAHANNI FORMATION
# KOTANEELEE AREA

Report in Liard M-25 file

**Ian G. Hunter, Ph.D., P. Geol.**
**Ian Hunter Consulting Ltd.**

**January, 2001**