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Message: 2011/0392059**From:****To:****Cc:****Sent:** 25/7/2011 at 09:30**Received:** 25/7/2011 at 09:32**Subject:** Notification for Completion and Welltest for Markwells Wood-1 Onshore Well S. England**Attachments:** [25.07.2011 HSE Markwells Wood-1 Completion and Test Programme.pdf](#)
(1 MB)

Good Morning ,

As discussed today Northern Petroleum Plc London plan to complete and test the Markwells Wood-1 (MW-1) onshore well in end August early September 2011.

The MW-1 was suspended on 26 Dec 2010. A brief note regarding this is below, details are within the attached notification:

The well was suspended safely with 2 mechanical barriers (EZSV- bridge plug @220ft MD), 2 7/8" killstring @ 600ft with BPV below the tubing hanger and with 8.8ppg brine. The barriers were pressure tested at 250psi and 3000psi and were all OK. Attached is an HSE submission notification for re-entry, completion and welltest. The notification contains information as set out in Schedule 1 of the Borehole Sites and Operations 1995 Regulations.

2. Northern Petroleum will have an independent competent well examiner (NRG) to review all work that takes place on the well to comply with regulation 18 of the Wells aspects of the offshore Installations and Wells (Design and construction etc) Regulations 1996.

If you have any queries regarding the subject well s HSE notification submission, please contact me (details as below) and kindly copy e-mails to

Thanks

Best Regards

Northern Petroleum Plc
Martin House, 5 Martin Lane
London UK EC4R 0DP

Tel: +44

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From: .

Sent: 23 February 2011 08:51

To:

Subject: UK Oil and Gas Guidelines on Well Abandonment

Attached guidelines for abandonment of wells - this is the standard that we expect well operators to meet

Regards

Tel

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NORTHERN PETROLEUM (GB) LTD

MARKWELLS WOOD-1

PEDL 126



Markwells Wood-1 Appraisal Well Completion & Well Test Programme

Document : Completion & Well Test Prog Markwells Wood-1 Rev2.docx

Revision No.: 2

Revision Date: 14 July 2011

Controlled : No

Task	Title	Signed	Date
Prepared by :	<i>Petroleum Engineer InterAct</i>		14 July 2011
Reviewed by	Independent Completions Supervisor		19 July 2011
Checked by :	<i>Senior Drilling Engineer Northern Petroleum</i>		20 July 2011
Approved by :	<i>Operations Director Northern Petroleum</i>		
Approved by :	<i>Exploration Manager Northern Petroleum</i>		

**Completion and Well Test Programme Distribution List**

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Completion & Well Test Supervisor [Wellsite]	6
Rig Manager [Wellsite]	7
Tool Pusher [Wellsite]	8
	9
Managing Director (Magellan Petroleum (N.T.) Pty Ltd)	10
Managing Director (Egdon Resources plc)	11



BACKGROUND

INTRODUCTION

The Markwells Wood – 1 well (MW-1) is to be completed with a work-over rig, and then well tested. These completion & well test activities follow the drilling & well suspension carried out during 2010.

Operations at the Well Site will continue under the management and safety systems as defined in the original Drilling Programme and Health and Safety Document.

The Northern Petroleum 'Completion & Well Test Supervisor' will have overall responsibility for all downhole and surface operations. During the completion and well test operations the work-over rig management team will be supplemented by specialist completion and well test personnel as necessary.

In addition on-site Service Company Representatives will be responsible for:

- Safe operation and installation of their equipment as per their company's approved operating procedures
- Checking their equipment promptly at the Well Site and informing the Northern Petroleum 'Completion & Well Test Supervisor' of their equipment status and any equipment shortfalls
- Obtaining the relevant work permits from the Northern Petroleum Company Rep.
- Carrying out work according to applicable method statements, risk assessments and with certified equipment
- Recorded 'Tool Box Talks' to be carried out at the start of each shift and before each major operation
- Completion operations will be carried out on a 12 hour / day time basis only, and the well test operation will be carried out on a 24 hour basis.

All questions or concerns relating to this Programme should be addressed to:

Name:			Drilling and Completions Manager
Position:			
Tel:			
Email:			



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COMPLETION AND WELL TEST OBJECTIVES

- Plug back open hole section to 5,593 ft, to isolate lower water zone
- Complete well with 2.7/8" completion and downhole rod pump
- Carry out an initial 10 day well test to evaluate productivity of the Great Oolite reservoir (open-hole section 5,443 to 5,593ft, 150ft). If low ie <30 bopd, an acid stimulation of the reservoir will be carried out. The well test will then continue for a further 20 days.
- Quantify productivity from the Great Oolite limestone over well test period
- Confirm oil zone identified by logs (5,443 to 5,593ft, 150ft)
- Confirm reservoir and fluid parameters
- To execute this programme safely, with no HSE incidents or environmental spills, no equipment failures, and on time & budget

WELL STATUS

The well is suspended with a 2.7/8" kill string to 600ft and a EZSV bridge plug @ 2200 ft. The tubing hanger has a back pressure valve (BPV) installed. The 9.5/8" casing shoe is at 5443 ft (Cornbrash), and the 8 1/2" open-hole section (Great Oolite reservoir) has been drilled to 5988 ft. The open-hole section has washouts of up to 10.5". An 11" 3K NOV wellhead spool has been installed on the top of the 9 5/8" casing. A tubing head adaptor and 2.9/16" gate valve are installed on the wellhead.

H₂S and CO₂ are not expected to be present. This is based on a review of adjacent wells, i.e. Horndean.

The 11" Wellhead and the 9 5/8" casing has been tested to 3000 psi.

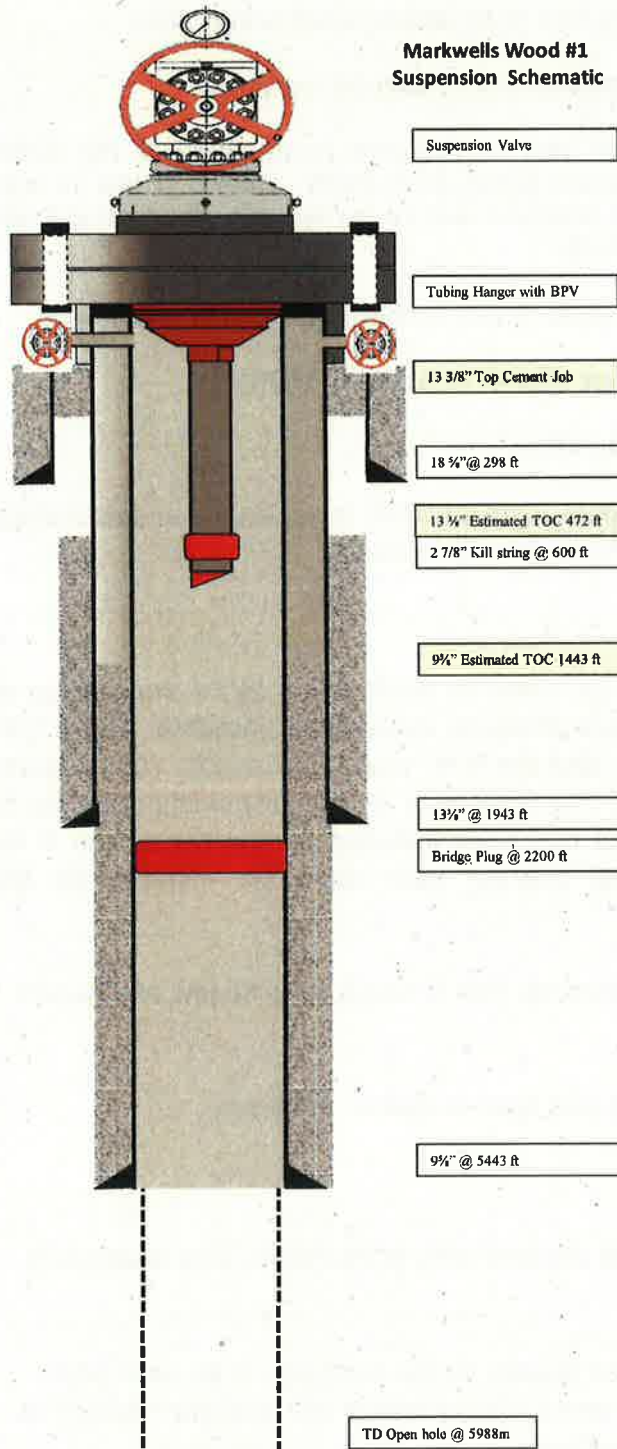
The well is filled with 8.8 ppg brine

The work-over rig will be installed over the well with BOPs (blind, pipe & annular) tested to 3000 psi.

Note: the Great Oolite reservoir section is open to the wellbore, ie an open hole completion. Two barriers, or a barrier and a full column of kill fluid are required at all times between the reservoir and surface.



Present Well Suspension Schematic





OUTLINE PROCEDURE

- Install rig & BOPs
- Pull BPV (back pressure valve) & kill string
- Drill bridge plug & push to bottom
- Circulate graded CaCO_3 pill into well via work-string from ~5,988 to 5,605ft
- Using wireline dump bailer, dump cement from 5,605ft to 5,593ft (12ft)
- WOC (wait in cement), tag cement with work-string & circulate well to completion brine
- Run completion, land tubing hanger, install slickline plug in tubing, set packer, pressure test tubing & annulus, set BPV in tubing hanger
- Remove BOPs & install surface valves
- Pull slickline plug & BPV, open SSD
- Install down-hole pump & rods
- Install surface linear rod pump
- Install surface well test facilities (this will be carried out in parallel with above activities)
- Start pump & conduct 10 day well test
- If productivity low carry out acid job, ~5 days estimated
- Conduct 20 day well test
- If economic oil production rates established, ongoing well testing will be considered.

Note: To improve the chances of a successful acid job, perforating with 4.1/2" tubing conveyed guns may be carried out prior to acid stimulation. For perforating to go ahead; the completion will need to be pulled, the perforating carried out & the completion re-run, prior to the acid stimulation. The packer is a retrievable type, being a straight pull release. A re-dress prior to re-run / re-completion being necessary. This workover / perforating operation would be the subject of a separate programme.



BARRIERS

The following barriers will be in place for the listed operations:

ACTIVITY	BARRIERS	
	TUBING / WORK STRING	ANNULUS
Pull BPV / kill string	Stabbing valve, fluid column & bridge plug @ 2200'	Rig BOPs, fluid column & bridge plug @ 2200'
Drill bridge plug	Check valve in string & fluid column	Rig BOPs & fluid column
Spot CaCO ₃	Check valve in string & fluid column	Rig BOPs & fluid column
Slickline dump bailer	Not present	Rig BOPs & fluid column
Run completion	Stabbing valve & fluid column	Rig BOPs & fluid column
Slickline operations	Rig BOPs & fluid column	Annulus valve & fluid column
BPV operations	Rig BOPs & fluid column	Annulus valve & fluid column
Remove BOPs & install Xmas tree	(x2) plugs & fluid column	Packer, tubing hanger & fluid column
Install rods	Rod BOP & fluid column	Tubing hanger & fluid column
Well test	Rod BOP & downhole pump shut down	Annulus valve (x2?)
Coiled tubing acid job	Coiled tubing BOPs (dual rams)	Packer (SSD closed) & annulus valve
Bullhead acid job	(x2) Xmas tree valves	Packer (SSD closed) & annulus valve
Perforating	Not present	Rig BOPs

COMPLETION FLUID

The well is suspended with 8.8 ppg brine in the hole. This fluid weight should be maintained for all workover and completion fluid unless there is formation pressure data which indicates that a lower density fluid is acceptable. Produced water at 8.9 ppg is the most commonly used fluid in nearby fields. This programme refers to the fluid to be used as "completion brine".

SURFACE LAYOUT

The test and acidizing phases have been risk assessed and P&ID drawings for the surface layout produced. It is most important that the surface layout is done per the drawings. Any deviations must be risk assessed, approved and properly documented.



COMPLETION ACTIVITIES

COMPLETION DETAILS

The properties of the tubing string are as follows:

2 7/8", 6.5 #/ft. K55, EUE

- Wall Thickness= 0.217 inch = 5.51mm
- ID =2.44 inch = 62mm
- Drift Diameter = 2.347inch=59.61mm
- Collapse Resistance = 7,680psi
- Burst Resistance = 7,260psi
- Tensile -Joint Yield Strength (Threaded and Coupled Upset) = 99,700 lbs.

The completion to be run, with components from top to bottom is as follows:

	2 7/8" Landing joint (to be retrieved)
Sub Assembly 5	NOV 11" X 2 7/8" tubing hanger with BPV profile 2 7/8" EUE pup joint
Tubing String	2 7/8" 6.5 ppf. K55 EUE Tubing (ca. 5100 ft.)
Sub Assembly 4	2 7/8" EUE 6.5 lbs. K55 / L80 Pup Jt. 2.313 SSD c/w 2.313 X nipple profile 2 7/8" EUE 6.5 lbs. K55 / L80 Pup Jt.
Tubing	1 joint 2 7/8" 6.5 ppf. K55 EUE Tubing
Sub Assembly 3	2 7/8" EUE 6.5 lbs. K55 / L80 10' Pup Jt. 2 7/8" EUE X 3 1/2" EUE Tubing Cross Over Weatherford 9 5/8" x 2 7/8" EUE Hydro Retrievable Packer 2 7/8" EUE X 3 1/2" EUE Tubing Cross Over 2 7/8" EUE 6.5 lbs. K55 / L80 10' Pup Jt.
Tubing	1 joint 2 7/8" 6.5 ppf. K55 EUE Tubing
Sub Assembly 2	2 7/8" EUE 6.5 lbs. K55 / L80 Pup Jt. 2.313" X Nipple c/w 2 7/8" EUE Threads 2 7/8" EUE 6.5 lbs. K55 / L80 Pup Jt.
Tubing	1 joint 2 7/8" 6.5 ppf. K55 EUE Tubing
Sub Assembly 1	2 7/8" EUE 6.5 lbs. K55 / L80 10' Pup Jt. 2 7/8" EUE 6.5 lbs. K55 / L80 10' Perforated Pup Jt. 2.313" XN Nipple c/w 2 7/8" EUE Threads 2 7/8" EUE 6.5 lbs. K55 / L80 10' Pup Jt. Wireline Entry Guide

The completion tail-pipe includes a 2.313" XN nipple (2.205" NO GO) below a perforated pup joint and a 2.313" X nipple above to allow the use of memory gauges. A retrievable packer will be set in the 9 5/8" casing with 3 wireline landing nipples installed, one above (in the SSD), one below the packer and one below the perforated joint. Wireline plugs will be used for packer setting / tubing testing / well barriers.



The completion tubing will be tested to 3000 psi and the tubing / casing annulus will be tested to 3000 psi. The 3000 psi tests are high enough to accommodate maximum anticipated pressures for rod pump operations.

RE-ENTER WELL & PLUG BACK OPEN HOLE SECTION

1. Install work-over rig over well
2. Check tubing for pressure on gauge above suspension valve. Bleed off if required. Open suspension valve & again check for pressure. Bleed off if required. Check tubing x 9.5/8" annulus for pressure.

Note: There should be no tubing or annulus pressure, except due to temperature effects, with BPV in tubing hanger & bridge plug @ 2200 ft.

3. Remove suspension valve. Install riser & BOPs.
4. Pressure test riser & BOPs
5. Pull BPV (back pressure valve) using rods
6. Pull kill string using THRT (tubing hanger retrieval tool)
7. Drill EZSV bridge plug using 8.1/2" bit, junk sub & mud motor, & push to bottom or retrieve with packer picker. After pushing packer to bottom, circulate the well to clean 8.8 ppg brine.
8. Circulate graded CaCO₃ pill into well via 3.1/2" work-string from ~5,988 to 5,605ft (383 ft). Refer to MI SWACO recipe.
9. Using wireline dump bailer, dump cement from 5,605ft to 5,593ft (12ft)

Step 1 Drift and Memory Gauges (for Trigger Setup)

- i) Make up the wireline tool-string c/w drift and memory gauges, (10 second sample rate).
- ii) Drift to tag and record HUD, pick up 6 ft above HUD, flag wire and complete a 10 minute station stop.
- iii) POOH.
- iv) At surface breakout tools and download data.

Step 2 Dump Cement

- i) Mix cement as per procedures.
- ii) Programme the memory trigger using parameters from drift run.
- iii) Fill the cement dump bailer (4 off tubes) and make up to the wireline tool-string.



- iv) RIH to flag; wait for the trigger to time out, and the bailer to dump the cement.
- v) POOH and breakout the bailer.
- vi) Repeat steps 1 to 6 an additional 4 times.

10.WOC (wait in cement)

- 11.RIH and tag / dress cement with 8.1/2" bit on work-string & circulate well to completion brine. Also include in work-string a 9.5/8" casing scraper, and scrape across packer setting depth @ 5,350ft, & to just above the 9.5/8" casing landing collar @ 5290 ft. POOH.

COMPLETION PREPARATION

1. Retrieve the wear bushing.
2. Ensure the pipe rams are suitable for the completion string. If not, change the rams and test the BOPs to 250 psi/5min and 3000 psi /10 min.
3. Check off the completion equipment against their data sheets or module release sheets, and ensure each component part number has been recorded.
4. Visually inspect completion equipment and packer sub-assembly to ensure that they have not been damaged during transport.
5. Drift all completion equipment to 2.347" for full bore, or relevant plug size as applicable.
6. Measure each module/module component (Lengths and O.D).
7. Check the correct number and type of shear screws are fitted to packer.
8. Inspect and check all completion, sub-assembly, tubing and crossover threads.
9. Check for damage to seals and threads and drift tubing hanger (2.347") and running tool.
10. Check the tubing bonnet, nuts, studs and seal ring.
11. Check the suspension valve nuts, studs and seal ring.
12. Record the part numbers and serial numbers of all the completion components.



13. Ensure copy of certification is available for all components, including pressure tests charts of individual valves. Make a document package of the certificates, record of part numbers / serial numbers and tallied lengths.
14. Check that and all required wireline running and pulling tools are of the correct size and on site and that adequate re-dress kits are available.
15. Check that all required plugs, including the tubing hanger BPV are dressed and ready to run.
16. Check that the relevant well control crossovers to be made up to the rig TIW valve and on the rig floor in case of back-flow.
17. Check the distance from the top of the 11" wellhead spool to the drill floor and ensure that the tubing hanger landing joint is of a suitable length to work with at the drill floor (ca. 3 ft. stick up).
18. Make up the required landing joint and make a dummy run with tubing hanger (sub-assembly #5) and landing joint. The tubing hanger will have been shipped made up with an EUE pup joint below and the tubing hanger running tool above (tubing hanger running tool connection to be advised – pressure sealing to 3000 psi required).
19. Land the tubing hanger in the wellhead. Make sure it is properly landed by checking the engagement of the hold down screws. Mark the landing joint at the floor with the hanger in place.
20. Ensure the hold down bolts have been backed out and retrieve the tubing hanger sub-assembly, standing it back for pick up at the appropriate time.

COMPLETION PROCEDURE

1. Hold a pre job safety meeting / Tool Box Talk with all participants prior to running the completion.
2. Driller to ensure well is kept full completion brine at all times.
3. Pick up Half Mule Shoe / Wireline Entry Guide and make up to 10ft pup joint, 2.313" XN nipple, 10ft perforated pup joint and 10ft pup joint. Use chain tongs to check that the mule shoe has been made up. Dog Collar to be used until 2.313" SSD run.
4. Run & make up one joint 2 7/8" tubing as per tally.
5. Run & make 6ft pup joint to 2.313" X Nipple complete and 10ft pup joint.



6. Run & make up one joint 2 7/8" EUE tubing as per tally.
7. Run pre-made up sub-assembly consisting of 9 5/8" Weatherford Hydro Retrievable Packer complete with crossovers and pup joints either end, and make up to 2 7/8" tubing.
8. Run & make up one joint 2 7/8" EUE tubing as per tally.
9. Run & make up 6ft pup joint, 2.313" SSD assembly with integral 2.313" X nipple, and 10ft pup joint.
10. Run & make up 2 7/8" EUE tubing as per tally to place packer at setting depth ca. 5350 ft. Ensure tubing and annuls are kept full of completion brine at all times as it is run.
11. Check the number of tubing joints left on deck against the running list. Recheck tubing tally and check the space out is correct prior to picking up the tubing hanger.
12. Pick & make up 6ft pup joint, tubing hanger and landing joint and RIH. Check and record up and down weights and land the tubing hanger in the wellhead. Check the mark on the landing joint to ensure the hanger is fully seated in the wellhead.
13. Tighten the tubing hanger hold down bolts and test the tubing hanger to 3,000 psi through its test port per the manufacturer's instructions (check possible). Carry out an over pull to 5K above the down weight or as advised by the Wellhead and Completion Engineers.
14. Make up test head to landing joint.
15. Open the A Annulus Valve in order to monitor the 2 7/8" X 9 5/8" annulus when pressure testing the tubing and setting the packer and testing the tubing.
16. Line up to Test Pump via the Test tree / Pump in Tee (confirm Rig Up).
17. RU slickline and run / install plug in 2.313" X nipple in SSD (2 runs, plug body & prong).
18. Pressure test tubing to 3000 psi for 10 min to ensure all 2 7/8" EUE connections are pressure tight.
19. Retrieve 2.313" plug & prong.
20. Install plug and prong in X nipple below the packer.



21. Pressure up the tubing to 500 psi for 10 min. (Tubing Test). Then pressure up in increments as per the Completion Engineer / Packer Reps instructions to set the packer. Hold the final setting pressure of 3000 psi for 20 minutes, or as advised by the supplier's representative. Record the volume of fluid pumped and monitor the annulus for any returns during the setting procedure.
22. After the packer has been set and the tubing tested, release the pressure on the tubing
23. Run slickline and pull the prong/plug to test annulus so returns can be seen
24. Line up the test pump to the tubing by 9.5/8" casing annulus. Pressure test the tubing annulus via the 9 5/8" annulus valve to 3000 psi for 10 min. Bleed down annulus.
25. Re-run prong /plug as barrier and test. Observe well?
26. Pick up and make up Polished Rod Lubricator to Test Head, Set BPV in Tubinghanger and test same. Rig down test head.
27. Rig down the Rig BOPs and make up the tubing bonnet and 2.9/16" isolation valve. Independently pressure test the tubing bonnet and isolation valve(s) to 250 psi/ 5 min and 3000 psi / 10 min per the Completion and Wellhead Engineers' instructions.
28. RU Polished Rod Lubricator & pull BPV
29. Partially RU up Xmas tree ie block, (x2) 2.9/16" wing valves & 2.9/16" swab valve
30. RU slickline BOPs / lubricator & pressure test to 3000 psi. Ensure both tubing and annulus are full of fluid prior to shifting sleeve.
31. Open SSD above packer. Hook up to annulus and check SSD is open by reverse circulating for 5 min.
32. Retrieve 2.313" X plug from X nipple below packer (2 runs for plug body & prong).
33. Install rod BOP & stuffing box.
34. Run down-hole pump on rods with rod centralisers. Set pump @ ~5250ft. (Setting method TBC).
35. Install surface linear rod pump unit. (Details TBC).
36. Clamp polished rod to clamp.

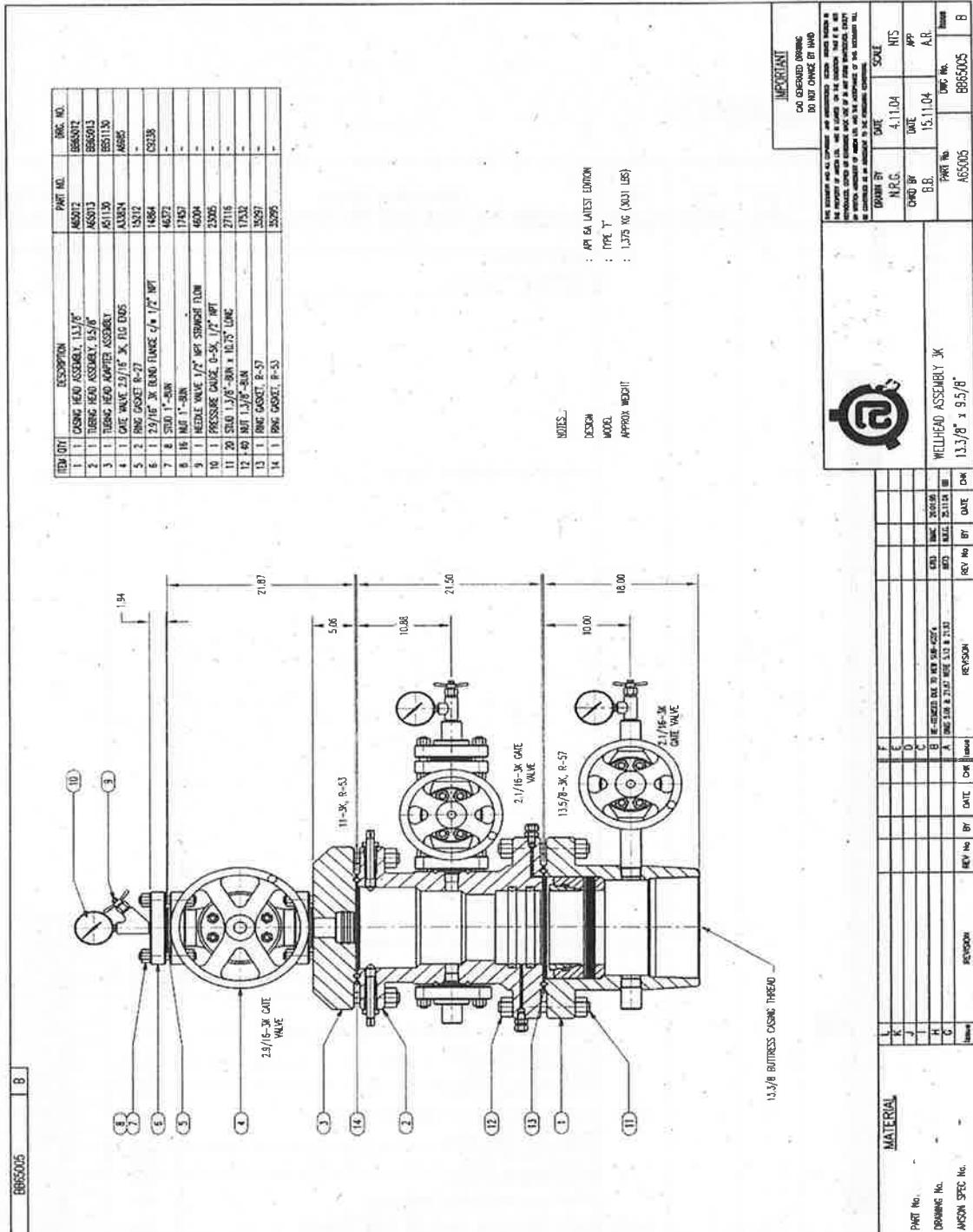


COMPLETION SCHEMATIC

					S.A Nos	OD Inches	ID Inches	Description of Item Including Part Nos & Serial Nos Where applicable	Length	Depth To Top (from GL)
					5			Tubing Hanger	2.0	5.0
								2 7/8" EUE Pup Joint	6.0	7.0
								2 7/8" EUE Production Tubing	5279.0	13.0

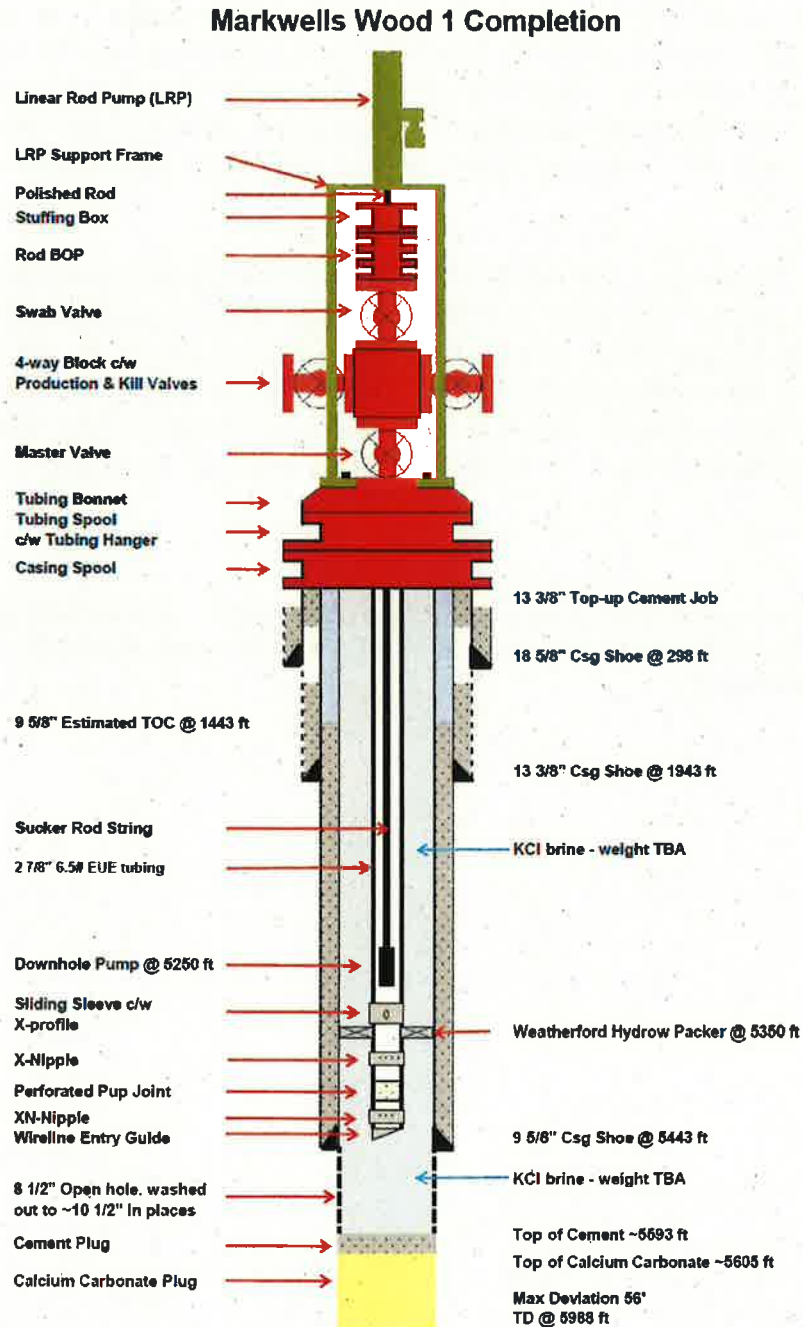


WELLHEAD SCHEMATIC





FINAL WELL SCHEMATIC





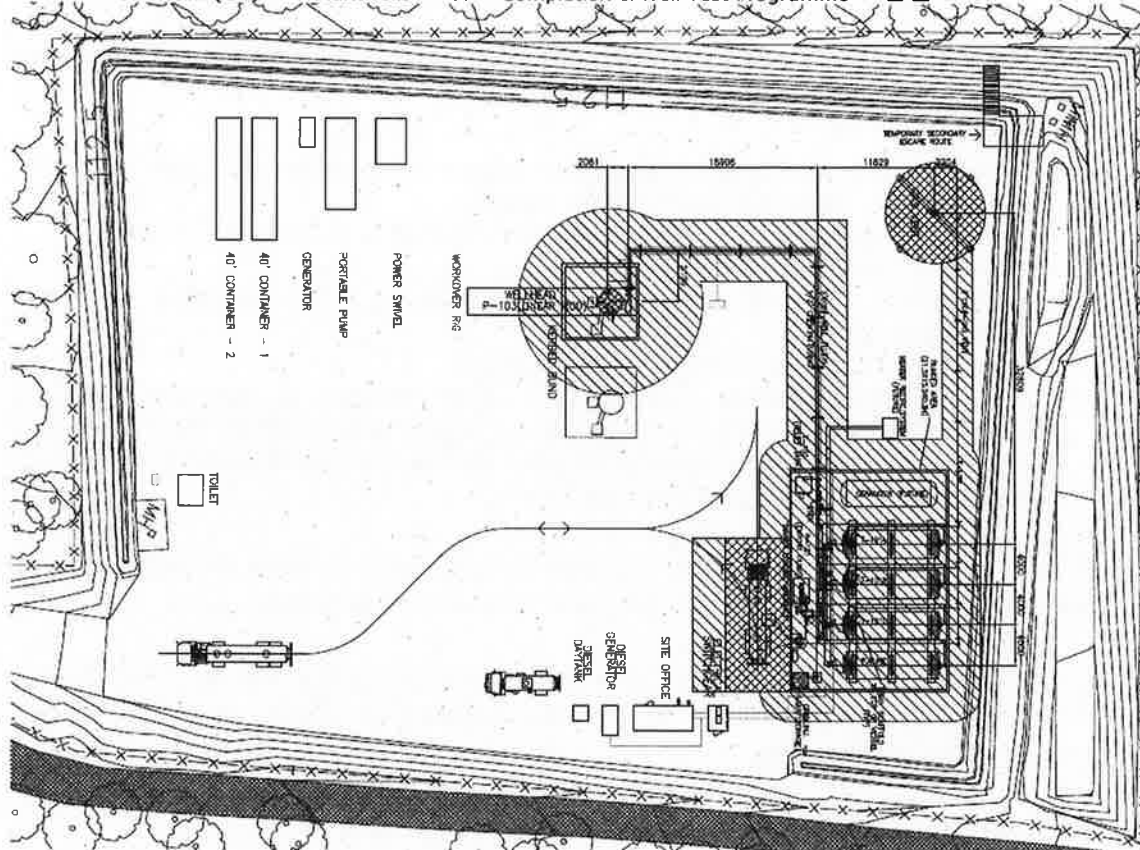
WELL TEST ACTIVITIES

WELL TEST PROCEDURE

The surface production facilities will be supplied by . The equipment will include an ESD system, a sample header, three graduated well fluid storage tanks, a gas venting system and fluid transfer pumps. Oil produced will be taken by road tanker to Star Energy's facilities at Holybourne Rail Sidings for transport to processing facilities. Produced water will be taken by road tanker to a suitable disposal site.

Initially, it is expected that some brine & mud lost to the Great Oolite formation during the drilling operation (although minimal losses were experienced during drilling) will be produced, followed by low GOR oil, ie 50 to 200 scf/bbl. It is expected to be similar to Horndean. The pump rate will be adjusted so that production rates stabilise with the fluid level ~200ft above the down-hole pump (~100psi intake pressure). If production rates are low, an acid job will be carried out

1. Install and pressure test surface well test facilities. This will need to be carried out prior to & during the well workover activities, i.e. SIMOPS. See proposed site plan below.



- Note: Acid Job Outline**

The acid job will be the subject of a separate detailed programme.

- C:\Documents and Settings\anagrath\My Documents\UK Wells\Well Test & Completions\Comp & Test Programme\25.07.2011 HSE Markwells Wood-1 Completion and Test Programme.docx



5. The well test parameters to be measured during the 10 and 20 day well test periods will include:

- Oil, gas & water production rates (calculated from tank levels & gas meter)
- Gas Oil Ratio - GOR (calculated from above)
- Surface flowing & shut-in pressures & temperatures (tubing & annulus)
- Oil gravity, water gravity & salinity
- Gas gravity, CO₂ & H₂S content (Draeger tubes needed for H₂S measurements)
- Oil, gas & water samples for further analysis
- Echometer fluid levels (for bottom hole flowing & shut-in pressure calculations). Additionally, a downhole pressure gauge could be installed in the XN-nipple below the perforated joint @ the bottom of completion string. Slickline would be used for this operation.

A low rate gas meter is needed to measure gas venting rates. An acoustic type meter will be strapped onto the gas vent line for this purpose.

In the unexpected case that GOR >200, a test separator will be needed. The well test facilities will need to be re-evaluated to check they can handle increased gas production.

Frequency of data recording, and reporting format TBC.

The following actions need to be carried out during the well test. These were from the HAZOP on 21 June 2011.

- I. Echometer to be used to monitor fluid level during pump operations. Fluid level to be kept at a minimum of 200 feet above pump intake. Pump stroke length & strokes per minute to be adjusted to ensure 200 feet of fluid are kept above pump intake to ensure pump intake does not go dry.
- II. The vent pot in the vent line should be manually drained, to ensure it allows gas venting to continue without fluid blockage of the vent pot.
- III. Route tank vents from PSV-02/03/04 to safe location.
- IV. Sampling equipment and procedures will be added to well test programme at a later date.
- V. Operators to wear suitable PPE during sampling activities.

Note: In the success case, ie economic oil production rates, an on-going well-test could be carried out. This would be conducted using one operator on a 12-hour per day basis, backed up by CCTV during the night hours. An appropriate well shut in system would also be in place in case of high pressure, high tank fluid levels etc.



6. Once well test complete, shut down linear rod pump.
7. Decommission surface facilities.
8. Pull down-hole rods from well.
9. Shut in surface valves & make well safe.
10. Record the well details and status on the well handover certificate.

Note: If the well test is successful, a production licence will be applied for.

End of Document

Message: 2011/0392255

6

From:
To:
Cc:
Sent: 25/7/2011 at 10:35
Received: 25/7/2011 at 10:36
Subject: RE: Notification for Completion and Welltest for Markwells Wood-1 Onshore Well S. England

WO rig and other equipment (slickline unit, pumping unit) supplied by will be contracted for this work. The main specs areas below. I have also attached a link for the rig specs , pictures etc..

well service rig

It stands 102 ft high has a monkey board to rack double stand pipe and a rodding board to rack tripple rod stands it is a 450 hp rig with a max pull of 200k lbs

Both rigs use the same well control equipment 35 gals koomy, 7.1/16" 5k BOP or 11" 5K bop , 10,000 psi choke manifold , C/w tubing running equipment for 2.3/8" or 2.7/8" tubing

Wire line unit (slick line unit)

This unit is equipped with 3000 psi lubricator and BOP, We have very good inventory of plugs and wire line tools (Again we do most of the wire work)

Pump truck

This unit is built on a scania truck

It has a gardener denver PAH pump driven by a V12 detroite engine gives approx 6.5 bbls/min max pressure of the pump is 5000 psi wp

Unit is used for Well kill, acid washing, Chemical squeeze, Pressure testing , Small cement jobs (cement squeeze), Also used as drilling pump for use with

power swivel

Power swivel

Venture tec power swivel , 3.5

Driven by Cat engine , Good for 8000 ft/lbs of torque (ideal for milling and small drilling jobs)

Mounted on a skid

Air driven Pressure test unit

Used for all kinds of pressure testing up to 10,000 psi

Link for the WO rig:

Regards

Northern Petroleum Plc
Martin House, 5 Martin Lane
London UK EC4R 0DP

WWW.

Tel:+44

Fax:+44 (0

From:

Sent: 25 July 2011 11:16

To: /

Cc:

Subject: RE: Notification for Completion and Welltest for Markwells Wood-1
Onshore Well S. England

Good Morning

Thank you for your HSE Notification Documents which will be assessed by
(

Please advise which Rig will be used for these Operations.

For your information, attached is a link to the HSE Offshore Wells Internet
page that includes guidance on the well notification process and other issues
in the industry.

<http://www.hse.gov.uk/offshore/wells.htm>

Please send subsequent Notification Documents and related correspondence to the
the following email address -

well.notifications@hse.gsi.gov.uk

Regards

Well Operations Administration

Room 2.01

Lord Cullen House

Fraser Place

Aberdeen

AB25 3UB

From: [REDACTED]
Sent: 25 July 2011 10:31
To: [REDACTED]
Cc: [REDACTED]
Subject: Notification for Completion and Welltest for Markwells Wood-1 Onshore Well S. England

Good Morning ,

As discussed today Northern Petroleum Plc London plan to complete and test the Markwells Wood-1(MW-1) onshore well in end August early September 2011.

The MW-1 was suspended on 26 Dec 2010. A brief note regarding this is below, details are within the attached notification:

The well was suspended safely with 2 mechanical barriers (EZSV- bridge plug @220ft MD), 2 7/8 killstring @ 600ft with BPV below the tubing hanger and with 8.8ppg brine. The barriers were pressure tested at 250psi and 3000psi and were all OK. Attached is an HSE submission notification for re-entry, completion and welltest. The notification contains information as set out in Schedule 1 of the Borehole Sites and Operations 1995 Regulations.

2. Northern Petroleum will have an independent competent well examiner (NRG) to review all work that takes place on the well to comply with regulation 18 of the Wells aspects of the offshore Installations and Wells (Design and construction etc) Regulations 1996.

If you have any queries regarding the subject well s HSE notification submission, please contact me (details as below) and kindly copy e-mails to

Thanks

Best Regards

Northern Petroleum Plc
Martin House, 5 Martin Lane
London UK EC4R 0DP

Tel:+44 (0)

Fax:+44

From: .
Sent: 23 February 2011 08:51
To: .
Subject: UK Oil and Gas Guidelines on Well Abandonment

Attached guidelines for abandonment of wells - this is the standard that we expect well operators to meet

Regards

Tel

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Interested in Occupational Health and Safety information?

Please visit the HSE website at the following address to keep yourself up to date

www.hse.gov.uk

Or contact the HSE Infoline on 0845 345 0055 or email hse.infoline@natbrit.com

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Dave Salmon

From: @northpet.com>
Sent: 03 August 2011 14:51
To:
Cc:
Subject: RE: Markwells Wood 1 Completion and Well Test
Attachments: 1219-PI-PT-0002_Rev01.pdf; 1219-PR-PI-0002_Rev02.pdf; Markwells Wood 1 Drilled vs Planned Final Survey 05.01.2011.pdf; Markwells Wood 1 Provisional Definitive Survey.pdf; Checklist BSOR for Operator.docx
Importance: High

The completion operations are to be daylights only. Please advise the status of the well when shut down and the security arrangements to ensure the well and equipment is not interfered with

1. a) When the completion operations are shut down there will be 3 1/2" work string installed with stabbing check valve on surface & kill weight fluid (8.8ppg) inside the string. The annulus will have pressure tested 3 1/2" double ram BOP and kill weight fluid in the annulus. It is not expected that there will be unassisted influx of hydrocarbons in the well bore, given reservoirs' very poor permeability < 1md.
- b) The completion supervisor will be on location 24hrs during the completion work and in addition the rig Contractor (P.W. Well services) will have one crew member on location so we will be fully covered as regards the security arrangement. When the well will be put on test there will be 24hr security guard on location.

The suspension schematic would seem to indicate a single barrier on the well head annulus. Please confirm that Northern Petroleum follow the industry practice of dual barriers to potential flow from a well

2. The well has been suspended with a 2000psi pressure tested bridge plug @2,200ft inside the 9 5/8" casing string with kill weight (8.8ppg) brine in the annulus and kills string. Very minor drilling fluid losses were experienced. The well was displaced to 8.8 ppg KCL slightly overbalance brine for suspension and fluid level was recorded as static while pulling out to set bridge plug. During final logging very minor only 4.5bbls of 9 ppg mud was lost in 24 hrs logging operation. The fractured carbonate nature of this reservoir provides a very low potential production capability and the immediate offset reservoir is oil bearing with a low GOR and wells need to be pumped for low rate production.

Advise the duration of pressure tests and test value for Bops and riser

3. The 250psi low pressure test will be for 10 minutes the 3000 psi high pressure test for 15 minutes.

Please supply a copy of the P&ID's of the test and acidizing phases of operations for review

4. P&ID's attached, Acid programme will follow later but at least 10 days before the reservoir is acid stimulated

For the wireline operations please advise the well control equipment to be used

5. We will be using a 5000 psi wire line lubricator complete with bops

Regards

Senior Drilling Engineer

_____@northpet.com
www.northpet.com

Northern Petroleum Plc

Martin House, 5 Martin Lane
London UK EC4R 0DP

Tel: +44 (0)20 7469

Fax: +44 (0)20 7469 2901

From: _____@hse.gsi.gov.uk [mailto:_____@hse.gsi.gov.uk]
Sent: 29 July 2011 10:57
To: _____
Cc: _____
Subject: Markwells Wood 1 Completion and Well Test

I have reviewed your notification submission for the above well and have a few queries as detailed below

I have attached a schedule 1 of the Borehole Sites and Operations Regulations 1995 - Please could you review and submit any information that has been omitted from the original submission.

The completion operations are to be daylights only. Please advise the status of the well when shut down and the security arrangements to ensure the well and equipment is not interfered with

The suspension schematic would seem to indicate a single barrier on the well head annulus. Please confirm that Northern Petroleum follow the industry practice of dual barriers to potential flow from a well

Advise the duration of pressure tests and test value for Bops and riser

Please supply a copy of the P&Id's of the test and acidizing phases of operations for review

For the wireline operations please advise the well control equipment to be used

Regards

Tel 01224 1

For the well file

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Interested in Occupational Health and Safety information?

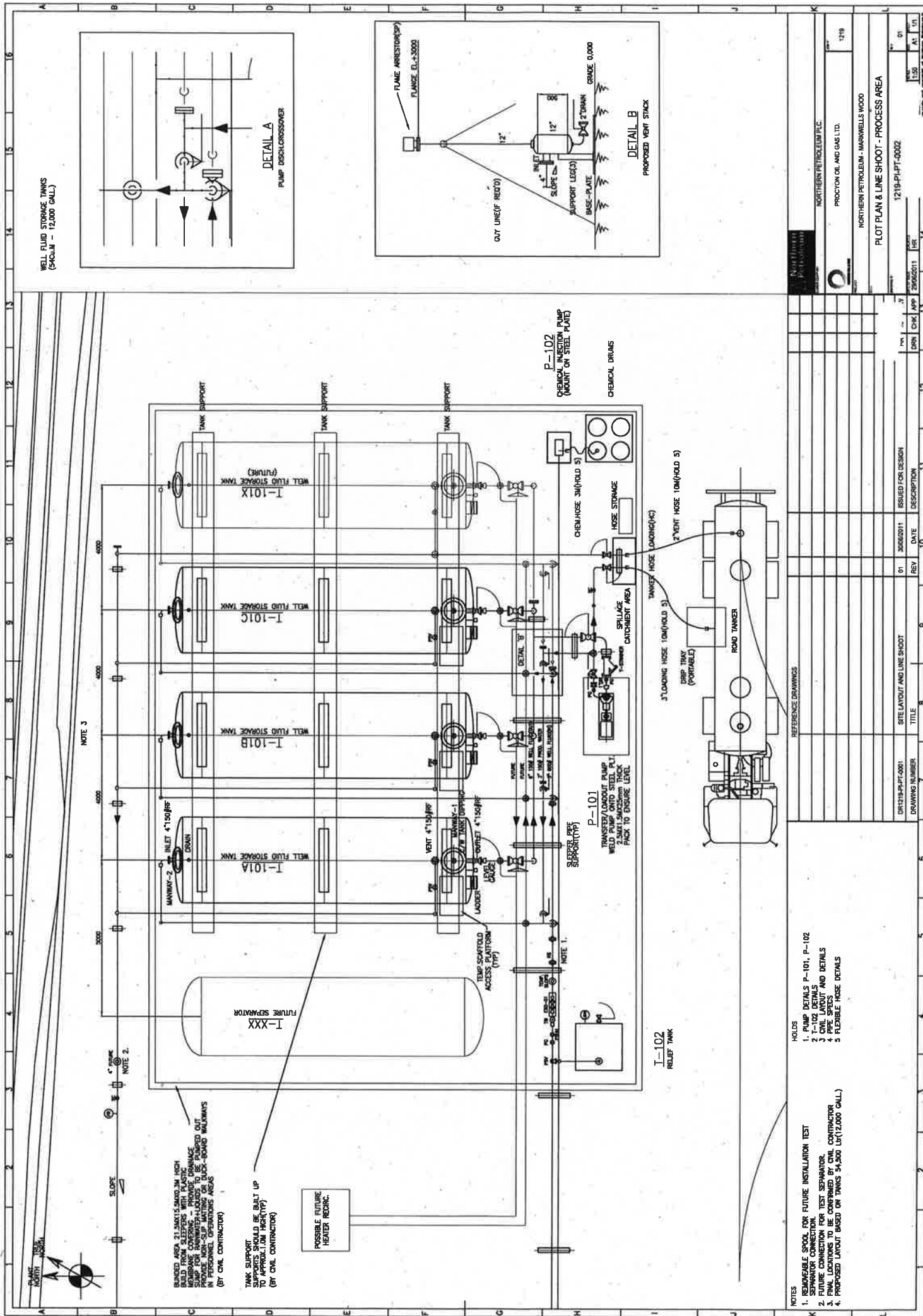
Please visit the HSE website at the following address to keep yourself up to date

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Project Information

Client: NORTHERN PETROLEUM PLC

Product: PROCYON OIL AND GAS LTD.

Location: NORTHERN PETROLEUM - MARKWELLS WOOD

Project Name: 1219-PI-PT-0002

Scale: 1:50

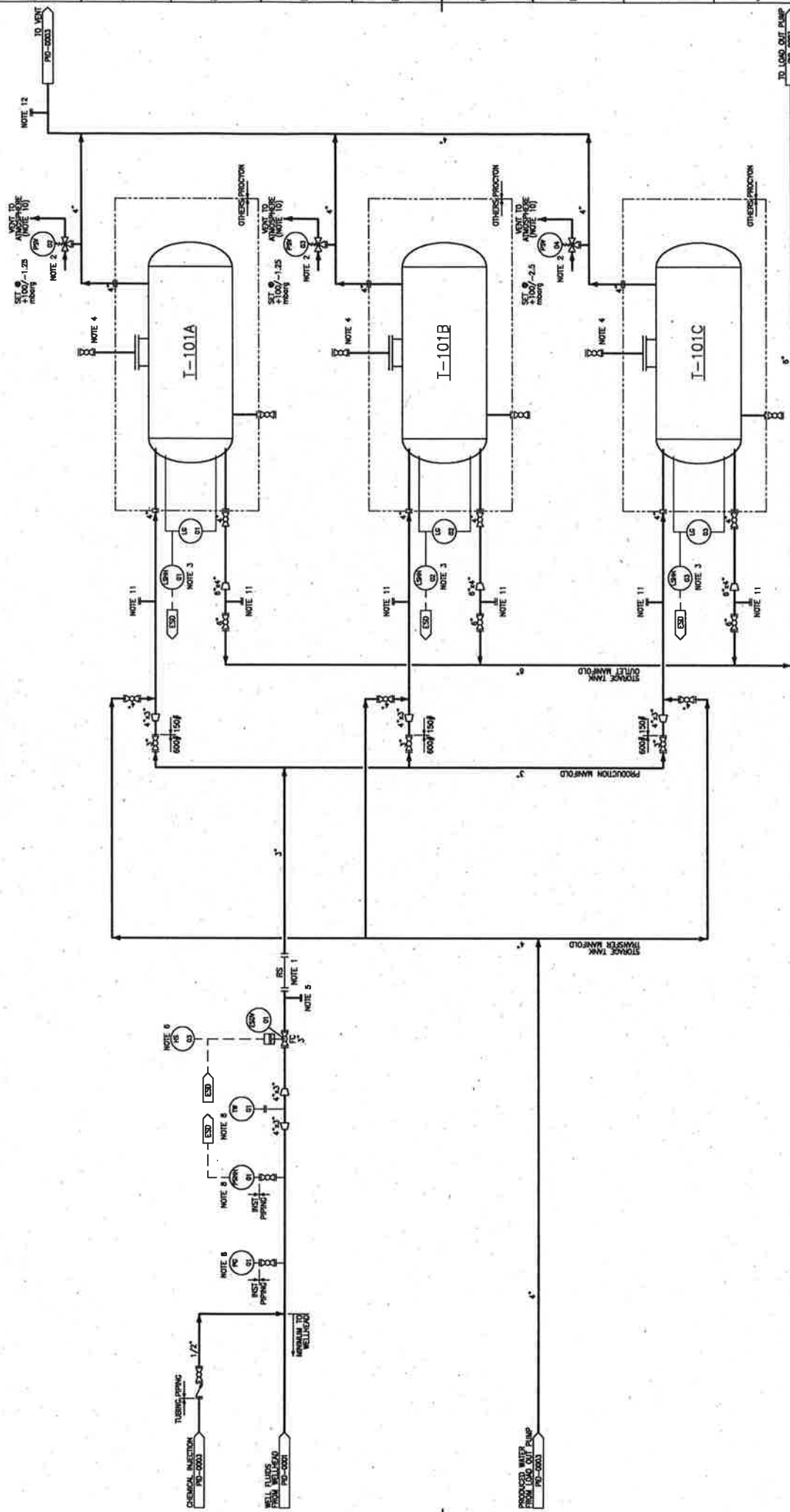
Sheet: 01

Al: 1/01

DATE	REV	DESCRIPTION	CHK	APP
30/06/2011	01	ISSUED FOR DESIGN	JM	AP
30/06/2011	01	ISSUED FOR DESIGN	JM	AP

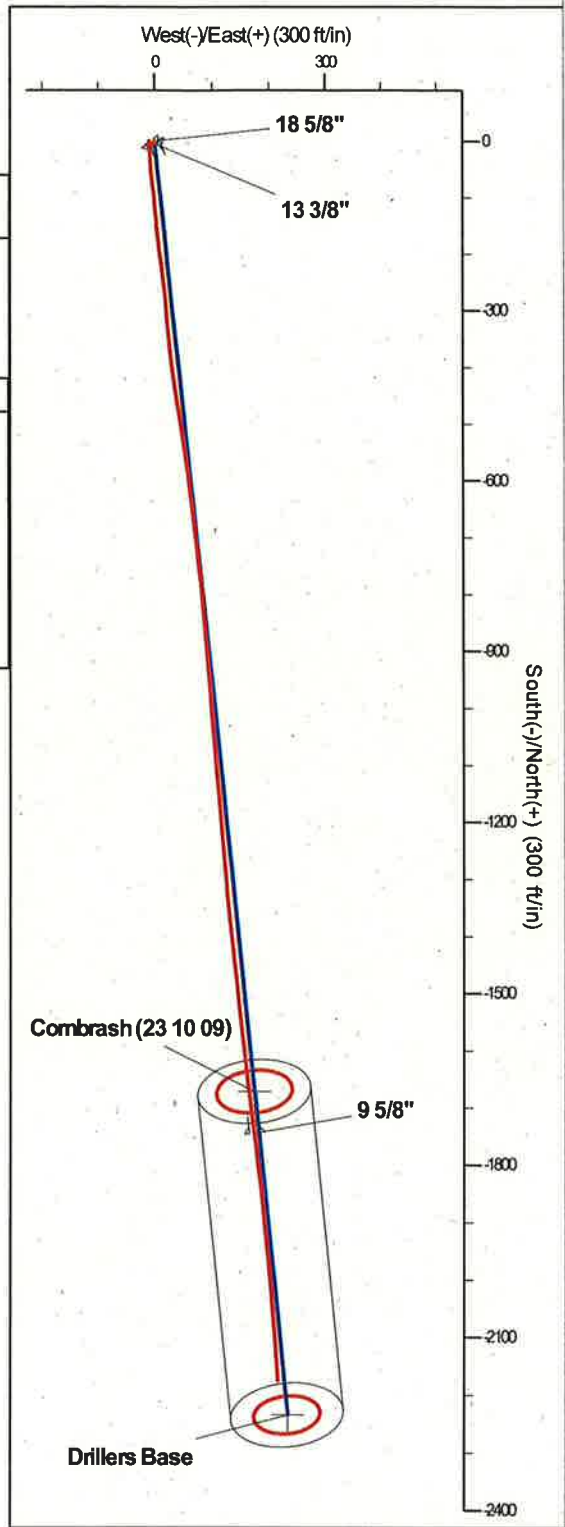
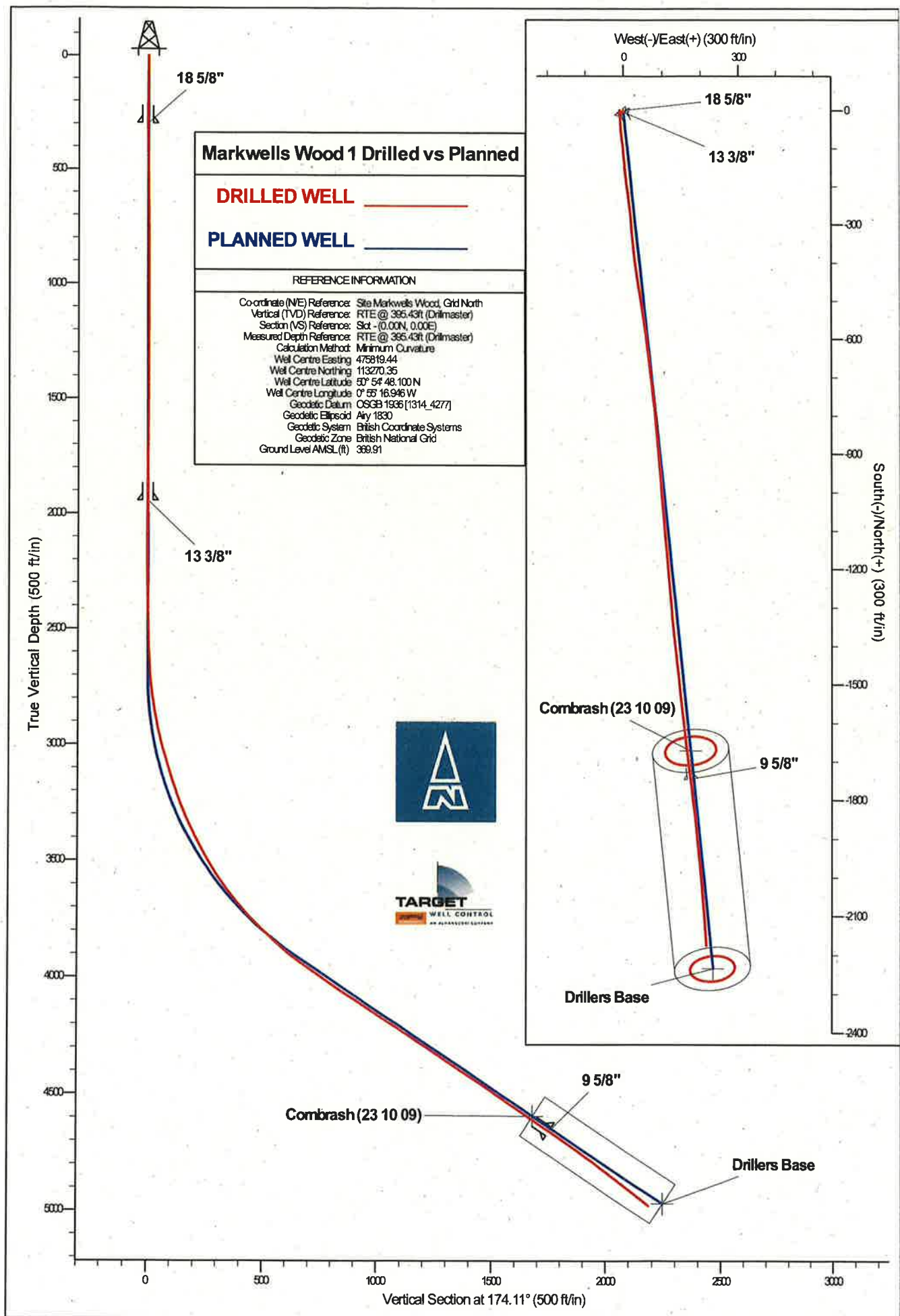
I-101A/B/C
WELL FLUID STORAGE TANKS

CAPACITY : 34,500 (NOTE 9)
DESIGN PRESSURE : 4.0 BAR



NORTHERN PETROLEUM - MARKWELLS WOOD									
P&ID - WELL FLUID STORAGE TANKS									
1210-PR-P1-0002									
25/03/11									
REV	DATE	DESCRIPTION	APP	CHK	APP	CHK	APP	CHK	APP
02	30/06/11	ISSUED FOR DESIGN	AS	GW	GW				
01	20/06/11	ISSUED FOR HAZOP	AS	GW	GW				
00	25/03/11	ISSUED FOR REVIEW	SD	NH	GW				
NORTHERN PETROLEUM - MARKWELLS WOOD									
P&ID - WELL FLUID STORAGE TANKS									
1210-PR-P1-0002									
25/03/11									
NORTHERN PETROLEUM - MARKWELLS WOOD									
P&ID - WELL FLUID STORAGE TANKS									
1210-PR-P1-0002									
25/03/11									

- NOTES:
1. RESPONSIBLE SPOOL FOR FUTURE SEPARATOR TIE-IN IF THE WELL COMES IN WITH HIGH GAS OIL RATIO.
 2. TANK VENT/ATMOSPHERE LINE.
 3. STOP P-101, P-102 & P-103.
 4. THE BALL VALVE WITH DPO TUBE CONNECTIONS (HOLD 7).
 5. CONNECTION FOR TEMPORARY SLOPS TANK TO OPERATE WITH INITIAL WELL FLUIDS.
 6. VALVE TO ALSO BE MANUALLY OPERATED TO SHUT-IN WELL.
 7. DPO TUBE CONNECTION TYPE.
 8. ATMOSPHERIC STORAGE TANKS PRESSURE TESTED TO 0.345 BAR.
 9. P&ID TO DISCHARGE TO ATMOSPHERE AT SAME LOCATION, 3m ABOVE PLATFORM.
 10. TIE-IN FOR FUTURE SEPARATOR VENT IF WELL COMES IN WITH HIGH GAS OIL RATIO.
 11. TIE-IN FOR FUTURE SEPARATOR VENT IF WELL COMES IN WITH HIGH GAS OIL RATIO.
 12. TIE-IN FOR FUTURE SEPARATOR VENT IF WELL COMES IN WITH HIGH GAS OIL RATIO.



Northern Petroleum (GB) Ltd
 Markwells Wood 1 Provisional Definitive Survey
 Directions Referenced To Grid North
 Permanent Datum is Mean Sea Level
 Ground Level Elevation 369.91ft AMSL
 RTE 395.43ft AMSL / 25.52ft AGL
 Vertical Section Azimuth 174.110 (from 0.00N & 0.00E)
 Geodetic System: British Coordinate Systems
 Geodetic Datum: OSGB 1936
 Geodetic Zone: British National Grid

MD ft	INC deg	AZIMUTH deg	TVD ft	N(+) ft	E(+) ft	VS ft	DOGLEG "/100ft	EASTING m	NORTHING m	LATITUDE	LONGITUDE	TVDSS ft	COMMENTS
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	475819.44	113270.35	50° 54' 48.0999 N	0° 55' 16.9463 W	-395.43	
275.00	0.50	352.87	275.00	1.19	-0.15	-1.20	0.18	475819.40	113270.71	50° 54' 48.1117 N	0° 55' 16.9484 W	-120.43	
383.00	0.80	191.70	382.99	0.92	-0.36	-0.95	1.19	475819.33	113270.63	50° 54' 48.1090 N	0° 55' 16.9518 W	-12.44	
563.50	0.80	200.80	563.48	-1.49	-1.06	1.37	0.07	475819.12	113269.90	50° 54' 48.0853 N	0° 55' 16.9633 W	168.05	
606.00	0.80	203.80	605.97	-2.04	-1.29	1.90	0.10	475819.05	113269.73	50° 54' 48.0800 N	0° 55' 16.9669 W	210.54	
646.00	0.70	174.40	645.97	-2.54	-1.38	2.38	0.98	475819.02	113269.58	50° 54' 48.0751 N	0° 55' 16.9684 W	250.54	
684.00	0.70	183.90	683.97	-3.00	-1.37	2.85	0.31	475818.92	113269.44	50° 54' 48.0705 N	0° 55' 16.9684 W	288.54	
805.00	0.70	203.40	804.96	-4.42	-1.71	4.22	0.20	475818.87	113269.00	50° 54' 48.0566 N	0° 55' 16.9741 W	409.53	
846.00	0.50	201.60	845.95	-4.81	-1.88	4.60	0.49	475818.87	113268.88	50° 54' 48.0527 N	0° 55' 16.9768 W	450.52	
886.00	0.50	263.60	885.95	-5.00	-2.12	4.75	1.29	475818.80	113268.83	50° 54' 48.0509 N	0° 55' 16.9805 W	490.52	
967.00	0.70	288.00	966.95	-4.88	-2.94	4.55	0.40	475818.54	113268.86	50° 54' 48.0522 N	0° 55' 16.9933 W	571.52	
1044.00	0.50	267.00	1043.95	-4.75	-3.72	4.35	0.38	475818.31	113268.90	50° 54' 48.0535 N	0° 55' 17.0055 W	648.52	
1085.00	0.40	288.40	1084.94	-4.72	-4.04	4.28	0.47	475818.21	113268.91	50° 54' 48.0539 N	0° 55' 17.0104 W	689.51	
1328.00	0.30	309.80	1327.94	-4.04	-5.33	3.48	0.07	475817.82	113269.12	50° 54' 48.0608 N	0° 55' 17.0304 W	932.51	
1447.50	0.30	315.90	1447.44	-3.62	-5.79	3.01	0.03	475817.68	113269.25	50° 54' 48.0650 N	0° 55' 17.0375 W	1052.01	
1567.50	0.60	304.60	1567.43	-3.04	-6.52	2.35	0.26	475817.45	113269.43	50° 54' 48.0709 N	0° 55' 17.0488 W	1172.00	
1647.50	0.50	345.00	1647.43	-2.46	-6.96	1.73	0.49	475817.32	113269.60	50° 54' 48.0766 N	0° 55' 17.0555 W	1252.00	
1767.50	0.40	352.10	1767.43	-1.54	-7.15	0.80	0.10	475817.26	113269.88	50° 54' 48.0857 N	0° 55' 17.0583 W	1372.00	
1805.00	0.50	305.00	1804.93	-1.32	-7.30	0.56	0.99	475817.21	113269.95	50° 54' 48.0880 N	0° 55' 17.0606 W	1409.50	
1886.00	0.70	315.40	1885.92	-0.76	-7.94	-0.06	0.28	475817.02	113270.12	50° 54' 48.0935 N	0° 55' 17.0704 W	1490.49	
1912.00	0.70	318.50	1911.92	-0.53	-8.16	-0.31	0.15	475816.95	113270.19	50° 54' 48.0959 N	0° 55' 17.0737 W	1516.49	
1973.00	0.50	326.50	1972.92	-0.03	-8.55	-0.85	0.35	475816.83	113270.34	50° 54' 48.1009 N	0° 55' 17.0798 W	1577.49	
2014.00	0.70	336.80	2013.91	0.35	-8.75	-1.25	0.55	475816.77	113270.46	50° 54' 48.1046 N	0° 55' 17.0828 W	1618.48	
2053.00	0.70	317.70	2052.91	0.75	-9.00	-1.67	0.60	475816.70	113270.58	50° 54' 48.1086 N	0° 55' 17.0866 W	1657.48	
2093.00	0.70	341.20	2092.91	1.16	-9.25	-2.10	0.71	475816.62	113270.70	50° 54' 48.1127 N	0° 55' 17.0903 W	1697.48	
2133.00	0.50	325.10	2132.91	1.53	-9.42	-2.49	0.65	475816.57	113270.82	50° 54' 48.1164 N	0° 55' 17.0930 W	1737.48	
2172.00	0.50	203.10	2171.91	1.51	-9.59	-2.49	2.24	475816.52	113270.81	50° 54' 48.1162 N	0° 55' 17.0956 W	1776.48	
2212.00	0.70	202.70	2211.90	1.13	-9.75	-2.12	0.50	475816.47	113270.69	50° 54' 48.1124 N	0° 55' 17.0982 W	1816.47	
2252.00	0.80	205.80	2251.90	0.65	-9.97	-1.67	0.27	475816.40	113270.55	50° 54' 48.1078 N	0° 55' 17.1017 W	1856.47	

MD ft	INC deg	AZIMUTH deg	TVD ft	N(+) ft	E(+) ft	VS ft	DOGLEG °/100ft	EASTING m	NORTHING m	LATITUDE	LONGITUDE	TVDSS ft	COMMENTS
2292.00	0.80	185.30	2291.90	0.12	-10.11	-1.16	0.71	475816.36	113270.39	50° 54' 48.1026 N	0° 55' 17.1041 W	1896.47	
2332.00	0.90	169.30	2331.89	-0.46	-10.08	-0.57	0.64	475816.37	113270.21	50° 54' 48.0968 N	0° 55' 17.1038 W	1936.46	
2372.00	1.00	180.10	2371.89	-1.12	-10.02	0.09	0.51	475816.39	113270.01	50° 54' 48.0903 N	0° 55' 17.1030 W	1976.46	
2411.00	1.20	172.70	2410.88	-1.87	-9.97	0.83	0.63	475816.40	113269.78	50° 54' 48.0829 N	0° 55' 17.1024 W	2015.45	
2451.00	1.10	174.40	2450.87	-2.66	-9.88	1.64	0.26	475816.43	113269.54	50° 54' 48.0750 N	0° 55' 17.1011 W	2055.44	
2490.00	1.30	170.70	2489.86	-3.47	-9.77	2.45	0.55	475816.46	113269.29	50° 54' 48.0671 N	0° 55' 17.0996 W	2094.43	
2532.00	1.30	175.40	2531.85	-4.42	-9.66	3.40	0.25	475816.50	113269.00	50° 54' 48.0577 N	0° 55' 17.0981 W	2136.42	
2572.00	1.40	172.60	2571.84	-5.36	-9.56	4.35	0.30	475816.53	113268.72	50° 54' 48.0485 N	0° 55' 17.0967 W	2176.41	
2610.00	2.60	179.50	2609.82	-6.68	-9.49	5.67	3.22	475816.55	113268.32	50° 54' 48.0354 N	0° 55' 17.0959 W	2214.39	
2651.00	2.90	178.50	2650.77	-8.64	-9.46	7.63	0.74	475816.56	113267.72	50° 54' 47.9913 N	0° 55' 17.0941 W	2255.34	
2691.00	4.30	175.30	2690.69	-11.15	-9.31	10.14	3.53	475816.60	113266.95	50° 54' 47.9568 N	0° 55' 17.0881 W	2295.26	
2731.00	5.80	171.10	2730.53	-14.64	-8.87	13.65	3.86	475816.74	113265.89	50° 54' 47.9118 N	0° 55' 17.0790 W	2335.10	
2771.00	7.40	172.50	2770.27	-19.19	-8.22	18.25	4.02	475816.93	113264.50	50° 54' 47.8578 N	0° 55' 17.0719 W	2374.84	
2811.00	8.40	176.10	2809.89	-24.66	-7.69	23.74	2.79	475817.10	113262.84	50° 54' 47.7968 N	0° 55' 17.0692 W	2414.46	
2851.00	9.40	178.80	2849.40	-30.84	-7.42	29.92	2.71	475817.18	113260.95	50° 54' 47.7282 N	0° 55' 17.0685 W	2453.97	
2891.00	10.60	176.30	2888.80	-37.79	-7.28	36.84	3.00	475817.22	113258.84	50° 54' 47.6487 N	0° 55' 17.0648 W	2493.37	
2932.00	12.10	176.30	2928.99	-45.85	-6.92	44.89	3.85	475817.33	113256.38	50° 54' 47.5622 N	0° 55' 17.0396 W	2533.56	
2972.00	13.30	174.50	2968.01	-54.61	-6.21	53.68	3.16	475817.55	113253.71	50° 54' 47.4619 N	0° 55' 17.0204 W	2572.58	
3012.00	15.20	172.00	3006.78	-64.38	-5.04	63.53	4.99	475817.91	113250.73	50° 54' 47.3619 N	0° 55' 16.9991 W	2611.35	
3051.00	16.30	172.90	3044.32	-74.88	-3.65	74.11	2.89	475818.33	113247.05	50° 54' 47.2490 N	0° 55' 16.9805 W	2648.89	
3091.00	17.20	171.90	3082.62	-86.30	-2.12	85.63	2.36	475818.79	113244.04	50° 54' 47.1319 N	0° 55' 16.9680 W	2687.19	
3131.00	17.50	174.90	3120.80	-98.15	-0.75	97.55	2.36	475819.21	113240.44	50° 54' 46.8850 N	0° 55' 16.9544 W	2725.37	
3171.00	18.20	175.90	3158.88	-110.37	0.23	109.81	1.91	475819.51	113236.72	50° 54' 46.7518 N	0° 55' 16.9378 W	2763.45	
3211.00	19.20	174.70	3196.76	-123.15	1.28	122.63	2.68	475819.83	113232.83	50° 54' 46.6107 N	0° 55' 16.9224 W	2801.33	
3251.00	20.40	174.60	3234.40	-136.64	2.54	136.18	3.00	475820.22	113228.72	50° 54' 46.4643 N	0° 55' 16.9040 W	2838.97	
3291.00	21.60	175.80	3271.74	-150.93	3.74	150.51	3.19	475820.58	113224.36	50° 54' 46.3050 N	0° 55' 16.8878 W	2876.31	
3330.00	23.30	173.50	3307.78	-165.75	5.14	165.40	4.91	475821.01	113219.85	50° 54' 46.1382 N	0° 55' 16.8778 W	2912.35	
3370.00	24.60	173.00	3344.34	-181.87	7.05	181.64	3.29	475821.59	113214.93	50° 54' 45.9635 N	0° 55' 16.8123 W	2948.91	
3410.00	25.80	171.80	3380.53	-198.75	9.31	198.66	3.26	475822.28	113209.79	50° 54' 45.7988 N	0° 55' 16.7789 W	2985.10	
3450.00	27.20	172.40	3416.33	-216.43	11.76	216.50	3.56	475823.76	113198.74	50° 54' 45.5862 N	0° 55' 16.7472 W	3020.90	
3490.00	28.70	172.80	3451.66	-235.02	14.17	235.24	3.78	475824.46	113192.77	50° 54' 45.3832 N	0° 55' 16.7194 W	3056.23	
3530.00	30.40	173.70	3486.46	-254.61	16.48	254.96	4.39	475825.10	113186.51	50° 54' 45.1723 N	0° 55' 16.6963 W	3091.03	
3570.00	31.80	174.70	3520.71	-275.17	18.57	275.62	3.73	475825.64	113180.00	50° 54' 44.9539 N	0° 55' 16.6726 W	3125.28	
3610.00	33.00	175.70	3554.48	-296.52	20.36	297.05	3.29	475826.26	113173.26	50° 54' 44.7260 N	0° 55' 16.6439 W	3159.05	
3650.00	34.40	174.80	3587.76	-318.64	22.20	319.24	3.72	475826.87	113166.23	50° 54' 44.4875 N	0° 55' 16.6114 W	3192.33	
3690.00	36.40	174.40	3620.36	-341.71	24.38	342.41	5.03	475827.61	113158.88	50° 54' 44.2385 N	0° 55' 16.5733 W	3224.93	
3730.00	38.30	174.10	3652.16	-365.85	26.81	366.67	4.77	475828.47	113151.20	50° 54' 43.9867 N	0° 55' 16.5289 W	3256.73	
3770.00	40.40	173.20	3683.09	-391.06	29.62	392.03	5.44	475829.45	113143.43	50° 54' 43.7207 N	0° 55' 16.4767 W	3287.66	
3809.00	42.00	172.40	3712.43	-416.54	32.85	417.71	4.32	475830.59	113135.23	50° 54' 43.4543 N	0° 55' 16.4207 W	3317.00	
3849.00	43.60	171.80	3741.78	-443.46	36.58	444.87	4.13	475831.80	113127.02	50° 54' 43.1673 N	0° 55' 16.3564 W	3346.35	
3888.00	45.00	171.40	3769.69	-470.40	40.56	472.08	3.66	475833.19	113118.17			3374.26	
3929.00	46.60	170.80	3798.27	-499.44	45.11	501.43	4.04					3402.84	

MD ft	INC deg	AZIMUTH deg	TVD ft	N(+) ft	E(+) ft	VS ft	DOGLEG °/100ft	EASTING m	NORTHING m	LATITUDE	LONGITUDE	TVDSS ft	COMMENTS
3970.00	47.00	171.50	3826.34	-528.97	49.71	531.28	1.58	475834.59	113108.17	50° 54' 42.8753 N	0° 55' 16.2914 W	3430.91	
4009.00	48.80	172.30	3852.49	-557.62	53.78	560.20	4.86	475835.83	113100.44	50° 54' 42.5922 N	0° 55' 16.2344 W	3457.06	
4050.00	49.70	172.90	3879.25	-588.42	57.78	591.24	2.46	475837.05	113091.06	50° 54' 42.2878 N	0° 55' 16.1790 W	3483.82	
4090.00	52.00	173.30	3904.50	-619.21	61.51	622.26	5.80	475838.18	113081.68	50° 54' 41.9835 N	0° 55' 16.1279 W	3509.07	
4129.00	54.20	173.70	3927.92	-650.20	65.04	653.44	5.70	475839.26	113072.23	50° 54' 41.6774 N	0° 55' 16.0799 W	3532.49	
4169.00	55.60	173.30	3950.92	-682.71	68.74	686.16	3.59	475840.39	113062.33	50° 54' 41.3562 N	0° 55' 16.0295 W	3555.49	
4209.00	55.20	173.50	3973.63	-715.42	72.53	719.09	1.08	475841.54	113052.36	50° 54' 41.0330 N	0° 55' 15.9779 W	3578.20	
4249.00	54.70	173.40	3996.60	-747.95	76.26	751.83	1.27	475842.68	113042.45	50° 54' 40.7116 N	0° 55' 15.9271 W	3601.17	
4289.00	56.20	174.10	4019.29	-780.70	79.85	784.77	4.02	475843.77	113032.47	50° 54' 40.3881 N	0° 55' 15.8786 W	3623.86	
4329.00	57.40	174.90	4041.19	-814.02	83.05	818.24	3.44	475844.75	113022.32	50° 54' 40.0590 N	0° 55' 15.8362 W	3645.76	
4368.00	56.60	175.20	4062.43	-846.60	85.88	850.95	2.15	475845.61	113012.39	50° 54' 39.7372 N	0° 55' 15.7996 W	3667.00	
4408.00	56.40	175.10	4084.51	-879.84	88.70	884.30	0.54	475846.47	113002.26	50° 54' 39.4090 N	0° 55' 15.7632 W	3689.08	
4448.00	57.60	175.80	4106.29	-913.28	91.36	917.83	3.34	475847.28	112992.07	50° 54' 39.0788 N	0° 55' 15.7293 W	3710.86	
4488.00	57.30	175.60	4127.81	-946.90	93.88	951.54	0.86	475848.05	112981.83	50° 54' 38.7468 N	0° 55' 15.6975 W	3732.38	
4528.00	57.10	175.30	4149.48	-980.42	96.55	985.15	0.80	475848.86	112971.62	50° 54' 38.4158 N	0° 55' 15.6636 W	3754.05	
4568.00	56.60	175.30	4171.36	-1013.80	99.30	1018.63	1.25	475849.70	112961.45	50° 54' 38.0862 N	0° 55' 15.6284 W	3775.93	
4608.00	56.30	175.40	4193.46	-1047.02	102.00	1051.96	0.78	475850.52	112951.32	50° 54' 37.7581 N	0° 55' 15.5938 W	3798.03	
4648.00	56.00	175.20	4215.74	-1080.13	104.72	1085.17	0.86	475851.35	112941.23	50° 54' 37.4312 N	0° 55' 15.5589 W	3820.31	
4688.00	57.50	175.20	4237.67	-1113.46	107.52	1118.62	3.75	475852.20	112931.08	50° 54' 37.1020 N	0° 55' 15.5228 W	3842.24	
4727.00	57.00	175.10	4258.77	-1146.15	110.29	1151.41	1.30	475853.05	112921.12	50° 54' 36.7792 N	0° 55' 15.4870 W	3863.34	
4767.00	56.70	175.00	4280.65	-1179.51	113.18	1184.90	0.78	475853.93	112910.95	50° 54' 36.4497 N	0° 55' 15.4495 W	3885.22	
4807.00	56.30	175.10	4302.72	-1212.74	116.06	1218.25	1.02	475854.80	112900.83	50° 54' 36.1215 N	0° 55' 15.4122 W	3907.29	
4846.00	55.90	175.30	4324.47	-1245.00	118.77	1250.61	1.11	475855.63	112891.00	50° 54' 35.8030 N	0° 55' 15.3773 W	3929.04	
4887.00	55.00	174.60	4347.13	-1279.03	121.78	1284.78	3.04	475856.55	112880.63	50° 54' 35.4668 N	0° 55' 15.3381 W	3951.70	
4927.00	56.10	176.00	4369.18	-1312.30	124.51	1318.15	3.69	475857.38	112870.49	50° 54' 35.1384 N	0° 55' 15.3030 W	3973.75	
4966.00	55.60	174.10	4391.08	-1344.45	127.30	1350.41	4.23	475858.23	112860.70	50° 54' 34.8209 N	0° 55' 15.2669 W	3995.65	
5006.00	57.30	173.80	4413.18	-1377.60	130.81	1383.75	4.30	475859.30	112850.60	50° 54' 34.4934 N	0° 55' 15.2196 W	4017.75	
5046.00	56.80	173.60	4434.94	-1410.96	134.49	1417.31	1.32	475860.42	112840.43	50° 54' 34.1638 N	0° 55' 15.1698 W	4039.51	
5086.00	56.10	173.60	4457.05	-1444.09	138.21	1450.65	1.75	475861.55	112830.34	50° 54' 33.8365 N	0° 55' 15.1194 W	4061.62	
5126.00	56.60	174.00	4479.21	-1477.19	141.81	1483.94	1.50	475862.65	112820.25	50° 54' 33.5095 N	0° 55' 15.0708 W	4083.78	
5167.00	55.60	174.10	4502.08	-1511.04	145.33	1517.97	2.45	475863.72	112809.94	50° 54' 33.1751 N	0° 55' 15.0235 W	4106.65	
5207.00	55.30	173.80	4524.76	-1543.80	148.81	1550.92	0.97	475864.78	112799.95	50° 54' 32.8515 N	0° 55' 14.9768 W	4129.33	
5247.00	56.50	173.80	4547.19	-1576.73	152.38	1584.04	3.00	475865.87	112789.92	50° 54' 32.5262 N	0° 55' 14.9285 W	4151.76	
5287.00	56.10	173.10	4569.38	-1609.79	156.18	1617.32	1.77	475867.03	112779.85	50° 54' 32.1996 N	0° 55' 14.8769 W	4173.95	
5326.00	55.70	173.10	4591.25	-1641.85	160.06	1649.61	1.03	475868.21	112770.08	50° 54' 31.8828 N	0° 55' 14.8236 W	4195.82	
5366.00	56.80	172.70	4613.47	-1674.85	164.17	1682.86	2.87	475869.46	112760.02	50° 54' 31.5567 N	0° 55' 14.7670 W	4218.04	
5484.00	55.10	173.40	4678.68	-1772.47	176.07	1781.18	0.77	475873.09	112730.28	50° 54' 30.9211 N	0° 55' 14.6036 W	4283.25	
5523.00	56.70	173.20	4700.55	-1804.54	179.84	1813.47	1.11	475874.24	112720.51	50° 54' 30.2752 N	0° 55' 14.5522 W	4305.12	
5564.00	55.10	173.50	4723.83	-1838.06	183.75	1847.22	1.58	475875.43	112710.29	50° 54' 29.9440 N	0° 55' 14.4988 W	4328.40	
5604.00	54.60	174.00	4746.86	-1870.57	187.31	1879.92	1.61	475876.51	112700.39	50° 54' 29.6228 N	0° 55' 14.4507 W	4351.43	
5643.00	54.10	174.10	4769.59	-1902.10	190.59	1911.61	1.30	475877.51	112690.78	50° 54' 29.3115 N	0° 55' 14.4066 W	4374.16	
5683.00	53.90	174.30	4793.10	-1934.29	193.86	1943.97	0.64	475878.51	112680.97	50° 54' 28.9935 N	0° 55' 14.3630 W	4397.67	

COMMENTS

MD ft	INC deg	AZIMUTH deg	TVD ft	N(+) ft	E(+) ft	VS ft	DOGLEG "/100ft	EASTING m	NORTHING m	LATITUDE	LONGITUDE	TVDSS ft	COMMENTS
5723.00	53.70	174.50	4816.72	-1966.41	197.01	1976.25	0.64	475879.47	112671.18	50° 54' 28.6762 N	0° 55' 14.3212 W	4421.29	
5763.00	53.20	175.00	4840.55	-1998.41	199.96	2008.38	1.60	475880.37	112661.43	50° 54' 28.3601 N	0° 55' 14.2826 W	4445.12	
5803.00	52.80	175.50	4864.62	-2030.25	202.60	2040.32	1.41	475881.17	112651.73	50° 54' 28.0457 N	0° 55' 14.2486 W	4469.19	
5843.00	52.30	175.20	4888.94	-2061.90	205.18	2072.07	1.38	475881.96	112642.09	50° 54' 27.7332 N	0° 55' 14.2156 W	4493.51	
5883.00	51.80	175.50	4913.54	-2093.34	207.73	2103.60	1.38	475882.74	112632.51	50° 54' 27.4227 N	0° 55' 14.1829 W	4518.11	
5923.00	51.50	175.90	4938.36	-2124.62	210.08	2134.96	1.09	475883.45	112622.98	50° 54' 27.1139 N	0° 55' 14.1533 W	4542.93	
5955.00	51.20	176.20	4958.34	-2149.55	211.81	2159.94	1.19	475883.98	112615.38	50° 54' 26.8677 N	0° 55' 14.1322 W	4562.91	
5988.00	50.89	176.51	4979.09	-2175.16	213.44	2185.58	1.19	475884.48	112607.58	50° 54' 26.6149 N	0° 55' 14.1126 W	4583.66	

Definitive Survey Compilation

Number	Interval (ft)	Well		Tool	
		Hole / Casing Size	Well	Tool	
1	275.00	24" Csg	Markwells Wood 1	Single Shot	
2	383.00 - 1912.00	17 1/2" Hole	Markwells Wood 1	Target MWD	
3	1973.00 - 5366.00	12 1/4" Hole	Markwells Wood 1	Target MWD	
4	5484.00 - 5955.00	8 1/2" Hole	Markwells Wood 1	Target MWD	
5	5988.00	8 1/2" Hole	Markwells Wood 1	Projection to TD	

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Reg 6(1)/Schedule 1. Part 1 Notification Particulars	Minimum Information Required for an Onshore Notification
1 <i>Name and address of operator</i>	<ul style="list-style-type: none"> Operators name & Operators address Northern Petroleum (GB) Limited Martin House, 5 Martin Lane, London EC4R ODP Contact: Telephone: Name and address of Operator of Site if different to above
2 <i>Particulars of the type of well, its number and its name</i>	<ul style="list-style-type: none"> Exploration, appraisal or development Function to which it will be used if development well, eg oil producer, gas producer, water injection The DTI well number. [The DTI numbering system is to be used prior to spud] <p> Licence PEDL 126 DTI Well Registration No. L99/01-MW1 Operator Assigned Name. Markwells Wood 1 Target Horizon Great Oolite Formation Classification Deviated Appraisal Participation Northern Petroleum (GB) Ltd - 50% Magellan Petroleum (UK) Ltd - 40% Egdon Resources – 10% Well suspended Dec 2010 Oil Well </p>
3 <i>Particulars of the rig or other plant which is to be used in connection with the operations on the well</i>	<ul style="list-style-type: none"> Name of Drilling Contractor/Name of rig Layout and brief description/capacities of the main equipment, eg derrick rating, drawworks hoisting capacity, high pressure mud pump(s), coiled tubing unit, mud storage, solids control equipment, well testing package <p>WO rig contractor . . . Mechanical Workover Rig .</p> <ul style="list-style-type: none"> P.W 475 well service rig 2008 year of manufacture Built on 5 axle carrier Max pull on derrick 210,000 lbs Max pull on drawworks 210,000 lbs Dual Disk assist braking system Derrick height 104 feet high <p>Well kill & Pressure testing pump Scania truck with pump mounted Gardener denver PAHBFB well service pump Dressed with 4.½" liners 8" stroke length Driven by separate 12-V-71 engine Max pressure 5000 Psi 60ft 5000 psi discharge hose and 30ft suction hose</p> <p>Wire (slick) line unit Mounted on Mercedes 814 14,500 ft of 0.108 slick line Various (many) down hole tool options C/w BOP and lubricator</p>
4 <i>Particulars of the surface equipment and of the circulating fluids to be used to control the pressure of the well</i>	<ul style="list-style-type: none"> Details of the Well control equipment [BOP, Rotating head, Diverter, Choke Manifold, Mud/gas separator] including size and pressure rating. Details of BOP control unit, eg accumulator capacity and sizing Generic fluid type for drilling each section of hole Mud weight for each hole section- Well suspended with kill weight NaCl+KCl brine 8.8ppg Generic fluid type for testing, completion, workover operation: Brine

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		<p>8.8ppg</p> <ul style="list-style-type: none"> Mud weight for each operation type; eg completion, testing, workover, etc <p>Accumulator</p> <ul style="list-style-type: none"> 60 Gal Accumulator unit 6 x 11 gal bottles 3 x station system with annular pressure regulating system Main Hydraulic pump driven by electric start diesel Yammar engine (pressure bypass for cold start) Air Operated back up system (6" 50:1 ratio air motor and pump assembly) Built on heavy duty skid <p>BOPS</p> <ul style="list-style-type: none"> 7.1/16" x 5k Townsend double ram Bop C/W 2.3/8" and 2.7/8" rams <p>Or</p> <ul style="list-style-type: none"> 11" 5k double ram BOP <p>Or</p> <ul style="list-style-type: none"> 7.1/16" 3k Torus Annular <p>Choke Manifold</p> <ul style="list-style-type: none"> 10,000 psi choke manifold H2S trim 2 x Adjustable chokes 1 x 5000 psi pressure gauge 1 x 1000 psi pressure gauge Skid mounted Complete with treating iron and valves to bop
5	<p>Particulars, with scale diagrams where appropriate, of -</p> <p>(a) the Ordnance Survey National Grid ref of the location of the top of the well</p> <p>(b) the directional path of the borehole</p> <p>(c) the terminal depth and location</p> <p>(d) its position and that of nearby wells and mine workings relative to each other</p>	<ul style="list-style-type: none"> National Grid reference of surface/target locations Latitude & longitude of surface/target locations <p>Markwells Wood 1</p> <p>Wellhead Co-ordinates: (Ref: National Grid, Airey Spheroid)</p> <p>Latitude / Longitude N 50° 54' 48.0999" / W 00° 55' 16.9463"</p> <p>Easting / Northing E475819.44 / N113270.35</p> <p>Actual target survey is attached</p> <ul style="list-style-type: none"> Directional plot for non vertical wells: to include vertical section and horizontal section-Attached Measured terminal depth and vertical terminal depth : Actual 5988ft MD; 4583TVDSS Map showing the surface location and entire lateral position of well and all others in the vicinity [either at surface or at sub surface level] together with any mine workings: Well is suspended , Details are given in HSE notification submitted in mid Sept 2010 Confirmation that the potential of collision of relevant wells or mine workings have been looked at and that plans are in place to minimise the risks . Submitted in Sept 2010 and attached is the final actual survey is attached .
6	<p>A description of operations to be performed and programme of works including -</p> <p>(a) the dates on which operations on the well are expected to start and finish</p> <p>(b) a diagram showing details of the intended final completion or recompletion of the well</p>	<ul style="list-style-type: none"> Estimated start/finish dates or duration End August –Mid October List of operations to be carried out, eg re-enter, plug back, sidetrack, test, drill, workover, etc Re-enter, WO, plug the water interval, complete and test Summary of the well programme which details the major steps related to safe operations : all main safety related issues would be addressed, eg casing pressure details, leak off tests and formation integrity tests to be carried out and required minimum values, cementing programme and method of confirmation of cement tops, testing of barriers prior to removal of BOPs, testing of BOPs, etc- Test Programme submitted and clarification in the body of the email The operational state at the end of operations should be one of completed, abandoned or suspended-Completed & put on EWT A schematic of the intended final well state should be included- within the test programme
7	A description of –	<ul style="list-style-type: none"> Identify those hazards and activities connected with the particular well

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	<p>(a) any activity during operations on the well which will involve a risk of the accidental release of fluids from the well or reservoir; and</p> <p>(b) such hazards</p>	<p>which have the potential to cause a major accident, eg shallow gas, H₂S, high pressure, lost circulation, underbalance drilling, DST</p> <ul style="list-style-type: none"> Identify where SIMOPS are to take place at drilling sites and the policy covering SIMOPS. The well will be put on Test after completion; this is the only well on this wellsite.
8	<p><i>In the case of a well which is to be drilled</i></p> <p>(a) particulars of the geological strata, and formations and fluids within them through which it may pass and of any hazards with the potential to cause fire, explosion or a blow-out, which they may contain</p>	<ul style="list-style-type: none"> Geological column from surface to TD, detailing measured and vertical depths Est. formation pressures in all permeable and porous zones Est. fracture pressures at intended casing points Prognosed fluid types [eg gas, condensate, oil, etc] presence of gas cap etc, fluid gradient, presence and concentration of toxic gases [eg CO₂, H₂S, etc] Identify potential producing formations Confirm a specific shallow gas assessment has been completed Particular hazards associated w/well, eg: Major loss circ zones, overpressures, salt domes <p>Well is suspended with kill weight brine and will be re-entered for WO, completion and then put on expected artificial lift</p>
	<p>(b) the procedures for effectively monitoring the direction of the borehole and the effects of intersecting nearby wells:</p>	<ul style="list-style-type: none"> Survey programme for each section of hole-attached final actual survey Confirmation that there is a system for programming surveys and for comparing survey data with that of nearby wells and that there are criteria for taking action List nearby wells which are of special significance with respect to the drilling of the particular well. Provide separation factors for the significant well
	<p>(c) particulars of the design of the well, sufficient to show that it takes account of matters in sub paragraph a) of this paragraph, and that it will, so far as is reasonably practicable, be safe</p>	<ul style="list-style-type: none"> Est. max whd press, during operations Summary of hole sizes/section TDs Summary of casing strings to be run, including setting depth, size, weight, grade and couplings. Kick tolerance and specification if not API grades. Provide details of the wellhead and Xmas tree Details of cementing prog/casing string and for any abandonment or suspension to be carried out Details of testing; surface equipment and shutdown systems Schematic diagram of the proposed completion <p>All above is in the completion and welltest programme</p>
9	<p><i>In the case of an existing well-</i></p> <p>(a) a diagram of the well</p> <p>(b) a brief history of the well including a summary of previous operations and any problems encountered; and</p> <p>(c) its present status and condition</p>	<ul style="list-style-type: none"> Current casing and completion or suspension diagram List, with dates, of major operations on the well eg spud date, drill and suspend, re-enter and redrill, re-enter and complete, major workovers Operational state is abandoned, suspended or completed Details of any known or suspected safety related failure or defect in the well eg corrosion problems, Xmas tree valve failure, DHSSV control line failure Details of barriers and fluids in the well <p>All above is in the completion and welltest programme</p>
10	<p><i>In the case of an abandonment operation details of the proposed sealing or treatment</i></p>	<ul style="list-style-type: none"> Current casing and cementing programme Depths of hydrocarbon bearing strata or aquifer Number and location of barriers Testing of barriers Monitoring of pressure build-up <p>All above is in the completion and welltest programme</p>

