

FINAL WELL REPORT 31/2-17BR

Ammendment to: Final Well Report 31/2-17S-17SA-17SB

Prepared: Norolf Henriksen 20/4-93

Verified: Norolf Henriksen 20/4-93

Approved: Arne Bergesen 20/4-93.

LIST OF CONTENT

| | <u>Page</u> |
|--|-------------|
| 1. SUMMARY OF OPERATIONS | |
| 1.1 Rig move and anchorhandling | 1 |
| 1.2 Permanent plug and abandonment | 1 |
| 1.3 Anchorhandling | 2 |
| Figure 1: Mooring line pattern | 3 |
| Table 1: Daily report | 4 |
| Figure 2: Permanent abandonment | 10 |
| Table 2: Time distribution | 11 |
| Figure 3: Time distribution pie | 12 |
| Table 3: Bit record | 13 |
| Table 4: Bottom hole assemblies | 14 |
| Table 5: Daily mud properties: Rheological parameters | 15 |
| Table 6: Daily mud properties: Other parameters | 15 |
| Table 7: Mud additive consumption | 16 |
| Table 8: Cement and cement additive consumption .. | 16 |
| 2. FINAL COST REPORT..... | 17 |
| 3. EQUIPMENT FAILURE AND PROBLEMS..... | 18 |

1. SUMMARY OF OPERATIONS

All depths referenced to RKB, seabed at 370 m.

The drilling rig West Delta started sailing for the location of well 31/2-17BR at 05:30 hours on February 13th 1993 to perform permanent abandonment of the well.

For detailed time breakdown of the operation, see Table 1: Daily report.

1.1 Rig move and anchorhandling

The rig was moved to the locaton of the well and anchored up with a rig heading of 316 degrees.

The anchor pattern is shown in Figure 1.

1.2 Permanent plug and abandonment

The corrosion cap/trawl frame installed on the wellhead was retrieved using a Cam Actuated Running tool.

Three unsuccessful attempts to land and lock the retrievable guide base to the wellhead housing were performed. Failure on the two first attempts were caused by obstructions on the seabed, preventing the guide base from coming down to the landing point. The third failure, occuring after having washed/cleaned the seabed with open ended drill pipe and drill bit, was either caused by landing of the guide base in the wrong groove or equipment failure. No evident failure of the equipment could be seen when checking the equipment.

The BOP was run without a guide base installed. Several attempts were made to land the BOP before landing succeeded. Pressure testing of the wellhead connector failed and the BOP was pulled. Inspection of the

wellhead with the ROV revealed damages on both the HX and VX profiles, expected to have arisen in the attempts to land the BOP.

A new retrievable guide base was successfully run and landed using a different type running tool.

A VX ring gasket with lead insert was installed in the BOP prior to re-running the stack. A positive test on the wellhead connector was obtained

The top cement plug was drilled out, and the hole displaced to 1.38 s.g. mud down to 1470 m. The bridge plug at 1485.5 m was pressure tested.

The seal assembly was retrieved with no gas trapped in the 13 3/8" x 18 5/8" casing annulus. The 13 3/8" casing was cut at 814 m and retrieved.

When running in the hole to set cement plug in the 18 5/8" casing, a top 18 5/8" wiper plug was run and set at 800 m to prevent drop-out of cement from the plug. A 250 m cement plug was set from 700 m. Pressure testing of the cement plug was attempted after 8.5 hours, but a good test was first obtained after 11.5 hours. The plug was weight tested using a 12 1/4" rock bit.

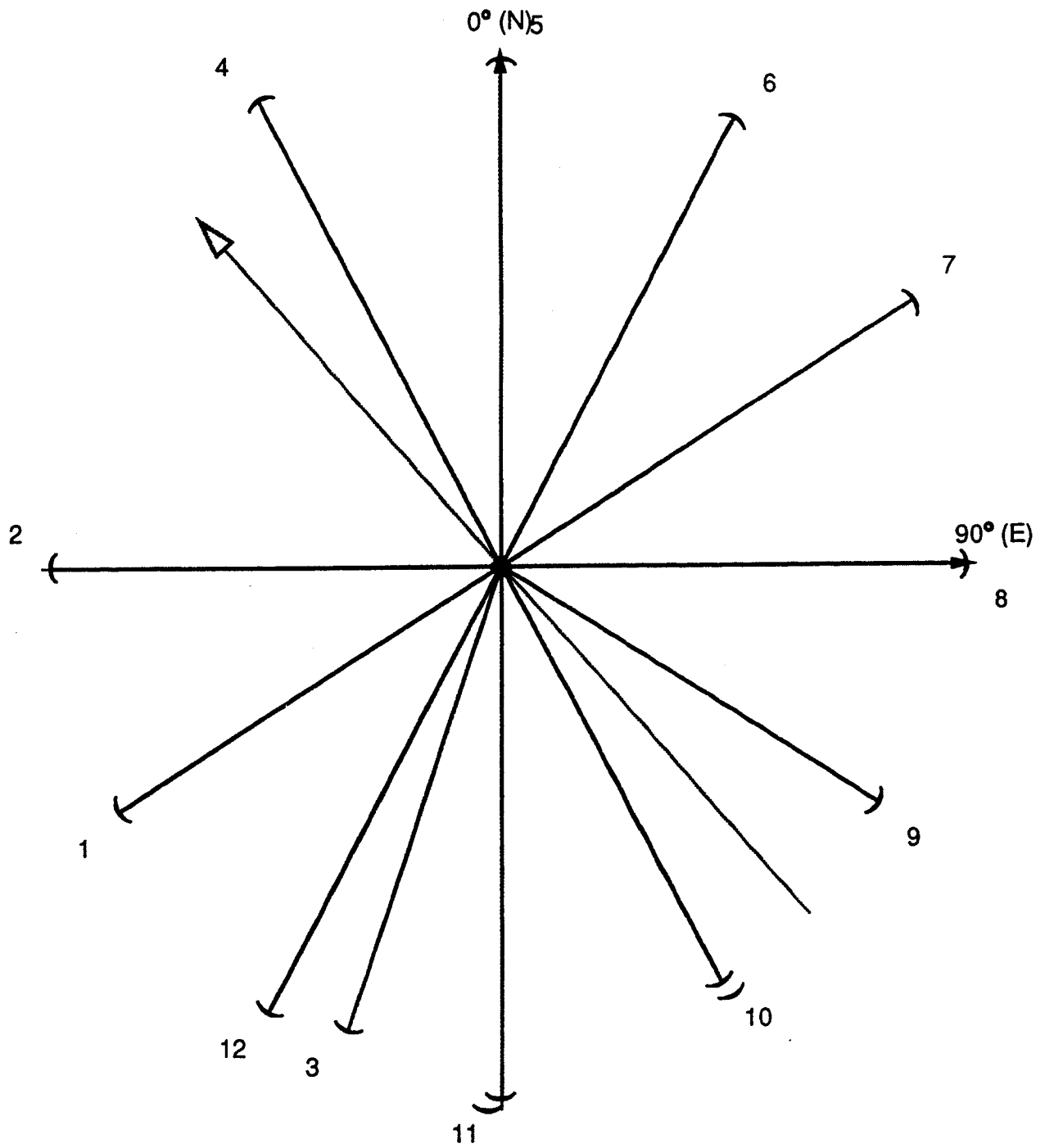
After pulling the BOP, the 18 5/8" and 30" casing was cut at 376.5 m and retrieved together with the guide base.

Permanent abandonment status is shown in Figure 2.

1.3 Anchorhandling

During anchorhandling, a period of 37.5 hours was lost waiting on weather.

The operation was completed at 19:00 hours on February 26th 1993.



RIG HEADING 316 DEG.

| ANCHOR NO | DIRECTION (DEG.) | LENGTH (m) |
|-----------|------------------|------------|
| 1 | 240 | 1870 |
| 2 | 270 | 1905 |
| 3 | 200 | 1900 |
| 4 | 330 | 2055 |
| 5 | 360 | 1930 |
| 6 | 30 | 1970 |
| 7 | 60 | 1995 |
| 8 | 90 | 1950 |
| 9 | 120 | 1825 |
| 10 | 150 | 1855 |
| 11 | 180 | 2040 |
| 12 | 210 | 1980 |

Figure 1

Mooring Line Pattern
WEST DELTA
31/2-17BR



TABLE 1: DAILY REPORT ON WELL 31/2-17BR

Daily report no: 1 Date : 13-feb-1993
 Midnight depth : 370 m MD Estimated PP: sg Mudweight: 1.20 sg

Stop time Description

05:30
 08:00 Rig in transit from well 31/5-5 to well 31/2-17BR.
 23:59 Anchorhandling. Dropped anchor No.10. Prepared to install
 new anchor on No.11.

Daily report no: 2 Date : 14-feb-1993
 Midnight depth : 370 m MD Estimated PP: sg Mudweight: 1.04 sg

Stop time Description

04:30 Anchorhandling. Set piggy back on anchor No.10. Ran in with
 the corrosion cap retrieving tool while anchorhandling.
 05:00 Positioned the rig.
 09:00 Retrieved the corrosion cap and trawl protector.
 12:00 Installed the guide posts and guide base running tool in the
 permanent guide base.
 14:00 Ran the permanent guide base.
 14:30 Positioned the rig
 15:30 Attempted to lock the guide base to the wellhead without any
 success.
 17:30 Retrieved the guide base.
 19:00 Ran in with open ended drill pipe to wash around the
 wellhead.
 19:30 Washed around the wellhead.
 20:00 Pulled out with the open ended drill pipe.
 23:59 Prepared and ran the permanent guide base.

Daily report no: 3 Date : 15-feb-1993
 Midnight depth : 370 m MD Estimated PP: sg Mudweight: 1.04 sg

Stop time Description

01:00 Continued running the guidebase.
 01:30 Positioned the rig.
 02:30 Landed the guidebase on the wellhead. The guide base landed
 too high to lock it to the wellhead housing.
 05:00 Pulled out with the guidebase.
 07:00 Ran in with bit, bitsub and 1 stand of 8" drill collars to
 wash around the wellhead.
 11:30 Washed around the wellhead.
 12:30 Pulled out with the washing string.
 15:00 Made up the guidebase to the running tool and ran the same.
 15:30 Positioned the rig.
 18:00 Made an attempt to lock the guidebase to the wellhead
 housing. No success.
 19:30 Pulled out with the guidebase.
 23:30 Started to modify the guidebase running tool to see the
 piston going down. Rigged down guidebase, running tool and
 work plate. Disconnected the guidelines and laid out the

TABLE 1: DAILY REPORT ON WELL 31/2-17BR

Daily report no: 3 Date : 15-feb-1993
 Midnight depth : 370 m MD Estimated PP: sg Mudweight: 1.04 sg

| Stop time | Description |
|-----------|--|
| 23:59 | guide posts. Prepared and rigged up to run the BOP and riser. |

Daily report no: 4 Date : 16-feb-1993
 Midnight depth : 370 m MD Estimated PP: sg Mudweight: 1.30 sg

| Stop time | Description |
|-----------|--|
| 07:30 | Continued preparing to run the BOP and riser. |
| 15:00 | Ran the BOP. |
| 15:30 | Pressure tested the kill- and choke lines. |
| 17:00 | Installed slip joint, kill- and choke lines and support ring. Positioned the rig. |
| 18:00 | Made attempts to land the BOP while positioning the rig. Landed the BOP and made an overpull test to 25 MT. |
| 19:30 | Laid down landing joint, installed the diverter and rigged down the riser running equipment. |
| 21:30 | Rigged up and ran the BOP test tool. Installed the same in the wellhead. |
| 22:30 | Made several attempts to test the wellhead connector against middle- and upper pipe rams without success. Tested the kill- and choke lines. |
| 23:59 | Pulled the BOP test tool above the BOP and closed the shear ram. Made an attempt to test the wellhead connector against the cement plug and shear ram. No success. |

Daily report no: 5 Date : 17-feb-1993
 Midnight depth : 370 m MD Estimated PP: sg Mudweight: 1.38 sg

| Stop time | Description |
|-----------|---|
| 00:30 | Pulled out of the hole and laid down the test tool. |
| 01:00 | Ran in the hole with open ended drill pipe. |
| 02:00 | Made an attempt to test the wellhead connector against the cement plug and the lower pipe ram. No success. |
| 04:30 | Spotted Fluorecein in the BOP. Pressured up below lower pipe ram. Found fluid leaking through the wellhead connector. Increased wellhead connector operating pressure to 3000 psi. Made several attempts to test the connector. No success. |
| 05:00 | Pulled out of the hole. |
| 07:00 | Rigged up to pull the BOP. |
| 09:00 | Laid down the diverter. Picked up one riser joint and connected the same to the slip joint. Disconnected the BOP and moved the rig 20 m of location. |
| 13:00 | Pulled the BOP. |
| 14:00 | Stopped pulling the BOP due to failure on pod tigger. |
| 17:30 | Continued pulling the BOP and landed the same on the fork lift. |
| 19:30 | Rigged down BOP and riser running equipment. |

TABLE 1: DAILY REPORT ON WELL 31/2-17BR

Daily report no: 5 Date : 17-feb-1993
 Midnight depth : 370 m MD Estimated PP: sg Mudweight: 1.38 sg

| Stop time | Description |
|-----------|---|
| 22:30 | Moved the permanent guidebase from deck to cellar deck. Installed the guidelines and the running tool. |
| 23:59 | Ran the guidebase on HWDP and DP. |

Daily report no: 6 Date : 18-feb-1993
 Midnight depth : 370 m MD Estimated PP: sg Mudweight: 1.38 sg

| Stop time | Description |
|-----------|---|
| 01:30 | Positioned the rig and landed the guidebase over the wellhead. |
| 07:30 | Made several attempts to land, orientate and lock the guidebase to the wellhead. Latched on and performed overpull test. Released the running tool. |
| 09:30 | Pulled out with the running tool and moved the same from cellar deck. |
| 15:30 | Rigged up for running BOP. Picked up 2 riser joints and moved the BOP from the stump to below rotary. Connected the riser joints to the BOP. |
| 23:59 | Waited on lead covered ring gasket to come from Aberdeen. |

Daily report no: 7 Date : 19-feb-1993
 Midnight depth : 370 m MD Estimated PP: sg Mudweight: 1.38 sg

| Stop time | Description |
|-----------|--|
| 01:30 | Continued waiting for ring gasket. |
| 10:00 | Installed ring gasket and ran BOP and riser. |
| 11:00 | Connected kill and choke lines, support ring and positioned the rig. |
| 19:00 | Waited on weather. |
| 20:30 | Positioned the rig. |
| 21:30 | One of the guidewire anchors was pulled out of the guide post. Stabbed the anchor in the post, but it was pulled out again. Pulled the guidewire anchor into the guidepost on the BOP. |
| 22:30 | Landed the BOP. |
| 23:00 | Tested the wellhead connector. |
| 23:59 | Stroked out the slip joint, laid down landing joint and installed the diverter. |

Daily report no: 8 Date : 20-feb-1993
 Midnight depth : 567 m MD Estimated PP: sg Mudweight: 1.38 sg

| Stop time | Description |
|-----------|---|
| 01:30 | Rigged down riser running equipment. Tested kill and choke lines. |

TABLE 1: DAILY REPORT ON WELL 31/2-17BR

Daily report no: 8 Date : 20-feb-1993
 Midnight depth : 567 m MD Estimated PP: sg Mudweight: 1.38 sg

| Stop time | Description |
|-----------|---|
| 02:00 | Ran in the hole with open ended drill pipe. |
| 03:00 | Function tested the BOP on both pods. |
| 03:30 | Pulled out of the hole. |
| 05:30 | Made up 12 1/4" BHA and ran in the hole to 312 m. |
| 06:30 | Slipped and cut the drilling line. |
| 07:00 | Continued running in the hole. Tagged top of cement at 403 m. |
| 17:30 | Drilled cement from 403 m to 536 m. |
| 18:30 | Circulated bottoms up. |
| 20:00 | Pulled out of the hole. |
| 21:30 | Changed the bit and ran in the hole. |
| 23:59 | Drilled cement from 536 m to 567 m. |

Daily report no: 9 Date : 21-feb-1993
 Midnight depth : 1485 m MD Estimated PP: sg Mudweight: 1.38 sg

| Stop time | Description |
|-----------|--|
| 02:00 | Continued drilling cement from 567 m to 612 m. |
| 03:00 | Flow checked. Changed bails and ran in to 620 m. |
| 03:30 | Pulled out of the hole to 249 m due to heave. |
| 05:00 | Waited on weather. Attempted to test the bridge plug at 1485 m without success due to cement bridge below 620 m. |
| 05:30 | Ran in the hole to 630 m. Took weight at 630 m. |
| 06:00 | Washed and reamed from 630 m to 700 m. |
| 07:00 | Ran in the hole to 1470 m. |
| 08:30 | Pumped a 8 m3 hi-vis pill and displaced the hole to 1.38 sg mud. |
| 09:30 | Pressure tested surface and pressure tested the bridge plug at 1485.5 m. |
| 11:30 | Flowchecked and pulled out of the hole to 368 m. |
| 12:00 | Washed and cleaned the wellhead area. |
| 14:00 | Continued pulling out of the hole. |
| 16:30 | Made up seal assembly retrieving tool and ran in with the same. |
| 17:00 | Turned the seal assembly loose with 4 turns to the left with the annular preventer closed. |
| 17:30 | Observed the well. No pressure below annular preventer, no flow after opening choke valve. Opened annular preventer. |
| 19:00 | Pulled out with the seal assembly retrieving tool and laid down the same. |
| 20:00 | Broke out single drill pipe joints on the two running tools for retrievable guide bases. |
| 23:59 | Made up 13 3/8" casing cutter assembly and ran in to 441 m. Made up spear assembly and ran in the hole to 825 m. Landed the spear and cut the casing at 814 m. |

TABLE 1: DAILY REPORT ON WELL 31/2-17BR

Daily report no: 10 Date : 22-feb-1993
 Midnight depth : 450 m MD Estimated PP: sg Mudweight: 1.38 sg

| Stop time | Description |
|-----------|---|
| 02:00 | Performed a flow check. Pulled out of the hole and laid down bumper sub. Racked back the spear assembly and the cutting assembly in the derrick. |
| 03:30 | Made up pack-off on spear assembly and ran in the hole. Landed and engaged the spear. |
| 06:00 | Pulled out of the hole with 13 3/8" casing. Racked back the spear assembly in the derrick. |
| 11:30 | Rigged up to lay down 13 3/8" casing. Laid down 38 joints of casing. Rigged down casing equipment. |
| 13:30 | Made up top 18 5/8" wiper plug on mandrel and 5" drill pipe. Ran in to 800 m. |
| 14:00 | Dropped the dart, pumped down the same and sheared the plug with rig pumps. |
| 14:30 | Pulled out to 700 m and lined up to the cement unit. |
| 16:00 | Pressure tested the surface lines. Pumped 2 m3 of seawater, 40 m3 of 1.90 sg cement slurry and 194 l seawater. Displaced the cement with 3.5 m3 of 1.38 sg mud. |
| 16:30 | Pulled out to 398 m. |
| 17:30 | Displaced kill and choke lines and riser to seawater. Washed the wellhead area. |
| 18:00 | Pulled out of the hole. Laid down cement mandrel. |
| 23:30 | Laid down the emergency hang-off tool, 5" HWDP and 13 3/8" casing cutting assembly. Built up 18 5/8" casing cutting assembly. |
| 23:59 | Made an attempt to pressure test the cement plug against the shear ram. No success. |

Daily report no: 11 Date : 23-feb-1993
 Midnight depth : m MD Estimated PP: sg Mudweight: 1.38 sg

| Stop time | Description |
|-----------|--|
| 02:00 | Waited on cement. |
| 02:30 | Retested the cement plug. Test OK. |
| 04:30 | Made up a 12 1/4" bit and ran in the hole. Washed down from 375m. Tagged solid cement at 446m. Load tested the cement with 10 ton. |
| 05:30 | Pulled out of the hole. |
| 10:00 | Rigged up to pull the riser and the BOP. Laid down the diverter element. Collapsed the slip joint. Rigged down the kill and choke lines. Laid down the slip joint. |
| 14:00 | Pulled the riser and the BOP. |
| 16:30 | Set the BOP on the fork lift. Disconnected the riser joints and moved the BOP out of rotary center. Laid down riser joints. |
| 17:00 | Rigged down the BOP handling equipment. |
| 20:00 | Made up 18 5/8" x 30" casing cutting assembly. Ran in to the top of the wellhead while pulling anchor no.10. |
| 21:30 | Positioned the rig. |
| 22:00 | Stabbed the cutting assembly into the wellhead. Engaged the |

TABLE 1: DAILY REPORT ON WELL 31/2-17BR

Daily report no: 11 Date : 23-feb-1993
 Midnight depth : m MD Estimated PP: sg Mudweight: 1.38 sg

| Stop time | Description |
|-----------|--|
| | spear and performed overpull test. |
| 23:30 | Cut the 18 5/8" and 30" casing. |
| 23:59 | Pulled out of the hole with the permanent guide base and the wellhead. Inspected the sea bed with the ROV. |

Daily report no: 12 Date : 24-feb-1993
 Midnight depth : 0 m MD Estimated PP: sg Mudweight: 1.38 sg

| Stop time | Description |
|-----------|--|
| 02:00 | Continued pulling the guide base and the wellhead out of the water. |
| 08:00 | Deballasted the rig and performed anchor handling. Retrieved the wellhead from the guide base and laid down the cutting assembly while deballasting. |
| 11:30 | Performed anchorhandling. |
| 23:59 | Waited on the weather to continue anchorhandling. |

Daily report no: 13 Date : 25-feb-1993
 Midnight depth : 0 m MD Estimated PP: sg Mudweight: 1.38 sg

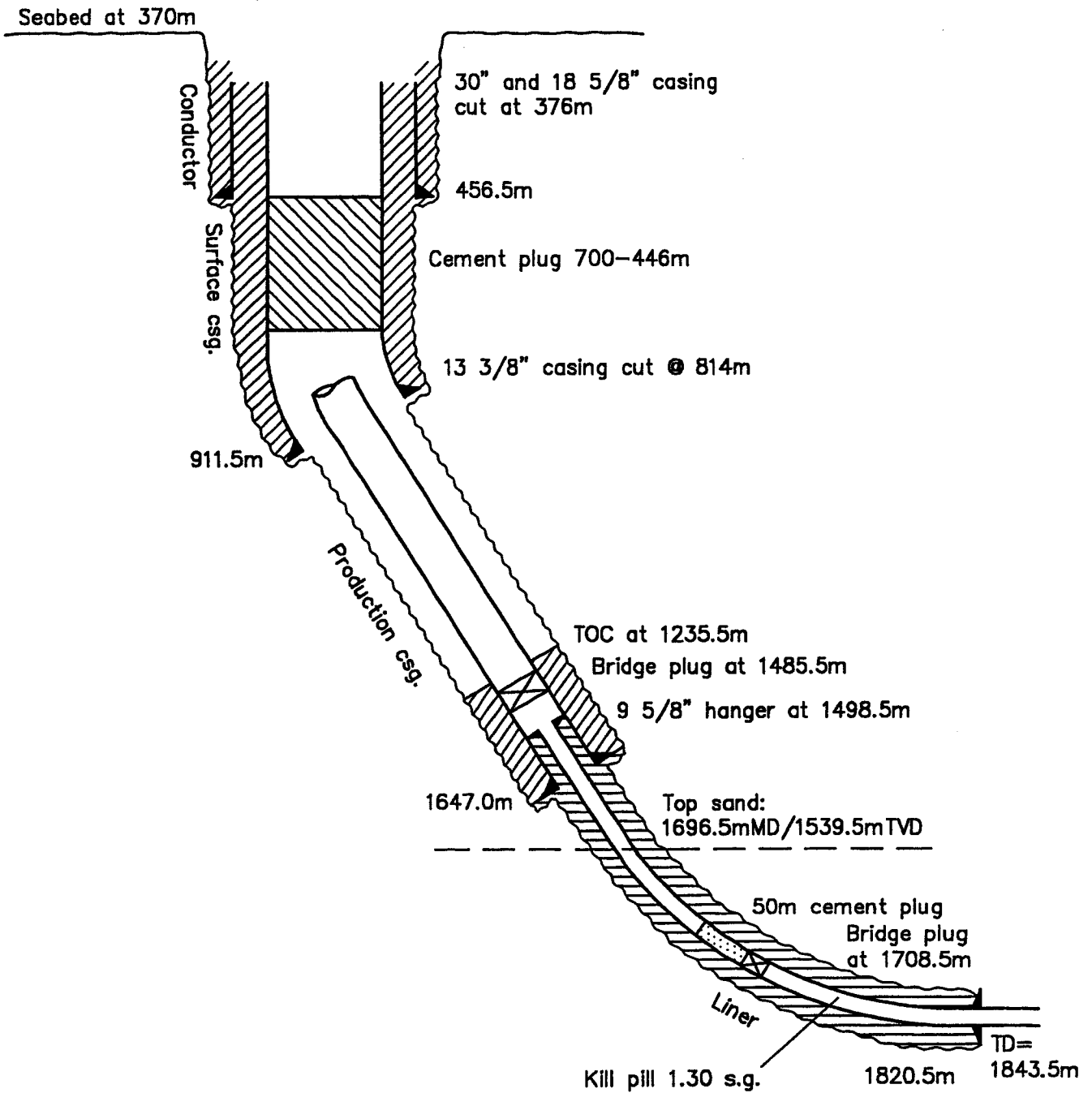
| Stop time | Description |
|-----------|---|
| 23:59 | Waited on the weather to continue anchorhandling. |

Daily report no: 14 Date : 26-feb-1993
 Midnight depth : m MD Estimated PP: sg Mudweight: 1.38 sg

| Stop time | Description |
|-----------|--|
| 01:00 | Waited on the weather. |
| 19:00 | Started deballasting the rig and performed anchor handling. Turned the rig to 195 deg. heading for sailing to new location, well 25/11-17. |
| 23:59 | No activity. |

=====

All depths with reference to RKB.
 RKB-MSL = 29m



| | | | |
|--------------------------------|-------------|---|--|
| FINAL WELL REPORT 31/2-17BR | FIGURE 2 | PERMANENT ABANDONMENT STATUS, WELL 31/2-17BR | |
|--------------------------------|-------------|---|--|

TABLE 2: T I M E D I S T R I B U T I O N

Well: 31/2-17BR
All phases

Rig: WEST DELTA

Depth: 1485.0 m

| Operations | Hours | % | Hours | % | Acc. to |
|--------------------------------------|--------------|-------|-------|-------|---------|
| ===== | | | | | |
| Rig moving | | | | | |
| Rig moving | : 2.5 | 0.77 | | | |
| Mooring | : 48.0 | 14.75 | | | |
| Sum..... | | | 50.5 | 15.51 | 50.5 |
| Plug and abandonment | | | | | |
| Tripping | : 21.0 | 6.45 | | | |
| Circ. and cond. hole and mud | : 3.0 | 0.92 | | | |
| Primary cementing | : 12.5 | 3.84 | | | |
| Slip and cut drilling line | : 1.0 | 0.31 | | | |
| Other | : 17.5 | 5.38 | | | |
| Equipment testing | : 61.5 | 18.89 | | | |
| Mechanical plug | : 1.0 | 0.31 | | | |
| Cutting | : 7.5 | 2.30 | | | |
| Sum..... | | | 125.0 | 38.40 | 175.5 |
| Downtime | | | | | |
| Other | : 2.5 | 0.77 | | | |
| Waiting on weather | : 48.0 | 14.75 | | | |
| Plug and abandon equip repair | : 89.5 | 27.50 | | | |
| Downtime wait | : 10.0 | 3.07 | | | |
| Sum..... | | | 150.0 | 46.08 | 325.5 |
| ----- | | | | | |
| Reported time (100.0 % of well total | 325.5 hours) | : | | | 325.5 |
| ===== | | | | | |

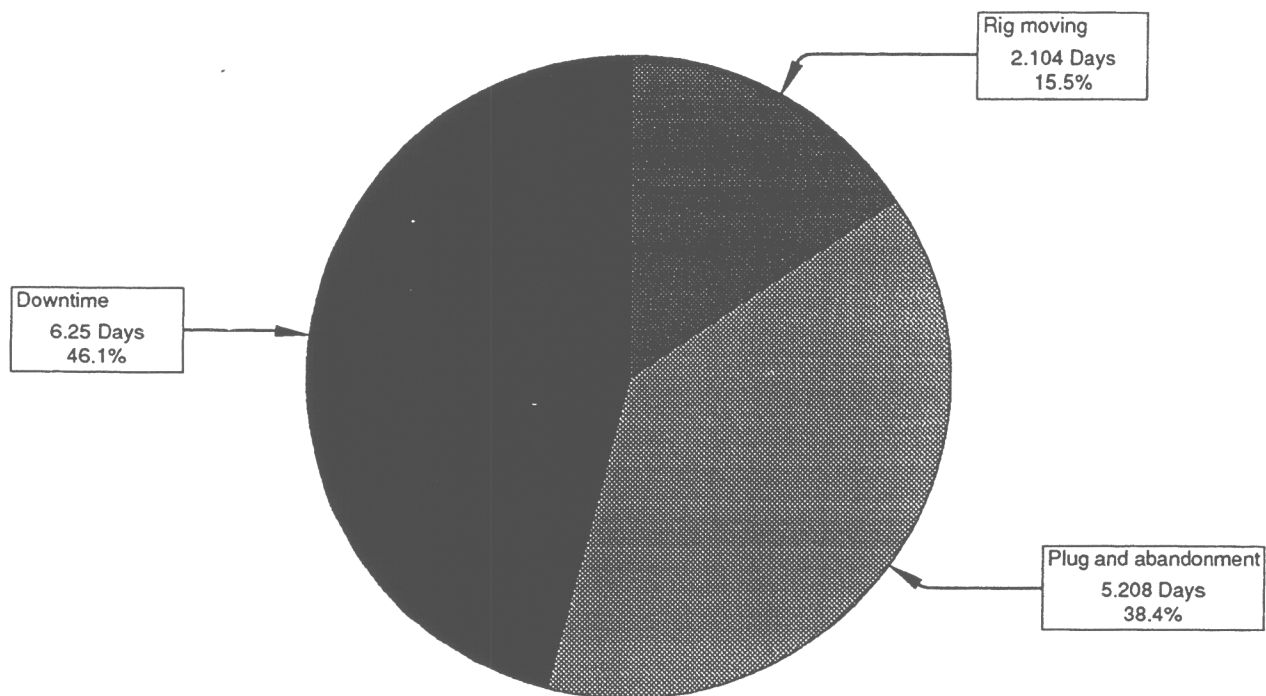


Figure 3

Time Distribution
Well: 31/2-17BR



TABLE 3: BITRECORD FOR WELL 31/2-17BR

| Bit | | Size (in) | Manu facturer | Tradename | Serial no. | IADC code | Nozzles diameter (.732in) | | | Flow area (in ²) | BHA no. | Depth out (m MD) | Bit meter (m) | Rot. hours (hrs) | ROP (m/hr) | Rotation min/max (rpm) | Total bit revol. | Weight min/max (kN) | Flow min/max (l/min) | Pump min/max (bar) | Bit grading | | | | | Remarks | | | | | |
|-----|---------|-----------|---------------|-----------|------------|-----------|---------------------------|---|---|------------------------------|---------|------------------|---------------|------------------|------------|------------------------|------------------|---------------------|----------------------|--------------------|-------------|-----------|------------|-----|-----|---------|---|---|---|----|----|
| No | RR Type | | | | | | I | O | D | | | | | | | | | | | | L | B | Gauge (in) | oth | pul | | | | | | |
| 1 | 4 MITO | 12.250 | REED | MHP11G | A84010 | 117M | 0 | 0 | 0 | 24 | 24 | 24 | 1.325 | 1 | 536 | 133 | 8.90 | 14.9 | 80/106 | 57521 | 20/190 | 2950/2950 | 122/122 | 1 | 1 | WT | A | E | I | NO | TQ |
| 2 | MITO | 12.250 | REED | HP13G | JY2595 | 137 | 0 | 0 | 0 | 24 | 24 | 24 | 1.325 | 2 | 612 | 76 | 3.40 | 22.4 | 80/150 | 28514 | 20/220 | 2970/2970 | 128/128 | 1 | 1 | WT | A | E | I | NO | TD |

TABLE 4: BOTTOM HOLE ASSEMBLIES USED ON WELL 31/2-17BR

| BHA no. | 1: | No./Element/OD(in)/Length(m) | Depth In: | 403 m MD | Out: | 536 m MD |
|---------|--------------------|------------------------------|-----------|--------------------|-------|----------|
| 1 | MHP11G | 12.250 0.34 | 5 | DRILL COLLAR STEEL | 8.000 | 27.12 |
| 2 | BIT SUB | 8.000 0.98 | 6 | X-OVER | 7.500 | 0.58 |
| 3 | DRILL COLLAR STEEL | 8.000 54.60 | 7 | HWDP | 5.000 | 191.25 |
| 4 | JAR | 7.750 9.68 | | | | |

Reason Pulled: TORQUE

Sum: 284.55

BHA no. 2: Depth In: 536 m MD Out: 612 m MD; same elements as in BHA no. 1
 Except Bit, here REED, HP13G (Length 0.34 m)
 Reason Pulled: TOTAL DEPTH/CASING DEPTH

TABLE 7: TOTAL CONSUMPTION OF MUD ADDITIVES ON WELL 31/2-17BR

| Section Size | Product/Additive | Total Amount Planned | Total Amount Used | Unit | Difference | | Difference in cost | |
|--------------|------------------|----------------------|-------------------|------|------------|---|--------------------|--------|
| | | | | | Amount | % | % | [kNOK] |
| 0.0 | BARITE | | 116000.0 | kg | | | | |
| | BENTONITE | | 11000.0 | kg | | | | |
| | IDVIS | | 350.0 | kg | | | | |
| | SODA ASH | | 150.0 | kg | | | | |

TABLE 8: CEMENT/ADDITIVE CONSUMPTION PER JOB ON WELL 31/2-17BR

| Date | CsgSize | Jobtype | Cement/Additive | Description | Unit | Amount | | Difference | | Cost [kNOK] |
|-------------|---------|---------|-----------------|--------------------------------|------|--------------|-------------|------------|---|-------------|
| | | | | | | Planned Used | Actual Used | Amount | % | |
| 22-feb-1993 | 18 5/8" | PLUG | API CLASS G | API CLASS G | MT | | 55.0 | | | |
| | | | A-7L | ACCELERATOR: LIQUID CACL2 | 1 | 1340.0 | | | | |
| | | | FP-6LN | SPECIAL ADDITIVE: DEFOAMER FP- | 1 | 10.0 | | | | |

TABLE 6: MUD RHEOLOGY PARAMETERS FOR WELL 31/2-17BR

Hole section:

WATER BASED SYSTEM

| Date | Depth (m) | | Mud Type | Funnel Visc [sec] | Dens [sg] | Mudtmp Out [DegC] | Fann Readings | | | | | | | | Rheo Test [DegC] | PV [mPas] | YP [Pa] | Gel0 [Pa] | Gel10 [Pa] |
|-------------------|-----------|-----|------------|-------------------|-----------|-------------------|---------------|-----|-----|-----|----|----|----|----|------------------|-----------|---------|-----------|------------|
| | MD | TVD | | | | | 600 | 300 | 200 | 100 | 60 | 30 | 6 | 3 | | | | | |
| 13-feb-1993 23:59 | 0 | 0 | KCL/POLYME | 78.0 | 1.20 | 0.0 | 69 | 47 | 36 | 24 | | | 5 | 3 | 0.0 | 22.0 | 12.0 | 1.0 | 3.0 |
| 14-feb-1993 23:59 | 0 | 0 | KCL/POLYME | 100.0 | 1.04 | 0.0 | | | | | | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 16-feb-1993 22:00 | 0 | 0 | KCL/POLYME | 80.0 | 1.30 | 0.0 | 70 | 48 | 37 | 25 | | | 5 | 3 | 50.0 | 22.0 | 12.5 | 4.0 | 5.0 |
| 17-feb-1993 23:59 | 0 | 0 | KCL/POLYME | 81.0 | 1.38 | 0.0 | 72 | 49 | 38 | 26 | | | 5 | 3 | 50.0 | 23.0 | 12.5 | 4.0 | 5.0 |
| 18-feb-1993 23:59 | 0 | 0 | KCL/POLYME | 81.0 | 1.38 | 0.0 | 71 | 48 | 36 | 24 | | | 5 | 3 | 50.0 | 23.0 | 12.0 | 4.0 | 5.0 |
| 19-feb-1993 22:00 | 0 | 0 | KCL/POLYME | 81.0 | 1.38 | 0.0 | 71 | 48 | 36 | 24 | | | 5 | 3 | 50.0 | 23.0 | 12.0 | 4.0 | 5.0 |
| 20-feb-1993 23:59 | 0 | 0 | KCL/POLYME | 78.0 | 1.38 | 13.0 | 70 | 47 | 39 | 27 | | | 13 | 12 | 50.0 | 23.0 | 11.5 | 7.0 | 18.0 |
| 21-feb-1993 22:00 | 0 | 0 | KCL/POLYME | 65.0 | 1.38 | 0.0 | 68 | 45 | 37 | 25 | | | 11 | 10 | 50.0 | 23.0 | 10.5 | 6.0 | 17.0 |
| 22-feb-1993 22:00 | 0 | 0 | KCL/POLYME | 61.0 | 1.38 | 0.0 | 48 | 32 | 26 | 17 | | | 8 | 7 | 50.0 | 16.0 | 7.7 | 5.0 | 16.0 |
| 23-feb-1993 10:00 | 0 | 0 | KCL/POLYME | 0.0 | 1.38 | 0.0 | | | | | | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 24-feb-1993 10:00 | 0 | 0 | KCL/POLYME | 0.0 | 1.38 | 0.0 | | | | | | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 25-feb-1993 10:00 | 0 | 0 | KCL/POLYME | 0.0 | 1.38 | 0.0 | | | | | | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

TABLE 6: DAILY MUD PROPERTIES : OTHER PARAMETERS FOR WELL 31/2-17BR

Hole section:


WATER BASED SYSTEM

| Date | Depth (m) | | Mud Type | Dens [sg] | Filtrate | | Filt. cake | | HPHT Press/Temp (psi/DegC) | pH | Alkalinity | | | Inhib Chem [Kg/m3] | K+ [mg/l] | CL- [mg/l] | Ca++ [mg/l] | Mg++ [mg/l] | Tot hard [mg] | Percentage | | | CEC [Kg/m3] | ASG [sg] | LGS [Kg/m3] |
|-------------------|-----------|-----|------------|-----------|----------|-----------|------------|-----------|----------------------------|------|------------|---------|---------|--------------------|-----------|------------|-------------|-------------|---------------|------------|---------|----------|-------------|----------|-------------|
| | MD | TVD | | | API (ml) | HPHT (ml) | API (mm) | HPHT (mm) | | | Em [ml] | Pf [ml] | Mf [ml] | | | | | | | Solid [%] | Oil [%] | Sand [%] | | | |
| 13-feb-1993 23:59 | 0 | 0 | KCL/POLYME | 1.20 | 3.2 | 0.0 | 0 | 0 | 0/0 | 8.8 | 0.4 | 0.1 | 0.6 | 135 | 71 | 93 | 220 | 24 | 0 | 12.0 | 0.0 | 0.0 | 260 | 0.0 | 0 |
| 14-feb-1993 23:59 | 0 | 0 | KCL/POLYME | 1.04 | 0.0 | 0.0 | 0 | 0 | 0/0 | 8.8 | 0.4 | 0.1 | 0.6 | 130 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0 | 0.0 | 0 |
| 16-feb-1993 22:00 | 0 | 0 | KCL/POLYME | 1.30 | 3.2 | 0.0 | 0 | 0 | 0/0 | 8.8 | 0.4 | 0.1 | 0.6 | 130 | 71000 | 93000 | 280 | 48 | 360 | 14.0 | 0.0 | 0.0 | 18 | 0.0 | 0 |
| 17-feb-1993 23:59 | 0 | 0 | KCL/POLYME | 1.38 | 3.2 | 0.0 | 0 | 0 | 0/0 | 8.8 | 0.4 | 0.1 | 0.6 | 130 | 71000 | 93000 | 280 | 48 | 360 | 17.0 | 0.0 | 0.0 | 18 | 0.0 | 0 |
| 18-feb-1993 23:59 | 0 | 0 | KCL/POLYME | 1.38 | 3.2 | 0.0 | 0 | 0 | 0/0 | 8.8 | 0.4 | 0.1 | 0.6 | 130 | 71000 | 93000 | 280 | 48 | 360 | 17.0 | 0.0 | 0.0 | 18 | 0.0 | 0 |
| 19-feb-1993 22:00 | 0 | 0 | KCL/POLYME | 1.38 | 3.2 | 0.0 | 0 | 0 | 0/0 | 8.8 | 0.4 | 0.1 | 0.6 | 130 | 71000 | 93000 | 280 | 48 | 360 | 17.0 | 0.0 | 0.0 | 18 | 0.0 | 0 |
| 20-feb-1993 23:59 | 0 | 0 | KCL/POLYME | 1.38 | 3.2 | 0.0 | 0 | 0 | 0/0 | 10.8 | 0.4 | 0.1 | 0.6 | 110 | 65000 | 88000 | 200 | 24 | 240 | 17.0 | 0.0 | 0.0 | 27 | 0.0 | 0 |
| 21-feb-1993 22:00 | 0 | 0 | KCL/POLYME | 1.38 | 3.2 | 0.0 | 0 | 0 | 0/0 | 10.8 | 0.4 | 0.1 | 0.6 | 110 | 64000 | 88000 | 200 | 24 | 240 | 17.0 | 0.0 | 0.0 | 27 | 0.0 | 0 |
| 22-feb-1993 22:00 | 0 | 0 | KCL/POLYME | 1.38 | 3.2 | 0.0 | 0 | 0 | 0/0 | 10.8 | 0.4 | 0.1 | 0.6 | 110 | 64000 | 88000 | 200 | 24 | 240 | 17.0 | 0.0 | 0.0 | 28 | 0.0 | 0 |
| 23-feb-1993 10:00 | 0 | 0 | KCL/POLYME | 1.38 | 0.0 | 0.0 | 0 | 0 | 0/0 | 10.8 | 0.4 | 0.1 | 0.6 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0 | 0.0 | 0 |
| 24-feb-1993 10:00 | 0 | 0 | KCL/POLYME | 1.38 | 0.0 | 0.0 | 0 | 0 | 0/0 | 10.8 | 0.4 | 0.1 | 0.6 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0 | 0.0 | 0 |
| 25-feb-1993 10:00 | 0 | 0 | KCL/POLYME | 1.38 | 0.0 | 0.0 | 0 | 0 | 0/0 | 10.8 | 0.4 | 0.1 | 0.6 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0 | 0.0 | 0 |

2. FINAL COST REPORT

17.

NORSK HYDRO A.S
 DRILLING SECTOR P&A

WELL : 31/2-17
 LICENS : LTV
 RIG : WEST DELTA
 DEPTH IN METER :
 RIG RATE : USD 53.344
 EXCHANGE RATE USD 1 = 
 DAYS PLANNED : 7,700
 DAYS USED : 13,562
 DATE OF REPORT : 01/09-93

FINAL WELL COST REPORT (in 1.000 NOK)

| | BUDGET | ACTUAL |
|-----------------------------------|--------------|---------------|
| 0 EMPLOYEE RELATED COSTS | 525 | 659 |
| 1 RIG COSTS | 3.539 | 4.855 |
| 2 RIG SUPPORT COSTS | 474 | 836 |
| 3A Fuel/lub | 243 | 259 |
| 3C Bits | 45 | 41 |
| 3D Casing/casing equipment | 0 | 0 |
| 3E Wellhead | 61 | 465 |
| 3F Cement/cement additives | 60 | 157 |
| 3G Mud & Mud chemicals | 150 | 110 |
| 3 CONSUMABLES COSTS, SUB TOTAL | 559 | 1.032 |
| 4B Fix. wing transport | 0 | 28 |
| 4C Other transportation | 39 | 48 |
| 4D Standby vessels | 220 | 336 |
| 4F Helicopter transport | 221 | 411 |
| 4G Supply vessels | 893 | 2.124 |
| 4 TRANSPORTATION COSTS, SUB TOTAL | 1.373 | 2.947 |
| 5A Coring | 0 | 0 |
| 5B Drilling | 154 | 75 |
| 5C Cutting of casing | 288 | 246 |
| 5D | | |
| 5F MWD-services | 148 | 0 |
| 5G Casing operations | 30 | 102 |
| 5H Mud logg & mud services | 294 | 254 |
| 5I Cement/press.test | 105 | 134 |
| 5J El. logging | 0 | 85 |
| 5K VSP | 0 | 0 |
| 5L Prod.testing | 54 | 103 |
| 5M Diving/ROV | 217 | 308 |
| 5N Misc.rental & op.costs | 309 | 1.065 |
| 5 SERVICE COSTS, SUB TOTAL | 1.599 | 2.372 |
| 6A Site survey | 0 | 0 |
| 6B Rig positioning | 250 | 71 |
| 6C Drilling site clean up | 300 | 0 |
| 6 SURVEY COSTS, SUB TOTAL | 550 | 71 |
| 7 WAREHOUSE COSTS | 231 | 694 |
| 8 LAB COSTS, SUB TOTAL | 0 | 0 |
| TOTAL OPERATION COSTS | 8.850 | 13.466 |

3. EQUIPMENT FAILURE AND PROBLEMS

| <u>Date</u> | <u>Failure/problem</u> | <u>Description</u> |
|-------------|------------------------|--|
| 14.02.93 | Guide base | Unable to lock guide base to wellhead housing. Ran guide base three times without success. |
| 16.02.93 | Wellhead connector | Leak in wellhead connector after landing BOP. Pulled and re-ran BOP. |
| 17.02.93 | POD tugger | Failure on POD tugger when pulling the BOP. |
| 19.02.93 | Weather | To rough weather to land the BOP. |
| 21.02.93 | Weather | To rough weather to continue operation. |
| 24.02.93 | Weather | To rough weather to perform anchorhandling. |