



STANDARD PROCEDURE CSG DEVELOPMENT (WALLOONS)

- DRILLING PROGRAM -




Standard Procedure Sign Off		
Procedure: Drilling Program		
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1. GENERAL INFORMATION

A number of coal seam gas wells will be drilled, cased and suspended in the Walloons area some 300 km's West of Brisbane. The wells are designed to appraise and produce the gas resource of the Juandah, Taroom and Macalister Coal Measures.

A 14" conductor will be preset to approximately 12m. The 12¼" surface hole section will be drilled and 9½" casing will be run and cemented. The 8¾" production hole will be drilled to total depth through the coals of the Juandah, Taroom and Macalister Coal Measures. The well TD will be approximately 60m below the last coal.

A testing/evaluation program may be undertaken. The well will then be cased with either a pre-perforated string of frac string. A mix of pre-perforated and non-perforated 7" K55 production casing with an external casing packer/stage collar will be used to cement above the coal in the case of the pre-perforated string. A string consisting of blank N80 joints cemented to TD will be used in the case of the fracture design.

2. PROJECT

2.1 Description

The objective of this document is to outline the processes for management and the technical procedure to drill, test, case and suspend the well.

The drilling campaign will be carried out on a nominal 24 hour day tour for the Drilling Contractor.

2.2 Wellsite Control

The Wellsite Representative should liaise with the Operations Superintendent to ensure there is full awareness by both parties of the planned activities at all times. The Wellsite Representative will report to the CSG Drilling and Completions Manager or delegate on a minimum daily basis during the course of the work program.

2.3 Compliance Documents

This program is directly linked to, and must be read in conjunction with, the Wellsite Safety Management Plan (SMP). The Wellsite SMP includes a list of Regulatory Documents, Safety Standards and Operating Procedures which are the governing documents for this Program of work. These documents are listed below and must be accessible in electronic or hard copy form to all personnel at the Wellsite. Compliance documents are listed on the WSDS.

2.4 Wellsite Control

Stage	From	To	Document
Pre-Rig Move	Operations Superintendent	Origin Energy Wellsite Representative	Well Handover Form
Post - Rig Move	Origin Energy Wellsite Representative	Operations Superintendent	Well Handover Form

It is important to ensure the Origin Energy landholder liason is consulted prior to moving onto privately owned land.

2.5 Reporting

Reports to be compiled onsite and made available to office personal with a timeline of expected submission. A full list of the required reporting, methods to which the reports are to be submitted and a timeline is contained in the WSDS.

3. OPERATIONS

ALL PERSONNEL ONSITE HAVE AN OBLIGATION TO STOP ANY ACTIVITY THEY BELIEVE TO HAVE AN UNACCEPTABLE LEVEL OF RISK

IN ALL EMERGENCY SITUATIONS THE PROTECTION OF PERSONNEL IS PARAMOUNT.
NO ATTEMPT SHOULD BE MADE TO ENTER A DESIGNATED EMERGENCY AREA.

3.1 General

- 3.1.1 The tasks listed in this program form a guide for the anticipated drilling activities and may need to be modified as the work progresses. Minor changes to the program may be made at the discretion of Wellsite personnel in consultation with the Wellsite Representative and the CSG Drilling and Completions Manager. A Drilling Change Control Record approved by the Brisbane Office will be required when:
- An equipment or well design change has a potential impact on safety;
 - There is a material change to what is documented in this program; or
 - The cost impact of the change is greater than 10% of the AFE.
- 3.1.2 All personnel participating in the project must have completed the Origin Subsurface HSE Induction, received a Site Specific Induction from the Wellsite Representative prior to commencement of activities on the site and be outfitted with appropriate PPE. Non-essential personnel and casual visitors should be discouraged from entering the Wellsite. Any visitors to the wellsite must receive the Site Specific Induction.
- 3.1.3 Toolbox Meetings (TBM) or Job Safety Analysis (JSA) meetings must be conducted prior to any new or critical operation and any change or variation in the procedure.
- 3.1.4 No equipment is to be moved onto location until Weed Hygiene Declaration forms have been received and approved by the Wellsite Representative. The Wellsite Representative will liaise with the Operations Superintendent, prior to the equipment mobilising to the wellsite to arrange handover and discuss local issues that may impact on the project.
- 3.1.5 All depths throughout this program unless otherwise noted refer to “hole measured depth below rotary table”. This reference point to be used for all drilling and logging activities.

3.2 Pre-Spud

- 3.2.1 Obtain well handover from Operations Superintendent or nominee (use the “Well Handover/ Handback Form - Oil/CSM Well”).
- Confirm with the Operations Superintendent that the landholder has been notified of the intended well activity prior to moving the rig and equipment onto location.

Safety meetings must be held at the appropriate times throughout the following procedures, including field inductions upon arrival. All safety meetings, JSA and TBM shall be documented in the daily report.

Fluids are not to be discharged to the wellsite, except to an approved pit.

The wellsite is to be cleaned up once the rig moves off of the lease.

- 3.2.2 Before the rig moves on site, the location will be surveyed, access roads, rig and camp locations will be built, a cellar will be installed, a 14" conductor will be pre-set at 12m. **NOTE: Prior to drilling out ensure that the 14" conductor is cut to correct height as per attachment 4 (9-5/8" STS space out requirements).**
- 3.2.3 Move in and rig up.
- 3.2.4 Hold safety meeting outlining the overall drilling scenario, designated smoking/ hot work areas, emergency phone numbers, safety board location, designated first aiders, emergency muster point, emergency shutdown devices (ESD's) and location of extinguishers and first aid kits. Complete the Site Specific Induction Form.
Ensure that wellsite communications are established and operational. Confirm well location, including well co-ordinates, and record on the safety board. Keep well name, location and emergency contact details by the phone and ensure all personnel are familiar with the phone and emergency number location.
- 3.2.5 The Wellsite Representative is to complete a Rig Safety and Environmental Audit Check and forward it to the On Call Engineer in the Brisbane Office.
- 3.2.6 The rig will be put in safe and good housekeeping order with a Hazard Hunt completed prior to spudding the well. The Hazard Hunt should be 1 hour in duration or as deigned necessary by the Wellsite Representative.

3.3 12¼" Hole Section

3.3.1 Objective

Drill the 12¼" hole to the depth detailed in the Well Specific Data Sheet.

3.3.2 Lithology and Anticipated Problems

Potential hole instability, mud rings, loss of circulation, communication to surface at conductor shoe.

3.3.3 Well Proximity Issues

Nil.

3.3.4 Expected Fluid Levels

Surface.

3.3.5 Bits and BHAs

Bit 1: 12¼" PDC

BHA 1: Refer to Well Specific Data Sheet.

Ensure all BHA measurements are captured in IDS.

3.3.6 Drilling Parameters

Flowrate 480 GPM or practical maximum (ensure cellar pump is functioning correctly). Drill with reduced parameters (40 - 60 RPM at 300 GPM) until the second collar is drilled. At section TD, circulate the hole clean with a high viscosity pill (minimum viscosity of 45 seconds).

3.3.7 Mud

Spud with water. Biocide will be used to control SRB's. An initial 'shock dose' of 20 litres per 150 bbl will be required for the surface and production hole. Ongoing treatment there after will consist of 4 litre additions per 150 bbl of drilling fluid. Maintain the pH at 9.0 - 9.5 with Soda Ash. A small quantity of PAC-R can be added to the system to increase viscosity. Water can be added to maintain volume and to minimise density increase. Dump and diluting the system may be required to control mud weight.

High viscosity pills (5 - 10 bbl) should be utilised as required while drilling to clean the hole. A pill can be formulated with 9 bbl water and 4 sacks of Bentonite (55 lb/sack) and pre-hydrated to allow the gel to yield. For a viscosity of 40-50 sec/qt, add a small quantity of PAC or XCD Polymer.

NOTE: Additions of any diesel or hydrocarbon based chemicals are not to be made without prior approval of the Drilling & Completions Manager, Queensland CSG.

3.3.8 Surveys

Nil.

3.3.9 Directional Program

Nil.

3.3.10 Evaluation and Testing

Nil.

3.3.11 Casing and Cementing

See Well Specific Data Sheet for casing setting depth. Allow a 2- 5 m rathole.

Accessories: 1 x guide shoe, 1 x float collar with HWE plug, bow type centralisers, 1 x stop ring, threadlock compound

- i) Clean threads, drift, strap and tally casing before spudding the well.
- ii) Make up landing joint and running tool for STS Casing housing as per WGPC running procedures.
- iii) Run 9 $\frac{5}{8}$ " casing:
 - a. Install guide/ float shoe on 1st joint and secure with threadlock;
 - b. Run 1st joint with centraliser and lock ring;
 - c. Install float collar and secure with threadlock;
 - d. Install centralisers on the 3rd and 5th joints;
 - e. Run the casing (make up STS adaptor on last joint) and landing joint as per WGPC STS running procedures;
 - f. Circulate at least the total volume of casing;
 - g. Install cement head;
 - h. Space out and land the 9-5/8" STS landing ring on the 14" conductor such that the installation of the BOP stack, bell nipple and flow line do not need modification. Refer to Attachment 4 - to get correct space out;
 - i. If not secured by the top drive, chain casing down prior to mixing and pumping cement.
- iv) Cement 9 $\frac{5}{8}$ " casing:
 - a. Pressure test all lines to 2000 psi;
 - b. Mix and pump cement slurry, monitoring pressure on cement unit;
 - c. Take two cement samples;
 - d. Release HWE top plug and displace with clean water. Monitor for returns during cement job;
 - e. Bump plug with 200 psi over final displacing pressure and hold for 5 minutes. If plug does not bump, do not over displace more than 0.5 bbl;
 - f. Bleed off pressure and ensure float is holding. If not, shut in casing at surface and wait on cement.
 - g. Flush conductor riser and flowline with water.

3.4 8¾" Hole Section

3.4.1 Objectives

Wait on cement. Rig up wellhead, nipple up and test BOP. Run in hole with 8¾" BHA. Drill the 8¾" hole from the 9⅝" casing shoe through the Juandah and Taroom Coal Measures to TD (approximately 60m below last coal, to be confirmed by OE geologist) in the Eurombah Formation.

3.4.2 Lithology and Anticipated Problems

Formation	Potential Hazard/ Consequence	Actions Required
Springbok Sandstone	Permeable formation - loss of circulation, differential sticking, water influx	Attempt to cure losses with LCM. Keep pipe moving at all times where practical. Adjust the mud density to overbalance formation.
Upper Juandah CM Macalister Seam Lower Juandah CM Taroom CM	Gas bearing coal seam - gas influx	Perform well control operations. If the well is shut in, the standpipe valve must be closed and pressure monitored at all times. The flare line must have a propane ignition system. The BHA must have 2 floats.

3.4.3 Well Proximity Issues

Nil.

3.4.4 Expected Fluid Levels

Surface.

3.4.5 Wellhead

11" 3000 psi x 9⅝" 'A Section' wellhead supplied by Wood Group or STS System Wellheads supplied by Wood Group.

Slack off on casing, break out and lay out landing joint as per WGPC STS running procedures.

3.4.6 BOP

9" or 11" 3000 psi ram-type double (or two single) gate studded hydraulic BOP and 9" or 11" 3000 psi Annular BOP studded top and flanged bottom.

With BOP and STS drilling adaptor assembly made up, lower it over casing housing and make up drive screws and pressure test connection as per WGPC procedures. Nipple up BOP stack and pressure test BOP and ancillary equipment to 250 psi low and 1500 psi high (annular to 1000 psi) for 5 minutes each. A BOP Pressure Test Checklist should be completed and submitted to the Brisbane Office together with any relevant pressure recording charts.

3.4.7 Bits and BHAs

Bit 2: 8¾” PDC, TFA as per Well Specific Data Sheet

BHA 2: Refer to Well Specific Data Sheet.

Ensure all BHA measurements are captured in the reporting system.

3.4.8 Drilling Parameters

Flowrate 480 GPM or practical maximum. Drill out cement plug and shoe track with reduced parameters.

Drill ahead with 5 - 15 klb WOB and 90 - 120 RPM. PacR system should provide enough lift for cleaning however sweep the hole as required and ream every connection to ensure the hole is free. At TD, circulate the hole clean and perform a wiper trip to the surface casing shoe.

NOTES: ~ Flow check any significant drilling breaks encountered.

- ~ Slow Pump Rate tests are to be carried out at the start of each tour, every 150m of hole drilled, following increasing in mud weight and prior to tripping out of hole. SCR's are to be recorded in the Tour Report.
- ~ FIT's requirements will be noted on the Well Specific Data Sheet.
- ~ BOP drills are to be held on a frequent basis. ESD should be tested before as part of the pre-spud procedure.
- ~ Hard shut-in procedure to be followed. After shut-in all personnel should assemble and remain at the muster point until both the WSR and Rig Manager have assessed the situation and planned subsequent operations.
- ~ Carefully monitor fluid returns. Treat loss circulation to avoid potential for flow from differing pressured coal seams.
- ~ TD is prognosed only. Confirm with on-call geologist prior to TD that the rig has drilled sufficient rat hole for 7” production casing. This adjustment will be made such that TD for each well will be ~60m below the last significant coal of the Taroom CM. The coals can be picked from monitoring drill breaks and from gas peaks shown on the Pason monitoring system.

3.4.9 Mud

Drill out the cement and casing shoe with water.

Displace hole to Water/PAC-R mud (1 lb per bbl PAC-R). Use biocide at 4 litres per 150 bbl of drilling fluid. Mud density should be kept to a minimum. Maintain the pH at 9.0 - 9.5 with Soda Ash. As drill solids increase, add additional PAC as required to keep the viscosity between 33 - 35 sec/qt. If required, high viscosity sweeps can be utilised to aid hole cleaning. The viscosity of the sweeps should be 45 sec/qt which can be achieved through the addition of PAC.

Should higher mud density be required, increase the density using KCl.

At TD, the hole should be circulated clean with a high viscosity sweep.

Lost circulation will be treated with LCM and results monitored to assess potential risk of the well flowing if annular level drops. Consult with Brisbane Office if it is not possible to keep the hole full.

NOTE: Additions of any diesel or hydrocarbon based chemicals are not to be made without prior approval of the Drilling & Completions Manager, Queensland CSG.

3.4.10 Surveys

Nil.

3.4.11 Directional Program

Nil.

3.4.12 Evaluation and Testing

The minimum logging program prior to running casing is as follows:

Run 1:	GR	TD to surface
	Cal-Den	TD to surface casing shoe with hi-res density

Additional loggings tools may be run as given by the well specification card.

In the event of severe fluid losses to the formation where keeping the hole full is not possible, consult Brisbane Office for decision to run wireline pack-off or lubricator.

The Wellsite Representative is to ensure that a fast copy of the logs is uploaded to IDS and the On-Call Geologist is informed for coal depth confirmation. The coal depths will be used to confirm placement of pre-perforated casing joints with the on-call engineer.

Log scales are to be as follows:

Density:	1 to 3 g/cc
Density correction:	0.25 to -0.25 g/cc
GR:	0 to 200 API
Sonic:	40 - 140 US/F
Caliper:	6 to 16 inches
Bit Size:	6 to 16 inches
Hole Volume:	m ³

On a number of wells, one or more DST's may be required to define reservoir characteristics. Attachment 3 outlines the generic testing program. Refer to the Well Specific Data Sheet for more specific information.

3.4.13 Under-reaming

On a number of wells, under-reaming may be carried out. Refer to the Well Specific Data Sheet. The under-reamed sections will be determined post-logging and will be confirmed by the Brisbane Office. Select wells will be subject to post under-ream logging.

Make up 7.5" x 12.25" under-reamer and BHA as per the Well Specific Datasheet. Perform pre-checks on under-reamer prior to running in hole. Surface check flow rates. Visual check pins, clips and blades for defects.

Run in hole to pre-determined intervals of the Upper and Lower Juandah and Taroom Coal Measure, starting at the bottom interval.

Under-ream intervals - refer to manufacturers operating guidelines.

NOTE: 2 floats to be inserted into BHA above under-reamer tool.

Once the targeted intervals have been under-reamed, pull out of hole for a wiper trip.

3.4.14 Casing and Cementing

Casing design will be determined from coal seam depths defined on wireline logs. The final casing design is to be provided by on-call engineer. Allow a 60m rathole. The well will be either completed with 7" pre-perforated casing or 7" N80 casing. For good permeability, the well will be cased with a mix of pre-perforated and non-perforated K55 7" production casing. An external casing packer with stage collar will be used to cement the casing from above the top coal to surface. Alternately, 7" N80 casing will be run to TD and cemented to surface to enable fracture stimulation. Prior to running casing ensure casing running tool is made up to the landing joint and pressure tested as per WGPC procedures.

7" Pre-Perforated Casing

Accessories: 1 x guide shoe, pre-perforated casing as required for Upper Juandah, Lower Juandah and Taroom CM, non-perforated 7" casing as required to surface, 1 x 7" float collar, 1 x adaptor baffle, 1 x shut-off plug, 1 x External Casing Packer, 1 x hydraulic stage tool, bow type centralisers, stop rings, cement baskets, thread lock kit

- i) Clean threads, drift, strap and tally casing while drilling 8¾" hole.
- ii) Run 7" casing:
 - a. Install guide on 1st joint and secure with threadlock;
 - b. Run one joint of casing with a centraliser mid joint secured with the stop ring;
 - c. Run casing to above the top Juandah Coal, placing pre-perforated joints across significant coals of the Taroom and Juandah Coal Measure;
 - d. Install additional centralisers at the following points:
 - On the 3rd and 5th couplings;
 - On every 3rd collar to the top of the Juandah coal seam;
 - e. Install float collar (must be threadlocked) and Adaptor Baffle (seat for shut-off plug) in casing connection, one non-perforated joint below ECP;
 - f. Install cement basket on joint below ECP, secured with lock ring;

- g. Space out casing to install ECP above top Juandah;
 Placement of ECP to be confirmed by Brisbane Office
- h. Install and threadlock ECP;
- i. Install and threadlock stage cementing tool immediately above ECP;
- j. Threadlock the first joint above the stage cementing tool;
- k. Run non-perforated casing from top stage cementing tool to surface;
- l. Install centralisers at the following points:
 - On collar of the first joint above ECP (~12 m above ECP);
 - On every 3rd collar thereafter until the surface casing shoe;
- m. Run casing and pick up landing joint and STS wellhead.

NOTE: FOR STS - Land casing assembly as per WGPC running procedures. Casing assembly should have been made up and pressure tested prior to running casing.

- n. Circulate at least the total volume of the casing;
 - IF TIGHT HOLE IS ENCOUNTERED DO NOT FORCE ECP INTO WELL. POOH FOR WIPER TRIP.
- o. Space out and land casing at the correct height and install cement head.

iii) Cement 7" casing:

- a. Pressure test all surface lines to 3000 psi;
- b. Establish circulation, drop shut-off plug;
- c. Displace plug to seat in Adaptor Baffle. Bump plug and pressure to 500 psi to confirm seat;
- d. Set ECP - refer to manufacturer's operating instructions;
- e. Rig down cement head and perform pull test to ensure that ECP has inflated;

NOTE: If ECP has not inflated, pull out of hole to replace ECP and stage cementing tool.

- Pull out of the hole with care to minimise swabbing risks;
- Ensure annulus is kept full and trip sheet is utilised.
- f. Open stage cementing tool - refer to manufacturer's operating instructions;
- g. Circulate well with mud for a minimum 1 casing volume;
- h. Load stage tool closing plug;
- i. Pump 10bbl fresh water pre-flush.
- j. Mix and pump cement slurry, monitoring for returns during cement job;
- k. Take two cement samples;
- l. Release stage tool closing plug and displace with clean water. Bump plug and pressure up to 2000 psi to close tool. Hold pressure for 5 minutes. If unable to pressure up, the well will need to be shut in at the cement head until

cement sets. Information needs to be collected and noted for well handovers with regards to completion activities;

m. Bleed off pressure and check tool has closed;

NOTE: Upload pressure profile data from the cementing operation into IDS on completion of the job.

- iv) Flush BOPs, well head, cellar pump, cellar floor and 2" side outlets on casing housing.
- v) Wood Group STS Wellhead:
 - a. With cement in place remove cement head;
 - b. Remove landing joint as per WGPC procedures;
 - c. Remove BOP's as per WGPC procedures;
 - d. Install casing protector;
- vi) Dump mud to sump and clean mud tanks;
- vii) Release rig.

7" N80 Casing

Accessories: 1 x float shoe, 1 x float collar, 1 x latch down plug, bow type centralisers, 1 x stop ring, 2 x frac baffles, thread lock kit

- i) Clean threads, drift, strap and tally casing while drilling 8¾" hole.
- ii) Run 7" casing:
 - a. Install float shoe on 1st joint and secure with threadlock;
 - b. Run one joint of casing with a centraliser mid joint secured with the stop ring;
 - c. Install float collar;
 - d. Run casing with frac baffles as per approved casing design;
 - e. Install centralisers on every 3rd collar to the surface casing shoe;
 - f. Run the landing joint. Circulate at least the total volume of the casing;
 - g. Space out and land casing at the correct height and install cement head.
- iii) Cement 7" casing:
 - a. Pressure test all surface lines to 3000 psi;
 - b. Pump 10bbl fresh water pre-flush.
 - c. Mix and pump cement slurry, monitoring for returns during cement job;
 - d. Take two cement samples;
 - e. Release latch down plug and displace with clean water.
 - f. Bump plug and increase pressure to 2000 psi. Hold pressure for 5 minutes;
 - g. Bleed off pressure and check float has held;

NOTE 1: If there were no returns and low pumping pressure during cementing, the Brisbane Office must be consulted before proceeding. BOPS should not be lifted without prior approval.

NOTE 2: Upload pressure profile data from the cementing operation into IDS on completion of the job.

- iv) Flush BOPs and well head;
- v) Wood Group STS Wellhead:
 - e. Slack off string weight and ensure casing is held in place;
 - f. Remove landing joint;
 - g. Nipple down BOPs;
 - h. Install casing protector;
- vi) Dump mud to sump and clean mud tanks;
- vii) Release rig.

ATTACHMENT 1 - FORMATION INTEGRITY TESTING PROCEDURE

A Formation Integrity Test is conducted to ensure that the strength of the open hole formation is able to provide an adequate maximum allowable casing pressure (MACP) for well control procedures.

The applied surface pressure for the formation Integrity test is 50 psi.

The FIT should be conducted after drilling out the cement of the 9 $\frac{5}{8}$ " casing shoe and the BOP stack has been tested.

Procedure

1. Drill out the 9 $\frac{5}{8}$ " casing shoe with water and drill 3-5 m of new formation;
2. Circulate to ensure mud column is balanced and cuttings are circulated out;
3. Pull bit inside the 9 $\frac{5}{8}$ " casing shoe;
4. Shut the well in using the annular or pipe rams. Close the kelly cock;
5. Rig up the pressure testing pump and pump down the annulus at a constant rate of approximately 0.05 - 0.10 bbl/min until an FIT Test pressure of 50 psi is reached and stabilised. Observe the pressure over a 5 minute interval (looking for any drop in pressure); and
6. Bleed off the pressure and record the volume of fluid recovered. Any difference between the volume bled back and the volume pumped is volume that has been lost to the hole.

NOTE: If 50 psi cannot be maintained consult with office on go forward plan.

Calculation

The maximum allowable mud density is calculated as follows:

$$MAMD = PT \text{ (psi)} / 0.170612 / TVD \text{ (m)} + MW \text{ (ppg)}$$

Where:

MAMD	=	maximum allowable mud density (ppg)
PT	=	Maximum Test Pressure achieved (psi), normally 100 psi per 100m
TVD	=	drilled depth (m)
MW	=	test mud weight (ppg)

ATTACHMENT 2 - WELL CONTROL WHILE RUNNING 7" PERFORATED CASING

The production wells in the Walloons development are designed with perforated casing set across significant coal seams. Coal picks will come from the OE geologist on call. The perforated casing will be intermixed with non-perforated casing joints.

Risk Event

Well control event while running the perforated casing. The perforations allow communication from open hole - casing annulus into the casing and to atmosphere via perforations at surface (irrespective of any closure of BOP annular or rams).

Consequence

Personnel injury, equipment damage, environmental damage, discharge hydrocarbon gases (ignition risk).

Existing controls

Keep the hole full of fluid. If required, circulate fluid via top drive casing nubbin once each joint is lowered to the point where the perforations are below the flow nipple level. BOP (annular and/or ram) for control of annulus. Casing running nubbin (for Ensign Rig 50) to seal off at top casing connection.

If a joint of perforated casing is being run at the time of the well control event, the casing should be lowered until the perforations are below the annular or rams, if practical and safe to do so. To facilitate this, each perforated joint remains non-perforated for 3m below the casing collar. This enables the joint to be lowered to the slips position, placing the top perforations below the annular BOP and/or rams. At this point the BOP can be closed, securing the well.

After each joint has been run, the well should be checked to ensure there is no flow prior to backing out the casing running nubbin. In the event the well flows during the period the drive nubbin is disengaged from the casing string, the nubbin should be made up to the casing joint in the slips, if practical and safe to do so, prior to shutting the annular and/or ram. If the casing running nubbin is engaged with the next casing joint to be run, personnel on the rig floor will have to assess if it is practical to stab the new joint of casing into the joint in the slips. Alternatively the nubbin could be backed out of the new joint prior to attempting to stab in to the joint in the slips. HOWEVER, the overriding consideration prior to taking any such action must be:

It is the philosophy of OE that human life is more important than plant, equipment and the environment. Under no circumstances are personnel to put their life in danger for the sake of plant, equipment and/or the environment. When in doubt evacuate the area.

After all the programmed perforated casing has been run, a float collar will be installed in the casing string to prevent any well fluids flowing back through the casing, and normal well control procedures will apply.

ATTACHMENT 3 - DRILL STEM TEST PROCEDURE

For drill stem tests the following procedure will be adopted:

(This procedure is applicable to testing services provided by DST Australia, and should be read in conjunction with DST Australia procedures.)

- (1) Circulate until hole is clean.
- (2) Pull out of hole.
- (3) Conduct Safety Meeting regarding testing procedures and hazards.
- (4) Make up testing assembly. Tests should be conducted using standard drill string. Please confirm with Brisbane office of water cushion requirements.
- (5) Final test string configuration will be confirmed with testing contractor prior to test. Tools must include as a minimum, three (3) recorders (these are: electronic - inside, outside and recovery) plus two independent circulating subs, safety joint and sample chamber. The drill stem recovery will be circulated conventionally. Jars, if available, may be run above the DST BHA and used to release the packers at the completion of testing. If possible, fax or email proposed tool string to the Brisbane office before make up.
- (6) Check measurements with the testing operator to ensure that the desired interval is being tested. Record all measurements on the back of the Drill Stem Test Report Form.
- (7) Check that the flare line to the flare pit is clear and all valves on the line downstream from the choke are open.
- (8) Ensure all sources of ignition have been suppressed.
- (9) Contact Brisbane office to confirm flow and shut in periods. Nominal test period for coal seam tests are 5 minute pre-flow, 30 minute shut in, 60 main flow, 300-minute final shut in. Electronic recorders should be set to collect data at one-second intervals.
- (10) Install top drive compatible testing head. Rotate pipe to inflate the packers. Confirm packers are set.
- (11) Open valve - observe annulus to ascertain if the packers are holding. A fill up line should be directed to the annulus to top up lost fluids. If a sudden drop is seen in the annulus the tool should be picked up to close.
- (12) Conduct drill stem test with flow periods as instructed. In some cases main flow period will be contingent on surface observations based on consultation with company reservoir engineer during test.

NOTE 1: If bubble rate (flow rate into drill pipe) decreases significantly during main flow period (second flow) after a very strong blow initially, shut in tool immediately. Do not change preflow or shut in periods. Ensure full 60 minute main flow if little flow (weak bubbles).

NOTE 2: IF THERE IS DRY GAS TO SURFACE

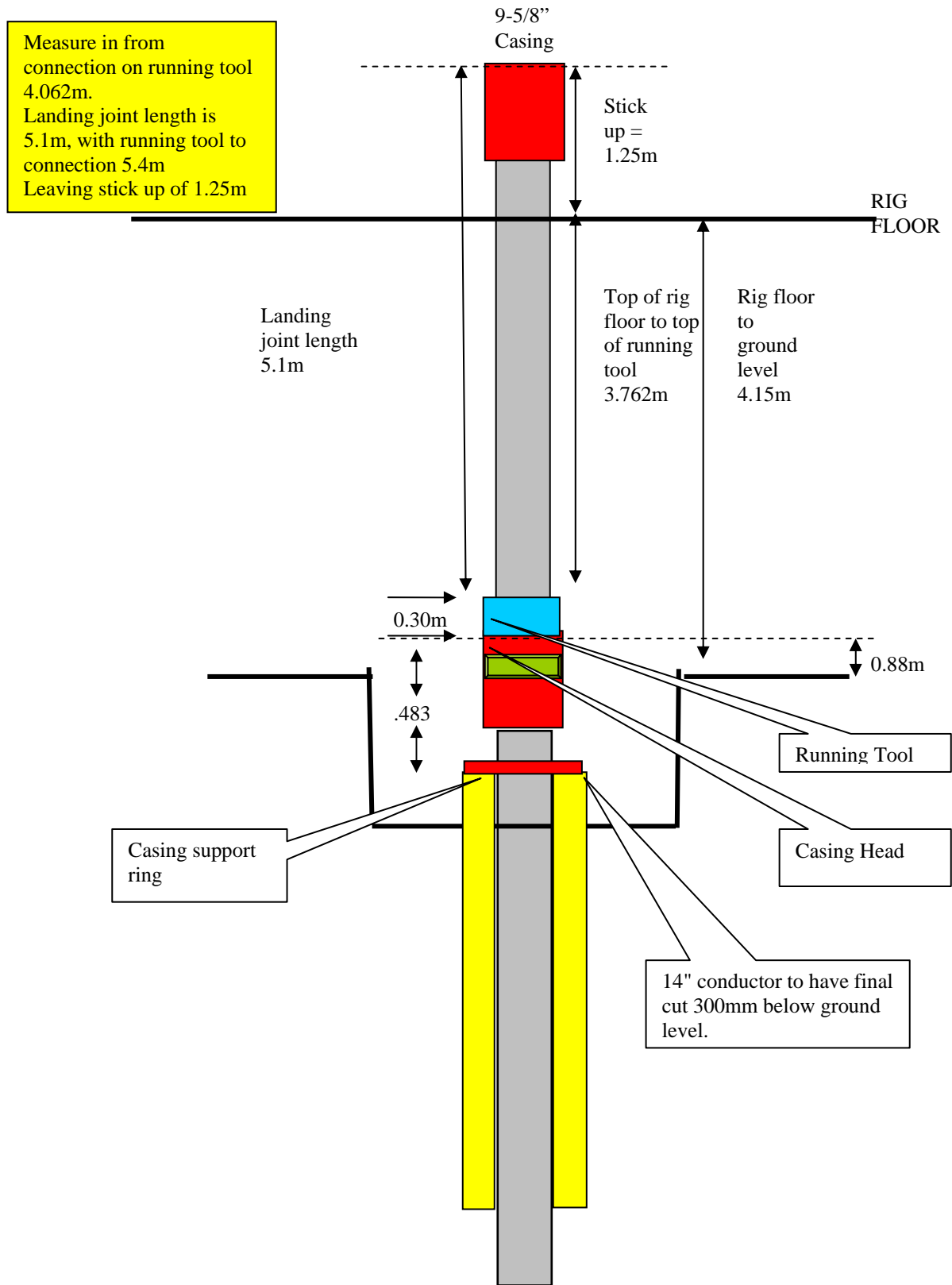
- i) Complete the test, shut the tool and bleed gas to flare.
- ii) Pull free, drop the bar and allow the system to u-tube from the annulus into the test string, displacing gas to flare. Ensure that the annulus is continually topped up with fluid.
- iii) Continue to fill the annulus until the fluid level stabilises.

- iv) Break out test head and run in hole to place circulating ports below the test interval.
 - v) Circulate conventionally a minimum of one hole volume, taking returns to the mud tank.
 - vi) Ensure there is an even mud weight in and out before proceeding.
- (13) Pull packer free. Observe the mud level in the hole for any returns. Ensure hole remains full at all times.
- (14) Drop bar to open drop bar sub. In the event of failure of the drop bar sub, pressure up to activate the pump out sub. Ensure drill string is shut in at test head. Have pumps on line to fill the annulus if needed.
- (15) Once the annulus is stable (and full), circulate conventionally a minimum of one hole volume or until any sign of gassiness is removed from the well bore fluid.
- (16) Pull out with test string. Ensure the hole is kept full at all times and that initially the tools are pulled slowly to avoid swabbing the well. Ensure kill sheet is up to date and the trip sheet is being utilised. At any stage during tripping the top drive may be made up and the well circulated to avoid/stop any influx of gas.

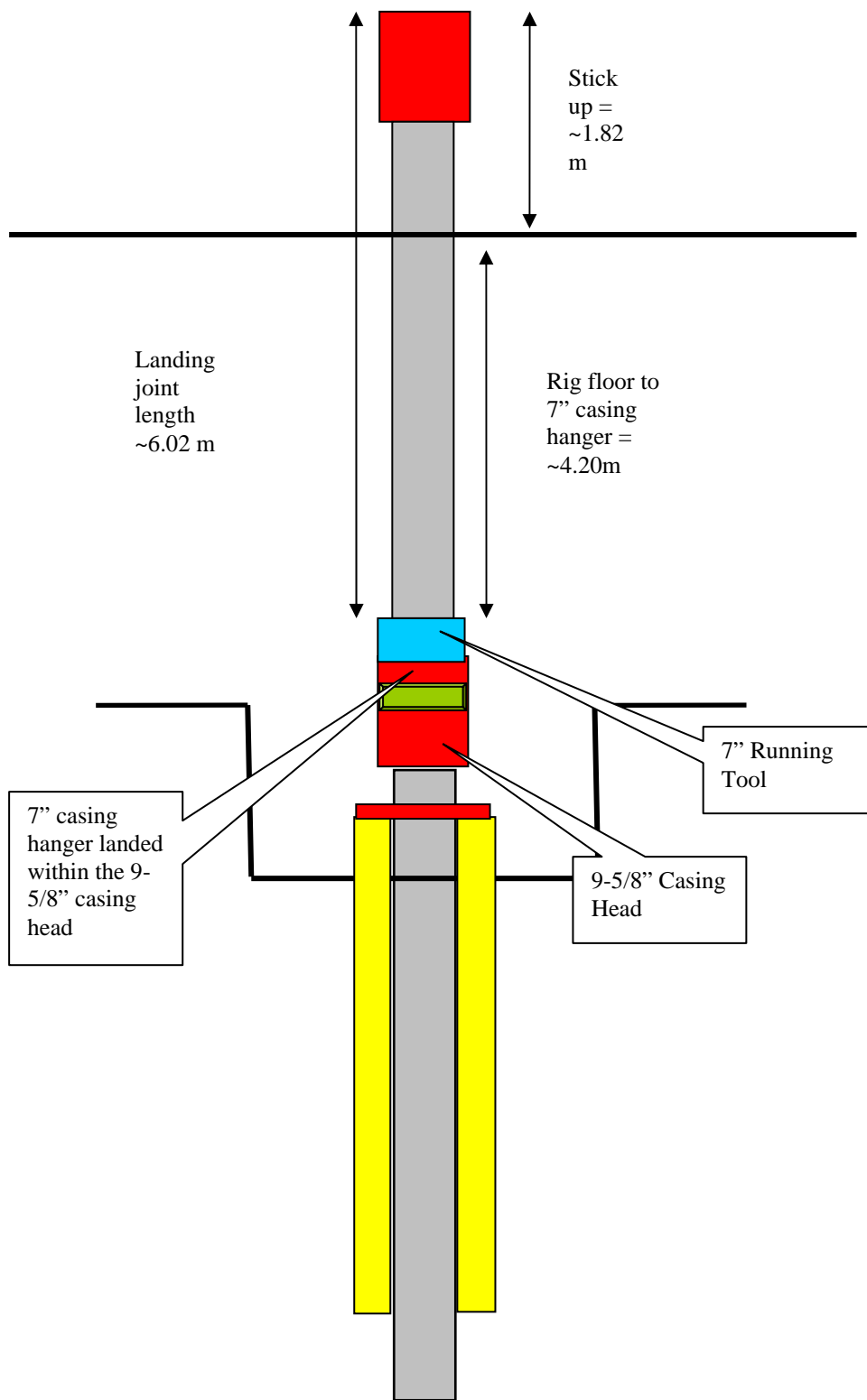
FORMATION FLUID SAMPLES

No gas or water samples are required. Use a gas sniffer to analyse the flow from the bubble hose during the pre and main flow.

ATTACHMENT 4 - 9-5/8" STS SPACE OUT REQUIREMENTS



ATTACHMENT 5 - 7" STS SPACE OUT REQUIREMENTS



All lengths related to landing 7" casing should be checked to find rig/land joint specific measurements.