

<b>Title</b>	Involve in full DEE cycle – Job Design, Execution & Evaluation					
<b>Target Population</b>	Field Engineers					
This requirement is applicable to:		JFE		FST		EOT
		FE1		FS1		EO1
	✓	FE2		FS2		EO2
			✓	FS3		EO3

**Objective:**

The objective of this task is to evaluate and verify the employee’s skills and knowledge in designing, executing and evaluating Coiled Tubing job, including safety outlines, complete procedure, equipment limits and interface with Clients

**Tasks:**

- Perform the job design tasks which include:
  - Data collection
  - Laboratory test
  - Cerberus simulation
  - Space/weight logistics
  - Job procedure
  - Equipment requirements
  
- Execute the jobs using following steps:
 

**Pre-job**

  - Review the program for the job
  - Understand and explain the Job Objective(s) for the operation
  - Perform under supervision the Job Safety Analysis or JHARC-Hazard Analysis and Risk Control for the operation
  - Perform a Pre EMC and Post EMC I to equipment with the unit operator
  - Execute under supervision the rig-up and rig-down of equipment. as per CTS standard
  - Make some basic calculation as requested by FE/FS in charge of operation (some examples: MPSP, PT1 and PT2 values, CT string volume, volume to displace bottoms up wellbore, CT speed required to place fluids in wellbore, Nitrogen required to flush CT string at surface, N2 required to displace CT string when at a given depth)
  - Write a report to summarize completed Pre-Job tasks based on requirements and discussed your findings with your Mentor

**Job Execution and Post Job Involvement**

- Draw a layout of wellhead stack and well completion with the dimensions
- Draw a schematic of downhole tool used for the operation, include dimensions and fishing diagram

# DIMENSION BID

## CTS TASK SHEET

- Assign tasks to the crew members and help the Supervisor leading the operation
- Keep a close relation with the Client during the operation
- Run the CT unit under supervision
- Participate in the Post Job report, including graphs interpretation and discussion of job results versus job objectives and prepare your own report for training purposes.

- Evaluation should include:
  - Participate in the post job report, including graphs interpretation and discussion on job results versus job objectives and prepare your own report for training purposes
  - Identify action plans and recommendations for next job.


### REQUIRED EVIDENCE:

- 1 All relevant documents from conception to completion (Cost Estimation, Project on Paper, Job Program, Post Job Report etc)

OVERALL SCORE	STRONG			ADEQUATE			IMPROVEMENT NEEDED		
	10	9	8	7	6	5	4	3	2


MENTOR / ASSESSOR's Comments & Recommendation (Service Quality Engineer):

Hafiz had prepared various SOP. With the experience handling in planning and communication with client, he had deliver good good in ensuring smooth planning and job delivery.

Signature		Assessment Date	14/10/2024
Name	MUHAMMAD NOORHAFZAN BIN AB. MANIS	Position	SERVICE QUALITY ENG.

FSM / OM Comments & Recommendation:

Manage to deliver task very well.

Signature		Assessment Date	14/10/24
Name	M. KHAIRUL RIDHWAN AZIZAN CTS FIELD SERVICE MANAGER Dimension Bid (M) Sdn Bhd.	Position	FSM

# DIMENSION BID

## CTS PRESENTATION ASSESSMENT FORM

Presenter's Name	Mahammad Hafiz Sahandian	Date	13/10/2024
Position	PE 2	SCORE	
Topic	Dulang B7-S SCO		
Objective	Job design and execution for Dulang B7S.		
Assessor (s)	M. NOORRAFIZAN BIN AB. MAJIB		

Assessment Criteria	Rating (Please ✓ where appropriate)									
	STRONG			ADEQUATE			IMPROVEMENT NEEDED			
	10	9	8	7	6	5	4	3	2	
<b>A Presentation Skill (20%)</b>										
a. The presenter was well prepared and delivered the material in a clear and structured manner.				✓						
b. The presenter was knowledgeable about the topic and able to relate the importance of the subject matter to his job					✓					
c. The presentation contained practical examples and useful techniques that applied to current work.					✓					
<b>B Creativity (20%)</b>										
a. Did the presenter show creative thinking in the method of development and presentation?				✓						
b. Did presenter get audience involved in "learning" the material?				✓						
<b>C Content (60%)</b>										
a. Did the presenter cover all the key points of the subject matter				✓						
b. Did the presentation incorporate strong, effective supporting material throughout?					✓					
c. Did the presenter give clear and concert explanation and example?				✓						
d. Was the presenter able to answer questions on subject matter? Answers were correct and corresponded with the required understanding?					✓					

Additional Comments:



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Assessed By:	Verified By:
	
Name: M. NOORRAFIZAN BIN AB. MAJIB	Name: M. KHAIRUL RIDHWAN AZIZAN
Position: SERVICE QUALITY ENG.	Position: CTS FIELD SERVICE MANAGER
Date: 14/10/2024	Date: 14/10/2024



**DIMENSION BID**

WELL INTERVENTION | PERFORATION SERVICES  
 Suite 5-1 & 5-2, Menara UOA II, 21 Jln Pinang,  
 50450 Kuala Lumpur, Malaysia  
 Tel: +603 - 2166 8877 Fax: +603 - 2166 8787

**QUOTATION**

DBCTS/DULANG/0724/Q-76

**Quote To:**

PETRONAS Carigali Sdn Bhd,  
 Peninsular Malaysia Operation  
 Kompleks Operasi Petronas  
 24300 Kerteh, Terengganu, Malaysia

Attn: Pravin Nair

Date: 8-Aug-24

Subject: Quotation to CTU Services for Dulang B-75

No	Item	UOM	Unit Price (RM)	Quantity/Day	Total (RM)
<b>Equipment, Personnel and Services list as per Contract requirement &amp; Price Book: Contract Ref: CHO/2015/DR/1006(A)</b>					
<b>A</b>	<b>CTU Package Rental &amp; Personnel Charges:</b>				
1	Mob/Demobilize for Pumping (Call Out)	EA	33,075.00	1	33,075.00
2	CTU#1 24 Hour Package as per below item: * 1ea of CTU Complete package with PCE * 1ea complete pumping Package * 2 ea Fluid Storage Tank capacity of 105 - 125 bbls each * 2" Treating iron for rig up * Piping/Valves/Hoses for surface rig up * Necessary Crossover * 6 ea of Transfer Pump (Wilden) * 1ea Tool Container * 1ea Iron Transport Basket * 1ea Zone II Air Compressor 175 scfm * 1ea Genset	PKG	1,129,519.33	1	1,129,519.33
3	21 pax of Personnel for 24 hour Operation		552,263.80	1	552,263.80
4	1 set Downhole tool for SCO	PKG	197,039.30	1	197,039.30
5	RIH Charges		21,359.31	2	21,359.31
<b>B</b>	<b>Chemical Charges (Estimation charge per usage):</b>				
1	Nitrogen	gal	6.00	8,000	48,000.00
	H2S/CO2 corrosion inhibitor	gal	73.50	220	16,170.00
	Microbiocide	gal	71.40	220	15,708.00
	Oxygen Scavenger	gal	121.00	220	26,620.00
	Contingency Wax Dissolver				
	Wax/Paraffin Removal (WaxCLEN300)	gal	165.90	550	91,245.00
	Contingency Lost Circulation Material				
	Calcium Carbonate	Lbs	1.58	1,760	2,780.80
<b>Grand Total:</b>					<b>2,133,780.53</b>

**Additional Notes :**

- Terms and condition as per contract PMA CHO/2015/DR/1006(A)
- Quotation is based on proposal which includes the risk mitigation.
- Charges applied based on rental, operating and services provided not objectivity basis.
- All other charges apply as per contract if there any deviation from the proposal.

Incoterms	Origin	Delivery Period	Validity	Payment Term
Ex Work	KSB	14 DAYS	60 DAYS	30 DAYS

Prepared by:	 Muhammad Hafiz	Approved By:	 Aji Adnan
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Please Indicate your acceptance below:

I hereby agree with the quoted prices, terms &amp; conditions in DBCTS/DULANG/0724/Q-76:

Agreed by (Name & Position):	Signature:
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**Terms and Conditions:**

**1. Definitions:**

- a. "COMPANY" means Dimension Bid M Sdn Bhd.
- b. "MOBILIZATION /DEMOBILIZATION POINT" means COMPANY warehouse In Kemaman Supply Base (KSB) and/or Asian Supply Base (ASB) or otherwise stated based on THIRD PARTY conditions.

**2. Customs Taxes & Duties**

- a. The above rates do not include customs taxes & duties (import & export charges). The said charges shall be borne by Customer. Any such charges paid in advance by Dimension Bid will be
- b. The above rates are exclusive of Withholding Tax (WHT) and any other taxes.

**3. Provisions by Clients**

- a. Client shall advise Company regarding their Company Requirements for Personnel to go onboard their Worksite (with regards to Safety Passport, Medical Examination, etc.)

- b. Transportation (other than covered under Mob/Demob Charges), and storage of equipment

- c. Customer shall extend their assistance for any issues related to customs clearance and also immigration procedures.
- d. Client needs to provide transportation for equipment and personnel from mobilization site and back to demobilization site, lodging including meals and any relevant matters.

**4. Lost, Damages and Repair**

- a. Any repairs for damages, or loss of equipment that occur during the performance of Works, during transportation from mobilization/demobilization site to the Worksite, or other conditions in which the Equipment is under the care of the client will be charged at Cost plus 20%. On top of that, any spare parts will be charged at cost plus 20%.

**5. Adverse/ Corrosive Environment**

- a. Customer is to advise on the existence of adverse and/or corrosive environments in their wells before the Works are being performed. Dimension Bid reserves the rights to suspend and/or cancel

**6. Mobilization/Demobilization**

- a. Equipment will be suitably prepared/ protected/packed for transportation. Special packaging will be available at cost plus 20% upon request.

**7. Stop Work Policy**

- a. Company implements a "Stop Work Policy" whereby Company and its Personnel reserves the right to stop the work if the condition at the time is considered unsafe. A copy of the said policy can

**8. Late Payment Charges**

- a. In the event customer fails to pay Company the agreed amount within 30 days from the date of invoice, a penalty of one and half per centum (1.5%) per month of the outstanding amount shall

**9. Liabilities and Indemnity**

- a. COMPANY will not be liable for any THIRD PARTY services being rendered thru our contract for the CLIENT.
- b. The performance of the said tools/equipments/services is not guaranteed by COMPANY.

**10. Validity of Unit Price**

- a. The quoted unit price is exclusive for once and only once for the well stated above, limited to the stated services above.
- b. The quoted unit price shall not govern and control any future commercial terms and conditions.

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- a. The quoted unit price is exclusive for once and only once for the well stated above, limited to the stated services above.
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# DIMENSION BID



CLIENT : PETRONAS CARIGALI SDN BHD / PENINSULAR MALAYSIA ASSET / PETRONAS SUB SURFACE & WELL INTERVENTION  
 DB CTU Contract: CHO/2015/DR/1006(A)  
 Package : DB CTU PACKAGE # 1 COST ESTIMATION JULY 2024 # 24 HOURS OPERATION  
 Field / Location : DULANG B-7S  
 Job Scope : CTU - SCO  
 Mobilization Date : July  
 Updated Date : 8-Aug-24  
 Quotation No: DBCTS/DULANG/0724/Q-76

ITEM	DESCRIPTION	Unit Price	UOM	Qty	Unit	Amount
1	<b>SURFACE EQUIPMENT &amp; MOB/DEMOS</b>					
1.1	Mobilization Cost for CTU Package (Call Out Package)	MYR 13,075.00	Mob	1		MYR 13,075.00
1.2	Demobilization Cost for CTU Package (Call Out Package)	MYR 13,075.00	Demob	1		MYR 13,075.00
<b>SUBTOTAL</b>						<b>MYR 26,150.00</b>
2	<b>COILED TUBING UNIT (CTU # 02) - All Zone 2 Unit</b>					
2.2.1	CT Mast 1-1/2 OD	MYR 24,150.00	Month	1	17	MYR 410,550.00
2.2.2	Control Cabin	MYR 19,277.60	Month	1	17	MYR 327,729.20
2.2.3	Extendable Jacking Frame	MYR 21,000.00	Month	1	17	MYR 357,000.00
2.2.5	CTU Power Pack	MYR 23,056.89	Month	1	17	MYR 391,967.13
2.2.6	Genset 60KVA Zone 2	MYR 76,112.45	Month	1	17	MYR 1,293,911.65
2.2.7	Air Compressor 175CFM Zone 2	MYR 40,540.50	Month	1	17	MYR 689,188.50
2.3	<b>PRESSURE CONTROL EQUIPMENT (PCE)</b>					
2.3.1	Injector Head Assembly	MYR 18,485.75	Month	1	17	MYR 314,257.75
2.3.2	Strainer	MYR 4,725.00	Month	1	17	MYR 80,325.00
2.3.4	4-1/16 Single Shear/Seal BOP	MYR 1,103.80	Month	1	17	MYR 18,764.60
2.3.5	4-1/16 Comb. BOP	MYR 5,222.75	Month	1	17	MYR 88,786.75
2.3.6	PCE Accumulator System	MYR 5,350.00	Month	1	17	MYR 90,950.00
2.3.7	Wellhead Crossover	MYR 15,750.00	Month	1	17	MYR 267,750.00
2.3.7	Quick test sub	MYR 4,935.00	Day	7	14	MYR 69,090.00
2.3.7	CT Deployment system	MYR 293,400.00	Month	1	17	MYR 4,987,800.00
2.4	<b>PUMPING UNIT FACILITIES (PP)</b>					
2.4.1	125 BBL Storage Tank	MYR 11,550.00	Month	1	17	MYR 196,350.00
2.4.2	100 BBL Batch Mixer	MYR 9,378.75	Month	1	17	MYR 161,438.75
2.4.3	Triples Pump Unit	MYR 23,504.00	Month	1	17	MYR 399,568.00
2.4.4	3" Treating Irons for Pump rig up	MYR 11,035.00	Month	1	17	MYR 187,595.00
2.4.5	3" Crossovers for Treating Irons	MYR 15,750.00	Month	1	17	MYR 267,750.00
2.4.6	Transfer Pump (Incl. 3" Wellhead Pump & Incl. 2" Wellhead Pump)	MYR 1,485.75	Month	5	17	MYR 126,281.25
2.4.7	Graco Pump	MYR 924.00	Day	1	17	MYR 15,708.00
2.4.8	Piping/Valves/Hoses for surface rig up	MYR 1,050.00	Month	10	17	MYR 17,850.00
2.5	<b>NITROGEN PUMPING FACILITIES</b>					
2.5.1	N2 Tank	MYR 21,845.00	Month	4	17	MYR 751,360.00
2.5.1	N2 Tank	MYR 735.00	Day	4	17	MYR 12,495.00
2.5.2	N2 Converter	MYR 31,500.00	Month	1	17	MYR 535,500.00
2.5.3	Piping/ Hoses for N2 rig up (Crossover/ Hoses)	MYR 1,050.00	Month	4	17	MYR 71,400.00
2.6	<b>ADDITIONAL ITEMS</b>					
2.6.1	15FT Toolbox Container	MYR 4,500.00	Month	2	17	MYR 153,000.00
2.6.2	10FT Cargo Basket	MYR 4,500.00	Month	8	17	MYR 67,500.00
2.6.3	10FT Cargo Basket	MYR 150.00	Day	7	17	MYR 2,550.00
2.6.4	15FT Iron Transport Basket	MYR 5,850.00	Month	3	17	MYR 99,450.00
2.6.4	20 FT Iron Transport Basket	MYR 6,300.00	Month	1	17	MYR 107,100.00
2.6.5	Air Tagger	MYR 10,440.00	Month	1	17	MYR 177,480.00
2.6.5	Breathing Apparatus - Escape Set	MYR 280.00	Day	8	17	MYR 3,824.00
2.6.6	H2S Detector - Personal Sensor	MYR 105.00	Day	16	17	MYR 2,856.00
2.6.10	Paendo Tornado price with 25% discount as per Contract - Startlink-Telecommunication Services	MYR 1,600.00	Day	1	17	MYR 27,200.00
2.6.10	Logging Head, Bakke equivalent with 15% discount as per contract (Max Completion)	MYR 1,575.00	Day	1	17	MYR 26,775.00
<b>SUBTOTAL</b>						<b>MYR 960,882.13</b>
2.7	<b>FLOWBACK EQUIPMENT</b>					
2.7.1	Choke Manifold	MYR 42,250.00	Month	1	17	MYR 718,250.00
2.7.2	Demulsing hydrocyclone unit Dual Port Sand Filter	MYR 97,400.00	Month	1	17	MYR 1,655,800.00
2.7.3	Sand Screen Box	MYR 14,175.00	Month	1	17	MYR 240,975.00
2.7.4	Emergency Shutdown Valve w/ Hydraulic Control Panel	MYR 34,650.00	Month	1	17	MYR 589,050.00
2.7.5	Surge Tank, 30 bbls capacity	MYR 11,025.00	Month	1	17	MYR 187,425.00
2.7.6	Sand rated Wildcat Pump	MYR 11,025.00	Month	2	17	MYR 372,825.00
2.7.7	Treating Irons	MYR 33,025.00	Month	1	17	MYR 561,425.00
2.7.8	Low pressure hoses & valve - Hydrocarbon Transfer hose (20 barg rating)	MYR 1,312.50	Month	1	17	MYR 22,312.50
2.7.9	Low pressure hoses & valve - Hydrocarbon Transfer hose (80 barg rating)	MYR 1,312.50	Month	1	17	MYR 22,312.50
2.7.10	Necessary Crossover	MYR 15,750.00	Month	2	17	MYR 267,750.00
2.7.12	20 FT Iron Transport Basket	MYR 6,300.00	Month	1	17	MYR 107,100.00
2.7.13	Sand Waste Container	MYR 6,217.00	Month	4	17	MYR 42,518.00
<b>SUBTOTAL</b>						<b>MYR 268,837.00</b>
<b>GRAND TOTAL CTU SURFACE EQUIPMENT</b>						<b>MYR 1,229,719.13</b>

Prepared by:  
  
 Muhammad Lahu  
 DB Operation Engineer

Reviewed by:  
  
 Ali Adnan  
 DB General Manager

Acknowledge by:  
  
 Pravin Raju  
 PIS Dulang EIC


Approved by:  
  
 Eddy B Samale  
 Head, Well Intervention

# DIMENSION BID





CLIENT : PETRONAS CARIGALI SDN BHD / PENINSULAR MALAYSIA ASSET / PETRONAS SUB SURFACE & WELL INTERVENTION  
 DB CTU Contract: CHO/2015/DR/1006(A)  
 Package : DB CTU PACKAGE # 1 COST ESTIMATION JULY 2024 # 24 HOURS OPERATION  
 Field / Location : DULANG B-7S  
 Job Scope : CTU - SCO  
 Mobilization Date :  
 Updated Date : 8-Aug-24  
 Quotation No: DBCTS/DULANG/0724/Q-76

ITEM	DESCRIPTION	Unit Price	UOM	Qty	Operational Day	Daily Rate	Amount
<b>2</b>	<b>CTU DOWNHOLE TOOL EQUIPMENT</b>						
2.1	Conventional Nozzle						
2.1.1	2-1/8" OD Single Bore Nozzle / Cleanout Nozzle (Monthly Rate)	MYR 179.55	Monthly	1	17	MYR 5.99	MYR 101.75
2.1.2	2-1/8" OD Single Bore Nozzle / Cleanout Nozzle (Call out - Standby Rate)	MYR 4.20	Day	1	17	MYR 4.20	MYR 71.40
2.1.3	2-1/8" OD Single Bore Nozzle / Cleanout Nozzle (Call out - Operating Rate)	MYR 5.36	Day	1	0	MYR 5.36	MYR 0.00
2.2	High Pressure Jetting Nozzle						
2.2.1	2-1/8" OD Multi-Jet Wash Nozzle (Monthly Rate)	MYR 5,490.45	Monthly	1	17	MYR 183.02	MYR 3,111.26
2.2.2	2-1/8" OD Multi-Jet Wash Nozzle (Call out - Standby Rate)	MYR 247.80	Day	1	15	MYR 247.80	MYR 3,717.00
2.2.3	2-1/8" OD Multi-Jet Wash Nozzle (Call out - Operating Rate)	MYR 353.85	Day	1	2	MYR 353.85	MYR 707.70
2.3	CT Connector						
2.3.1	Roll On Connector for 1-1/2" CT OD (Monthly Rate)	MYR 158.55	Monthly	1	17	MYR 5.29	MYR 89.85
2.3.2	Roll On Connector for 1-1/2" CT OD (Call out - Standby Rate)	MYR 3.68	Day	1	17	MYR 3.68	MYR 62.56
2.3.3	Roll On Connector for 1-1/2" CT OD (Call out - Operating Rate)	MYR 5.25	Day	1	17	MYR 5.25	MYR 89.25
2.3.4	External Dimple Connector for 1-1/2" CT OD (Monthly Rate)	MYR 378.00	Monthly	1	17	MYR 12.60	MYR 214.20
2.3.5	External Dimple Connector for 1-1/2" CT OD (Call out - Standby Rate)	MYR 9.45	Day	1	17	MYR 9.45	MYR 160.65
2.3.6	External Dimple Connector for 1-1/2" CT OD (Call out - Operating Rate)	MYR 12.60	Day	1	17	MYR 12.60	MYR 214.20
2.3.7	Internal Dimple Connector for 1-1/2" CT OD (Monthly Rate)	MYR 378.00	Monthly	1	17	MYR 12.60	MYR 214.20
2.3.8	Internal Dimple Connector for 1-1/2" CT OD (Call out - Standby Rate)	MYR 7.42	Day	1	15	MYR 7.42	MYR 111.30
2.3.9	Internal Dimple Connector for 1-1/2" CT OD (Call out - Operating Rate)	MYR 10.60	Day	1	2	MYR 10.60	MYR 21.20
2.4	Motor Head Assembly						
2.4.1	2-1/8" OD MHA (Monthly Rate)	MYR 5,145.00	Monthly	1	17	MYR 171.50	MYR 89.85
2.4.2	1-11/16" OD MHA (Call out - Standby Rate)	MYR 720.30	Day	1	17	MYR 720.30	MYR 12,245.10
2.4.3	1-11/16" OD MHA (Call out - Standby Rate)	MYR 720.30	Day	1	15	MYR 720.30	MYR 10,804.50
2.4.4	1-11/16" OD MHA (Call out - Operating Rate)	MYR 1,029.00	Day	1	2	MYR 1,029.00	MYR 2,058.00
2.5	Straight Bar						
2.5.1	1-11/16 to 2-1/8" OD Straight Bar (Monthly Rate)	MYR 96.60	Monthly	1	17	MYR 3.22	MYR 54.74
2.5.2	1-11/16 to 2-1/8" OD Straight Bar (Call out - Standby Rate)	MYR 31.50	Day	17	15	MYR 535.50	MYR 8,032.50
2.5.3	1-11/16 to 2-1/8" OD Straight Bar (Call out - Operating Rate)	MYR 44.10	Day	17	2	MYR 749.70	MYR 25,489.80
2.6	Cross Over						
2.6.1	Sufficient X-Over (Monthly Rate)	MYR 871.50	Monthly	1	17	MYR 29.05	MYR 493.85
2.6.2	Sufficient X-Over (Call out - Standby Rate)	MYR 50.40	Day	1	17	MYR 50.40	MYR 856.80
2.6.3	Sufficient X-Over (Call out - Operating Rate)	MYR 71.40	Day	1	0	MYR 71.40	MYR 0.00
2.7	SpinCAT Tool						
2.7.1	SpinCAT (Operating Rate)	MYR 4,410.00	Day	1	0	MYR 4,410.00	MYR 0.00
2.7.2	SpinCAT (Call out - Standby Rate)	MYR 2,205.00	Day	1	0	MYR 2,205.00	MYR 0.00
2.7.3	SpinCAT (Call out - Standby Rate)	MYR 2,205.00	Day	1	0	MYR 2,205.00	MYR 0.00
2.7.4	Downhole Filter	MYR 564.90	Day	2	0	MYR 1,129.80	MYR 0.00
2.8	Deployment BHA						
2.8.1	Quick connect for deployment system (Call - out Standby Rate)	MYR 2,169.30	Day	2	14	MYR 4,338.60	MYR 60,740.40
2.8.2	Quick connect for deployment system (Call - out Standby Rate)	MYR 2,169.30	Day	2	12	MYR 4,338.60	MYR 52,063.20
2.8.2	Quick connect for deployment system (Operating Standby Rate)	MYR 6,099.60	Day	2	2	MYR 6,199.20	MYR 12,398.40
<b>3</b>	<b>CTU OPERATION COST / RUN IN HOLE CHARGES</b>						
3.1	Run-In-Hole Charges # 1 (SCO)	MYR 4.20	feet	5096	1	MYR 21,359.31	MYR 21,359.31
						<b>SUBTOTAL</b>	<b>MYR 197,039.30</b>
						<b>SUBTOTAL</b>	<b>MYR 218,398.61</b>
	<b>GRAND TOTAL CTU ADDITIONAL EQUIPMENT</b>						<b>MYR 218,398.61</b>

Prepared by:  
  
 Muhammad Hafiz  
 DB Operation Engineer

Reviewed by:  
  
 Alif Adenan  
 DB General Manager

Acknowledge by:  
  
 Pravin Nair  
 PSS Dulang EIC

Approved by:  
  
 Eddy B. Samalle  
 Head, Well Intervention

# DIMENSION BID



CLIENT : PETRONAS CARIGALI SDN BHD / PENINSULAR MALAYSIA ASSET / PETRONAS SUB SURFACE & WELL INTERVENTION  
 DB CTU Contract: CHO/2015/DR/1006(A)  
 Package : DB CTU PACKAGE # 1 COST ESTIMATION JULY 2024 # 24 HOURS OPERATION  
 Field / Location : DULANG B-75  
 Job Scope : CTU - SCO  
 Mobilization Date :  
 Updated Date : 8-Aug-24  
 Quotation No: DBCTS/DULANG/0724/Q-76

ITEM	DESCRIPTION						
		Unit Price	UOM	Qty	Day	Daily Rate	Amount
<b>1</b>	<b>CTU PERSONNEL (24 hours Crew)</b>						
1.1	CTU Supervisor (Day)	MYR 46,725.00	Month	1	17	MYR 1,557.50	MYR 26,477.50
	CTU Supervisor (Night)	MYR 46,725.00	Month	1	17	MYR 1,557.50	MYR 26,477.50
1.2	CTU Operator (Day)	MYR 42,000.00	Month	1	17	MYR 1,400.00	MYR 23,800.00
	CTU Operator (Night)	MYR 42,000.00	Month	1	17	MYR 1,400.00	MYR 23,800.00
1.3	Pump Operator (Day)	MYR 28,875.00	Month	1	17	MYR 962.50	MYR 16,362.50
	Pump Operator (Night)	MYR 28,875.00	Month	1	17	MYR 962.50	MYR 16,362.50
1.4	Pump Operator (Day)(BMX)	MYR 28,875.00	Month	1	17	MYR 962.50	MYR 16,362.50
	Pump Operator (Night)(BMX)	MYR 28,875.00	Month	1	17	MYR 962.50	MYR 16,362.50
1.5	Nitrogen Operator (Day)	MYR 28,875.00	Month	1	17	MYR 962.50	MYR 16,362.50
	Nitrogen Operator (Night)	MYR 28,875.00	Month	1	17	MYR 962.50	MYR 16,362.50
1.6	Helper (Day)	MYR 12,600.00	Month	1	17	MYR 420.00	MYR 7,140.00
	Helper (Night)	MYR 12,600.00	Month	1	17	MYR 420.00	MYR 7,140.00
1.7	Safety Officer (Day)	MYR 78,750.00	Month	1	17	MYR 2,625.00	MYR 44,625.00
	Safety Officer (Night)	MYR 78,750.00	Month	1	17	MYR 2,625.00	MYR 44,625.00
1.8	Chargemen	MYR 1,800.00	Month	1	17	MYR 1,800.00	MYR 30,600.00
1.9	Mechanic/ET	MYR 1,627.50	Day	1	17	MYR 1,627.50	MYR 27,667.50
1.9	Tool Specialist	MYR 3,255.00	Day	1	10	MYR 3,255.00	MYR 32,550.00
						<b>SUBTOTAL</b>	<b>MYR 393,077.50</b>
<b>2</b>	<b>FLOWBACK PERSONNEL (24 hours Crew)</b>						
2.1	Sand Separation/Filtration System Operator (Day)	MYR 70,229.25	Month	1	17	MYR 2,340.98	MYR 39,796.58
2.2	Sand Separation/Filtration System Operator (Day)	MYR 70,229.25	Month	1	17	MYR 2,340.98	MYR 39,796.58
2.4	Sand Separation/Filtration System Operator (Night)	MYR 70,229.25	Month	1	17	MYR 2,340.98	MYR 39,796.58
2.5	Sand Separation/Filtration System Operator (Night)	MYR 70,229.25	Month	1	17	MYR 2,340.98	MYR 39,796.58
						<b>SUBTOTAL</b>	<b>MYR 159,186.30</b>
<b>GRAND TOTAL CTU PERSONNEL OPERATION</b>							<b>MYR 552,263.80</b>

Prepared by:

  
 Muhammad Hafiz  
 DB Operation Engineer

Reviewed by:

  
 Alif Adenan  
 DB General Manager

Acknowledge by:

Pravin Nair  
 PSS Dulang EIC

Approved by:

Eddy B. Samaile  
 Head, Well Intervention

[Open]

# DIMENSION BID



CLIENT : PETRONAS CARIGALI SDN BHD / PENINSULAR MALAYSIA ASSET / PETRONAS SUB SURFACE  
DB CTU Contract: CHO/2015/DR/1006(A)  
Package : DB CTU PACKAGE # 1 COST ESTIMATION JULY 2024 # 24 HOURS OPERATION  
Field / Location : DULANG B-7S  
Job Scope : CTU - SCO  
Mobilization Date :  
Updated Date : 8-Aug-24  
Quotation No: DBCTS/DULANG/0724/Q-76

ITEM	DESCRIPTION	Unit Price	UOM	Qty	Amount
1	<b>CTU CHEMICAL USED FOR OPERATIONS</b>				
1.1	Nitrogen	MYR 6.00	gal	8000	MYR 48,000.00
1.2	H2S/CO2 corrosion inhibitor	MYR 73.50	gal	220	MYR 16,170.00
1.3	Microbiocide	MYR 71.40	gal	220	MYR 15,708.00
1.4	Oxygen Scavenger	MYR 121.00	gal	220	MYR 26,620.00
2	<b>Contingency Wax Dissolver</b>				
2.1	Wax/Paraffin Removal (WaxCLEN300)	MYR 165.90	gal	550	MYR 91,245.00
3	<b>Contingency Lost Circulation Material</b>				
3.1	Calcium Carbonate	MYR 1.58	lb	1760	MYR 2,780.80
<b>SUBTOTAL</b>					<b>MYR 200,523.80</b>
<b>GRAND TOTAL FOR CHEMICAL USED FOR CTU &amp; PUMPING OPERATIONS</b>					<b>MYR 200,523.80</b>


Prepared by:

  
Muhammad Hafiz  
DB Operation Engineer


Reviewed by:

  
Alif Adenan  
DB General Manager

Acknowledge by:

  
Pravin Nair  
PSS Dulang EIC

Approved by:

  
Eddy B. Samaile  
Head, Well Intervention

[Open]

# DIMENSION BID



CTU - SCO		
<b>A</b>	<b>EQUIPMENT RENTAL CHARGES</b>	<b>MYR</b>
1	Mobilization CTU & Pumping package	33,075.00
2	CTU Surface Equipment, PCE, Pumping, Nitrogen Pumping	960,682.13
3	Flowback / Sand Filtration System Equipment	168,837.20
	<b>Total Charges</b>	<b>1,162,594.33</b>
<b>B</b>	<b>DOWNHOLE TOOLS &amp; OPERATION CHARGES</b>	<b>MYR</b>
1	Call Out Downhole Tools	197,039.30
2	Operating / Run In Hole, Logging Services Charges	21,359.31
	<b>Total Charges</b>	<b>218,398.61</b>
<b>C</b>	<b>MANPOWER CHARGES</b>	<b>MYR</b>
1	CTU Manpower, 24Hrs Operation	393,077.50
2	Flowback / Sand Filtration Manpower, 24Hrs Operation	159,186.30
	<b>Total Charges</b>	<b>552,263.80</b>
<b>D</b>	<b>CHEMICAL &amp; CONSUMMABLE CHARGES</b>	<b>MYR</b>
1	Chemical Supplied & Used	200,523.80
	<b>Total Charges</b>	<b>200,523.80</b>
	<b>Grand Total (A + B + C + D)</b>	<b>2,133,780.53</b>



# DULANG B07S SAND CLEANOUT Rev.0

# Table of content:

- Introduction & well overview
- Well overview : well diagram, background info
- Job Execution
- Equipment layout, P&ID and well stack-up
- Volume calculation
- Execution summary and plan
- Decision tree
- TFA & cleanout simulation

# Introduction & well overview

➤ **Problem statement**

Decline in production rate, suspected sand accumulate outside of the tubing in short string

➤ **Operation objective**

1. To perform CT Sand/Scale cleanout inside casing until 17 m below btm perforation, depth 1,545 m,

**Note:**

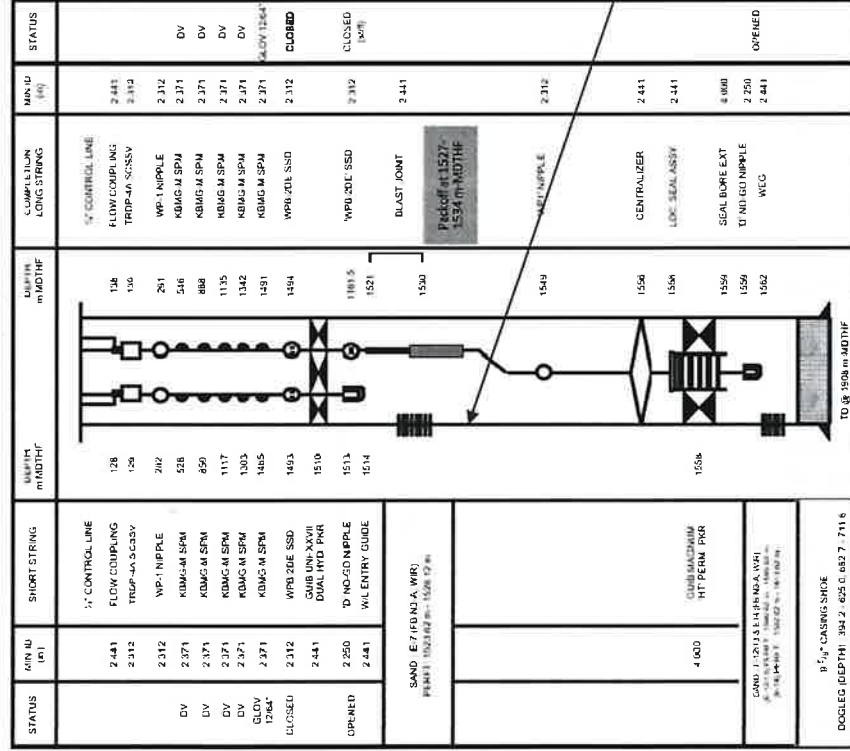
All depth stated is m-MDTHF

# Well schematic

## DULANG WELL COMPLETION DIAGRAM

WELL B-7, DUAL OIL PRODUCER IN 9 5/8" CASING (TYPE 5)

DATE OF COMPLETION: 8 JUNE 1981	CASING: 20" X-56 CONVD 34 WPI @ 354.0 m MDHF 13 1/8" K-55 JURF 54.5 PPI @ 0.20 m MDHF 9 5/8" H-40 PROD. 49 PPI @ 1915.0 m MDHF
RIG: TOMAHAWK	PIPD: 1844.0 m MDHF
TUBING: 2 7/8" K-55 PPF N-80 9X2.58	RTE TO TUBING HANGER: 11.88 m
K HAST TREE WDM DUAL 3M	MAXIMUM DEVIATION: 48.30 DEG
PACKER FLOID: 3.6 PPG 3% KCl - NaCl - 0.05% NaClO 3500 BIODIESE & CORN INHIBITOR	



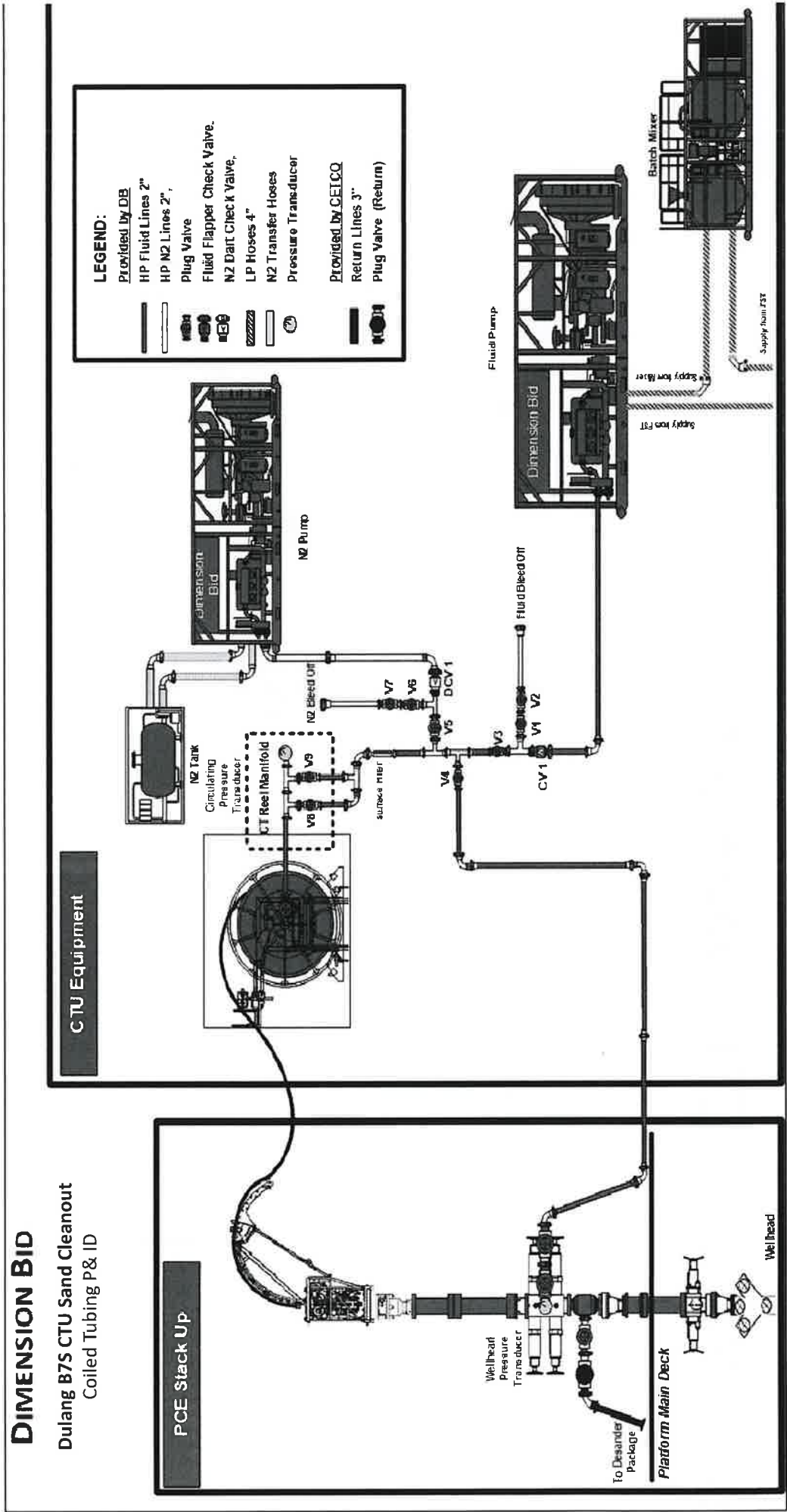
Input Parameter	Parameter Value
Field	Dulang Bravo
Max. Deviation (degrees)	48.3 degree
Min. Restriction (inch)	2.25" @ No Go nipple
Type of Fluid & Density	9.6 ppg (based on data in Well Diagram)
Top of Fluid	N/A
Current Well Status	Production decline, assume sand accumulated outside of the tubing
Reservoir Pressure	1600-1900 psi
Fracture Gradient	0.72
H2S Content	H2S - 0 ppm
CO2 Content	CO2 - 15-30 mole% (oil), 50-60 mole% (gas)
Mercury, HG	N/A

Target depth 1,545m

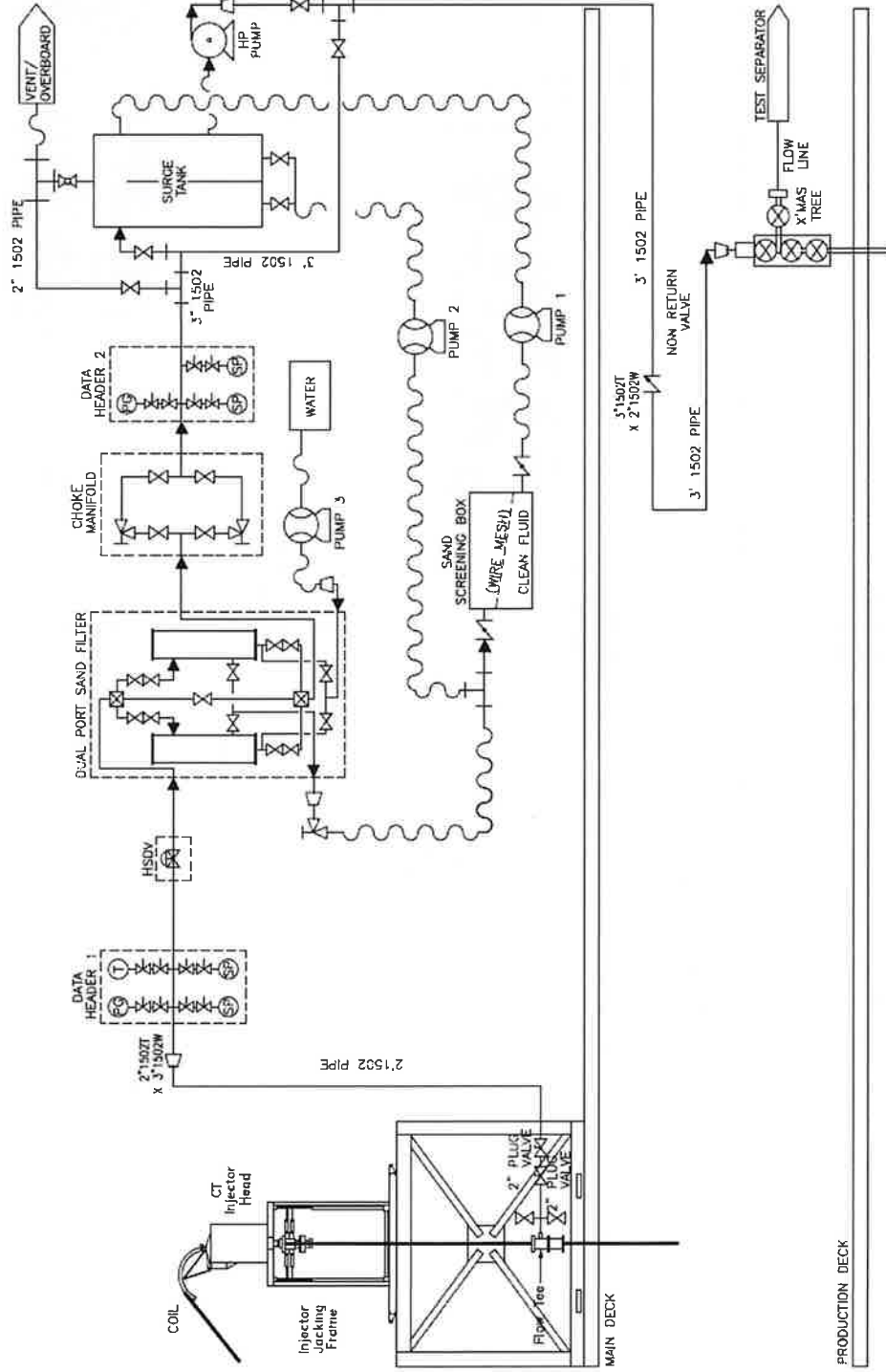
# P&ID – CTU Cleanout

## DIMENSION BID

Dulang B7S CTU Sand Cleanout  
 Coiled Tubing P&ID

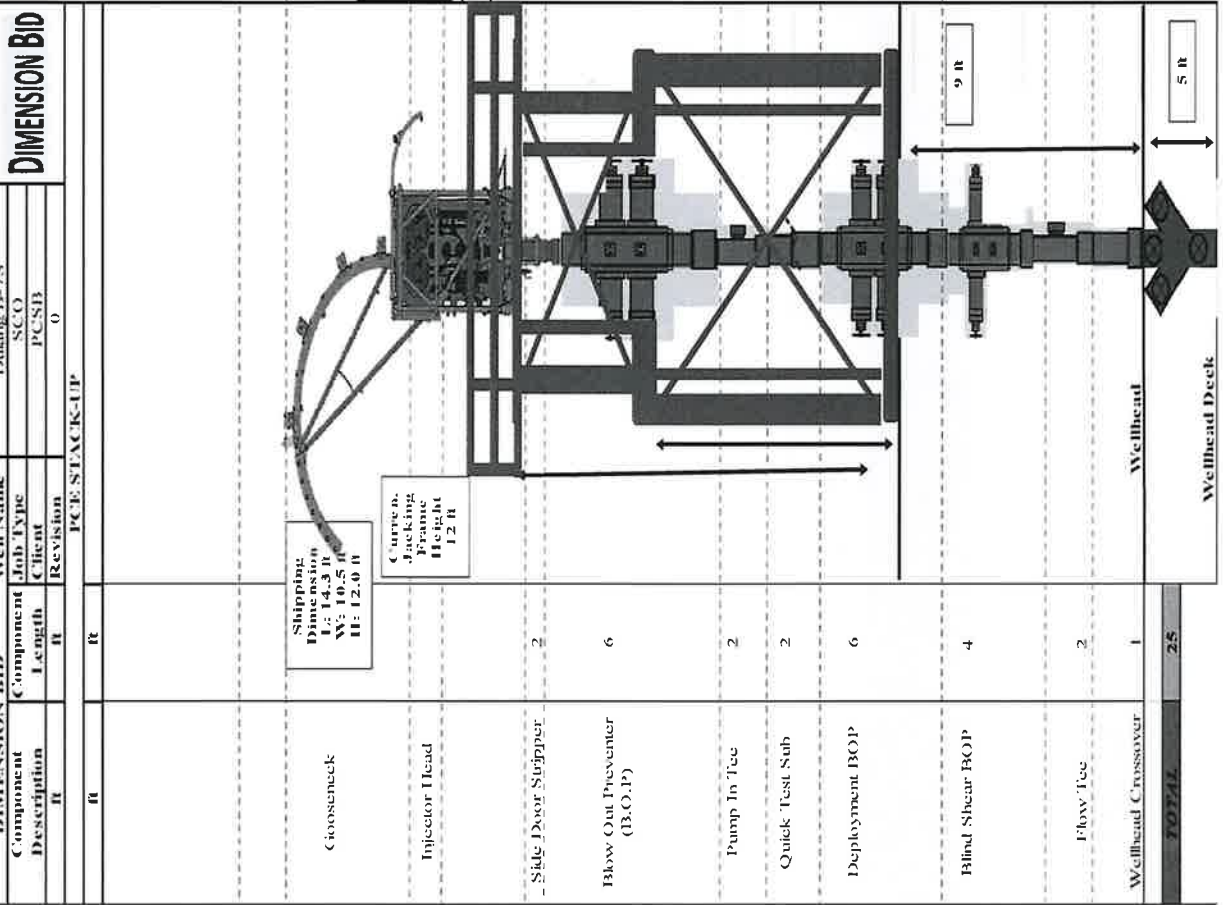


# P&ID – CTU cleanout



# Well stack-up

DIMENSION BID		Well Name		Duking B-7S	
Component Description	Component Length	Job Type	Client	SCO	PCSB
H	R	Revision	0		
<b>PCF STACK-UP</b>					
H R					
Crossneck					
Injector Head					
- Side Daxor Slipper	2				
Blow Out Preventer (B.O.P)	6				
Pump In Tee	2				
Quick Test Sub	2				
Deployment BOP	6				
Blind Shear BOP	4				
Flow Tee	2				
Wellhead Crossover	1				
<b>Wellhead</b>					
<b>Wellhead Deck</b>					
<b>TOTAL</b>					<b>25</b>



Max Jack-up 16ft  
Condition  
16 ft Jack-up

Min. Jacking Frame Height 12 ft

Required 8 ft height scaffolding

Main deck floor

Shipping Dimension W: 14.5 ft H: 12.0 ft

Currie's Jacking Frame Height 12 ft

Min. Jacking Frame Height 12 ft

Required 8 ft height scaffolding

Main deck floor

5 ft

9 ft

Wellhead

Wellhead Deck

TOTAL 25

# Volume calculation

Type	External Pipe		Internal Pipe 1		Internal Pipe 2		Caps Barrel/in (ft)	From m	To m	From ft	To ft	Length ft	Total Volume (tbbis)
	OD (inch)	ID (inch)	W(lb/ft)	OD (inch)	ID (inch)	W(lb/ft)							
Tubing volume until EOT	2 7/8	2.441					0.00579	0	1,514	0	4,967	4,967	28.75
Wellbore volume	9 5/8	8.835		2 7/8			0.07582	1,510	1,558	4,954	5,112	157	11.94
PCP volume	9 5/8	8.835		2 7/8			0.05977	0	1,510	0	4,954	4,954	296.10



# String details

### CT String Details

String	#40423
Manufacturer	TENARIS
OD	1.5"
Grade	HS 90
Initial Spooled Length, ft	16,520
Cable (length/ID Num)	
Weld Type	BIAS WELD
Tubing Weight	30399lbs
Commission Date	18-Apr-23

Run #	Date	Client Name	Field Name	Well Num	Job type	CT leng ft	Job Fatigue %	Job Corrosion %	Cum Fatigue	Cum Corrosion %	Used String Life %
	15/7/2023	PCSB	OPEN YARD	NA	Received CT String from Manufacturer	16520	0	0	0	0	0
	1/9/2023	PCSB	OPEN YARD	NA	1 Month storage at Open yard	16,520	0	0.5	0	0.5	0.5
	1/10/2023	PCSB	OPEN YARD	NA	1 Month storage at Open yard	16,520	0	0.5	0	1	1
	1-Nov-23	PCSB	OPEN YARD	NA	1 Month storage at Open yard	16,520	0	0.5	0	1.5	1.5
	1-Dec-23	PCSB	OPEN YARD	NA	1 Month storage at Open yard	16,520	0	0.5	0	2	2
	1-Jan-24	PCSB	OPEN YARD	NA	1 Month storage at Open yard	16,520	0	0.5	0	2.5	2.5
	1-Feb-24	PCSB	OPEN YARD	NA	1 Month storage at Open yard	16,520	0	0.5	0	3	3
	1-Mar-24	PCSB	OPEN YARD	NA	1 Month storage at Open yard	16,520	0	0.5	0	3.5	3.5
	1-Apr-24	PCSB	OPEN YARD	NA	1 Month storage at Open yard	16,520	0	0.5	0	4	4
	1-May-24	PCSB	OPEN YARD	NA	1 Month storage at Open yard	16,520	0	0.5	0	4.5	4.5
	1-Jun-24	PCSB	OPEN YARD	NA	1 Month storage at Open yard	16,520	0	0.5	0	5	5
	13-Jul-24	PCSB	OPEN YARD	NA	SPOOLING INTO CTR DRUM	16,520	0	0.5	0	5.5	5.5
	14-Jul-24	PCSB	OPEN YARD	NA	DROB BALL/MAKE UP/PT/C/PURGE	16,513	0	0	0	5.5	5.5

# Job execution summary

Operation	Job summary
Slickline operation	1. TCC (depends on client job execution plan)
CT operation	1. Sand cleanout from EOT(1,514 m) until 17 m below perforation zone (1,545m)
Slickline operation	1. TCC (depends on client job execution plan)

# Job execution plan – Deployment BOP

➤ Run#1 – Sand cleanout from EOT at 1,514m until 1,545m using multi-jet nozzle;

1. Make up BHA consist of the following tool:

#	Description (OPTION 1 BHA)	OD <sub>(max)</sub>	Length , ft	Length , m
1	End connector: Internal dimple	1.69"	0.3	0.1
2	Motorhead assembly (MHA)	1.69"	2.3	0.7
3	Carsac	1.69"	1.6	0.49
4	Kelly Cock Valve	1.69"	1.6	0.49
5	Deployment bar	1.5"	6	1.83
6	Straight Bar	1.69"	90	27.4
7	Multi jet nozzle	1.69"	1.0	0.3
Cumulative Length			102.8	32.61

First section

2. Refer to next slide for Rig-up/rig-down procedure

# Job execution plan – Deployment BOP

Run#1 – Continue..

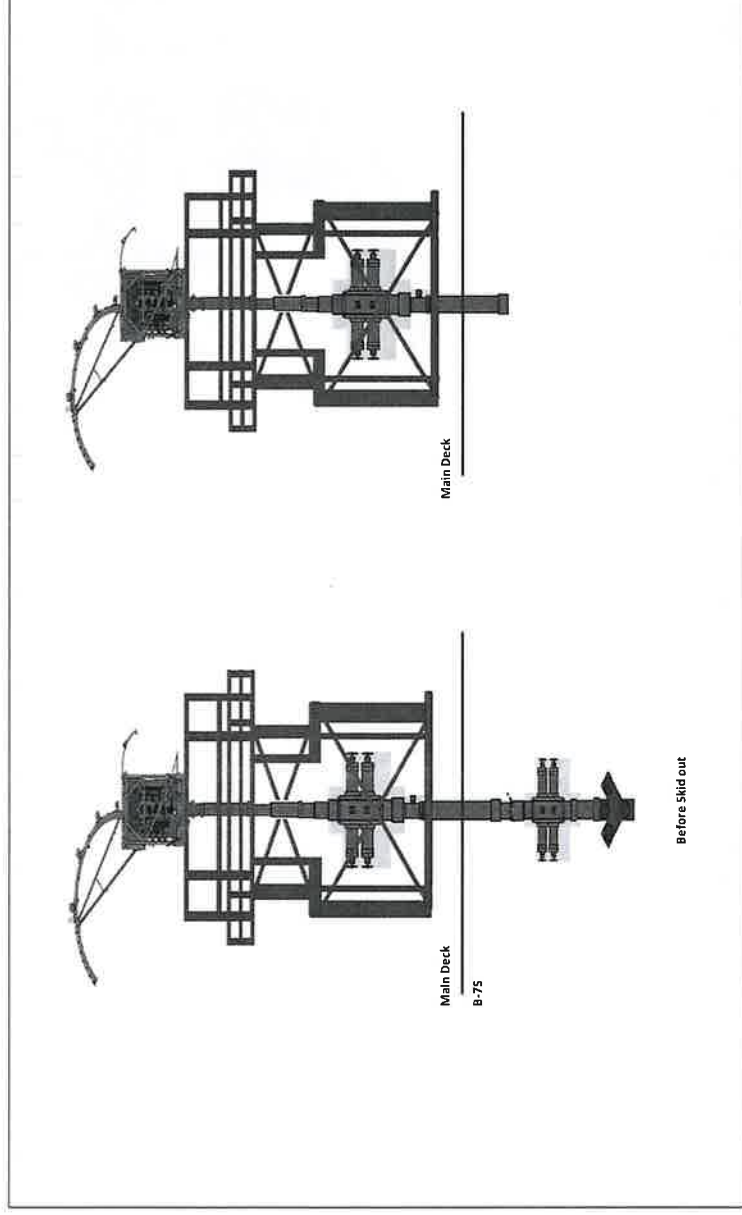
- After perform pressure test stack-up, break off at QTS as per diagram below

DIMENSION BID		Well Name		DULANE B-7S	
Component Description	Length	Unit Type	SC-O	PC-SB	U
ft	ft	Revision			
PCP STACK-UP					
ft	ft				
Crossneck					
Injector Head					
Stack Door Stripper	2				
Blow Out Preventer (BOP)	6				
Pump In Tee	2				
Quick Test Sub	2				
Deployment BOP	6				
Blind Shear BOP	4				
Flow Tee	2				
Wellhead Crossover	1				
<b>TOTAL</b>					<b>25</b>

# Job execution plan – Deployment BOP

Run#1 – Continue..

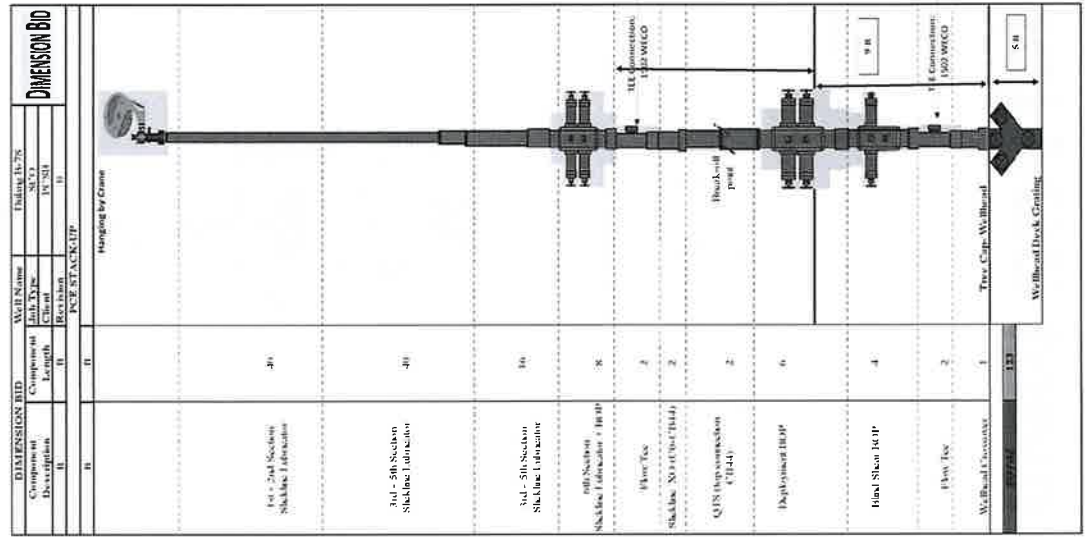
- After skid out from B-7S, place the CT PCE stack up into other well slot by opening the hatch cover in order to hang the riser (below main deck) temporarily



# Job execution plan – Deployment BOP (option 1)

Run#1 – Continue..(Note, total lubricator height subject to discussion with slickline)

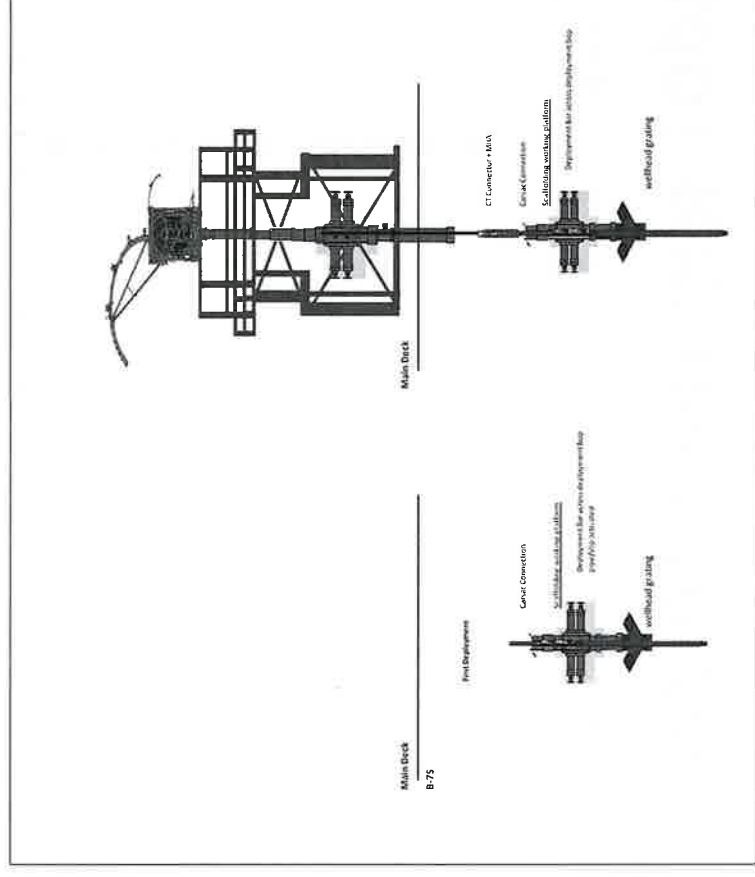
- Make-up slickline lubricator on top of Lower QTS
- Deploy the BHA using Slickline
- Slowly RIH and open well, once the first deployment bar section at Deployment BOP, stop RIH



# Job execution plan – Deployment BOP (option 1)

Run#1 – Continue..

- Active deployment BOP to anchor and hold at deployment bar.
- Break-off at QTS, rig-down slickline PCE, and rig up full CTU stack-up.
- Connect MHA with the Carsac, and Open Kelly cock valve on BHA section.
- Perform pressure test at QTS.



# Rig-up procedure with barrier (Option 1)

No.	Job step	Primary / Active barrier	Secondary Barrier	Tertiary Barrier
1.	Disconnect at slickline crossover that attached together with QTS	<ol style="list-style-type: none"> <li>1. Crown Valve</li> <li>2. Master Valve</li> <li>3. <del>SCSSV</del></li> <li>4. SSV</li> </ol>	<ol style="list-style-type: none"> <li>1. SBOP (Blind/shear)</li> </ol>	
2.	Make-up 100 ft BHA consist of Nozzle, Straight bar, DKCV and Carsac. Swallow all first section BHA into slickline lubricator.	<ol style="list-style-type: none"> <li>1. Crown Valve</li> <li>2. Master Valve</li> <li>3. <del>SCSSV</del></li> <li>4. SSV</li> </ol>	<ol style="list-style-type: none"> <li>1. SBOP (Blind/shear)</li> </ol>	
3.	Box in and connect slickline XO and flow tee into top QTS XO to slickline PCE. Perform pressure test.	<ol style="list-style-type: none"> <li>1. Crown Valve</li> <li>2. Master Valve</li> <li>3. <del>SCSSV</del></li> <li>4. SSV</li> </ol>	<ol style="list-style-type: none"> <li>1. SBOP (Blind/shear)</li> </ol>	
4.	Open CV and MV, RIH until deployment Bar at Deployment BOP section	<ol style="list-style-type: none"> <li>1. <del>SCSSV</del></li> <li>2. DKCV</li> <li>3. Stuffing box - Slickline</li> </ol>	<ol style="list-style-type: none"> <li>1. SBOP (Blind/shear)</li> </ol>	
5.	Engage deployment BOP to hold deployment bar in first section BHA	<ol style="list-style-type: none"> <li>1. <del>SCSSV</del></li> <li>2. DKCV</li> <li>3. Stuffing box - Slickline</li> </ol>	<ol style="list-style-type: none"> <li>1. SBOP (Blind/shear)</li> </ol>	
6.	Disconnect at slickline crossover	<ol style="list-style-type: none"> <li>1. <del>SCSSV</del></li> <li>2. DKCV</li> <li>3. Deployment BOP (Dual Pipe/slip ram)</li> </ol>	<ol style="list-style-type: none"> <li>1. SBOP (Blind/shear)</li> </ol>	

# Rig-up procedure with barrier (Option 1)

No.	Job step	Primary / Active barrier	Secondary Barrier	Tertiary Barrier
7.	Rig-up CT PCE on top of QTS	<ol style="list-style-type: none"> <li>1. <del>SCSSV</del></li> <li>2. DKCV</li> <li>3. Deployment BOP (Dual Pipe/slip ram)</li> </ol>	<ol style="list-style-type: none"> <li>1. SBOP (Blind/shear)</li> </ol>	
8.	Make-up CT connector and MHA	<ol style="list-style-type: none"> <li>1. <del>SCSSV</del></li> <li>2. DKCV</li> <li>3. Deployment BOP (Dual Pipe/slip ram)</li> </ol>	<ol style="list-style-type: none"> <li>1. SBOP (Blind/shear)</li> </ol>	
9.	RIH MHA and connect to the Carsac at first deployment BHA section	<ol style="list-style-type: none"> <li>1. <del>SCSSV</del></li> <li>2. DKCV</li> <li>3. Deployment BOP (Dual Pipe/slip ram)</li> </ol>	<ol style="list-style-type: none"> <li>1. SBOP (Blind/shear)</li> </ol>	
10.	Open DKCV and Box-in to connect PCE, perform pressure test stack-up	<ol style="list-style-type: none"> <li>1. <del>SCSSV</del></li> <li>2. Deployment BOP (Dual Pipe/slip ram)</li> <li>3. Stripper</li> </ol>	<ol style="list-style-type: none"> <li>1. SBOP (Blind/shear)</li> </ol>	
11.	Disengage deployment BOP	<ol style="list-style-type: none"> <li>1. <del>SCSSV</del></li> <li>2. Stripper</li> </ol>	<ol style="list-style-type: none"> <li>1. SBOP (Blind/shear)</li> <li>2. COMBI BOP (Pipe/Slip) + (Blind/Shear)</li> </ol>	
12.	Start RIH	<ol style="list-style-type: none"> <li>1. Stripper</li> </ol>	<ol style="list-style-type: none"> <li>1. SBOP (Blind/shear)</li> <li>2. COMBI BOP (Pipe/Slip) + (Blind/Shear)</li> </ol>	

# Job execution plan – Deployment BOP (option 1)

## Reverse deployment method

- a. Once CT at surface, proceed for reverse deployment for dummy/Gun using same approach during deployment rig-up.
- b. Once CT tag stripper, RIH back slowly until deployment bar at deployment BOP
- c. Cross the pipe slips ram, of the deployment BOP, Manually lock it.
- d. Bleed the remaining pressure inside riser through flowback line.
- e. Close the DKCV
- f. Secure the 1<sup>st</sup> section BHA with C- plate and disconnect at Carsac connection.
- g. Skid aside injector head, stripper, combi BOP and riser.
- h. Rig- up back the lubricator as per agreed with slickline (Geowell)
- i. RIH slickline wire and connect at Carsac connection. Remove the C-Plate.
- j. Box-in and pressure test at QTS.
- k. Open pipe slip/ram of the deployment BOP
- l. POOH until tag stuffing box
- m. Secure the well.
- n. Break-off QTS connection and retrieve the gun.

# Job execution plan

➤ Run#1 – Continue..

3. Open up well and start RIH (pump idle rate TSW / IW (Fluid selection subject to client Approval)) until reaching 10m above EOT at depth 1,514m. Slow down coil speed to 10ft/min, 50ft before and after passing through completion accessories.
4. Perform pull test and pump 2bbbls of drag reducer for every 1000ft interval .
5. At EOT, increase pump rate to **1.1bpm with 300scfm** nitrified TSW/IW. Establish return at surface first prior to entering the casing section and to penetrate the HUD.
  - During establishing the return at surface, line up the flowback line to surge tank and monitor the return volume and calculate the flowrate. (bbl/min)
  - If unable to establish the return, stop pumping N2 and continue to fill up tubing + wellbore and re-attempt to establish the circulation with nitrified TSW / IW
  - Mark the flowrate as baseline and fill up the additional flowback data monitoring table

# Job execution plan

Run#1 – Continue..

5. Penetrate the HUD with 1ft/min as per CIRCA simulation. Monitor the THP, return and RIH weight. (Start Cleanout from EOT, assume Sand at EOT)
6. Circulate 5 bbls of gel (D801) for every 5 m penetration. Perform pull test 5ft/min to previous HUD for each bite taken. Repeat the step until 1,545m .
7. *Note: after every 5m bite, pull test to EOT as a precautionary steps.*
8. In the event of lost return, POOH CT to 10m above EOT at depth 1,505m and re-establish the circulation before resume the cleanout
9. Once at 1,545m, flag coil at surface as Flag#1. Do not set down more than 200lbf if experience hard tag. (downhole force)
10. Pump 30 bbl of gel and continue CBU for 3 hours as per CIRCA. To perform pull test 10m for every 30 minutes.
11. Once completed CBU, POOH to EOT at depth 1,545m with 5 ft/min of tripping speed and using pump rate 1.1bpm, 300scfm.
12. At EOT, CBU for another 2 hours, continue to POOH to surface with 30-50ft/min of tripping speed, stop N2 and continue pumping TSW with 1.4bpm.

# Job execution plan

➤ Cleanout table until 1,545m

No.	Stage	Fluid	Liquid Rate BPM	Total Liquid BBL	N2 Rate SCFM	CT Speed ft/min	Duration Minute	Depth m	Remarks
2	RIH to HUD and Penetrate HUD/Fill	TSW / IW	1.1	17.6	300	1	16	HUD + 5m	Monitor return & CT weight on surface
3	Circulate	Gel	1.1	5.0	300	0	5		Provide suspension to the fill and lift to surface
Pull Test to EOT after 5m bites									
4	RIH to last HUD and Penetrate HUD/Fill	TSW / IW	1.1	17.6	300	1	30	HUD + 5m	Monitor return & CT weight on surface
5	Circulate	Gel	1.1	5.0	300	0	5		Provide suspension to the fill and lift to surface
Pull Test to previous HUD									
Repeat above step until reached 1,545m. Flag CT at surface.									
6	At depth 1,545 m	Gel	1.1	30	300	0		Stationary at 3160m	Pump 1tbg volume of D801 gel
7	Bottoms Up (Circulate)	TSW / IW	1.1		300	0	180	Stationary at 3160m	CBU remaining 3 hrs
POOH to EOT while maintaining 5 ft/min and pump rate 1.1bpm, 300scfm, Continue CBU for another 2 hours									
stop N2, continue POOH to surface with 30-50ft/min tripping speed by pumping high rate TSW / IW only									

# Loss return scenario

1. Procedure for loss return during cleanout operation;
  - Pick-up CT to less deviated section at range of 400m or attempt at 10m above EOT.
  - Re-establish the circulation until stable return is observed.
  - During establishing the return at surface, line up the flowback line to surge tank and monitor the return volume and calculate the flowrate. (bbl/min)
  - Mark the flowrate as our new baseline and fill up the flowback data monitoring as per below table;

CTS FLOWBACK DATA LOGSHEET						
Job Type	Date	Run Details	DIMENSION BID			
Run No.	Location	Shift	Volume Entry (At Surge tank)	Flowmeter Flowrate	Remarks	
Time	Fluid Type	Flow Rate (bbl/min)	THP (psi)	Choke Size		

- RIH back to last penetrated HUD and resume cleanout operation.

# Reduction in THP during cleanout

1. Procedure for addressing the reduction in THP during cleanout operation:
  - Pick-up CT 10m above 1<sup>st</sup> HUD
  - Vary the;
    - Decrease the liquid rate
    - Increase nitrogen rate
  - Manipulate choke size
  - Re-establish continuous return and stable THP
  - Resume cleanout operation

# Job execution plan

➤ Run#1 – BHA Diagram – Deployment

## DIMENSION BID

BHA DIAGRAM #1 - 1.69" MULTIJET NOZZLE

Client	Petronas Carigali
Field	Dulang Bravo
Job Type	
Run#1	

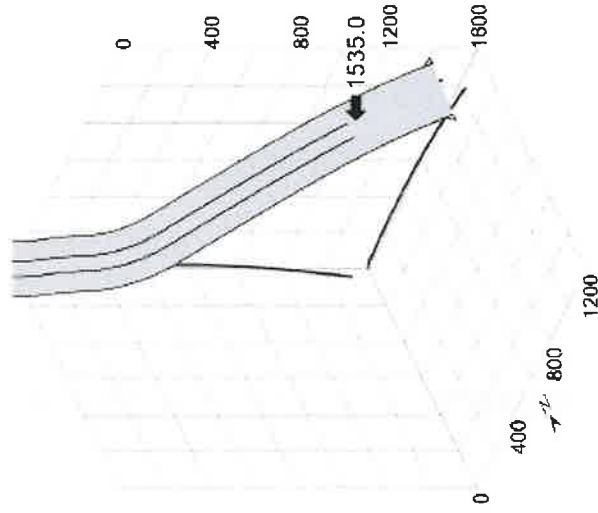
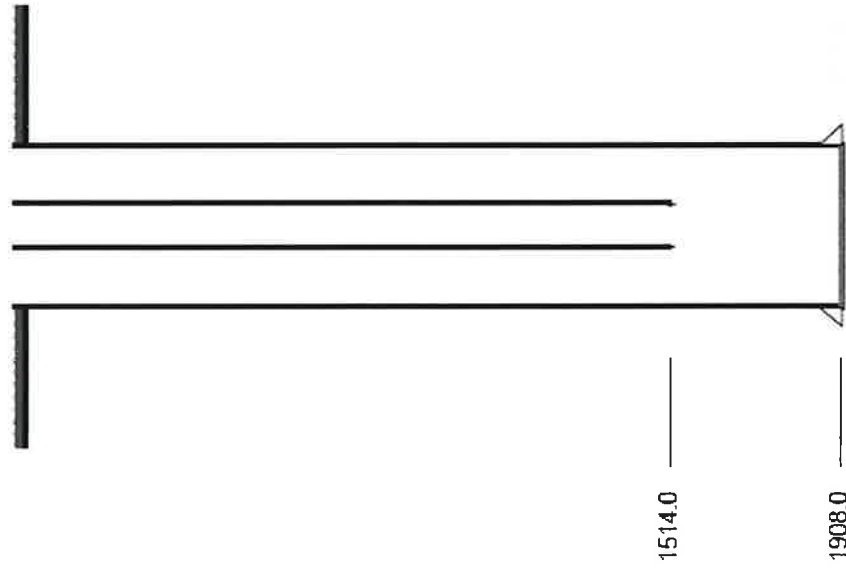
Well	B7S
Min Restriction	
BHP	
BHT	

BHA DRAWING	DESCRIPTION	CONNECTION		ID	OD	TOOL LENGTH		CUMULATIVE LENGTH
		UPHOLE	DOWNHOLE			INCH	FT	
	Dimple Connector	1.5" CT	1.0" AMMT PIN	1.690	1.690	0.3	0.3	0.3
	MIHA Disconnect drop ball 5/8"	1.0" AMMT BOX	1.0" AMMT PIN	1.690	1.690	2.3	2.6	2.6
	Circulating drop ball 1/2"							
	Burst Disc 5000 psi							
	Carsac	1.0" AMMT BOX	1.0" AMMT PIN	1.690	1.690	1.6	4.18	4.18
	Kelly Cock Valve	1.0" AMMT BOX	1.0" AMMT PIN	1.690	1.690	1.6	5.76	5.76
	6 ft Deployment Bar	1.0" AMMT BOX	1.0" AMMT PIN	1.500	1.500	6.0	11.76	11.76
	Straight Bar	1.0" AMMT BOX	1.0" AMMT PIN	1.690	1.690	92.0	103.76	103.76
Multijet	1.0" AMMT BOX		1.690	1.690	1.0	104.8	104.8	

BHA LENGTH	104.76
MAXIMUM OD	1.69
MINIMUM ID	

# Tubing force analysis-well geometry

A1 ■ The job can probably be performed with the current input parameters.



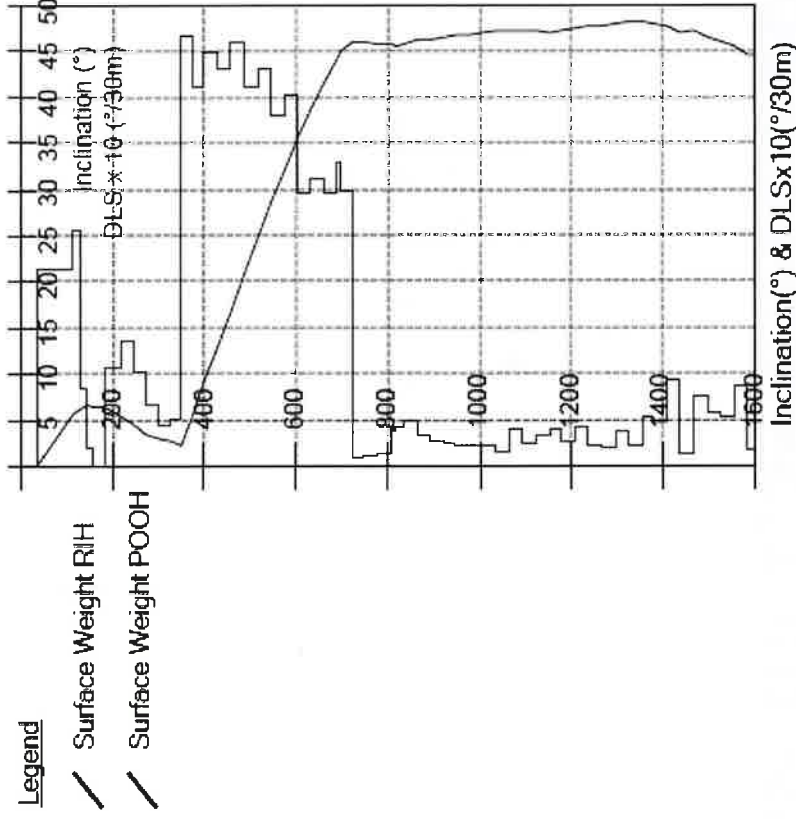
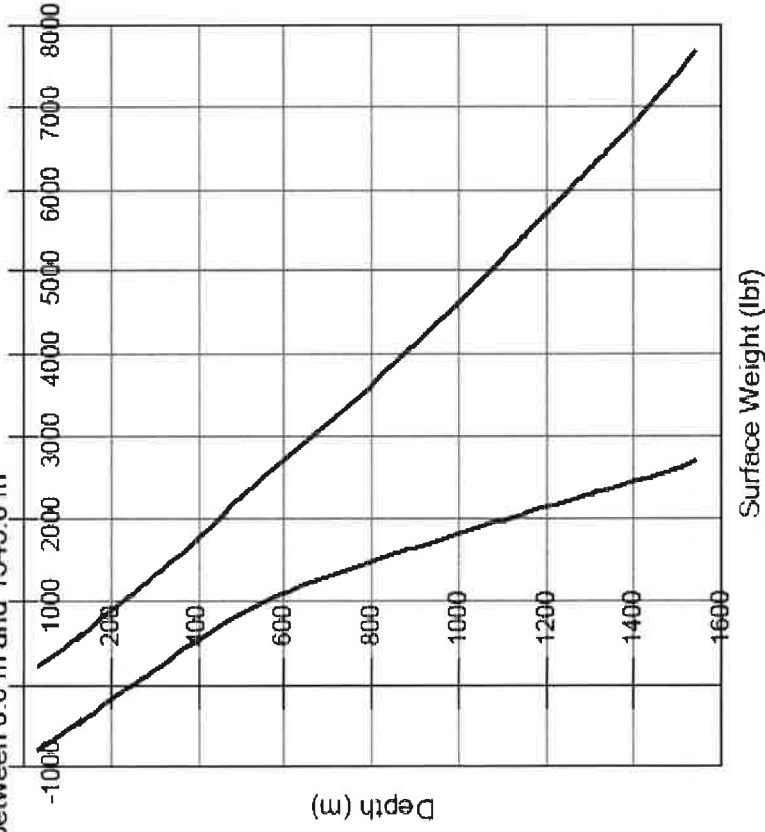
Well name: Dulang B07S  
 Total depth: 1908.0 m  
 Max inclination: 48.4° at 1353.0 m  
 Max DLS: 4.678 °/100ft at 371.0 m  
 Min ID: 2.250 in at 1513.0 m  
 WHP: 150 psi

# Tubing force analysis- till 1,545m (1.1bpm 300scfm)

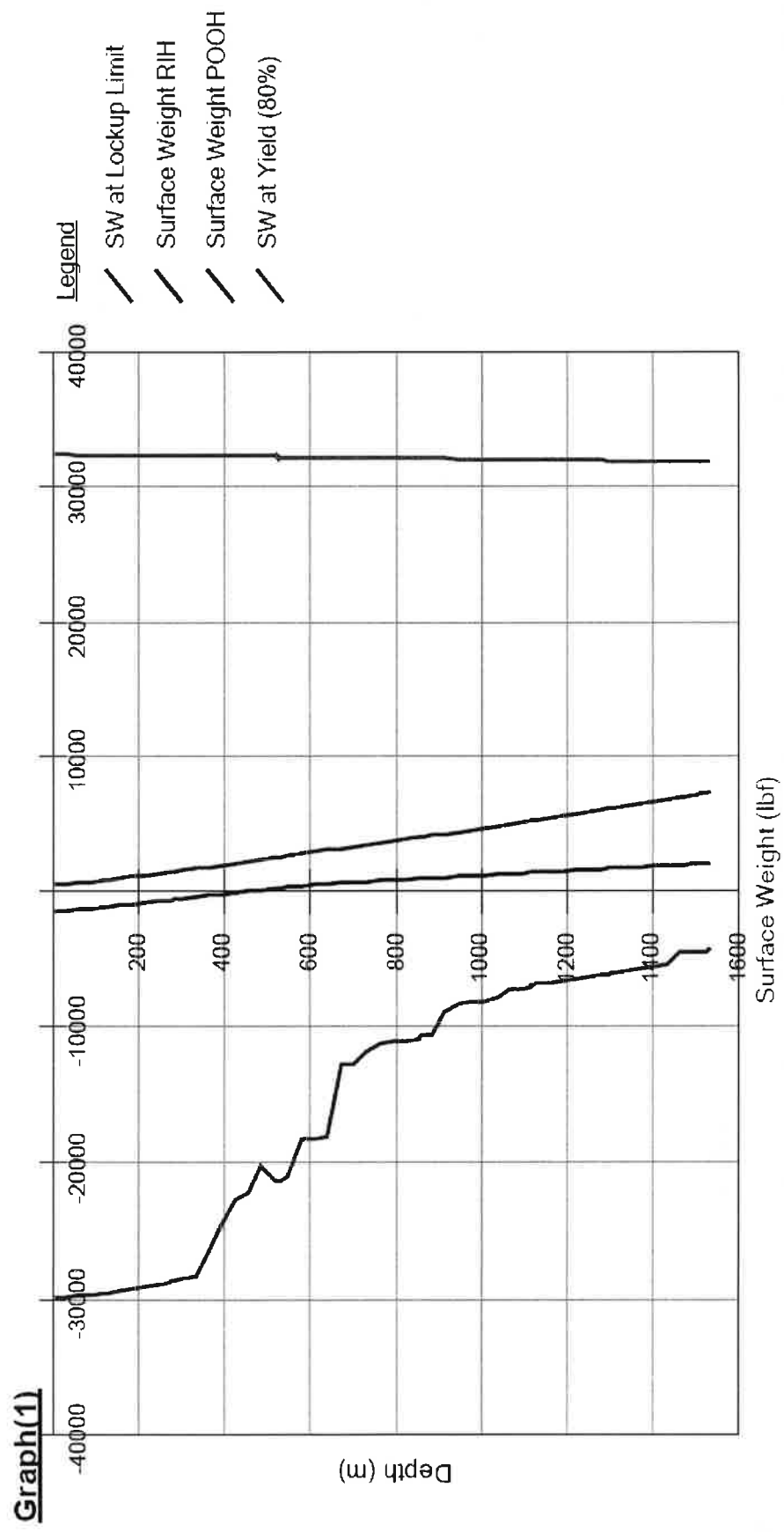
## Reaching Depth

RIH and POOH

between 0.0 m and 1545.0 m

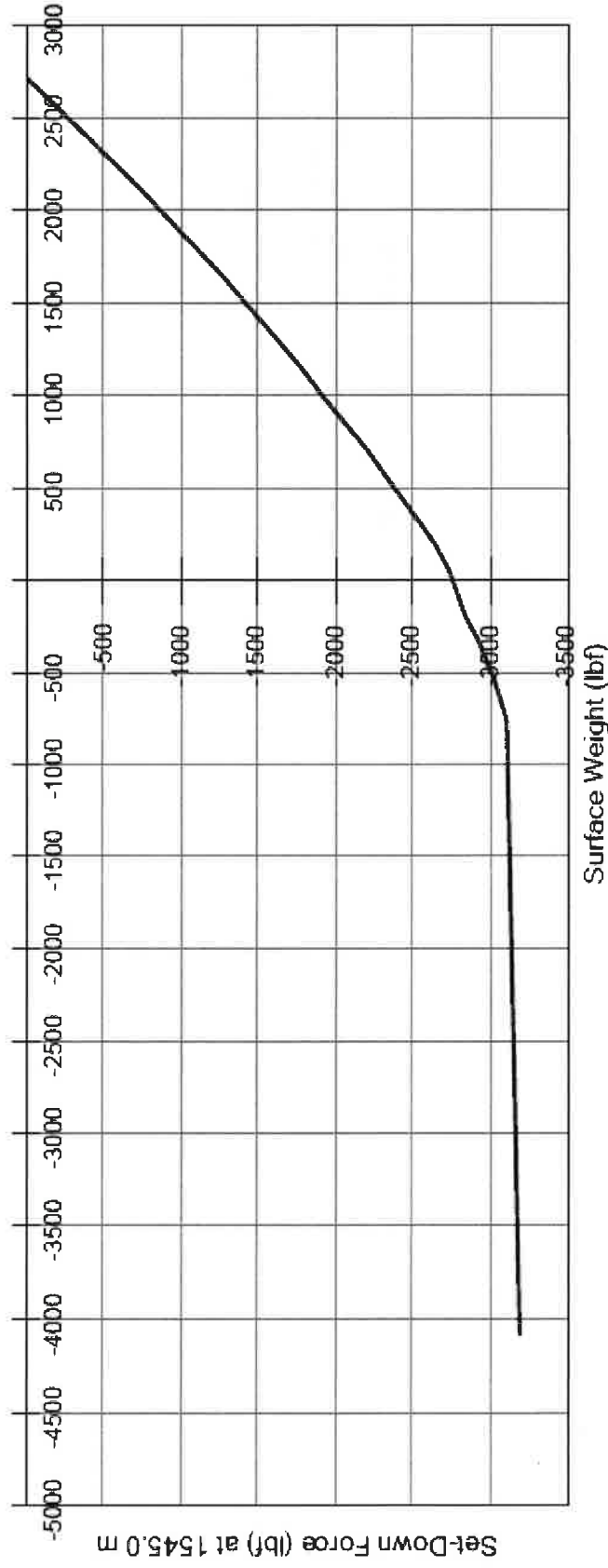


# Tubing force analysis- till 1,545m (1.1bpm 300scfm)



# Tubing force analysis-set down graph

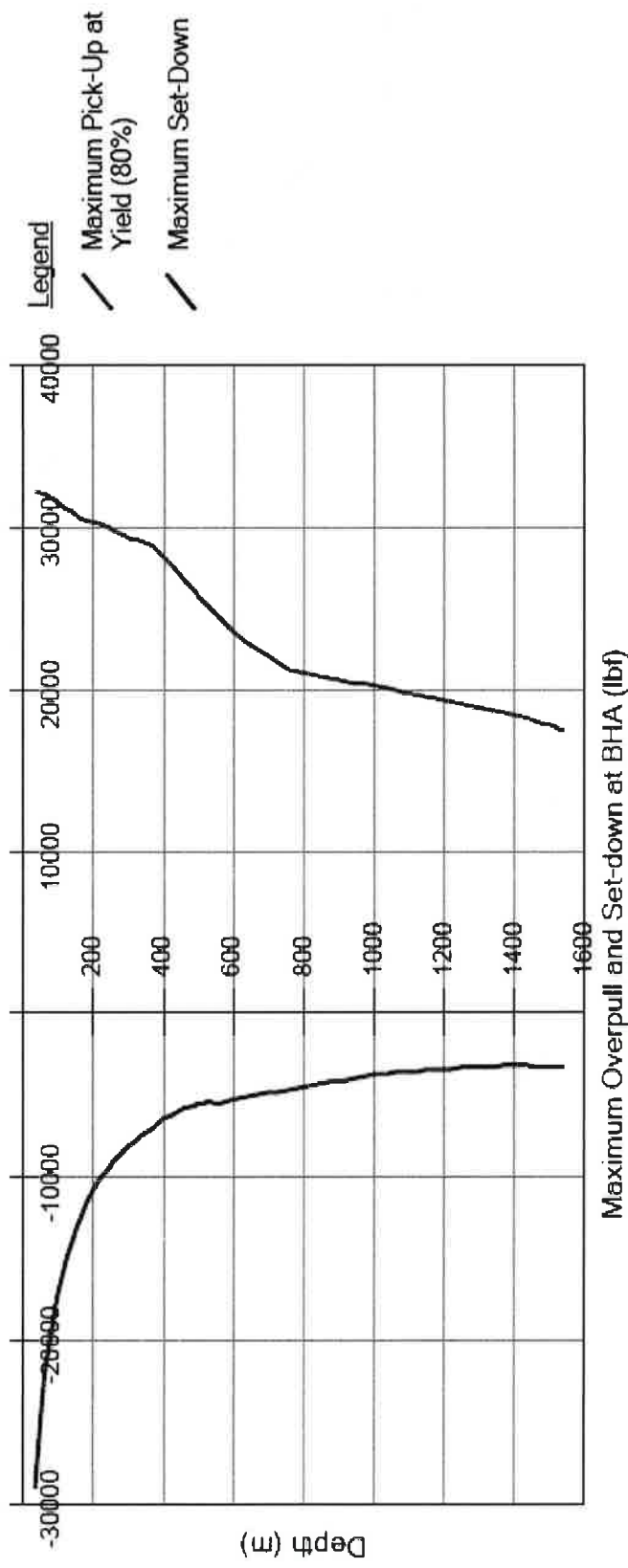
- MD3 ■ The available set-down force at 1545.0 m is -3272 lbf at the end of the string.  
The weight indicator reading will be -4090 lbf on surface.  
The minimum available set-down force is -3159 lbf at 1433.7 m.



# Tubing force analysis- overpull graph

Calculations at 1545.0 m

MD1 ■ The available pick-up at 1545.0 m based on 80% of yield strength is 17502 lbf.  
The weight indicator reading will then be 31786 lbf.



# CIRCA simulation- 1.1bpm, 300scfm

Project: New Project

Field-Well: Unknown

**Flow Summary**

**SUMMARY OF FLOW RESULTS**

Produced Fluids  
Pressure known at:  
Production Mode:  
Fluid Composition:

Perforations  
No Production  
Oil and Gas

Circulated Fluids  
Fluid Composition:  
Liquid:  
Solids:  
Gas:  
Circulation Point  
HHP Required :

1.10 bbl/min  
0.00 bbl/min  
300.0 scfm/min  
1544.00 m  
79.86 KW

**COMPLETION:**

Wellhead Pressure.....  
Hydrostatic pressure loss.....  
Friction pressure loss.....  
Kinetic pressure loss.....  
Restriction pressure loss.....  
Equivalent Circulation Density[ECD].....

129.8 psi g  
953.8 psi  
514.5 psi  
-0.4 psi  
2.2 psi

7.07 lb/gal (US)

Perforation Pressure.....  
Hydrostatic pressure loss.....  
Friction pressure loss.....

1800.0 psi g  
390.4 psi  
0.1 psi

Bottom Hole Pressure.....

1868.5 psi g

**FROM CIRCULATION POINT TO WELLHEAD:**

Liquid transit time.....  
Gas transit time.....  
Annular volume.....  
Volume below circulation point.....  
Total liquid volume.....

8 min  
8 min  
21.0 bbl  
41.2 bbl  
53.1 bbl

Total gas volume.....  
(Surface equivalent).....

0.1 bbl  
2485.0 scf

**WORKSTRING:**

Liquid:

1584.0 bbl/day  
0.43 MMscf/day

Gas:

3850.0 psi g  
1941.0 psi

Pressure at reel rotating joint.....

Friction pressure loss on reel.....

Pressure inside WS at Gooseneck.....

Hydrostatic pressure loss.....

Friction pressure loss.....

Equivalent Circulation Density[ECD].....

2017.3 psi g  
-1103.9 psi  
1012.3 psi  
1.40 lb/gal (US)

BHA total pressure loss.....

BHA Hydrostatic loss.....

BHA Friction loss.....

BHA Kinetic loss.....

Nozzle.....

487.3 psi  
-18.5 psi  
228.6 psi  
6.8 psi  
272.4 psi

Circulation Point pressure.....

1621.6 psi g

**FROM REEL ROTATING JOINT TO CIRCULATION POINT:**

Liquid transit time.....

Gas transit time.....

Displacement Volume.....

Internal Volume.....

Internal liquid volume.....

Internal gas volume.....

(Surface equivalent).....

Length of Workstring on reel.....

12 min  
15 min  
11.1 bbl  
18.6 bbl  
13.2 bbl  
5.4 bbl  
4438.2 scf  
2131.78 m

# CLEANOUT ANALYSIS

Flow State

Measured Depth[Flow] m	Temperature	Completion Pressure	Workstring Pressure	Concentric Pressure	Completion Liquid Velocity ft/min	Workstring Liquid Velocity ft/min	Concentric Liquid Velocity ft/min
0.0	95.0	129.9	2017.3	0.0	1622	1163	0
4.0	95.4	135.2	2018.4	0.0	1638	1163	0
29.0	97.7	166.0	2025.2	0.0	1422	1164	0
54.0	100.1	194.7	2032.0	0.0	1278	1165	0
79.0	102.5	222.3	2038.7	0.0	1173	1166	0
104.0	104.8	249.1	2045.5	0.0	1082	1168	0
129.0	107.2	275.4	2052.1	0.0	1232	1169	0
132.0	107.4	278.9	2052.9	0.0	1019	1170	0
157.0	109.8	304.9	2059.5	0.0	967	1171	0
182.0	112.1	330.6	2066.1	0.0	923	1172	0
207.0	114.5	356.3	2072.7	0.0	885	1173	0
232.0	116.8	381.9	2079.3	0.0	853	1174	0
257.0	119.2	407.6	2085.9	0.0	824	1175	0
282.0	121.5	433.3	2092.6	0.0	956	1176	0
303.1	123.5	455.3	2098.2	0.0	779	1177	0
328.1	125.9	481.1	2104.8	0.0	758	1178	0
353.0	128.2	507.1	2111.4	0.0	739	1179	0
378.0	130.6	533.1	2117.9	0.0	722	1181	0
403.0	132.9	559.1	2124.3	0.0	708	1183	0
428.0	135.2	585.2	2130.4	0.0	693	1187	0
453.0	137.5	611.3	2136.2	0.0	681	1191	0
478.0	139.8	637.4	2141.6	0.0	670	1195	0
503.0	142.0	663.3	2146.4	0.0	660	1201	0

Flow State (continued)

Measured Depth[Flow] m	Temperature	Completion Pressure	Workstring Pressure	Concentric Pressure	Completion Liquid Velocity ft/min	Workstring Liquid Velocity ft/min	Concentric Liquid Velocity ft/min
528.0	144.1	689.2	2150.7	0.0	781	1206	0
534.1	144.6	695.7	2151.7	0.0	650	1209	0
559.1	146.7	721.2	2155.1	0.0	642	1213	0
584.1	148.7	746.3	2158.0	0.0	636	1216	0
609.1	150.6	770.7	2160.1	0.0	631	1222	0
634.1	152.5	794.6	2161.5	0.0	628	1225	0
659.1	154.3	817.9	2162.3	0.0	621	1228	0
684.0	156.0	840.7	2162.5	0.0	617	1230	0
709.0	157.7	862.9	2162.0	0.0	613	1232	0
734.0	159.3	885.0	2161.2	0.0	609	1233	0
759.0	160.9	907.0	2160.3	0.0	604	1235	0
784.0	162.6	929.2	2159.5	0.0	599	1236	0
809.0	164.2	951.4	2158.6	0.0	594	1237	0
834.0	165.9	973.7	2157.7	0.0	590	1239	0
859.0	167.5	995.9	2156.7	0.0	702	1240	0
887.1	168.0	1003.2	2156.3	0.0	585	1240	0
917.1	169.7	1025.5	2155.2	0.0	581	1242	0
942.0	171.3	1047.7	2154.0	0.0	577	1243	0
967.0	172.9	1069.9	2152.7	0.0	574	1245	0
992.0	174.5	1092.2	2151.4	0.0	571	1246	0
1017.0	176.1	1114.4	2150.0	0.0	568	1247	0
1042.0	177.7	1136.7	2148.5	0.0	565	1249	0
1067.0	179.3	1158.9	2146.9	0.0	562	1250	0

# CLEANOUT ANALYSIS

Flow State (continued)

Measured Depth[Flow] m	Temperature	Completion Pressure	Working Pressure	Concentric Pressure	Completion Liquid Velocity ft/min	Working Liquid Velocity ft/min	Concentric Liquid Velocity ft/min
1087.0	180.9	1181.2	2145.3	0.0	559	251	0
1082.0	182.5	1203.6	2143.6	0.0	566	253	0
1117.0	184.1	1225.9	2141.9	0.0	663	254	0
1128.0	184.9	1236.0	2141.2	0.0	552	255	0
1153.0	186.5	1258.5	2139.5	0.0	549	256	0
1178.0	188.1	1280.9	2137.7	0.0	547	258	0
1203.0	189.6	1303.4	2135.8	0.0	545	259	0
1228.0	191.2	1325.8	2133.9	0.0	542	260	0
1253.0	192.9	1348.3	2131.9	0.0	540	262	0
1278.0	194.4	1370.7	2129.8	0.0	538	263	0
1303.0	196.0	1393.2	2127.6	0.0	643	264	0
1315.0	196.7	1404.2	2126.5	0.0	536	265	0
1340.0	198.3	1426.6	2124.3	0.0	534	266	0
1365.0	199.9	1449.0	2121.9	0.0	532	268	0
1390.0	201.5	1471.6	2119.6	0.0	530	269	0
1415.0	203.0	1494.2	2117.3	0.0	527	271	0
1440.0	204.6	1517.0	2115.1	0.0	524	272	0
1465.0	206.2	1539.9	2112.9	0.0	628	274	0
1488.0	206.4	1542.8	2112.7	0.0	522	274	0
1493.0	208.0	1565.9	2110.5	0.0	622	276	0
1513.0	206.3	1584.6	2108.9	0.0	682	277	0
1513.2	208.4	1585.1	2108.9	0.0	517	277	0
1514.0	208.4	1565.8	2086.9	0.0	616	257	0

Flow State (continued)

Measured Depth[Flow] m	Temperature	Completion Pressure	Working Pressure	Concentric Pressure	Completion Liquid Velocity ft/min	Working Liquid Velocity ft/min	Concentric Liquid Velocity ft/min
1515.0	209.5	1588.0	2080.3	0.0	85	3159	0
1526.0	210.2	1600.0	2016.7	0.0	84	3182	0
1543.7	211.4	1621.2	1896.0	0.0	89	3222	0
1544.0	211.4	1621.6	1893.9	0.0	88	13354	0
1558.1	212.3	1635.0	0.0	0.0	0	0	0
1583.1	214.0	1659.1	0.0	0.0	0	0	0
1608.1	215.7	1663.4	0.0	0.0	0	0	0
1633.1	217.3	1707.7	0.0	0.0	0	0	0
1658.1	219.0	1732.0	0.0	0.0	0	0	0
1663.1	220.7	1756.7	0.0	0.0	0	0	0
1708.1	222.5	1781.6	0.0	0.0	0	0	0
1733.0	224.2	1806.9	0.0	0.0	0	0	0
1758.0	226.0	1832.3	0.0	0.0	0	0	0
1783.0	227.8	1857.9	0.0	0.0	0	0	0
1808.0	229.5	1883.6	0.0	0.0	0	0	0
1833.0	231.3	1909.3	0.0	0.0	0	0	0
1858.0	233.1	1935.1	0.0	0.0	0	0	0
1883.0	234.9	1960.9	0.0	0.0	0	0	0
1908.0	236.7	1986.5	0.0	0.0	0	0	0

# CLEANOUT ANALYSIS

Clean Summary

SUMMARY OF HOLE CLEANING RESULTS

<b>Initial Condition:</b>	
% of fill interval occupied by solids before cleanout .....	100.0 %
Top of fill .....	1515.01 m
Deepest Circulation point .....	1543.88 m
Bottom of fill .....	1543.88 m
Initial Volume of Solids .....	3.3 bbl
Initial Mass of Solids .....	1682.4 lb
Solids type: .....	Mud Residue/Formation Fines
Fluid Description: .....	NitroFeed Water

**Penetration Hole Cleaning Mode:**  
 Penetration rate..... 1.0 r/min  
 Penetration time..... 1.58 hr  
 Solids volume in the well after penetration..... 2.7 bbl  
 Solids mass in the well after penetration..... 1370.4 lb

**Circulation Hole Cleaning Mode:**  
 Hole circulation time..... 3.25 hr  
 Solids volume in the well after circulation..... 0.5 bbl  
 Solids mass in the well after circulation..... 245.4 lb

<b>Wiper Trip Hole Cleaning Mode:</b>	<b>User Specified rate, Tornado not</b>
Wiper Trip Scheme:	
Wiper trip time .....	0.20 hr
Solids volume in the well after wiper trip .....	0.5 bbl
Solids mass in the well after wiper trip .....	245.4 lb

**Volume of Fluids Pumped During Penetration, Circulation & Wiper Trip:**  
 Gas volume..... 80679.2 scf  
 Liquid Volume..... 332.5 bbl  
 Penetration, Circulation & Wiper Trip time..... 5.04 hr

Circulation results at point of Maximum Solids Head:

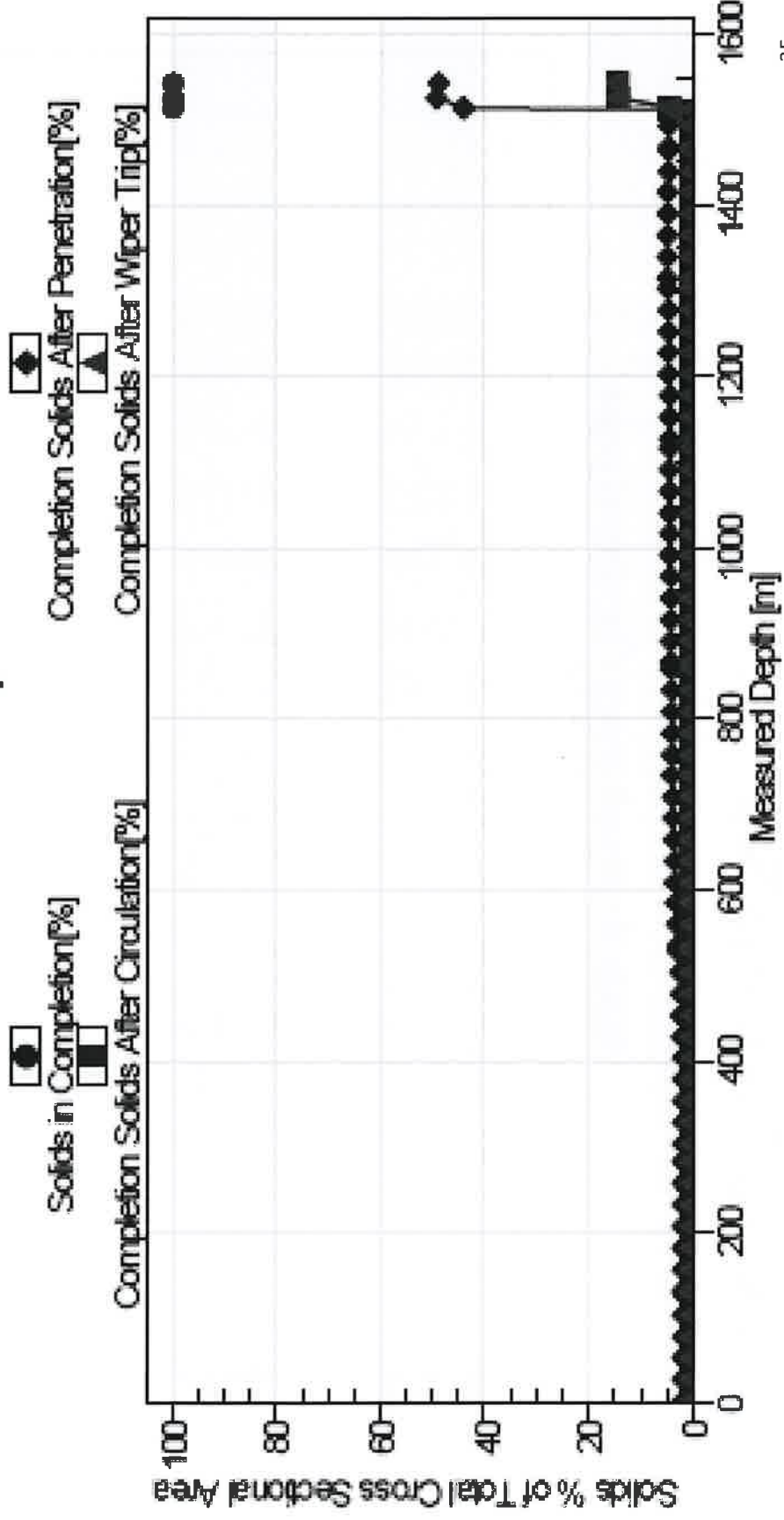
Percentage initial fill	% Left in hole after CBU
100%	14.6
90%	16.9
50%	30.1

**Cleanout unable to lift 100% solid inside well!**

# CLEANOUT ANALYSIS

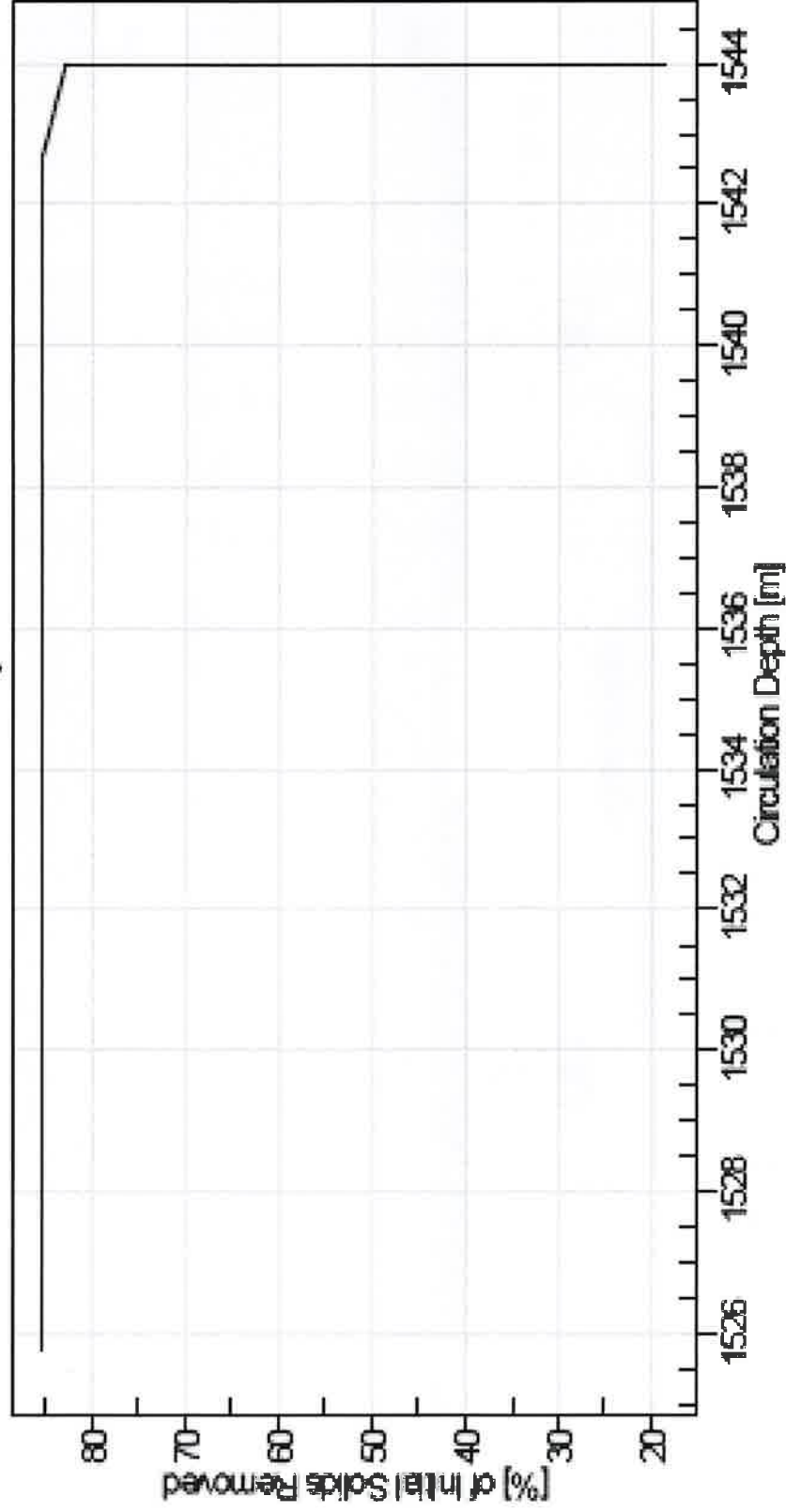
## Solids Bulk Cross Sectional Area

Clean Analysis



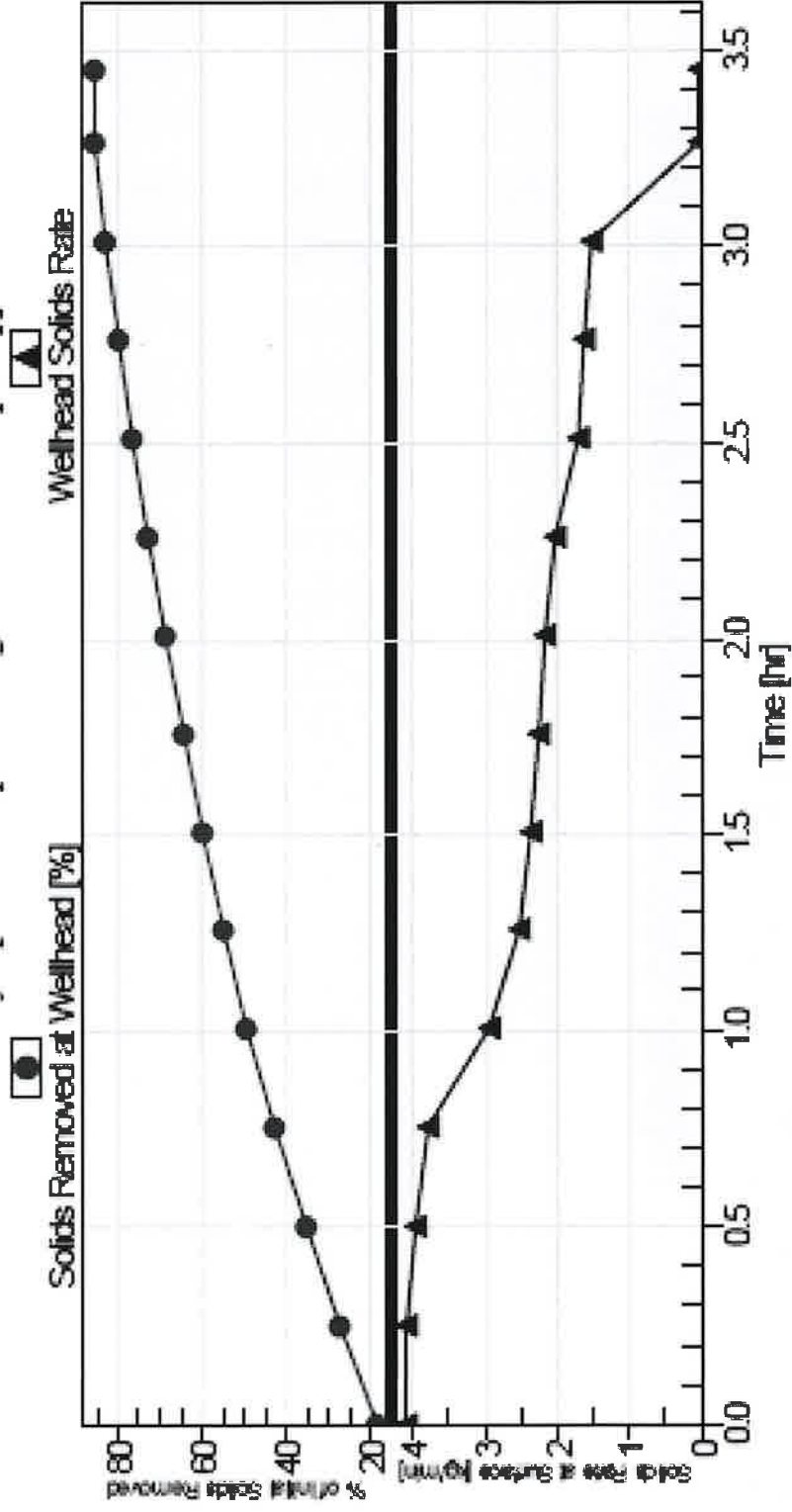
# CLEANOUT ANALYSIS

Solids Removed versus Circulation point  
Clfran Analysis



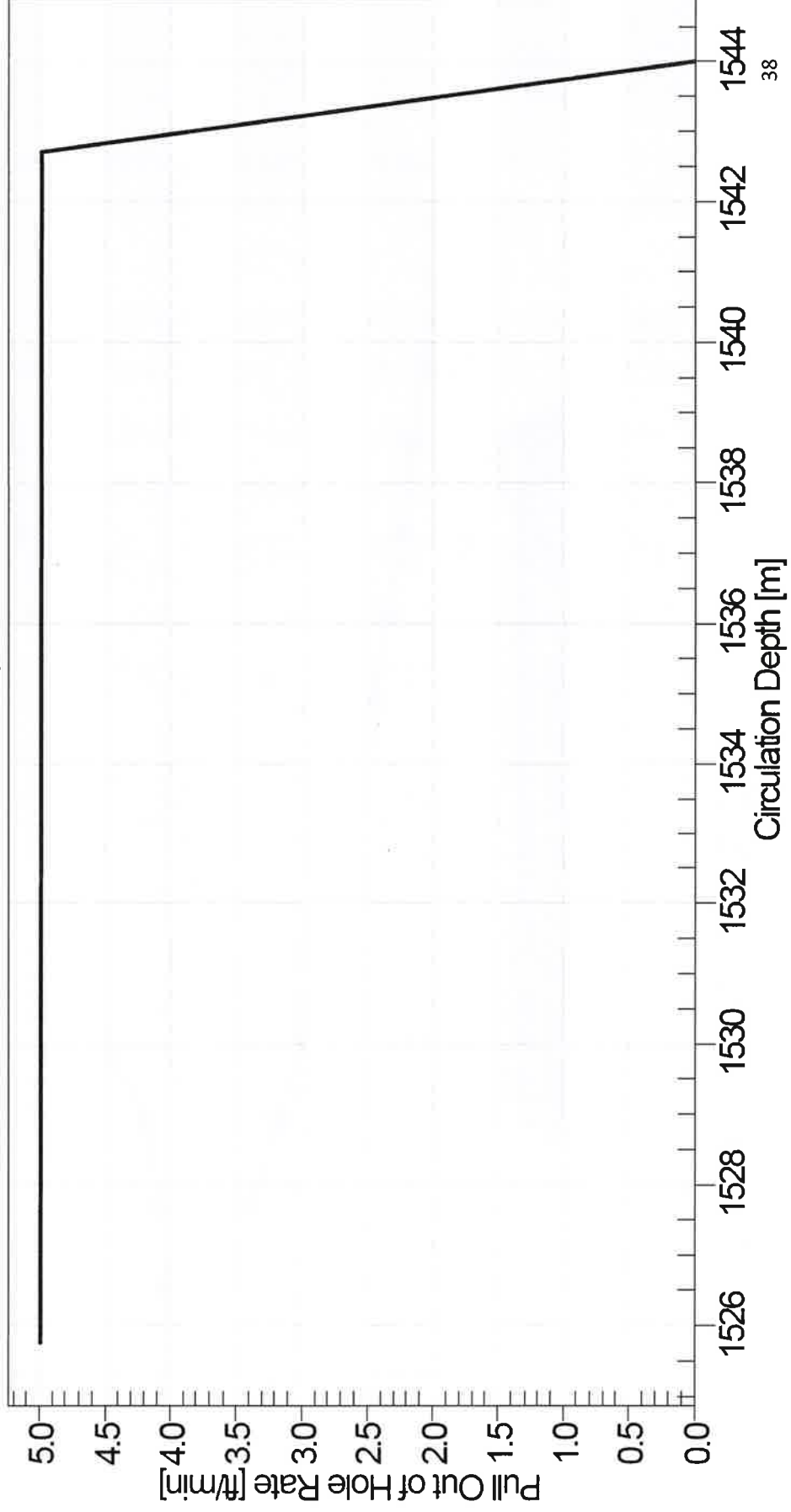
# CLEANOUT ANALYSIS

**Solids Removal after Penetration to Target Depth**  
Clean Analysis [Transient response during Circulation and Wiper Trip]



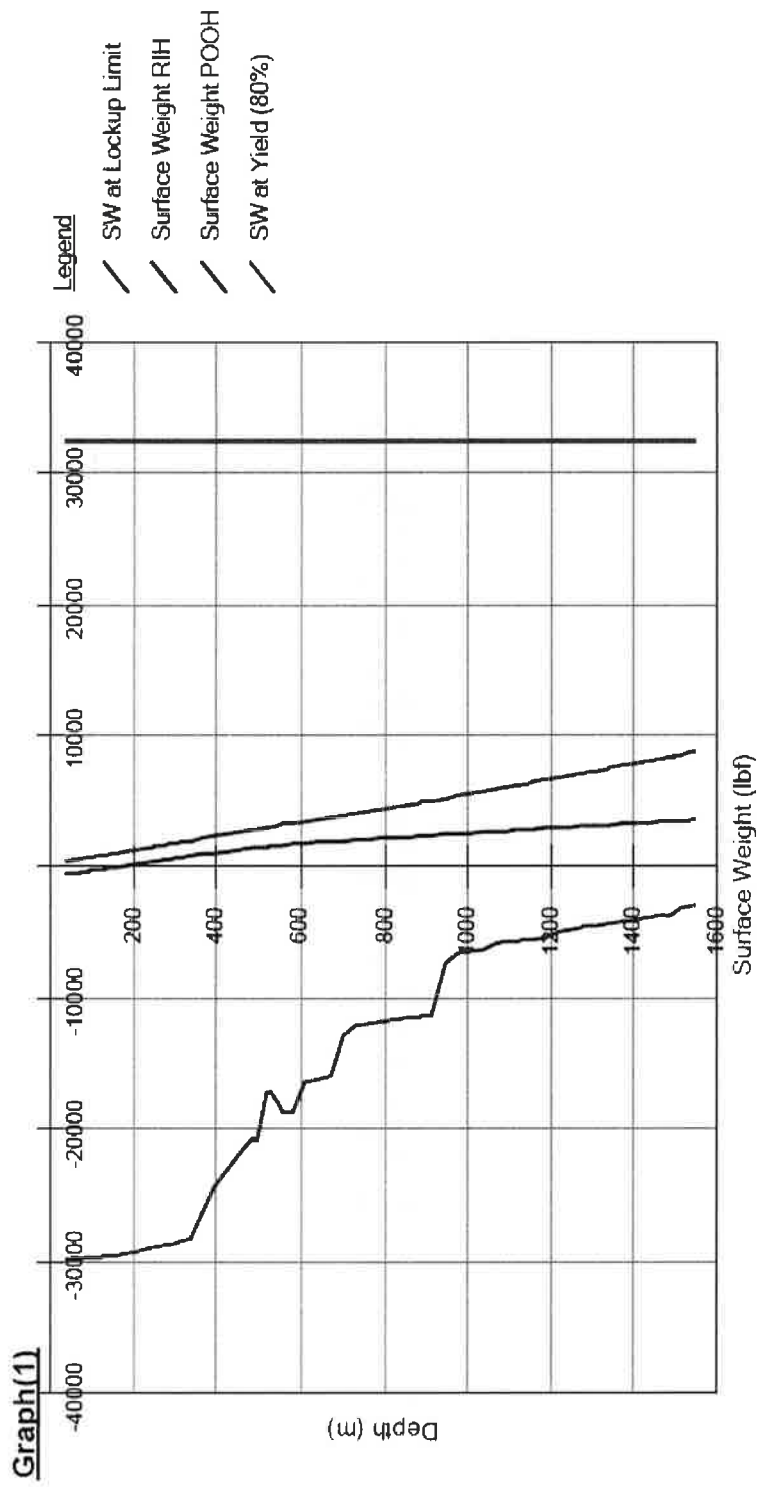
# CLEANOUT ANALYSIS

Tripping Speed to be used while Pulling Out of Hole  
Cfran Analysis

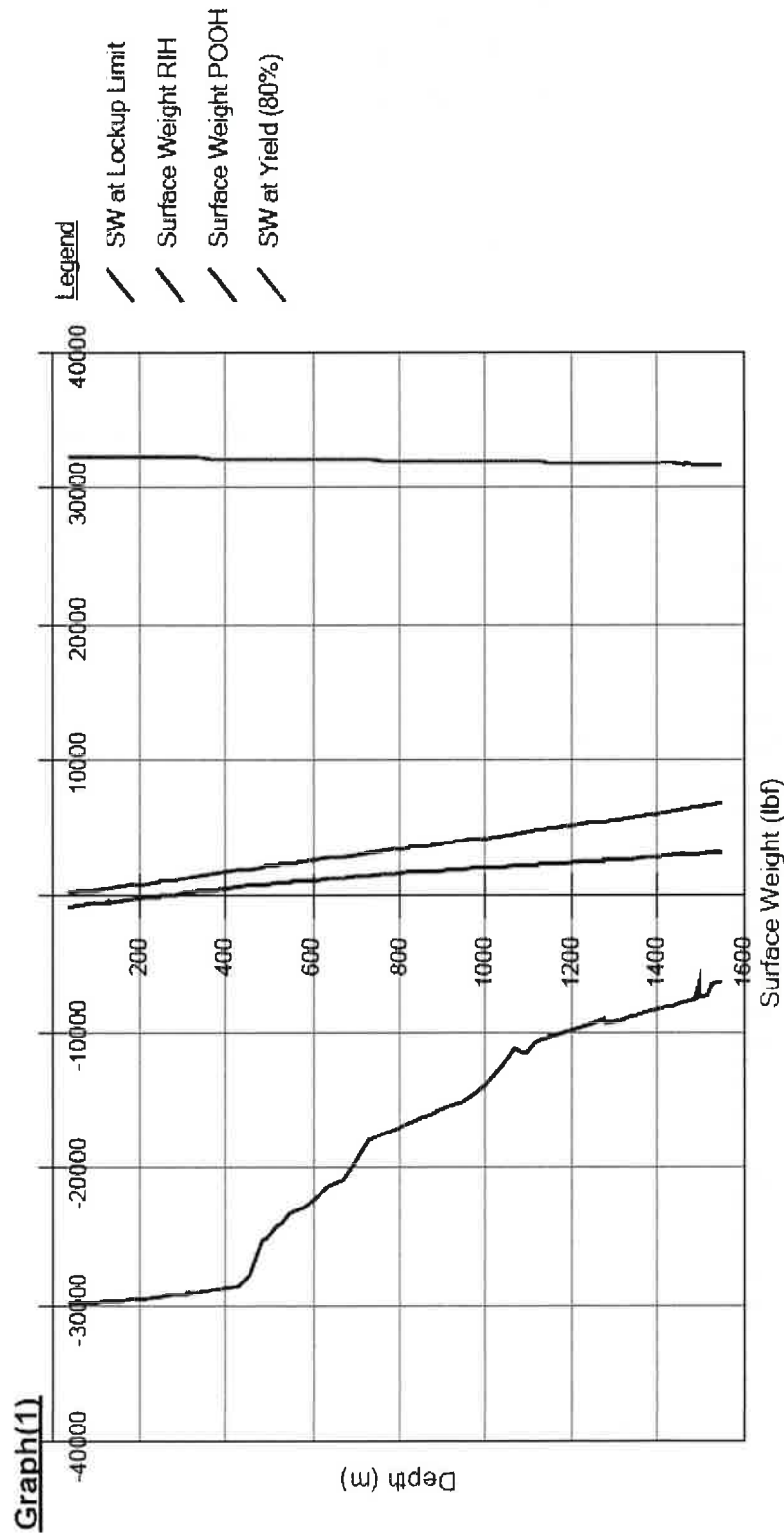


# TFA SENSITIVITY ANALYSIS

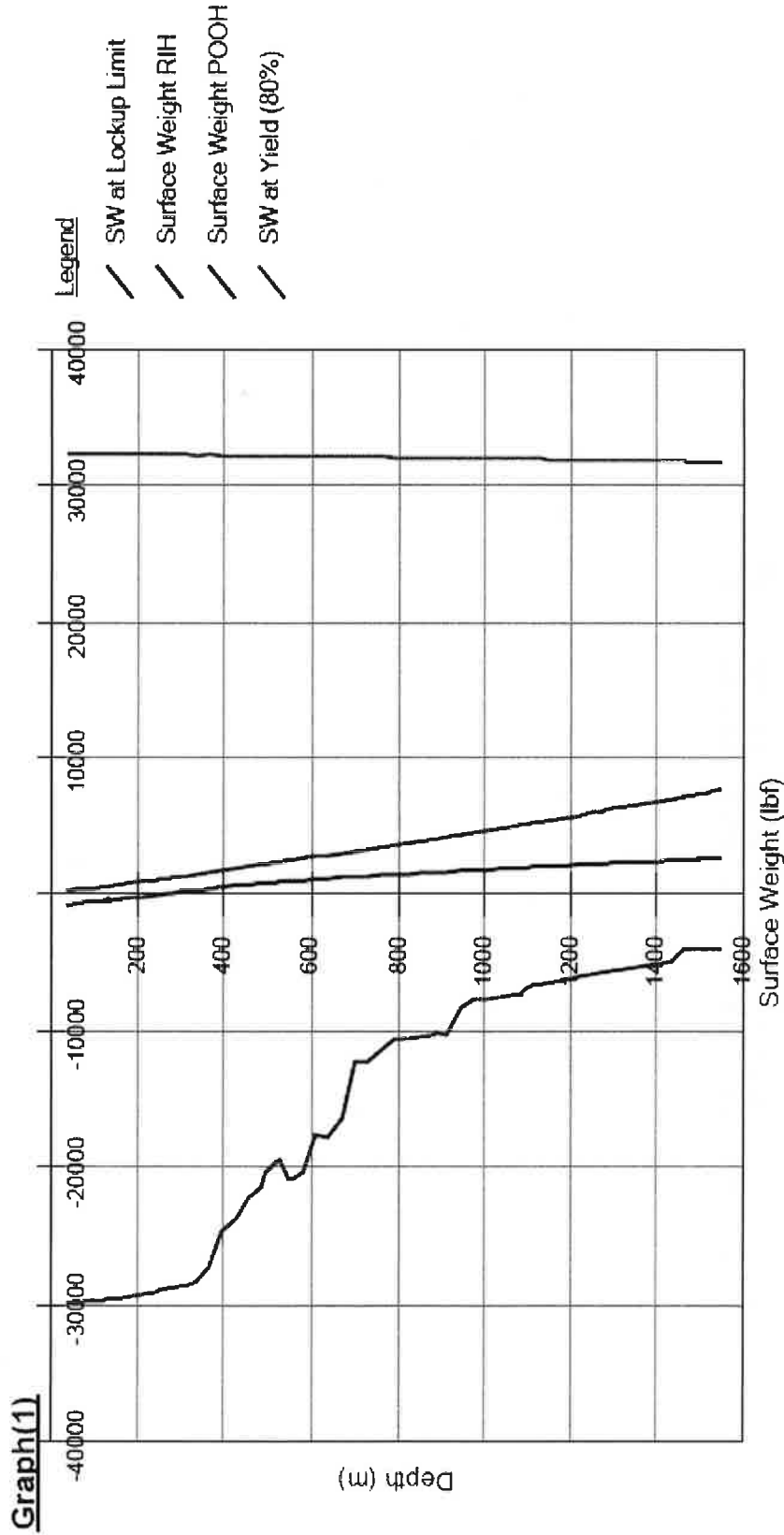
# TFA SENSITIVITY ANALYSIS – IDLE RATE



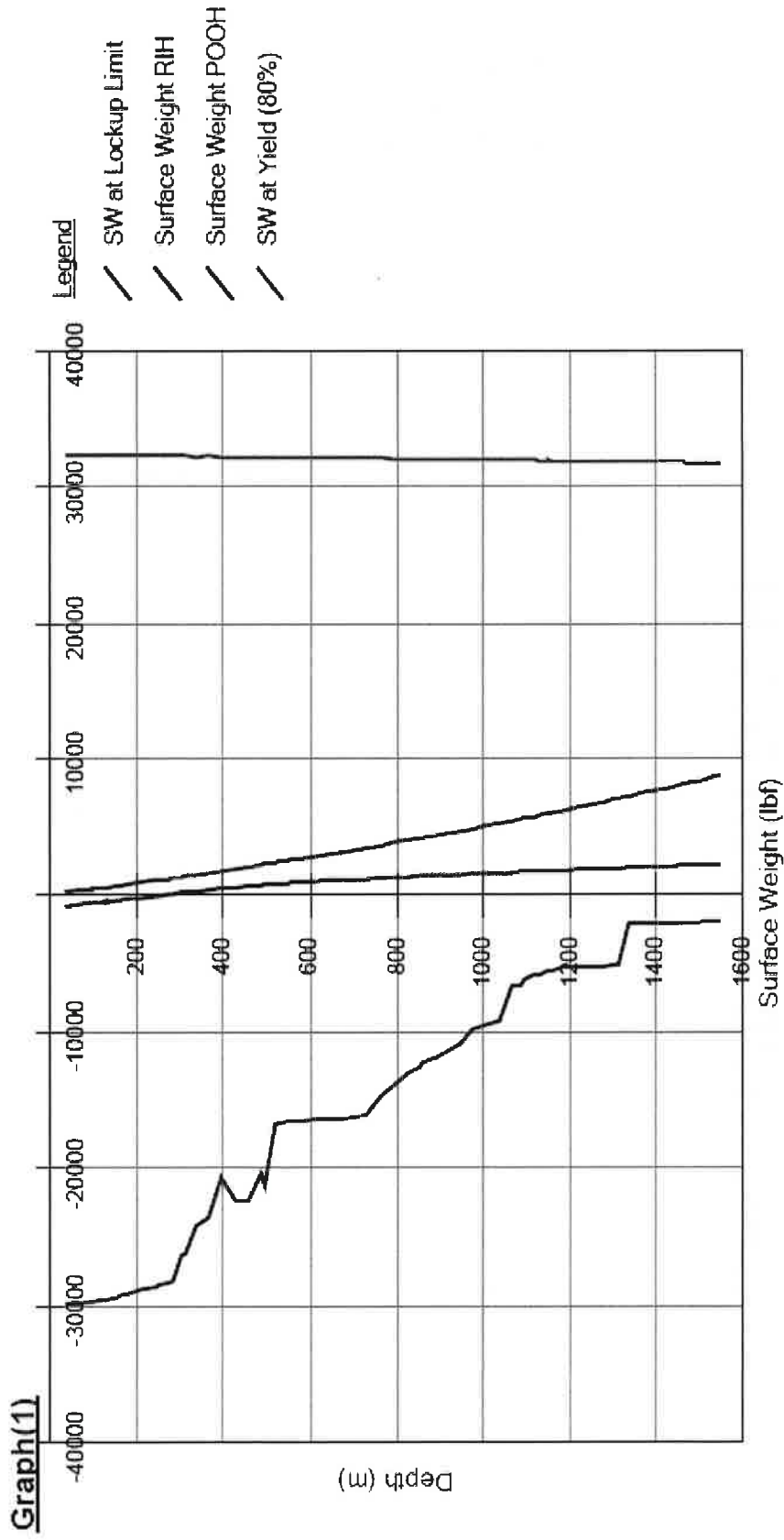
# TFA SENSITIVITY ANALYSIS – 1.1 BPM 300 SCFM 0.2 FF



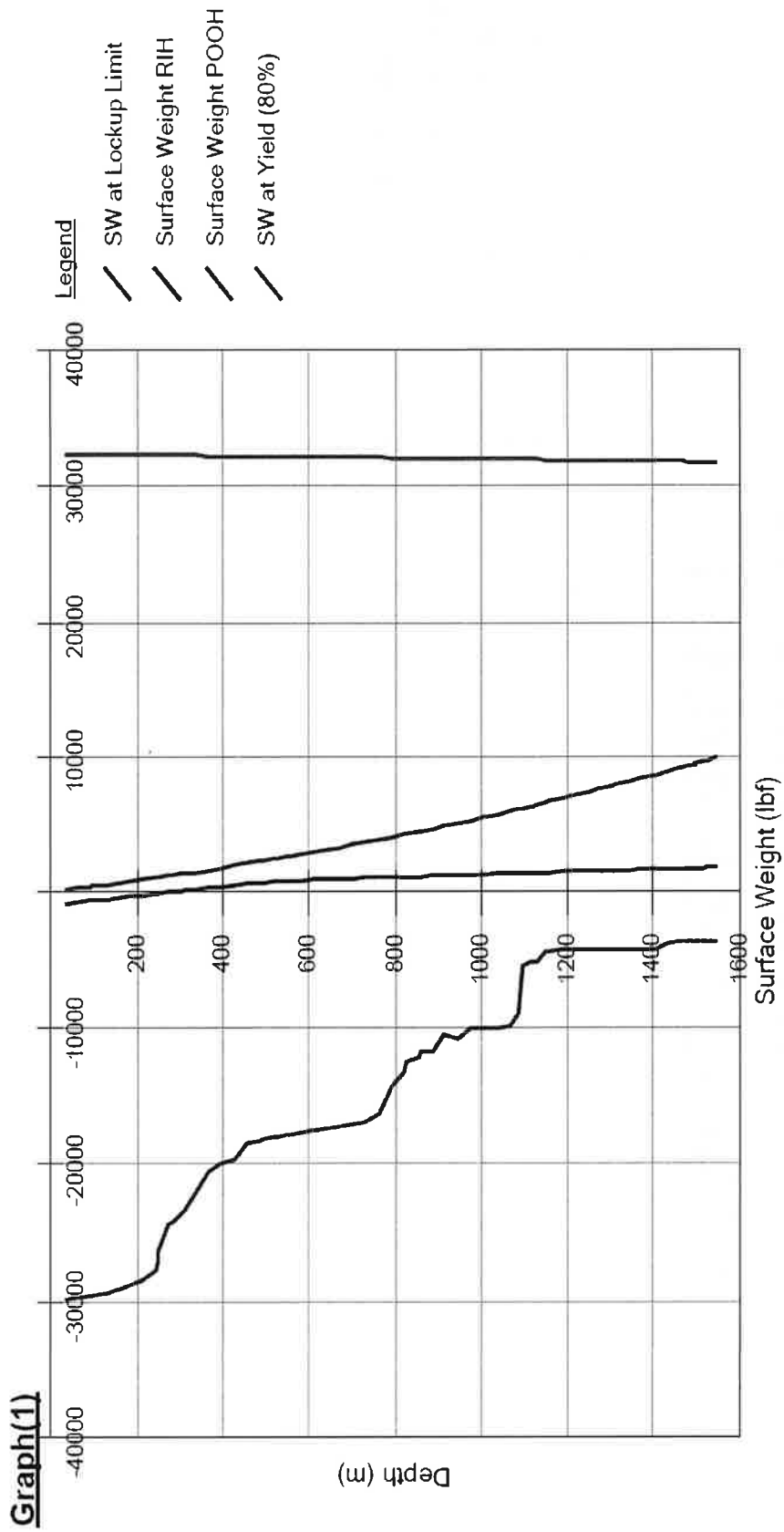
# TFA SENSITIVITY ANALYSIS – 1.1 BPM 300 SCFM 0.3 FF



# TFA SENSITIVITY ANALYSIS – 1.1 BPM 300 SCFM 0.4 FF



# TFA SENSITIVITY ANALYSIS – 1.1 BPM 300 SCFM 0.5 FF



# TFA SENSITIVITY ANALYSIS – SUMMARY

Friction Factor	Depth (m)	Lock-up Limit (lbf)	RIH Weight (lbf)	POOH Weight (lbf)	Max Pulling Weight at 80% Yield Limit
0.2	500	-25,230	903	2,167	32,214
	1000	-13,788	2,066	4,273	32,034
	1,545	-6,300	3,178	6,794	31,773
0.3	500	-20,439	843	2,240	32,230
	1000	-7,675	1,819	4,653	32,010
	1,545	-4,089	2,710	7,707	31,786
0.4	500	-21,369	786	2,317	32,213
	1000	-9,586	1,587	5,077	32,019
	1,545	-1,968	2,286	8,758	31,774
0.5	500	-18,142	136	2,392	32,213
	1000	-9,954	1,363	5,553	32,043
	1,545	-3,635	1,893	9,963	31,784

# Pro & Cons Deployment vs conventional

# Conventional BHA

Pro	Cons
<ol style="list-style-type: none"><li>1. Crew familiarity</li><li>2. Minimal rig up/down time (1 additional item – Deployment BOP +/- xover)</li><li>3. Faster BHA makeup / strip down</li><li>4. Regular CT operational/standby charges</li></ol>	<ol style="list-style-type: none"><li>1. Does not address likelihood of CT string entangled and helical lock against well long string.</li><li>2. Unable to disconnect using MHA disconnect. If stuck in completion annulus, disconnect will likely be below entanglement depth.</li><li>3. Will be forced to use chemical cutters if desire to disconnect on stuck. Expansive, difficult and very time-consuming intervention.</li><li>4. Extremely difficult/almost impossible to retrieve whole FISH if forced to sever the CT string using plasma cutter.</li><li>5. CT string will be left downhole. If cut is only feasible at depth inside the completion tubing, additional resistance to producing well with fish left in hole.</li><li>6. Additional lost in hole charges for CT string.</li><li>7. If extended lengths of CT string is left in hole, the remaining string will no longer be usable as is. Time, effort and additional cost to demob reel, spool out remaining string, spool in new string, reinspect and mob back to location etc.</li></ol>

# Extended BHA

Pro	Cons
<ol style="list-style-type: none"><li>1. Addresses likelihood of CT string entanglement and helical lock against well long string.</li><li>2. Gain ability to disconnect IF stuck in completion annulus</li><li>3. Disconnecting is a fast and easy process.</li><li>4. Only BHA will be left downhole if disconnect. Lesser resistance to producing well with fish left in hole.</li><li>5. Easier to retrieve FISH if disconnect at MHA.</li><li>6. CT string can be immediately used for subsequent wells with zero additional effort, time or cost. As such no delay to subsequent CT intervention plan after disconnect.</li></ol>	<ol style="list-style-type: none"><li>1. Minimal rig up/down time (1 additional item – Deployment BOP)</li><li>2. Additional extended BHA makeup / strip down.</li><li>3. Additional CT operational/standby charges.</li></ol>

# Previous History for Dulang B7S

# Summary

9 May 2020

1. CT RIH to Tag No-GO nipple.
2. CT able to tag the NO-GO without any issue after slickline fish has been retrieved.

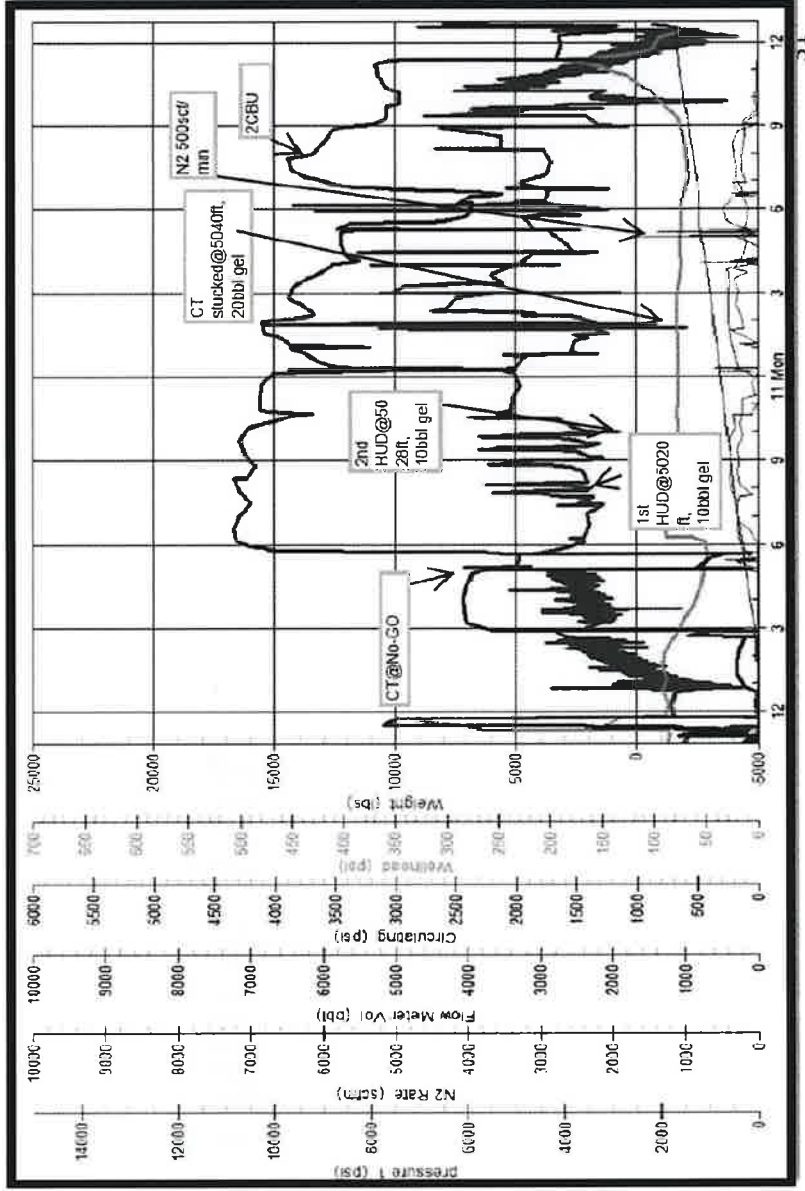
10 May 2020

1. CT RIH to perform SCO inside casing.
2. CT weight during entering casing RW:2200lbs
3. CT get return 0.3% sand with D801 gel at depth 5020ft
4. CT continue RIH at HUD at depth 5028ft and continue penetrate and experienced HPW at depth 5040ft. CT able to release with overpull 14500lbs. (Target SCO depth: 5052ft)
5. After CT is free, straight POOH inside tubing and CBU6
6. POOH to surface

# Summary

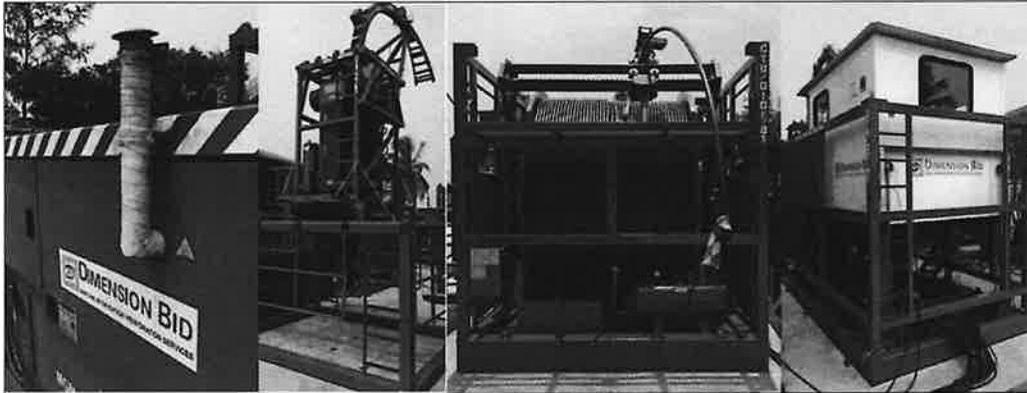
10 May 2020

1. 4 hours stuck during cleanout stage inside casing
2. Overpull 9,500 lbs
3. Normal pick-up weight, 5,000 lb



**Thank you**

# DIMENSION BID




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## DULANG B-7S SAND CLEAN OUT

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Revision: 4  
Prepared for: Pravin Nair / Rahila  
Date Prepared: 30<sup>th</sup> July 2024  
Well: B-7S  
Field: DULANG  
Operation Region: PMA  
Prepared by: Muhammad Hafiz  
Phone: +6019-2640410  
Email: Hafiz.saharuddin@neudimension.com

<b>DIMENSION BID</b>	<b>DIMENSION BID COILED TUBING SERVICES</b>		
	DULANG B-7S	SCO	

**DESIGN VERIFICATION**

**PREPARED BY DB**  
CTS Operation Engineer



\_\_\_\_\_  
Muhammad Hafiz

\_\_\_\_\_  
20/8/2024  
Date

**REVIEWED BY DB**  
CTS Technical Advisor



\_\_\_\_\_  
Kung Yee Han

\_\_\_\_\_  
20/8/2024  
Date

**APPROVED BY DB**  
CTS General Manager



\_\_\_\_\_  
Aliff Adenan

\_\_\_\_\_  
20/8/2024  
Date

**APPROVED BY PCSB**  
Dulang  
Well Intervention Engineer

\_\_\_\_\_  
Pravin Nair / Rahila

\_\_\_\_\_  
Date

**APPROVED BY PCSB**  
Technical Professional  
Well Intervention, PMA

\_\_\_\_\_  
Izwan Jalil

\_\_\_\_\_  
Date


**APPROVED BY PCSB**  
Head of Cluster 2  
Well Intervention, PMA

\_\_\_\_\_  
Hafizi Zaini

\_\_\_\_\_  
Date

**Remark: Do not execute the procedures in this document if it is not fully approved and signed by all parties.**


Prepared By: Muhammad hafiz	Reviewed By: Kung Yee Han	Date: 20/8/2024	Rev. Rev4	Controlled Document DB-CT-MHS-24013	Pg. 2
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<b>DIMENSION BID</b>	<b>DIMENSION BID COILED TUBING SERVICES</b>		
	DULANG B-7S	SCO	

**DISTRIBUTION LIST**

<i>No</i>	<i>Personnel</i>	<i>Company</i>	<i>Name</i>	<i>Email</i>
1	Well Intervention Engineer	PCSB	Pravin Nair Rahila	pravin.venugopalan@petronas.com rahila.mrafe@petronas.com
2	Well Service Supervisor (WSS)	PCSB	TBA	TBA
3	Offshore Installation Manager (OIM)	PCSB	TBA	TBA
4	Tech Professional	PCSB	Izwan Jalil	izwanjalil@petronas.com
5	Cluster Head	PCSB	Hafizi Zaini	Hafizi.zaini@petronas.com
6	Head of well Intervention	PCSB	Eddy Samaile	Eddysamaile@petronas.com
7	Material Coordinator (Logistics)	DB – Kemaman	Marzokey	marzokey@neudimension.com
8	Service Supervisor	DB – Kemaman	TBA	TBA
9	Operation Engineer CT Services	DB – Kemaman	Muhammad Hafiz	hafiz.saharuddin@neudimension.com
10	Operation Engineer CT Services	DB – Kemaman	Mohammad Faizal Ali	faizal.ali@neudimension.com
11	Technical Advisor CT Services	DB – Kemaman	Kung Yee Han	yeehan.kung@neudimension.com
12	Field Service Manager CT Services	DB – Kemaman	Mohd Khairul Ridhwan	khairul.ridhwan@neudimension.com
13	General Manager CT Services	DB – Kemaman	Aliff Amirul Adenan	aliff.adenan@neudimension.com
14	HSE Supervisor	DB – Kemaman	Ahmad	ahmad@neudimension.com

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<b>DIMENSION BID</b>	<b>DIMENSION BID COILED TUBING SERVICES</b>		
	DULANG B-7S	SCO	

**PERSONNEL CONTACT**

Any means of following doubt / unusual parameters / Emergency, please contact Dimension Bid personnel in onshore immediately.

<b>No</b>	<b>Name</b>	<b>Position</b>	<b>Company</b>	<b>Location</b>	<b>Contact No</b>
1	Muhammad Hafiz	Operation Engineer	DB	Kemaman	019 – 264 0410
2	Mohammad Faizal Ali	Operation Engineer	DB	Kemaman	013 – 736 1046
3	Kung Yee Han	Technical Advisor	DB	Kemaman	019 – 610 2088
4	Mohd Khairul Ridhwan	Field Services Manager	DB	Kemaman	014 – 515 4452
5	Alif Adenan	General Manager	DB	Kemaman	011 – 1225 7044


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<b>DIMENSION BID</b>	<b>DIMENSION BID COILED TUBING SERVICES</b>		
	DULANG B-7S	SCO	

**REVISION HISTORY**


<i>Rev. No</i>	<i>Section</i>	<i>Date</i>	<i>Revised By</i>
0	All	30/7/2024	Muhammad Hafiz
1	<ol style="list-style-type: none"> <li>1. Perform pressure test against DKCV after make-up MHA to Carsac</li> <li>2. Flag CT String after make-up MHA to Carsac</li> <li>3. Revise Slickline deployment stack-up (remove BOP)</li> </ol>	15/8/2024	Muhammad Hafiz
2	<ol style="list-style-type: none"> <li>4. To include offline pressure test DKCV before Deployment</li> </ol>	16/8/2024	Muhammad Hafiz
3	<ol style="list-style-type: none"> <li>5. change pressure test to 15 minutes</li> <li>6. Include BHA diagram during Pressure test Deployment BOP before slickline deployment.</li> <li>7. Revise overpull weight by slickline cable to 1.2 x 2<sup>nd</sup> Section BHA length (900 lbs)</li> <li>8. include pressure test Pipe/Slip ram after engage during reverse deployment.</li> </ol>	17/8/2024	Muhammad Hafiz
4	<ol style="list-style-type: none"> <li>9. To include additional pressure test to lower ram during reverse deployment.</li> <li>10. To perform MultiJet Surface function test prior before deployment using slickline.</li> <li>11. To include positive pressure test against the DKCV during reverse deployment.</li> </ol>	20/8/2024	Muhammad Hafiz

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<b>DIMENSION BID</b>	<b>DIMENSION BID COILED TUBING SERVICES</b>		
	DULANG B-7S	SCO	

**ACRONYM**


<i>Acronym</i>	<i>Abbreviation</i>
BHA	Bottom Hole Assembly
RIH	Run In Hole
POOH	Pull Out of Hole
HUD	Hang Up Depth
TCC	Tubing Clearance Check
SCO	Sand Clean Out
TIT	Tubing Integrity Test
BOP	Blow Out Preventer
CT	Coiled Tubing
ID	Internal Diameter
MDTHF	Measure Depth Tubing Head Flange
TOP	Top of Plug
MASTP	Maximum Allowable Surface Treating Pressure
STP	Surface Treating Pressure
IH	Injector Head
JF	Jacking Frame
DKCV	Dual Kelly Cock Valve
MHA	Motor Head Assembly
IW	Injection Water
TSW	Treated Sea Water

<b>DIMENSION BID</b>	<b>DIMENSION BID COILED TUBING SERVICES</b>		 <b>PETRONAS</b>
	DULANG B-7S	SCO	


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<b>DIMENSION BID</b>	<b>DIMENSION BID COILED TUBING SERVICES</b>		 <b>PETRONAS</b>
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**OBJECTIVES**

1. To perform sand cleanout inside casing, until 17m below bottom perforation (1,545m).

***Note: All depth mention inside this job program in MDTHF***


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<b>DIMENSION BID</b>	DIMENSION BID COILED TUBING SERVICES		
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## WELL DATA

Input Parameter	Parameter Value
Field	Dulang Bravo
Max. Deviation (degrees)	48.3 degrees
Min. Restriction (inch)	2.25" @ No Go nipple
Type of Fluid & Density	9.6 ppg based on data in well diagram
Top of Fluid	N/A
Current Well Status	Production decline, assume sand accumulated outside of the tubing
Reservoir Pressure	1600-1900 psi
Fracture Gradient	0.72 psi/ft
H <sub>2</sub> S Content	0 – ppm
CO <sub>2</sub> Content	CO <sub>2</sub> - 15-30 mole% (oil), 50-60 mole% (gas)
Mercury, HG	N/A

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<b>DIMENSION BID</b>	<b>DIMENSION BID COILED TUBING SERVICES</b>		
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**OPERATION SUMMARY**

Item	Job Description	Remark
A	CT Operation	SCO using MultiJet nozzle:  From: 1,514m (EOT) To: 1,545m (17m below bottom perforation zone)

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<b>DIMENSION BID</b>	<b>DIMENSION BID COILED TUBING SERVICES</b>		
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**WELL DIAGRAM**

Internal Use - Authorized for External distribution


LATEST UPDATE: MAR 2022

**DULANG WELL COMPLETION DIAGRAM**

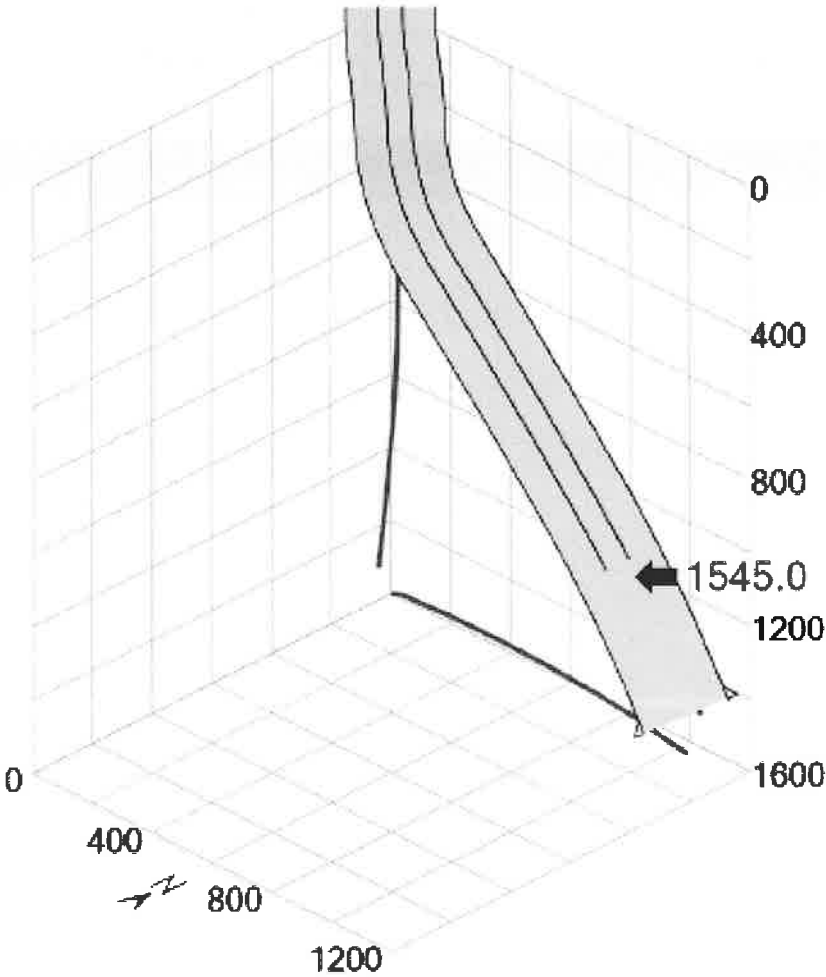
WELL B-7: DUAL OIL PRODUCER IN 9 5/8" CASING (TYPE 5)

DATE OF COMPLETION : 8 JUNE 1991 RIG : TIOMAN 3 TUBING : 2 7/8" 6.5 PPF N-80 NK3SB X-MAS TREE : WKM, DUAL 3M PACKER FLUID : 9.6 PPG 3% KCl + NaCl + 0.05% NALCO 3300 BIOCID & CORR. INHIBITOR	CASING : 20" X-56 COND., 94 ppf @ 354.0 m MDDF 13 5/8" K-55 SURF., 54.5 ppf @ 820 m MDDF 9 5/8" N-80 PROD., 40 ppf @ 1915.0 m MDDF  PBTD : 1644.0 m MDDF RTE TO TUBING HANGER : 13.88 m MAXIMUM DEVIATION : 48.30 DEG
--	---

STATUS	MIN ID (in)	SHORT STRING	DEPTH m MDTHF	DEPTH m MDTHF	COMPLETION LONG STRING	MIN ID (in)	STATUS
		1/4" CONTROL LINE			1/4" CONTROL LINE		
	2.441	FLOW COUPLING	128	138	FLOW COUPLING	2.441	
	2.312	TRDP-4A SCSSV	129	139	TRDP-4A SCSSV	2.312	
	2.312	WP-1 NIPPLE	282	291	WP-1 NIPPLE	2.312	
DV	2.371	KBMG-M SPM	528	548	KBMG-M SPM	2.371	DV
DV	2.371	KBMG-M SPM	859	888	KBMG-M SPM	2.371	DV
DV	2.371	KBMG-M SPM	1117	1135	KBMG-M SPM	2.371	DV
DV	2.371	KBMG-M SPM	1303	1342	KBMG-M SPM	2.371	DV
GLOV 12/64"	2.371	KBMG-M SPM	1485	1491	KBMG-M SPM	2.371	GLOV 12/64"
CLOSED	2.312	WPB-2DE SSD	1493	1494	WPB-2DE SSD	2.312	CLOSED
	2.441	GUIB UNI-XXVII DUAL HYD. PKR	1510				
OPENED	2.250	'D' NO-GO NIPPLE	1513	1161.5	'WPB-2DE' SSD	2.312	CLOSED (stiff)
	2.441	W/L ENTRY GUIDE	1514	1521			
SAND : E-7 (FB N3-A; WR) PERFT: 1523.82 m - 1528.12 m				1530	BLAST JOINT	2.441	
					<b>Packoff at 1527-1534 m-MDTHF</b>		
				1549	'WP1' NIPPLE	2.312	
				1558	CENTRALIZER	2.441	
				1558	LOC SEAL ASSY.	2.441	
				1559	SEAL BORE EXT.	4.000	
				1559	'D' NO-GO NIPPLE	2.250	OPENED
				1562	WEG	2.441	
SAND : E-1213 & E14 (FB N3-A; WR) (E-1213) PERFT: 1589.62 m - 1589.62 m (E-14) PERFT: 1592.62 m - 1613.62 m							
9 5/8" CASING SHOE DOGLEG (DEPTH) : 394.2 - 625.0, 682.7 - 711.6							
			1558				
			TD @ 1908 m MDTHF				

<b>DIMENSION BID</b>	<b>DIMENSION BID COILED TUBING SERVICES</b>		
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**WELL 3D PLOT**



Well name: Dulang B07S


Max Inclination: 48.4° at 1353.0 m

Max DLS: 4.678 °/100ft at 371.0 m

Min ID: 2.250 in at 1513.0 m

WHP: 150 psi


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<b>DIMENSION BID</b>	<b>DIMENSION BID COILED TUBING SERVICES</b>		
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**TREATMENT VOLUME**

Description	Details
Tubing Specification	2-7/8" 6.5 ppf
Production Casing Specification	9-5/8" 40 ppf# N80

Type	External Pipe		Internal Pipe 1				Internal Pipe 2				Casing Weight (lb/ft)	From (ft)	To (ft)	From (ft)	To (ft)	Length (ft)	Total Volume (bbl)
	OD (in)	ID (in)	OD (in)	ID (in)	WT (lb/ft)	OD (in)	ID (in)	WT (lb/ft)									
Tubing volume until EOT	2 7/8	2.441								0.00579	0	1,514	0	4,967	4,967	28.75	
Wellbore volume	9 5/8	8.835	2 7/8							0.07582	1,510	1,558	4,954	5,112	157	11.94	
PCP volume	9 5/8	8.835	2 7/8			2 7/8				0.05977	0	1,510	0	4,954	4,954	296.10	

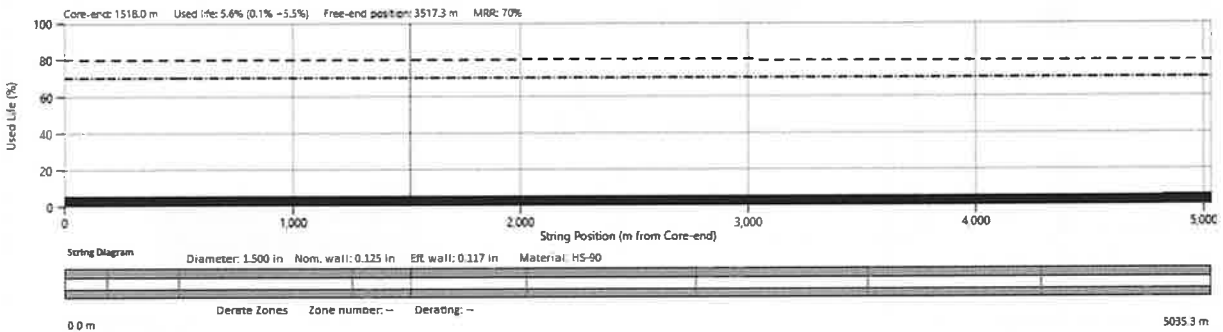
<b>DIMENSION BID</b>	<b>DIMENSION BID COILED TUBING SERVICES</b>		
	DULANG B-7S	SCO	

**CT STRING INFORMATION**

<i>OD (in)</i>	<i>Spec</i>	<i>W/T (in)</i>	<i>ID (in)</i>	<i>Length (ft)</i>
1.5	HS – 90	0.125	1.25	16,513
<b>CT Volume: 25 bbls</b>				

**CT STRING FATIGUE**

- **Current used life for Tenaris #40423 is at 5.5%**

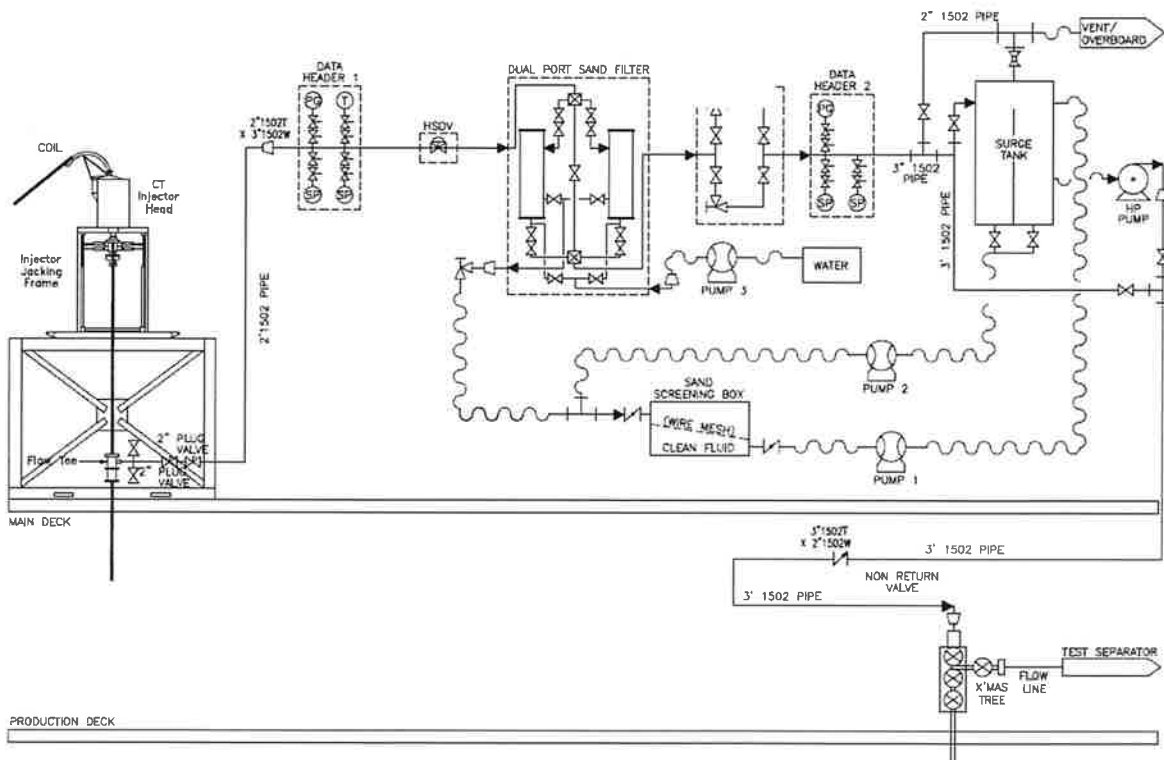
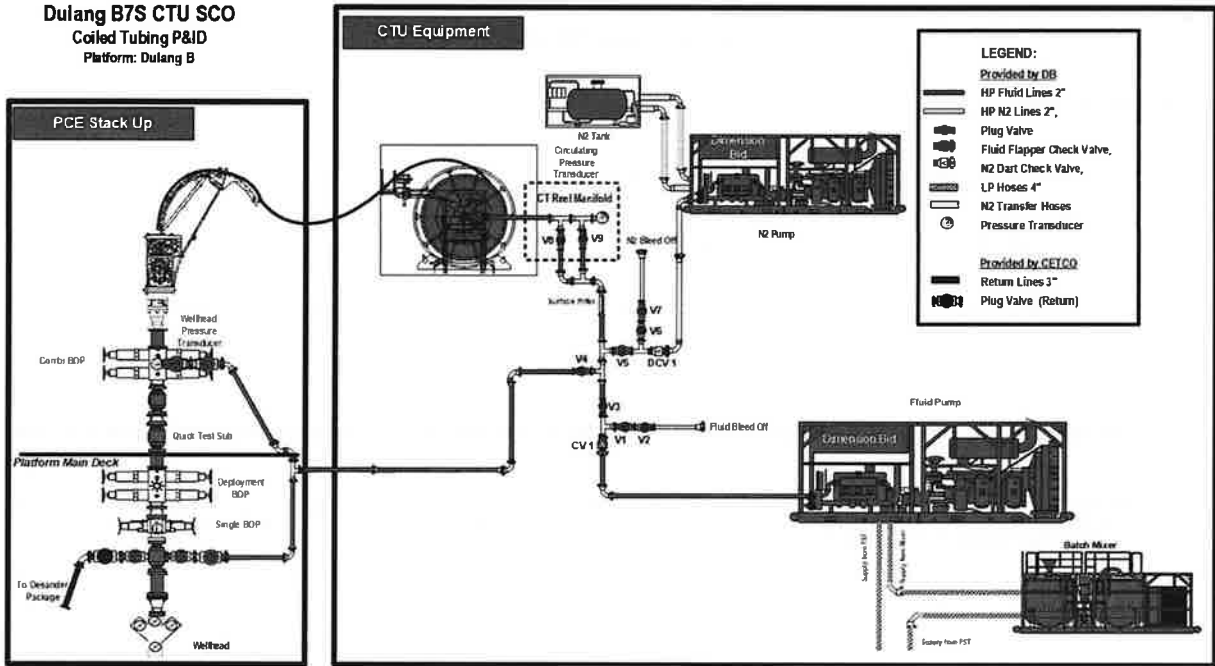


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<b>DIMENSION BID</b>	<b>DIMENSION BID COILED TUBING SERVICES</b>		
	DULANG B-7S	SCO	

**PROCESS FLOW DIAGRAM**

**DIMENSION BID**  
Dulang B7S CTU SCO  
Coiled Tubing P&ID  
Platform: Dulang B



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<b>DIMENSION BID</b>	DIMENSION BID COILED TUBING SERVICES		 <b>PETRONAS</b>
	DULANG B-7S	SCO	

## SAFETY OPERATIONAL PROCEDURES

**Prior to commencement of the CT / Bullheading operation, a pre-job meeting will be held. This should be attended by the following parties as a minimum:**


OIM, WSS, CT Supervisor, Representatives of other service companies involved and others as necessary.

**Safety meetings should be held at the start of every shift and risk assessments must be evaluated during this time. Tool box talks should be held immediately prior to the job execution.**

**Note: The safety meeting must be driven by DB Supervisor addressing the following topics as a minimum:**

1. Muster point.
2. Take list of personnel on site (Head count)
3. All personnel should review and be familiar with escape routes and emergency procedures.
4. Describe the **job objective, fluids and volumes to be pumped, pressures expected** during the job, and others.
5. **Review Dimension Bid Operations Policy and Procedure Manual.**
  - 5.1. Ensure at all steps carried out during the operations comply with this Manual.
  - 5.2. Management of change **MUST** be applied any time there is a need to deviate from the steps contained this procedure.
  - 5.3. A document **MUST** be created describing each the step of the deviation. This document shall also include the deviation Risk Assessment and it **MUST** be approved and signed by PCSB – Head of Well Intervention and Dimension Bid General Manager.
6. Exercise Stop work authority if unsafe condition occurs and assess situation with all team members, resume operation after mitigation plan is in place.
7. Personnel responsibilities throughout the job.
8. Spills, fire, blow out, unexpected well behaviour.
9. Emergency shower station and eye wash station location.
10. Trapped potential energy such as pressure or CT stiffness.
11. Prepare related Job Hazard Analysis (JHA) prior commencement of any work, get approval from Client Site Representative (CSR) and review it with all personnel involved as well as to review Risk Assessment.
12. Discuss the well H<sub>2</sub>S, CO<sub>2</sub>, Hg (Mercury) content (if applicable).
13. Adhere all **PCSB Zeto Rules** and other guidelines.
14. Take a physical count of inventory and make sure all required materials are available on site.
15. **Barricade** the work area and display the appropriate **warning sign**.
16. On chemical mixing and handling; all personnel involved shall hold **safety meeting** and review **Safety Data Sheet** (SDS).
  - 16.1. Personnel involve during chemical handling shall be briefed by DB Chemical Specialist onsite and extra precautions must be taken. All SDS must be available on site and reviewed prior chemical handling.
  - 16.2. All non-essential personnel shall stay away from mixing site.
  - 16.3. Use PPE including respirators, hard hats, eye protection and steel-toed boots.
  - 16.4. Verify if there is any **dead volume** in the mixing tanks and adjust volumes to account for non-usable volume in the blender / mix tank.
  - 16.5. Consider wind direction and note all trip hazards in the mix / pumping area.

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<b>DIMENSION BID</b>	<b>DIMENSION BID COILED TUBING SERVICES</b>		
	DULANG B-7S	SCO	

- 16.6. Prior to mixing chemicals, clean and verify the tank/batch mixer and lines are free of any debris and or contaminants.
- 16.7. In case of spill; wash the place where any chemical has been spilt with available spill kit.
- 16.8. Take care to prevent leakage due to ejection from valves, fittings, flanges, or other joints flexible chemical hoses and pumps. Never repair the equipment during transfer into mixing tank/container.
17. Take reading of Shut in / Flowing Tubing Head Pressure (SI/FTHP), Casing Head Pressure (CHP) and fluid sample (if available) prior to operation.
18. Check gas lift condition and capability with Site Operation Representative (SOR).
19. Ensure fitness prior to perform duties assigned.
20. Ensure all barriers are in place and followed.

### **HEALTH, SAFETY & ENVIRONMENT**

1. Evaluate possible risks to arise during the job execution.
2. Evaluate risk assessment. Report any abnormal or insecure condition on site, taking into account all the steps or procedures to follow. Discuss with PCSB HSE coordinator, the execution or suspension of the job.
3. Review SDS of each product that will be used. Verify that all personnel on location handling toxic or corrosive products have the proper PPE.
4. Review the contingency plan for spills.
5. Do not vent / release any hydrocarbons from the well to atmosphere. Returns from the well should be handled safely by Flowback Company.
6. Prior to DB personnel walking on upper deck, DB Supervisor to inspect upper deck and ensure that the area it is in good condition (Gratings, Hatches, etc.)

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<b>DIMENSION BID</b>	<b>DIMENSION BID COILED TUBING SERVICES</b>		
	DULANG B-7S	SCO	

## EQUIPMENT RIG UP PROCEDURE


Conduct safety meeting with all personnel on location detailing the program, pressure limitations, and personnel responsibilities, well control emergency drill and safety precautions.

1. Spot the equipment accordingly to space availability (as per lifting plan), ensure reel position is aligned with the well.
2. Spot JF at available space with sufficient height and crane capacity to rig up the IH and gooseneck.
3. Rig up the 4" LP hoses from fluid storage tanks to batch mixer and single pump unit
4. Rig up 2" HP treating line as per DB Technical Standard from single pump unit and N2 converter unit to CT reel manifold. Include bleed off line on both lines as well.
5. Install correct wellhead crossover on the wellhead. Ensure well is fully secure and record the MV and CV turns.
6. Install Blowout Preventer (BOPs):
  - 6.1. Rig up Single BOP with necessary length of risers on top of the wellhead crossover.
  - 6.2. Rig up Combi BOP with flow tee above the risers
  - 6.3. Hook up BOP hoses and conduct function test for each ram.
7. Rig up 2" kill line from single pump unit line to BOP kill port.
8. Rig up flow back line from flow tee to Choke manifold -> desander unit -> High pressure flowback pump -> flowback Well
9. Spot IH assembly (c/w stripper) with JF on top of wellhead area. Ensure the gooseneck is aligned with the reel position
10. Inspect the chain and gripper block condition and ensure the alignment is correct
11. Rig up the following hydraulic hoses:
  - 11.1. From CT Power Pack to CT Control Cabin
  - 11.2. From CT Power Pack to CT Injector hose reel
  - 11.3. From CT Control Cabin to CT Reel
  - 11.4. From CT Control Cabin to CT BOPs
  - 11.5. From CT Power Pack to JF
12. Perform EMC 1 for all equipment. Start up and run all equipment for few minutes.
13. Jack up CT control cabin.
14. Function test BOP rams (primary and deployment).
 

\*Observe indicator pin to confirm that all rams are in good working condition.
15. Install the stab-in-guide on the CT then stab the string into IH.
16. Record the total cut length of CT String in Cerberus and Pipe Management for future reference.
17. Make up the CT connector and perform pull test at least 15,000 lbs as per DB SOP. This test to be recorded in OrionNET.
 

\*Do not perform pull test more than 80% from CT string Limit.
18. Install pressure test plate onto the CT connector.
19. Circulate the string with water until clean return is seen prior to proceed with pressure test CT Connector.
20. Pressure up the CT string to 5,000 psi gradually by 500 psi increment then hold for 10 minutes.

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- Open the needle valve to release the pressure slowly.
- To address long term inactivity (CT string idle >2 weeks), pickle CT String with 10 bbls of 7.5% HCl, neutralization fluid to remove internal rust / foreign debris inside the CT string.

7.5% HCl (CT Pickle)			420	gals	10	bbls	Description
Products	Concentration		Volume				
IW	794	gptg	333	gals	7.92	bbls	Base Fluid
33% HCl	202	gptg	84	gals	2.00	bbls	Raw acid
Corr 400	4	gptg	2	gals	0.01	bbls	Corrosion Inhibitor

**Mixing Instruction:**

- Fill up tank with IW
- Add 33% HCl & Corr 400 into the tank
- Agitate until the mixture is homogenous


**Notes: All acid to be neutralized prior to flowing back to system.**

- Make up the BHA onto the string as per BHA diagram provided.
- Secure down the injector assembly with chains.
- Measure the following length to set the CT depth:

Distance	Length (ft)
A: Tubing Hanger (THF) to RKB	
B: Tubing Hanger (THF) to Stripper	
C: BHA Length	

- Pick up CT and tag the stripper to set CT depth based on this calculation "A-B+C".

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## GENERAL EQUIPMENT PRESSURE TESTING PROCEDURE


Conduct safety meeting with all personnel on location detailing the program, pressure limitations, and personnel responsibilities, well control emergency drill and safety precautions. Refer the following procedure to pressure test BOP Body, Blind Ram, Surface Line and Wellhead connection.

1. Isolate the line to CT. Double confirm the valve is closed.
2. Fill and pressure test the treating line with IW/TSW (subject to IW availability) to 500 psi and hold for 5 minutes. Inspect the lines for leaks and observe for any pressure drop.
3. Increase pressure to 3,000 psi and hold for 15 minutes. Inspect the lines for leaks and observe for any pressure drop.
4. Fill the pressure control equipment and ensure air is vented from the system by leaving the blind ram and blind ram equalizing valves open.
5. Close blind ram and equalizing valve. Pressure up the surface lines, BOP body, blind rams and wellhead connection to 500 psi then increase gradually to 3,000 psi through the kill line, hold for 15 minutes. Inspect the lines for leaks and observe for any pressure drop.
6. Once test complete, open blind ram pressure equalizing port then bleed off any residual pressure and open the blind rams.

Conduct safety meeting with all personnel on location detailing the program, pressure limitations, and personnel responsibilities, well control emergency drill and safety precautions. Refer the following procedure to pressure test BOP Body, Blind Ram, Surface Line and Wellhead connection.

1. Fill up the CT string and stack up until leak can be seen at stripper.
2. Energize the stripper and begin pressure test the complete stack up (CT string, stripper, CT stack and risers) to 3,000 psi against Crown Valve, hold for 15 minutes.
3. Bleed off pressure inside PCE stack up to 1,500psi. Thereafter, bleed off pressure inside CT string to 0psi to test the Double Flapper Check Valve (DFCV) with DP of 1,500psi and hold for 15 minutes.
4. Bleed off the pressure from BOP kill port side.  
\*Step 4-8 can be neglected if pipe ram has been pressure tested prior to the job.
5. Place CT string across pipe ram then close the pipe ram.
6. Open pipe ram equalizing valve then fill up the BOP slowly.
7. Close the equalizing valve and begin pressure test the pipe ram to 3,000 psi, hold for 15 minutes.
8. When the tests are complete, bleed off the pressure.

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## DUAL KELLY COCK VALVE (DKCV) OFFLINE PRESSURE TEST



Perform offline pressure test DKCV before deployment system.

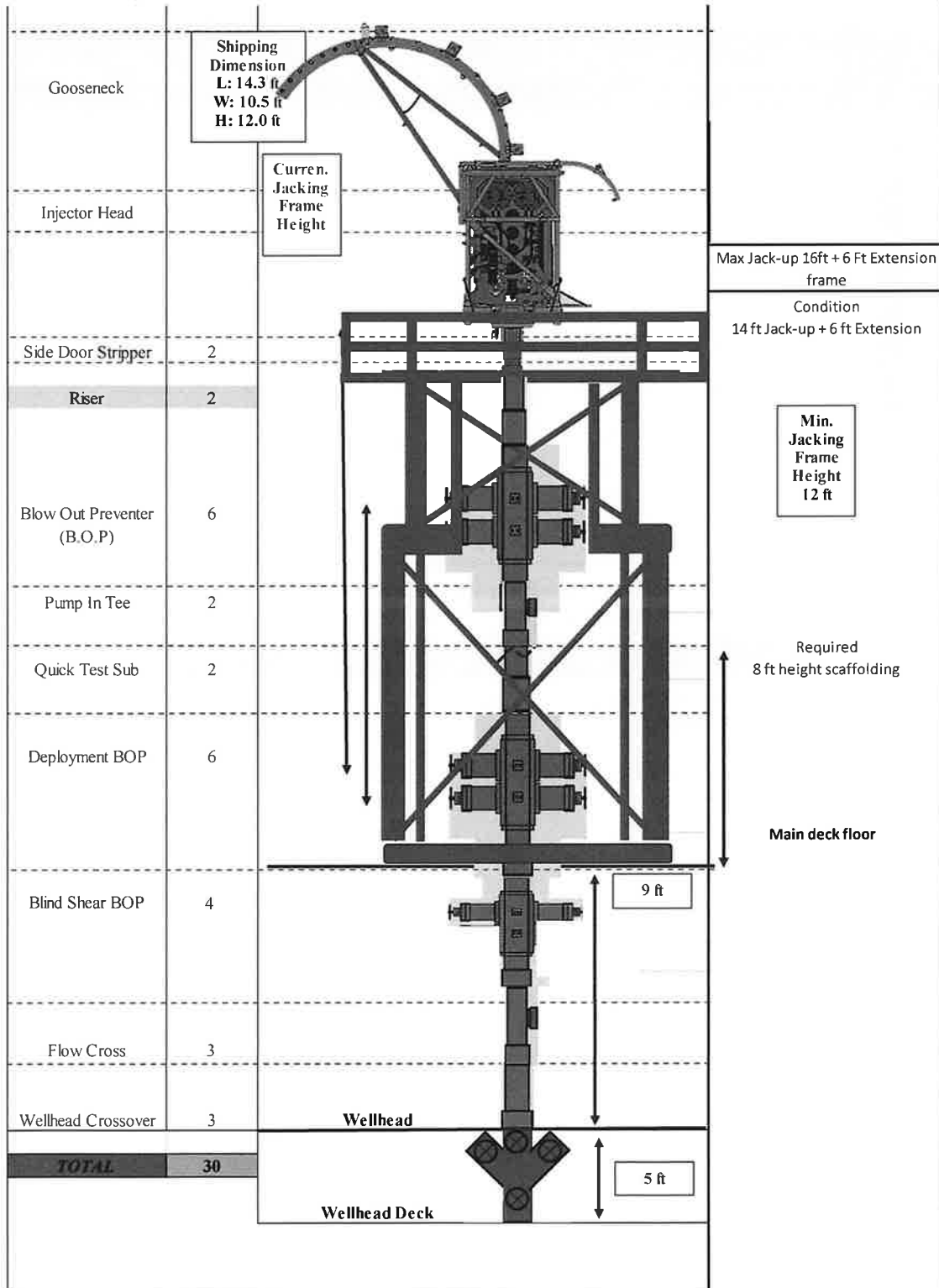
9. Rig up the following BHA sections to pressure test individually DCKV. Fill up BHA with FW. Close valve #1 and pressure test using Hand Pump or pump unit.
  - 9.1. For low pressure:
 


Acceptance criteria: No visible leaks. Pressure drop is less than 10% (above 270 psi) over 5-minutes test interval after the pressure stabilizes.
  - 9.2. For high pressure:
 

Acceptance criteria: No visible leaks. Pressure drop is less than 10% (above 2,700 psi) over the 15-minutes test interval after the pressure stabilizes.
10. On successful pressure test, bleed off pressure and proceed to step #18. Else rectify and redo step #16.
11. Test valve #2 as per step #15. Ensure only valve #2 is closed while valve #1 remains open.
12. On successful pressure test, bleed off internal pressure


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**DEPLOYMENT RIG UP PROCEDURE**



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1. Rig-up CT PCE stack-up as per proposal above.
2. Rig-up treating line and flowback line to Flow cross at Wellhead area. (Contingency Kill well if required)
3. Connect CT connector, MHA MultiJet nozzle as per below schematic.

BHA DRAWING	DESCRIPTION	CONNECTION		ID	OD	TOOL LENGTH	CUMULATIVE LENGTH	WEIGHT
		UPHOLE	DOWNHOLE					
	Dimple Connector	1.5" CT	1.0" AMMT PIN		1.690	0.3	0.3	2.0
	MHA Disconnect drop ball 5/8"	1.0" AMMT BOX	1.0" AMMT PIN		1.690	2.3	2.6	6.5
	Circulating drop ball 1/2"							
	Burst Disc 5000 psi							
	MultiJet Nozzle	1.0" AMMT BOX	1.0" AMMT PIN		1.690	1.0	1.00	1.0
<b>Total</b>								<b>9.50</b>

4. Function tests the MultiJet Nozzle to determine the surface operating pumping parameter. Record the data in the table below, do not exceed 5,000psi.


Flow rates (bpm)	Pressure (psi)	Remark
... (as minimum as possible)		
0.3		
0.5		
0.7		
1.0		
1.1		
1.3		
... (as maximum as possible, below 5,000 psi)		

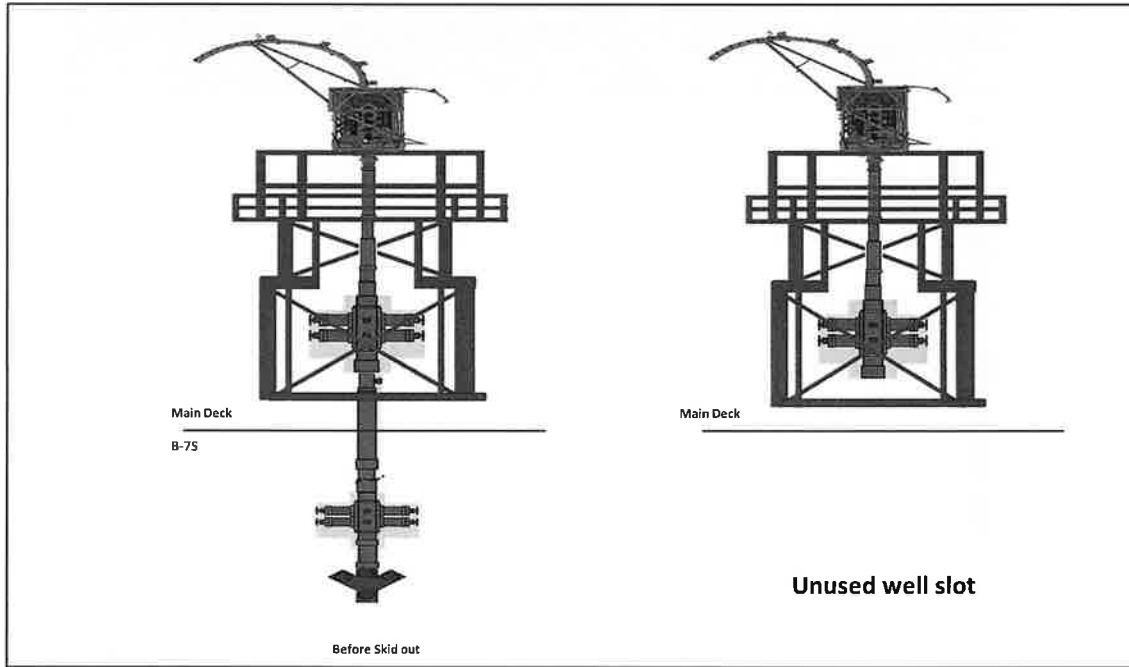
5. Upon successful pressure test, disconnect the MultiJet nozzle and connect the deployment bar as per below schematic:-

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BHA DRAWING	DESCRIPTION	CONNECTION		ID INCH	OD INCH	TOOL LENGTH FT	CUMULATIVE LENGTH FT	WEIGHT KG
		UPHOLE	DOWNHOLE					
	Dimple Connector	1.5" CT	1.0" AMMT PIN		1.690	0.3	0.3	2.0
	MHA Disconnect drop ball 5/8"	1.0" AMMT BOX	1.0" AMMT PIN		1.690	2.3	2.6	6.5
	Circulating drop ball 1/2"							
	Burst Disc 5000 psi							
	6 ft Deployment Bar	1.0" AMMT BOX	1.0" AMMT PIN		1.500	6.0	6.00	20.0
							1.0	
							<b>Total</b>	<b>29.50</b>

6. Pressure test CT PCE stack up / riser against the crown valve, low pressure (300 psi) and High pressure (3,000 psi) for 15 minutes each after stabilization. Record the pressure test.
7. Upon successful test, bleed off the pressure and test DFCV as per GENERAL EQUIPMENT PRESSURE TEST PROCEDURE step.
8. Once complete test DFCV, Slowly RIH and engage deployment bar at deployment BOP.
9. Once Upper pipe/slip ram engage, pressure test through Flow Cross above the Wellhead crossover.
10. Fill-up the line and low pressure test the upper pipe/slip ram to 500 psi and hold for 5 minutes. Inspect the lines for leaks and observe for any pressure drop.
11. Increase pressure to 3,000 psi and hold for 15 minutes. Inspect the lines for leaks and observe for any pressure drop.
12. Once confirm pressure holding good, disengage upper pipe/slip ram. Bleed off pressure.
13. Proceed to engage lower pipe/slip ram, pressure test through Flow Cross above the Wellhead crossover.
14. Fill-up the line and low pressure test the upper pipe/slip ram to 500 psi and hold for 5 minutes. Inspect the lines for leaks and observe for any pressure drop.
15. Increase pressure to 3,000 psi and hold for 15 minutes. Inspect the lines for leaks and observe for any pressure drop.
16. Once confirm pressure holding good, disengage lower pipe/slip ram. Bleed off pressure.
17. Break the riser section at QTS connection and skid aside the IH, stripper, combi BOP and riser as per picture below to another well slot.

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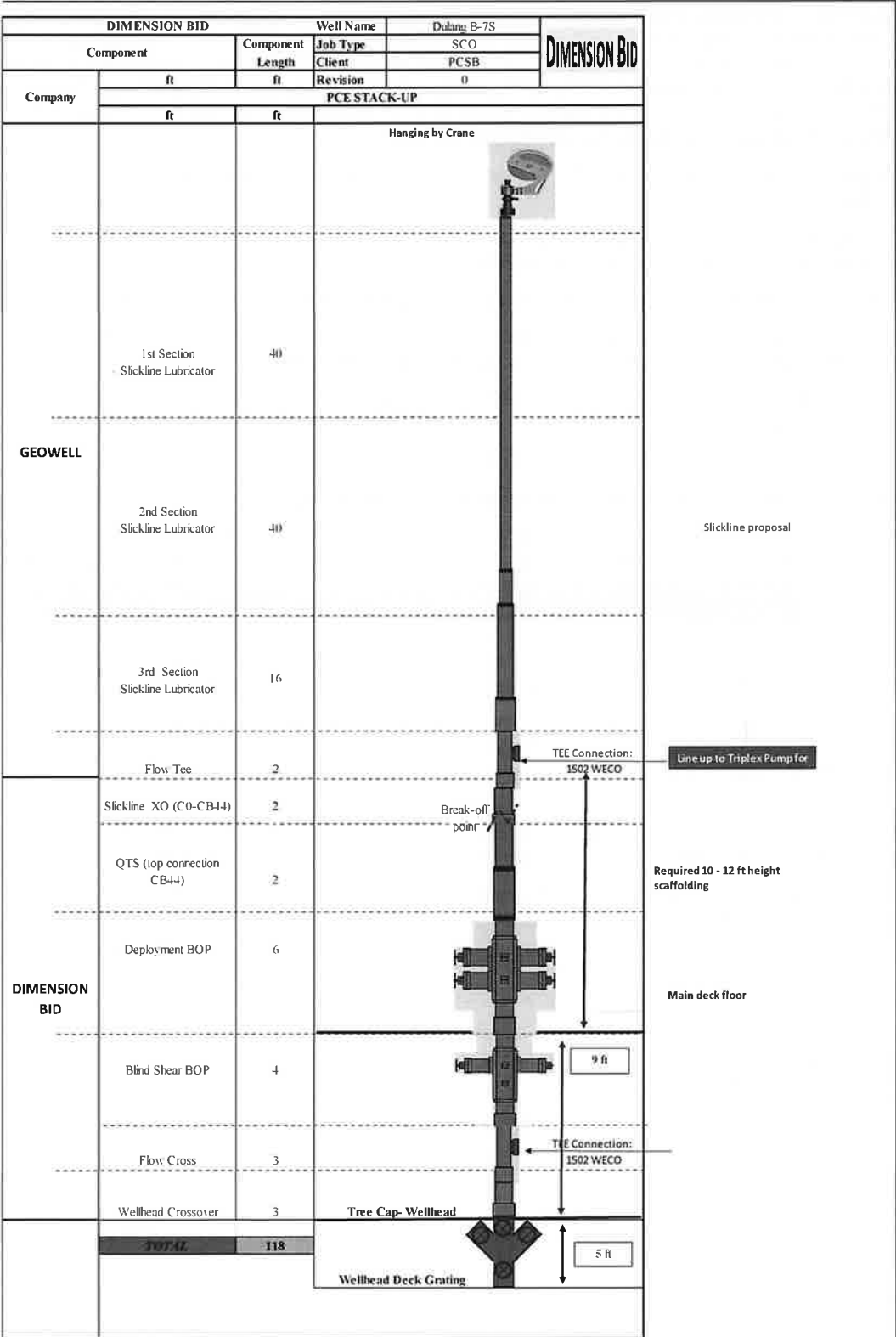
18. The BHA will be deployed in 2 separate sections as per below:

Section	Items	Description	BHA OD, Inch	Length, ft	Deploy by	
1	1	DB	Dimple End Connector	1.687	2.6	CT
	2	DB	CT MHA	1.687		
2	3	DB	Torque-Thru Deployment Connector / CARSAC High-Torque Connectors	1.687	102.2	Slickline
	4	DB	Dual-ball Kelly cock valve	1.687		
	5	DB	Deployment bar	1.5		
	6	DB	Straight bar	1.687		
	7	DB	MultiJet Nozzle	1.687		

19. Slickline to prepare PCE stack for deploying section #2.

20. Slickline PCE stack will make up to top of QTS, CT deployment BOP as per below picture.

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21. Manually make up BHA on the platform main deck from Torque-Thru Deployment Connector / CARSAC High-Torque Connector until deployment bar.

22. Slickline to physically space out BHA beside PCE stack and mark/flag wire accordingly. This will serve as a visual guide during the next deployment procedure. The position of the 1.5" OD deployment bar, which is the main focus, should span across both the pipe and slip ram of the CT deployment BOP. RIH wireline thru PCE stack and connect to Torque-Thru Deployment Connector / CARSAC High-Torque Connector. POOH wireline and retrieve/swallow the attached BHA into the slickline lubricator. Lower BHA and cross reference vertically the deploy bar vs deployment BOP.
23. Engage the deployment bar with the deployment BOP, slickline to overpull 800 lbs (1.2 x 2<sup>nd</sup> Section BHA weight).
24. Disengage the deployment BOP, make-up full BHA as per 2<sup>nd</sup> section CT BHA. (POOH wireline and swallow piece by piece until Multi-Jet Nozzle).
25. Lower the slickline PCE stack up and connect the slickline crossover at upper QTS section.
26. Fill and pressure test the treating line with IW/TSW (subject to IW availability) to 500 psi and hold for 5 minutes. Inspect the lines for leaks and observe for any pressure drop.
27. Increase pressure to 3,000 psi and hold for 15 minutes. Inspect the lines for leaks and observe for any pressure drop.
28. Bleed off the pressure to the current SITHP of the well.
29. Confirm all wellhead valves are in open position via physical check.
  - 29.1. During the opening process, count the number of turns made by the wellhead valves and document this in the operation report. This record will serve as a reference for future operations.


CV Opening Turns	LMV Opening Turns

- 29.2. Record initial SITHP and all annulus pressure (PCP, ICP, SCP etc) in the Daily Operation Report (DOR).
30. RIH slickline and deploy BHA section #2. Earlier wire mark/flag to be used as guide to ensure the 1.5" OD deployment bar spans across both the pipe and slip ram of the CT deployment BOP.
31. On confirming deployment bar position, close pipe/slip ram on LOWER section of deployment bop and manually lock the ram. Observe for 15 minutes, any pressure builds up above the upper section of deployment BOP. Once confirm no pressure build, proceed for next step.
32. Perform light weight check by pulling the slickline cable to observe the weight increase to make sure that pipe slip ram is functioning good and holding.
33. Pump IW thru the 2" Flow Tee and pressure test against the upper pipe/slip ram, 3000 psi for 15 minutes.
34. After successfully pressure test, bleed of PCE stack pressure to zero.
35. Activate and close UPPER section of pipe/slip ram of the CT deployment BOP. Perform pressure test (3,000 psi) through the kill port between the deployment BOP for 15 minutes. On successfully pressure test, bleed off the pressure.
36. Disconnect PCE stack at slickline crossover that attach to QTS. Rig a side slickline stack-up.
37. Skid in injector frame with IH and CT PCE stack-up to wellhead slot for Dulang B7S.
38. Make up Section 1- BHA to CT String.
39. Lower section #1 BHA until it meets the 2<sup>nd</sup> BHA at the Torque-Thru Deployment Connector / CARSAC High-Torque Connector connection.
40. Make up and connect Section#1 and Section#2 BHA at Torque-Thru Deployment Connector / CARSAC High-Torque Connector.
41. Pump through CT String, and pressure test against DKCV 1,500 psi to test the connection at MHA and Torque-Thru Deployment Connector / CARSAC High-Torque Connector.

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42. Box-down PCE stack-up, perform pressure test against the upper pipe/slip ram.
43. Fill and pressure test the treating line with IW/TSW (subject to IW availability) to 500 psi and hold for 5 minutes. Inspect the lines for leaks and observe for any pressure drop.
44. Increase pressure to 3,000 psi and hold for 15 minutes. Inspect the lines for leaks and observe for any pressure drop. On successfully pressure test, bleed off the pressure.
45. Break-off at the QTS.
46. Slowly open DKCV, ensure both valves at DKCV are opened before RIH. If it is closed, unable to pump through CT.
47. Connect back at QTS and pressure test at QTS.
48. Unlock the manual lock of the CT deployment BOP and open both pipe/slip rams.
49. Flag CT String at surface and pick-up BHA until it tags the stripper, this will be the distance as reference for reverse deployment later after complete the job. Once tag Stripper, flag CT string against and measure the distance between two flag depth. Record in the Daily report.

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**OPERATIONAL PROCEDURE**

**CT RUN#1: Casing cleanout until 1,545m / 5,069ft**

Conduct safety meeting with all personnel on location detailing the program, pressure limitations, personnel responsibilities, emergency well control drill, and safety precautions.

- Function tests the MultiJet Nozzle to determine the surface operating pumping parameter. Record the data in the table below, do not exceed 5,000psi.

Flow rates (bpm)	Pressure (psi)	Remark
... (as minimum as possible)		
0.3		
0.5		
0.7		
1.0		
1.1		
1.3		
... (as maximum as possible, below 5,000 psi)		

- Zero both depth counters (Orion and Mechanical) at reference point.

Note: Current fluid use for the operation is IW (if use IW is used, there is no need for it to be treated), in the event injection module is down, and IW is not available, switch to using TSW. Mix TSW as per below recipe (if required)

<b>TSW</b>				<b>100</b>	<b>BBL</b>	<b>Description</b>
<b>Seq.</b>	<b>Product</b>	<b>Concentration</b>		<b>Volume</b>		
1	Sea Water	992	gptg	4,166	gal	Base Fluid
2	ACM H2S Clear 200	2	gptg	8	gal	CO <sub>2</sub> & H <sub>2</sub> S Corrosion Inhibitor
3	ACM BACT 200	2	gptg	8	gal	Micro Biocide Control
4	ACM OXYFREE 100	2	gptg	8	gal	Oxygen Scavenger

**Mixing Instruction:**

- Prepare sea water in the mixing tank.
- Add ACM H2S Clear 200 into the tank and circulate the mixture.
- Add ACM BACT 200 & ACM OXYFREE 100 into the tank and circulate the mixture until homogenous.

Note: The above recipe is for 100bbbls of TSW. Please prepare another batch of TSW once needed.


<b>D801 Cleanout Gel</b>				<b>50</b>	<b>BBL</b>	<b>Description</b>
<b>Seq.</b>	<b>Product</b>	<b>Concentration</b>		<b>Volume</b>		
1	IW / Sea Water	992	gptg	2,083	gal	Base Fluid
2	D801 Gel	40.5	pptg	85	lbs	Gelling Agent

**Mixing Instruction:**

- Prepare IW / sea water in the mixing tank.
- Add D801 Gel into the tank and circulate the mixture until homogenous.

Note: The above recipe is for 50 bbls of gel. Please prepare another batch if needed. Prepare only when require.

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Drag reducer solution				100	BBL	Description
Seq.	Product	Concentration		Volume		
1	Sea Water	970	gptg	4,074	gal	Base Fluid
2	Im Lube	30	gptg	126	gal	Friction reducer

**Mixing Instruction:**  
a) Prepare Sea Water into the mixing tank.  
b) Add IM Lube 10 and mix till homogenous


Note: The above recipe is for 100 bbls of drag reducer solution. Please prepare another batch if needed. Prepare only when require.

3. Start RIH BHA while pumping IW at idle rate until at EOT depth **1,514 m / 4,967 ft (or slickline latest HUD if any), target cleanout inside casing section until depth 1,545m / 5,069 ft.**
  - 3.1. Refer to CT Tubing Force simulation (Orpheus modelling) at Appendix III.
  - 3.2. Conduct pull test for every 300m (1,000ft) interval, use CT Fatigue graph as reference. Ensure the CT Fatigue graph is available at location before RIH. Record RIH, Hanging and POOH weight in treatment report.
  - 3.3. Pump drag reducer solution, 2 bbls as lubricant every 1,000 ft interval
  - 3.4. Maximum CT RIH speed is **30-50 ft/min/ 9-10m/min.**
  - 3.5. Slow down CT speed to **10 ft/min/ 10m/min**, 50 ft / 15m before and after passing through completion accessories.
  - 3.6. Observe and record return (if any and in what form)
  - 3.7. Do not exceed operating safety limits **5,000 psi (Circulating pressure).**
  - 3.8. If the well condition differs from original job design, contact appropriate personnel in charge before proceeding.
  - 3.9. At all time, while RIH, the injector torque control shall be set at the minimum pressure required to move the CT at specified speed.
4. Once BHA reaches 1,504 m (10m above EOT or 10m above latest slickline HUD (if any)), stop CT and conduct pull test (minimum of 10m/30ft) and record the pulling weight both static and dynamic. (If encounter early HUD, Pick-up BHA and record the weight parameter).

Depth	RIH weight, lbf	Static weight, lbf	Pick up weight, lbf

5. Continue RIH to tag top of HUD (do not set down more than 200 lbf if experience hard tag (downhole force)). RIH until 5 meters below EOT. In the event no HUD is encountered, POOH CT to EOT and flag the CT string.
6. Attempt to establish circulation while varying pump rates and choke sizes, this will be reference at which rate and choke, able to establish the circulation without nitrified condition. (if still no surface return, consider worst case scenario where there is no column of water inside production tubing, fill up at least 1.5 x CT string /Production tubing annulus volume before reattempting to establish return with varying rates + choke sizes)
7. After establishing surface returns without nitrifying, switch to pumping 1.1 bpm 300 scfm. After establishing surface returns, slowly increase liquid injection rate until maximum circulation pressure allowable (4,600 psi). This will be the nitrified rate reference for penetration into sand HUD with established surface return at surface.

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Circulation Rate suggest by CIRCA: -


- 1.1 bpm with 300 scfm

**Notes:**

- **For gas rate minimum at 300 scfm, increase gas rate if require maximum up to 4,600 psi circulation pressure.**
- **On establishing constant surface return, divert the flow into surge tank for 15 – 30 minutes, record the volume inside the surge tank to calculate losses rate into reservoir. Repeat this step every time there is a change in choke size.**
- **Continuously record return volume during cleanout operation. (Record inside improved FDR)**
  - 7.1.1. In the event of lost return, kindly refer to the step below for reference:
    - 7.1.1.1. Check surface flowback back pressure. Must be less than WHP
    - 7.1.1.2. Wait till system stabilizes
    - 7.1.1.3. Check gas lift injection
      - Is it on?
      - Injection pressure > Wellbore pressure?
    - 7.1.1.4. Manipulate choke size
  - 7.1.2. If still no return at surface, pick-up BHA to a shallower depth. Pick up in regulated interval while attempting to establish return. (Proposed to depth where returns were previously obtained).
  - 7.1.3. If unable to establish return at surface, consult town. (Provide the details of THP, choke size and circulation pressure).
  - 7.1.4. After return establish, RIH to perform cleanout.
  - 7.1.5. At all times, monitor and record the return (a pattern if there is), THP and debris sample at surface. (Take note if there any THP drop during penetration).
  - 7.1.6. **If no debris recover at surface while penetrating HUD with fluid return, stop penetration and circulate with Gel and CBU until debris recover at surface.**
  - 7.1.7. **Pump 5 bbls gel to lift the suspected debris to surface.**
  - 7.1.8. **CBU at least 2x Annulus volume at that depth.**
  - 7.1.9. **After confirm there's no longer debris at that depth, proceed penetration.**
  - 7.1.10. **In the event unable to penetrate due to hard solid, slowly increase jetting rate until maximum allowable during penetration (ensure the return always establish at surface). After complete 1 cycle penetration, follow rate suggest by CIRCA to lift up the debris.**

8. Every 5m bite, circulate with 5 bbls of gel, and pull test until EOT, 1514m. (Current fluid use is IW, in event injection module down, fluid will change to TSW).

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No.	Stage	Fluid	Liquid Rate	Total Liquid	N2 Rate (if require)	Nitrogen Consumption	CT Speed	Duration	Depth	Remarks
			BPM	Bbl	SCFM	SCFM	ft/min	Minutes	m	
1	CT at EOT	TSW	1.1	0	300	36000	0	120	1514	Establish return on surface (CT at EOT)
2	Penetrating HUD/Fill	TSW	1.1	18.7	300	5100	1	17	5	Monitor return & CT weight on surface
3	Circulate	Gel	1.1	5	300	1500	0	5	1519	Provide suspension to the fill and lift to surface
4	<b>Pull test</b>	TSW	1.1	18.7	300	5100	1	17	1514	<b>Pull test to EOT</b>
5	RIH to HUD and Penetrate HUD/Fill	TSW	1.1	36.3	300	9900	1	33	1524	Monitor return & CT weight on surface
6	Circulate	Gel	1.1	5	300	1500	0	5	1524	Provide suspension to the fill and lift to surface
7	<b>Pull test</b>	TSW	1.1	36.3	300	9900	1	33	1514	<b>Pull test to EOT</b>
8	RIH to HUD and Penetrate HUD/Fill	TSW	1.1	55	300	15000	1	50	1529	Monitor return & CT weight on surface
9	Circulate	Gel	1.1	5	300	1500	0	5	1529	Provide suspension to the fill and lift to surface
10	<b>Pull test</b>	TSW	1.1	55	300	15000	1	50	1514	<b>Pull test to EOT</b>
11	RIH to HUD and Penetrate HUD/Fill	TSW	1.1	72.6	300	19800	1	66	1534	Monitor return & CT weight on surface
12	Circulate	Gel	1.1	5	300	1500	0	5	1534	Provide suspension to the fill and lift to surface
13	<b>Pull test</b>	TSW	1.1	72.6	300	19800	1	66	1514	<b>Pull test to EOT</b>
14	RIH to HUD and Penetrate HUD/Fill	TSW	1.1	91.3	300	24900	1	83	1539	Monitor return & CT weight on surface
15	Circulate	Gel	1.1	5	300	1500	0	5	1539	Provide suspension to the fill and lift to surface
16	<b>Pull test</b>	TSW	1.1	91.3	300	24900	1	83	1514	<b>Pull test to EOT</b>
17	RIH to HUD and Penetrate HUD/Fill	TSW	1.1	112.2	300	30600	1	102	1545	Monitor return & CT weight on surface
18	Circulate	Gel	1.1	30	300	8400	0	28	1545	Provide suspension to the fill and lift to surface
19	Perform Bottom up circulation as per CIRCA	TSW	1.1	198	300	54000	0	180	1545	Monitor return & CT weight on surface
Wiper trip up to EOT										
20	Wiper trip as per CIRCA	TSW	1.1	23.1	300	6300	5	21	1514	Monitor return & CT weight on surface
21	Additional Bottom up	TSW	1.1	132	300	36000	0	120	1514	CBU for 2 hour
22	POOH to surface	TSW	1	939	0	0	0	939	0	CT at surface

9. If CT encountered hard obstruction, proceed to pick up CT 10m above the obstruction and circulate at least 2x bottom up until clear return is observe on surface before proceed with the following steps.
- 9.1. RIH and slack off CT not exceeding 200 lbf (downhole force) on top of the obstruction and attempt to jet on the obstruction. If no success mixes 10 bbls of 15% HCl acid and Neutralization Fluid as per the following recipe:

15% HCl (Main Treatment)	10	BBL	Description
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<b>DIMENSION BID</b>	<b>DIMENSION BID COILED TUBING SERVICES</b>		
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Seq.	Product	Concentration		Volume		
1	IW	419	gptg	176	gals	Base Fluid
2	ACM CORR 400	4	gptg	2	gals	Acid Corrosion Inhibitor
3	MESB NE 200	4	gptg	2	gals	Non-Emulsifier
4	ACM Surf 210	3	gptg	1	gals	Surfactant
5	Ammonium Chloride	417	pptg	175	lbs	Clay Stabilizer
6	ACM Iron 300	25	pptg	11	lbs	Iron Sequestering
7	ACM Iron 200	15	gptg	6	gals	Iron Control
8	33% HCl	419	gptg	176	gals	Raw Acid
9	MESB MS 300	100	gptg	42	gals	Mutual Solvent

**Mixing Instruction:**

1. Fill up tank with IW.
2. Add additives as per above sequence.
3. Agitate until mixture is homogenous.

Neutralization Fluid (Soda Ash)			10	BBL	Description	
Seq	Product	Concentration	Volume			
1	IW	976	gptg	9.8	bbl	Base Fluid
2	Soda Ash	500	gptg	210	lbs	Neutralization Fluid


**Mixing Instruction:**

1. Prepare IW into mixing tank
2. Mix soda ash into tank and agitate until the mixture is homogenous.
- 9.2. Proceed to jet 5 bbls of 15% HCl on top of the obstruction (HUD) while attempt to pass through the obstruction.
- 9.3. If no success during jetting HCl acid, proceed to spot another 5 bbls of 15% HCl on top of obstruction (HUD) and soak the acid for 2 hours (pick-up at least 300m above). After completed soaking, proceed to RIH to pass through the obstruction while pumping high-rate nitrified IW. If unable to penetrate consult town for further instruction.
- 9.4. In the event of encounter waxy return at surface, spot 3 drums of Waxclen and soak for 3 hours (pickup to safe depth, based on CIRCA simulation, solid distribution after penetration without circulation, the solid will distribute until depth 1,500m, pick-up until depth 1,400m)
- 9.5. During circulation, if acid return observes on surface return line, inject soda ash using Graco Pump on the surface return line to neutralize the acid.

**Notes: if able to pass through for few feet, and re-encounter hard tag again, repeat step Jetting/Soaking with 15% HCl until TD.**

10. Once at target depth, flag CT string on surface.
11. Remaining stationary and proceed to pump 30 bbls of gel followed with CBU for 3 hours (as per CIRCA analysis).
12. Once complete CBU, start to wiper trip up to EOT at 5 ft/min.
13. Perform CBU at EOT for another 2 hours. Stop pump nitrogen after complete CBU.
14. POOH to surface.


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## REVERSE DEPLOYMENT PROCEDURE

15. Once BHA at surface, proceed for reverse deployment using the same approach during deployment rig-up.
  - 15.1. Once BHA tag stripper, RIH back xx ft (calculated previously during BHA tag before RIH), to position the deployment bar across the deployment BOP.
  - 15.2. Close the LOWER Pipe/Slip ram of the deployment BOP. Manually lock it.
  - 15.3. Observe if there any remaining pressure above the pipe/slip ram of CT deployment BOP. (for 5 minutes)
  - 15.4. Perform pressure test through the flow tee above the Main deck, 3,000 psi for 15 minutes.
16. Bleed the remaining pressure (if any) inside the riser through flowback line.
17. Once confirmed no pressure build up thru the deployment BOP, Activate and close UPPER section of pipe/slip ram of the CT deployment BOP. Perform pressure test (3,000 psi) through the kill port between the deployment BOP for 15 minutes. On successfully pressure test, bleed off the pressure.
18. Break the PCE at QTS and jack-up the JF.
19. Flush the DKCV until clean water observe at bleed off point at DKCV. (In event got trace of hydrocarbon at bleed off point, continue to flush until clean trace of water observe at bleed off point.
20. Close LOWER DKCV, perform pressure test 3,000 psi for 15 minutes. Upon successfully pressure test, bleed off the pressure through the bleed off point at DKCV.
21. Close the UPPER DKCV, perform pressure test 3,000 psi for 15 minutes. Upon successfully pressure test, bleed off the pressure through the bleed off point at DKCV.
22. Secure the 2<sup>nd</sup> section BHA with C-Plate and disconnect at Torque-Thru Deployment Connector / CARSAC High-Torque Connector connection.
23. Skid the JF aside along with the PCE above the QTS section.
24. Rig-up back slickline lubricator 12 (section) with slickline PCE on top of the QTS connect through slickline crossover.
25. Once rig-up, RIH slickline wire and connect at Torque-Thru Deployment Connector / CARSAC High-Torque Connector connection.
26. Box down Slickline crossover and perform pressure test for the stack-up.
27. Open Pipe/Slip rams of the deployment BOP.
28. POOH slickline wire until tag slickline stuffing box.
29. Secure the well by close the crown and master valve.
30. Break the QTS connection, and disconnect the 2<sup>nd</sup> section BHA.

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**APPENDIX I – BHA SCHEMATIC**

**BHA#1: 1-11/16 MultiJet Nozzle**

**DIMENSION BID  
BHA DIAGRAM #1 - 1.69" MULTIJET NOZZLE**


<b>Client</b>	Petronas Carigali
<b>Field</b>	Dulang Bravo
<b>Job Type</b>	
<b>Job No.</b>	Run#1

<b>Well</b>	B7S
<b>Min Restriction</b>	
<b>BHP</b>	
<b>BHT</b>	

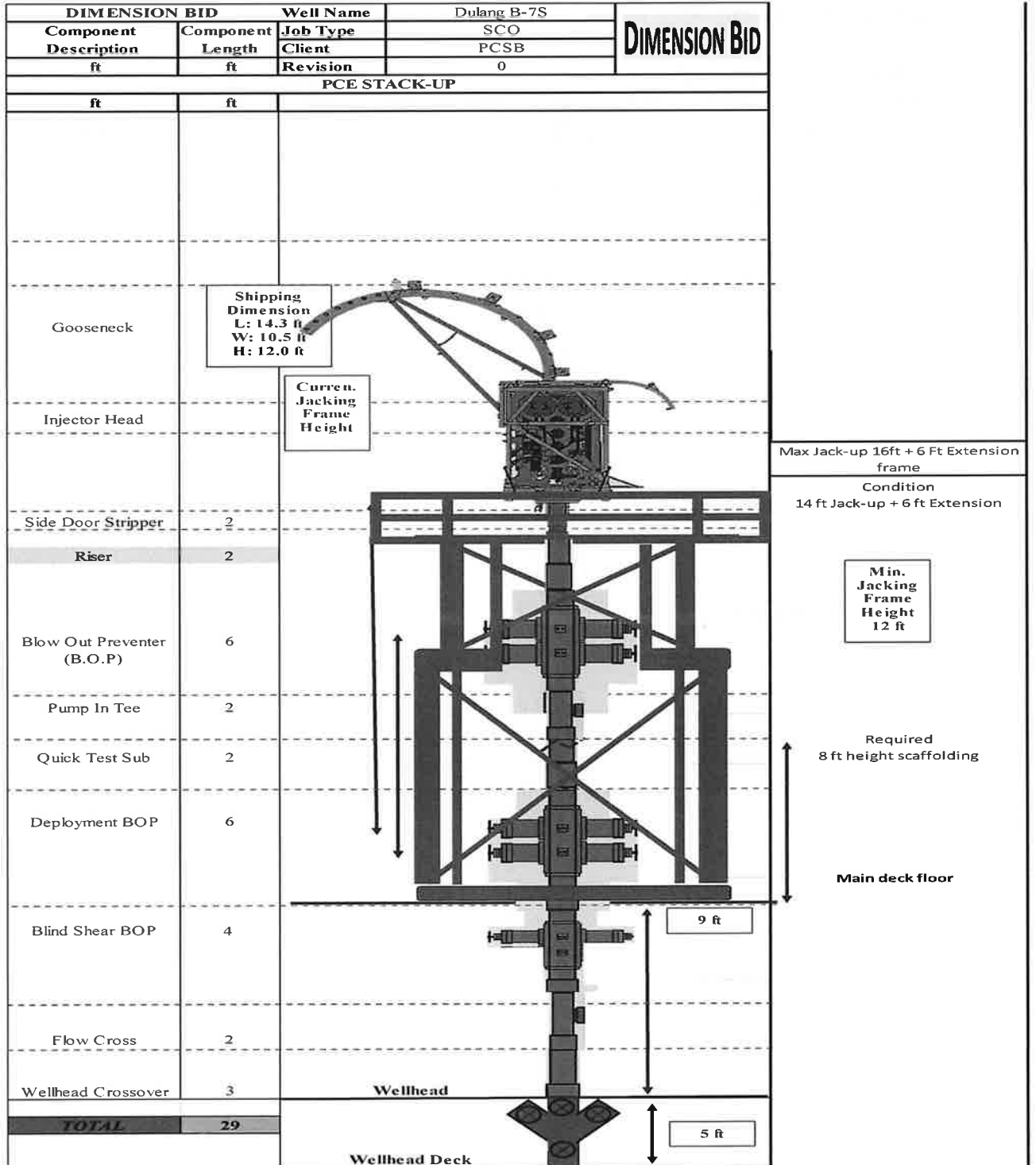
BHA DRAWING	DESCRIPTION	CONNECTION		ID	OD	TOOL LENGTH	CUMULATIVE LENGTH	WEIGHT
		UPHOLE	DOWNHOLE					
	Dimple Connector	1.5" CT	1.0" AMMT PIN		1.690	0.3	0.3	2.0
	MHA Disconnect drop ball 5/8"	1.0" AMMT BOX	1.0" AMMT PIN		1.690	2.3	2.6	6.5
	Circulating drop ball 1/2"							
	Burst Disc 5000 psi							
	Torque-Thru Deployment Connector / CARSAC High-Torque Connectors	1.0" AMMT BOX	1.0" AMMT PIN		1.690	1.6	4.18	1.0
	Dual Kelly Cock Valve	1.0" AMMT BOX	1.0" AMMT PIN		1.690	1.6	5.76	2.0
	6 ft Deployment Bar	1.0" AMMT BOX	1.0" AMMT PIN		1.500	6.0	11.76	20.0
	92 ft Straight Bar	1.0" AMMT BOX	1.0" AMMT PIN		1.690	92.0	103.76	266.8
MultiJet	1.0" AMMT BOX			1.690	1.0	104.8	1.0	
<b>Total</b>								<b>299.30</b>

<b>BHA LENGTH</b>	<b>104.76</b>
<b>MAXIMUM OD</b>	<b>1.69</b>
<b>MINIMUM ID</b>	

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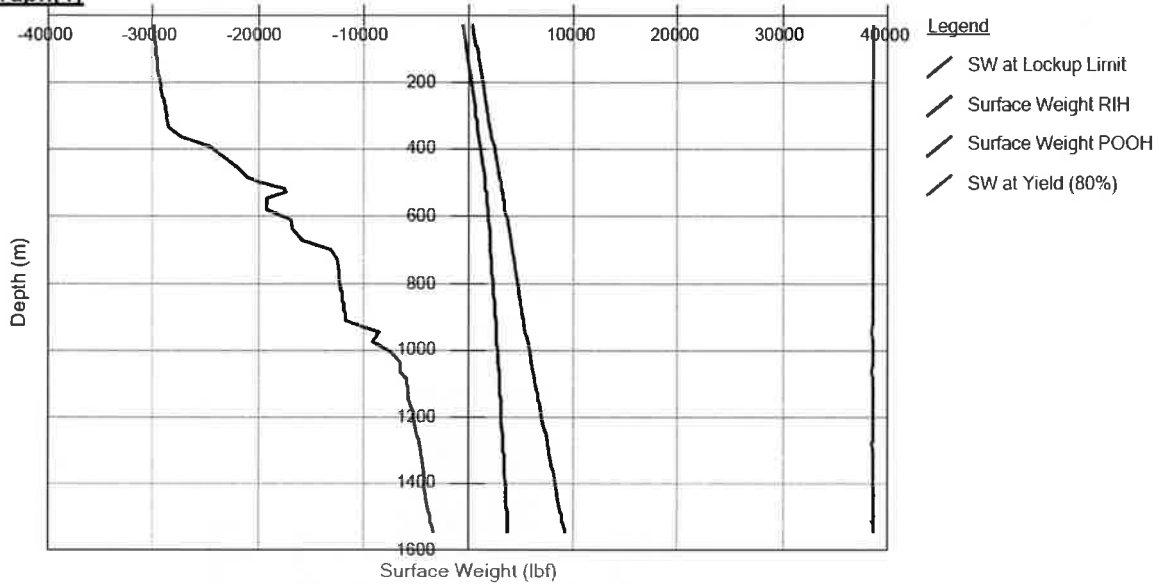
**APPENDIX II – CT STACK UP**



**APPENDIX III – ORPHEUS SIMULATIONS**

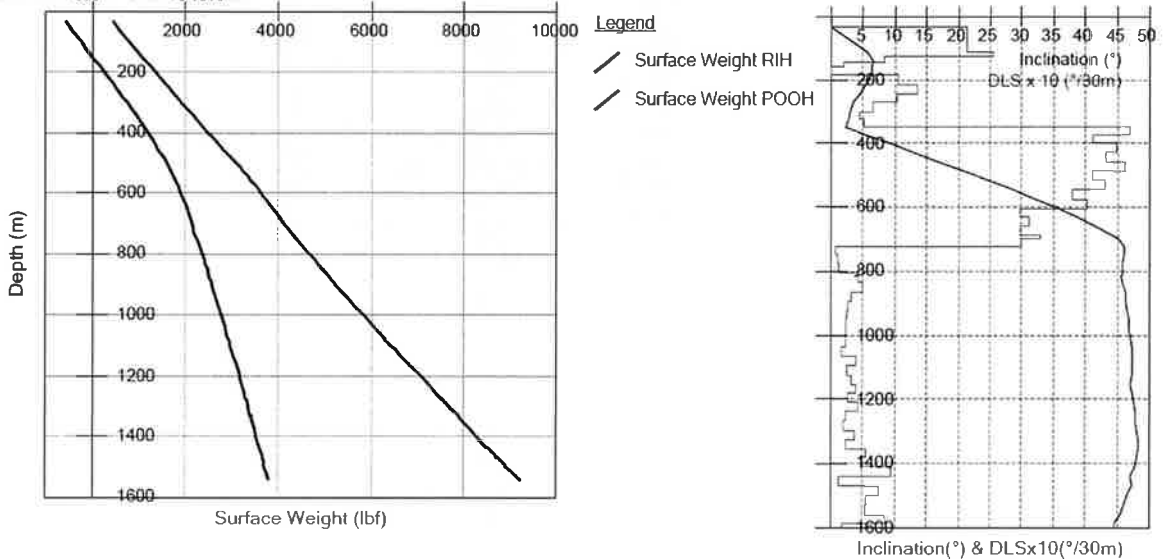
**TUBING FORCE ANALYSIS (IDLE RATE)**

**Graph(1)**



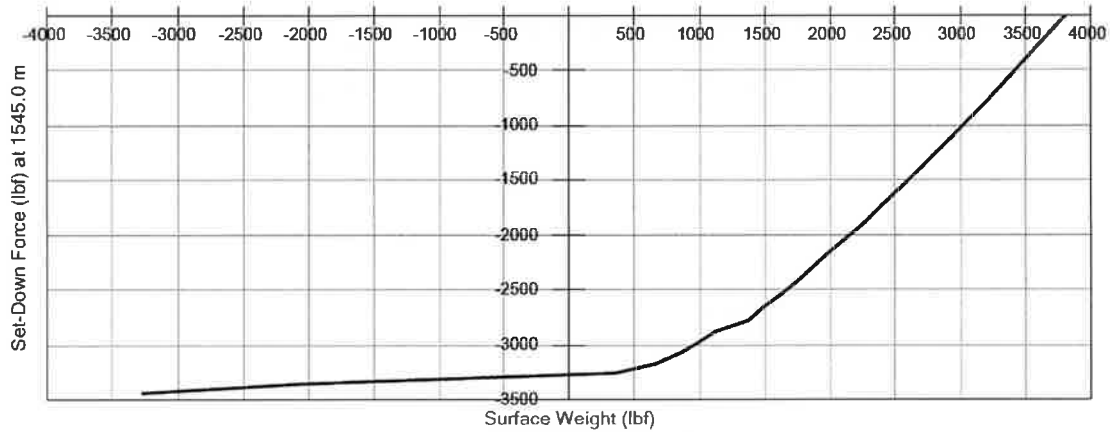
**RIH & POOH WEIGHT**

**RIH and POOH**  
between 0.0 m and 1545.0 m



### MAXIMUM STRING SET DOWN LIMIT

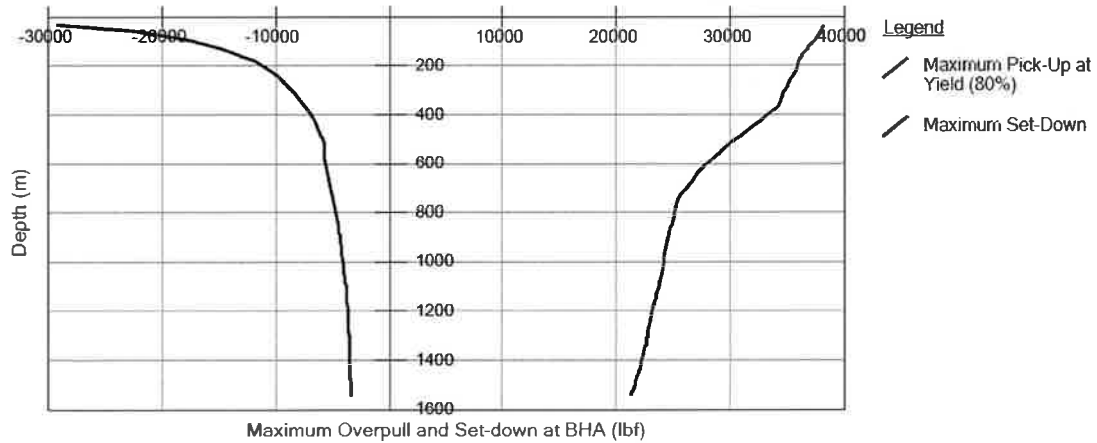
MD3 ■ The available set-down force at 1545.0 m is -3443 lbf at the end of the string.  
The weight indicator reading will be -3273 lbf on surface.



### MAXIMUM STRING PICK UP LIMIT

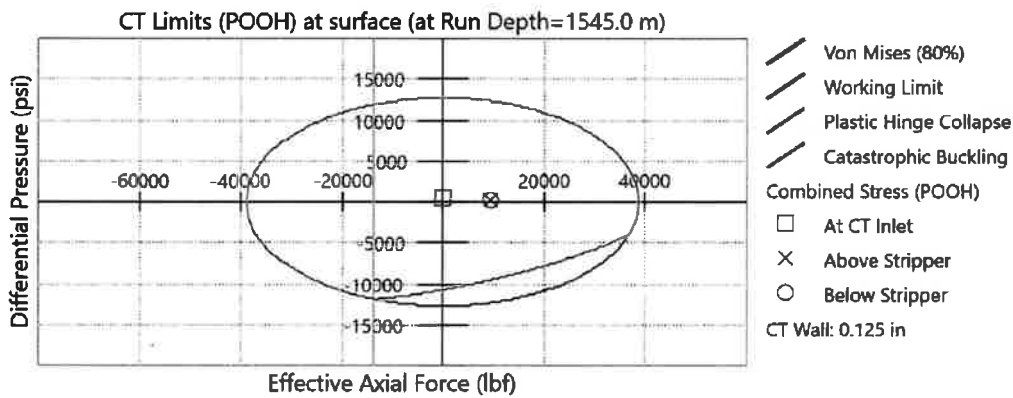
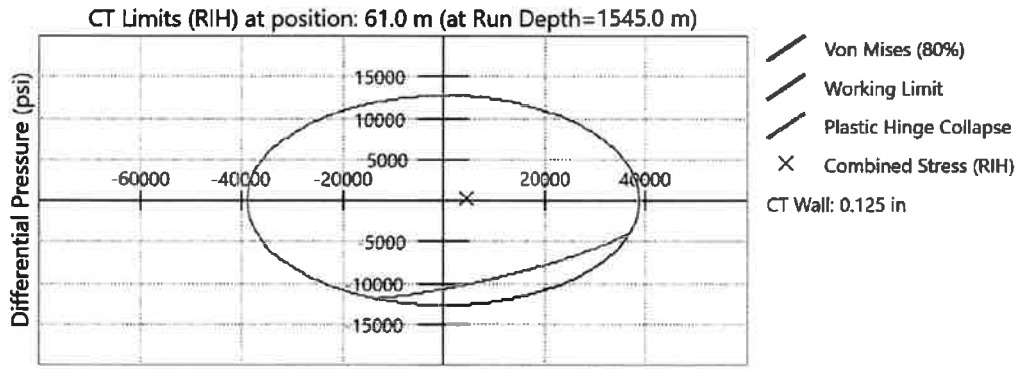
#### Calculations at 1545.0 m

MD1 ■ The available pick-up at 1545.0 m based on 80% of yield strength is 21255 lbf.  
The weight indicator reading will then be 38564 lbf.



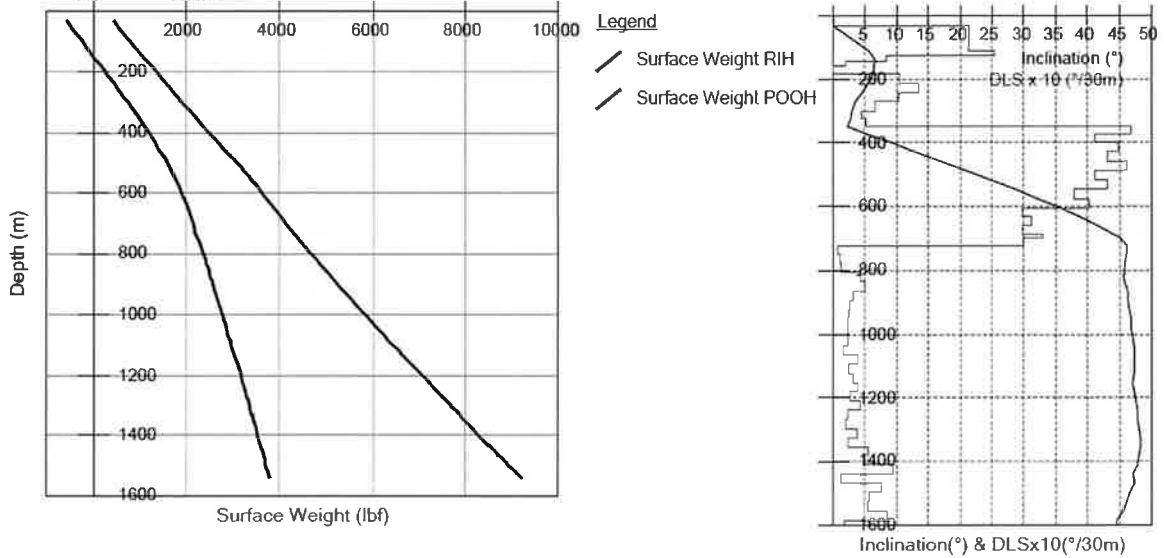
**STRING LIMIT**

CT Limits



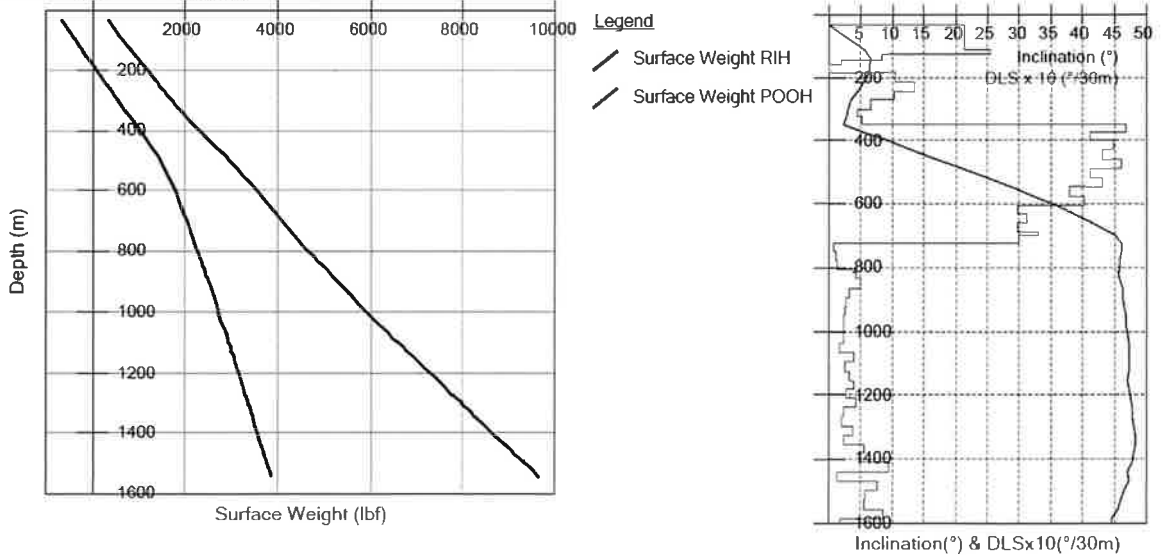
**SENSITIVITY ANALYSIS TFA**  
**Idle Rate (0.3 bpm)**

RIH and POOH  
between 0.0 m and 1545.0 m



**0.3 bpm 300 scfm**

RIH and POOH  
between 0.0 m and 1545.0 m



# DIMENSION BID

DIMENSION BID  
COILED TUBING SERVICES



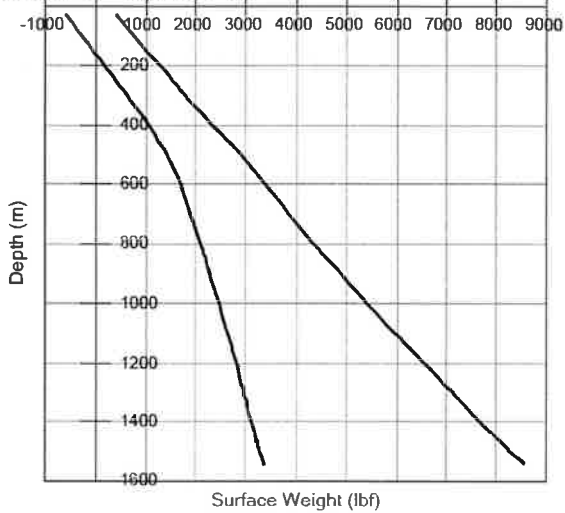
DULANG B-7S

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## 1.1 bpm 0 scfm

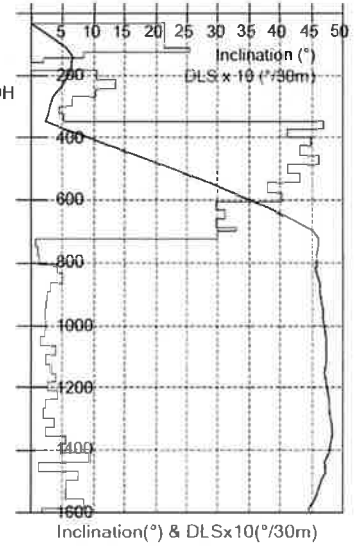
RIH and POOH

between 0.0 m and 1545.0 m



Legend

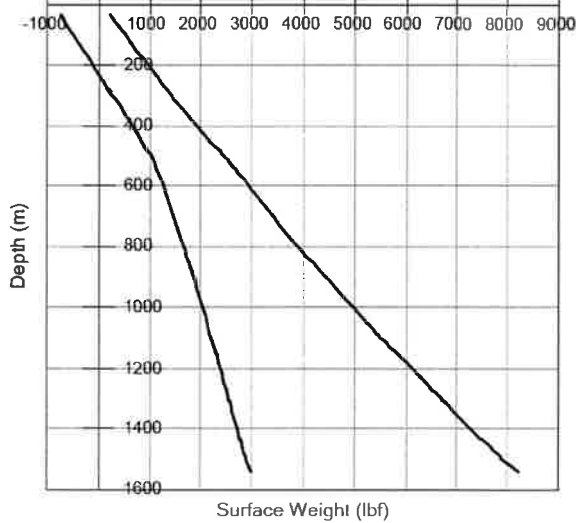
- Surface Weight RIH
- Surface Weight POOH



## 1.1 bpm 300 scfm

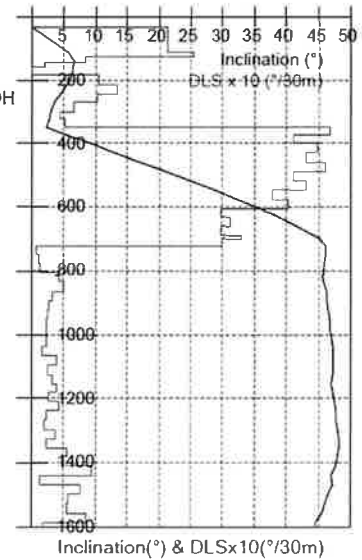
RIH and POOH


between 0.0 m and 1545.0 m



Legend

- Surface Weight RIH
- Surface Weight POOH



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## APPENDIX IV – EMERGENCY PROCEDURE

### EMERGENCY BOP OPERATIONS

In the event of an emergency arising and the well having to be secured, the following steps should be taken:

1. Stop CT movement, close the Slip and Pipe rams and slack off string weight to ensure slips are holding. If time permits, review all options with the client representative. (Ensure that rams with guides are activated first to avoid damaging the CT).

**Note: The decision to proceed past the above step should normally be made after consultation with the client representative unless there is an immediate and serious danger to personnel and/or equipment and the client representative is not immediately available to be involved in the decision.**

2. Stop pumping.
3. Close the upper Shear Seal rams to cut the CT.
4. Set up to circulate well to kill fluid through the CT remaining in the well.
5. Make arrangements necessary to fish the CT from the BOP.

**Note: When actuating any ram in the BOP system, the corresponding manual lock should be closed behind it to prevent accidental release in the event of total loss of hydraulic power. The force required to close the rams manually against pressure cannot be supplied by turning in the locks. Use of a pipe wrench, cheater bars or snipes will damage the internal workings of the ram actuators. Some form of hydraulic power is required to operate the actuators. This pressure can be supplied via a hand pump or a hydraulic pump from any other piece of equipment on location, including a fluid pumper.**


#### Actuating the BOP System Hydraulic Controls

1. Remove locks on control panel
2. Move the control lever to the desired position.
3. Push the BOP activate button supplying pressure to the circuit.
4. Observe the pressure drop in the hydraulic circuit and subsequent pressuring back up to system pressure as ram opens or closes completely.
5. Observe the ram indicator pins to verify the operation of the ram.
6. Close in the manual locks if required. (Flag system to indicate position of rams.)

The connections below the CT BOP must be all flanged. Should one of these connections start leaking, the following steps should be taken in consultation with the client representative:

1. Call local alert and ensure all personnel are removed from the wellhead area.
2. Notify the client representative of the problem and determine the best method to make the area safe.
3. If the leak is minor, it may be possible to continue to pull the CT to surface. Assess the scenario and consider all the risks associated then proceed to pull the CT to surface. Once at surface, close available valves below the leak point.
4. If the leak is more severe, initiate a well kill through the well kill line and continue to pull the CT to surface.
5. If the leak is catastrophic, run the CT to HUD; pick up sufficient so that after the CT is cut at surface by CT BOP shear; the top of the CT falls below the X-mass Tree. Once the end of the CT is off bottom, proceed to cut the CT with the shear RAM then close the available valves below the leak point. A well kill operation can be started through the kill line if requested by the client representative.

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### LEAK IN CT AT SURFACE

In the event of a leak in the CT occurring at surface, the following steps should be taken:

1. Call local alert and ensure all personnel are removed from the operational area. In particular make sure all personnel remain clear of the area between the IH and the CT reel.
2. If the leak is small or a pinhole leak, POOH and position the leak on the lower part of the CT reel as soon as possible. Be careful when area of leak is bent onto the reel as failure may occur. Make arrangements to have a water hose present to wash away any fluid from the reel which may be hazardous. Make arrangements to start pumping water through the CT reel. Depressurize reel as much as conditions allow without exceeding collapse limitations of CT.
3. Notify client representative of problem and determine best method to make area safe. If leak is minor and water can be displaced to leak, continue to POOH and change reel.
4. If leak is considered to be too serious to displace to water and POOH, or serious and uncontrolled leakage of hydrocarbon or hazardous materials prevents this, (i.e. check valves not holding, lost BHA, parted CT) set the CT slips and pipe rams. Activate the upper Shear Seal rams on either the triple or quad BOP and manually lock in place.
5. Depressurize the CT reel and flush through the reel. If hydrocarbons are present in the reel, displace the reel with water and empty the contents to specified safe disposal area.


### LEAK IN CT BELOW SURFACE

If a leak occurs in the CT below the Stuffing Box during down hole operations (usually indicated by a drop in pump pressure or loss of string weight), suspend CT operations and alert the client representative.

**Note: If indications are that the BHA has been lost in hole then revert to section 0.**

1. Once the client representative has been alerted, clear all personnel from the immediate area of the CT around the IH and between the IH and the CT reel.
2. Displace the CT to water and commence to POOH at not more than 20 ft per minute (5 meters/min). Ensure at all times that all personnel are clear of the immediate area as the possibility exists to pull the CT out of the Stuffing Box. Continue pumping water at a slow rate through the CT.
3. When the leak in the CT appears above the Stuffing Box, stop the injector and hold the leaking section of CT between the chains and the Stuffing Box.
4. Inspect leak. If leak is minor continue to POOH.
5. If leak is major, or CT is actually severed or well bore fluids are escaping through the CT, continue as per Section 09.2.

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## LEAK IN SURFACE PRESSURE CONTROL EQUIPMENT

### Stuffing Box

1. **Stop** CT movement and close both sets of pipe rams to seal CT annulus. Set manual lock.
2. On semi-submersible operations this will be a set of pipe rams and pipe/slip rams.
3. Notify Client representative.
4. Ensure the injector is in neutral and that the brake is engaged.
5. Bleed off pressure above pipe rams
6. Set reel brake. On Semi-Submersible jobs the CT should be clamped at the level wind and CT run out of hole until enough slack between the injector and reel is obtained to cope with the heave from the rig, prior to setting reel brake.
7. Bleed off closing pressure on Stuffing Box. Open side doors and apply pressure to retract piston. Replace packer elements and then re-apply pressure to Stuffing Box. Close side doors.  
**Note: 3" side door Stuffing Boxes first bleed off closing pressure. Remove hoses from pack and retract piston and connect to open and close on side door. Open door and replace packer element. Close door, bleed off pressure and connect to pack and retract piston.**
8. Slowly open both equalizing valve on pipe rams and check that stripper is holding pressure.
9. If stripper is holding pressure, undo manual locks and open pipe rams or pipe slip rams. When using pipe/slip rams the depth that they were set on the CT must be recorded. Release reel brake and continue operations.


### Surface Leaks Other Than Stuffing Box

1. If leak is minor and a relatively short length of CT is in the hole and the Shear Seal safety head is **below the leak**:
2. Call local alert and notify the client representative.
3. Clear all non-essential personnel away from the area
4. Continue POOH and monitor situation closely
5. Hook up kill line to BOP and pump water slowly down annulus.

### **Note: Avoid collapse situation**

1. Close swab valve and Shear Seal once CT is in riser and repair leak
2. Perform reinstatement test on surface equipment after leak has been repaired
3. If CT is in the well to a considerable depth and leak is considered serious:
4. Call local alert and notify Client representative.
5. Ensure all non-essential personnel are removed from the area.
6. Ensure that CT is sufficiently off bottom so that when the Shear Seal safety head is activated the pipe will drop below the Xmas tree manual master valve. If the CT is stuck down hole, pull to 80% of operating limit before activating Shear Seal BOP, thus allowing the CT to drop below the Xmas tree manual master valve. If the CT is attached to a fish, packer etc pull to 80% of operating limit (if possible) or maximum weight possible before activating Shear Seal BOP, thus allowing the CT to drop below the Xmas tree manual master valve. **If at all possible**, the decision to cut the CT and activate the system will be taken by the Client representative in charge of the operation. This may not always be possible. If the situation is extremely dangerous and requires a fast decision, the Supervisor in charge will take this decision.

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7. Close the Shear Seal rams in the safety head to cut the pipe and allow it to drop. (If the safety head has separate shear and blind rams, close the shear rams to cut the pipe, pull up the CT and close the blind rams).
8. Close the swab valve on the Xmas tree.
9. Close the master valve on the Xmas tree
10. Repair leak and pressure test riser.
11. Plan for fishing operations.

#### Rotating Joint Leak

Eliminate the potential for reel movement by securing the reel with turnbuckles and set reel brake. On Semi-Submersible jobs the CT should be clamped at the level wind and CT run out of hole until enough slack between the injector and reel is obtained to cope with the heave from the rig. Close the reel isolation valve inside the reel and repair or replace the rotating joint as required. Re-test and resume operations.

#### CT RUNS AWAY INTO WELL


If the inside chain tension system on the IH should fail for any reason, and CT is pulled into the well under its own weight with no control, the procedure should be as per the following:

1. Call a local alert.
2. Attempt to speed the injector up to match the speed of the descending CT.
3. Increase inside chain tension to increase friction on CT.
4. Increase stripper pressure to exert more friction on CT.
5. If these actions fail to make any difference, reduce injector hydraulic pressure to zero.
6. In the event that there is insufficient CT on the reel to reach bottom close CT slips. This action may damage or break the CT. This is the preferred option to using the pipe rams as these will become damaged and a primary well control system will be lost.
7. If the CT is not too far off bottom it may be practical to let it fall to bottom then investigate the causes and repair. This can only be done if there is sufficient CT on the reel to reach bottom.

**Note: CT may helix when hitting bottom making it difficult to pull into tail pipe.**

8. Once CT has been controlled, examine IH for damage including chains and POOH.
9. The CT run away may be caused by the injector becoming overloaded with the weight of the CT and fluid in the CT. This situation should not occur if proper pre job planning is done. Correct selection of IH or ensuring CT is full of Nitrogen would prevent this situation from occurring.
10. If a runaway situation occurs, reduce the injector hydraulic pressure to zero. This may cause the safety brake in the motors to actuate and counter balance valves to close, stopping the injector.
11. Under certain circumstances if the runaway CT is at a speed above the critical speed, the back pressure created by the circulating hydraulic fluid may prevent the injector motor brakes from actuating. If this situation occurs, select the pull mode for the injector and increase system hydraulic pressure until the CT comes to a standstill.

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### CT IS PULLED OUT OF STUFFING BOX

This situation is most likely to occur when the CT is being pulled into the riser section. If the BHA is lost including the End Connector there will be no external upset to prevent the CT from passing through the Stuffing Box. If this situation occurs, stop injector before CT passes through the chains and shut in Shear Seal rams on upper BOP's.

If it is thought that the BHA may be lost while down hole, stop the CT at 300ft from surface. Slowly close in the swab valve counting the number of turns. If the CT is still deemed to be across the wellhead, POOH the CT no more than the distance between the top of the wellhead and the top of the CT BOP's. Repeat this step until the swab valve can be fully shut. Once the swab valve is shut, bleed off the pressure in riser.

### CT COLLAPSED AT SURFACE

Collapsed CT at surface will be obvious by escape of well bore fluids from the Stuffing Box, as the strippers will no longer seal round the deformed pipe. In addition to this the collapsed pipe will not allow the IH to grip the CT due to its change in shape. Usually collapsed CT will not pull through the bottom brass bushings on the Stuffing Box.

1. If POOH, immediately run CT back in well a sufficient distance to make sure round pipe is in contact with the Stuffing Box.
2. Call alert and notify client representative.
3. Ensure that all non-essential personnel are cleared from the immediate area.
4. Immediately reduce well head pressure by all safe means possible; either flow well through choke at a higher rate or stop annular fluid injection if reverse circulating.
5. Increase CT internal pressure by circulating.
6. Once pressure conditions inside and outside the CT have been optimized, a decision can be taken on how to proceed. If it is not possible to position un-collapsed pipe across the stripper rubbers, i.e., well contents are escaping from stripper rubbers:
7. Call alert and notify client representative.
8. Close pipe rams in an effort to reduce flow of fluid/gas around CT.

**Note: If it is not possible to control the well, the slips will have to be set, and the CT cut using the Shear Seal rams.**


9. Arrange for clamps to be fitted to CT above IH.
10. Remove all non-essential personnel from immediate area
11. Under authority from client representative, kill well.
12. Release pressure from Stuffing Box and remove bushings.
13. Open pipe rams.
14. Attempt to pull CT from the well using the IH.
15. Cut CT at the gooseneck and use the rig or a crane to pull the CT through the injector. Re-clamp the CT above the IH and cut off in thirty-foot sections (or as appropriate to the crane or rig)
16. Continue pulling and cutting CT until the CT pulled to surface can be pulled by the IH.
17. Once CT in good condition (i.e. not collapsed) is at surface, set CT slips and pipe rams and make up roll-on connector to CT on reel.
18. Continue POOH.

If the leak is too serious and cannot be controlled and well fluids are escaping, continue as per Section 9.2.

### CT BREAKS AT SURFACE

If CT breaks at surface into two separate sections:

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1. Stop the injector and set the slips.
2. Stop pumping operations.
3. Call alert and notify client representative. Ensure all non-essential personnel are cleared from the area and that the area is secure.
4. Secure CT reel.
5. If the reel capacity is insufficient to hold all of the CT remaining in the well due to uneven spooling resulting from the CT failure, it may be necessary to obtain another reel with sufficient capacity to hold the CT remaining in the well.
6. After consulting with client representative, remove damaged section of CT and insert in line roll-on connector and continue to POOH.
7. If this course of action is considered inappropriate or dangerous due to well conditions or condition of CT still in the well, continue as per Section 0.

### BUCKLED TUBING

Should the CT hit an obstruction down hole while RIH with the thrust pressure set too high or running speed too fast, the CT will buckle in a 'Z' shape (plastically hinged).

CT being run inside CT and through small ID BOP's/lubricators will normally buckle between the Stuffing Box and the chains.

CT being run through casing or open hole will normally break below the BOP, usually somewhere around the largest ID.

- The CT will generally buckle several times.
- This type of failure is a little more difficult to detect.

If the CT is being run into casing and a large amount of weight is lost suddenly, there is a very good possibility that the CT is buckled somewhere down hole. Indications of this could be:


- An increase in pump pressure as fluid or gas is now being pushed through an additional restriction created by a hinge.
- A decrease in pump pressure as the CT may have broken removing a restriction such as a BHA.
- A loss of string weight due to the CT breaking and falling off.
- An increase in string weight while pulling out of the hole as the buckled portion of CT creates additional drag or needs to be straightened to get through a restricted ID.

In the event CT buckling is suspected, the CT movement should be stopped and the pump pressure kept within operating limits allowing the situation to be analyzed and determine the correct action to be taken for existing conditions.

#### **If there is an increase in pump pressure or an increase in string weight:**

1. Stop the pumps and pick up slowly.
2. POOH slowly (10 to 20 feet per minute) watching the weight indicator carefully.
3. If the CT is buckled close to surface, the buckled CT will pull into the bottom of the Stuffing Box and stop.
4. Close and lock the slip and pipe rams.
5. If the ram indicators show that the rams are not completely closed, there may be more than one piece of CT inside the BOP. In this event, open the rams and try to put undamaged CT across the pipe and slip rams.
6. Make arrangements to kill the well and retrieve the remaining CT from the well.

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7. If the buckled CT is down hole and cannot be pulled free, consult the client representative as he may want the CT left at TD prior to being hung off in the slip and CT rams.
8. Arrangements should be made to run CT cutter on wireline to retrieve the CT above stuck point.

**If there is a decrease in pump pressure or a loss of string weight:**

1. It must be assumed that the CT has parted somewhere down hole.
2. Calculate from the remaining string weight approximately how much CT is left in the well.
3. Stop the pumps and POOH slowly.
4. Should the CT come out of the Stuffing Box, the blind rams should also be closed in.

**If the CT is buckled above the Stuffing Box, the following steps should be taken:**

1. Stop the injector as quickly as possible.
2. Close the slip and pipe rams and manually lock them.
3. If the down hole check valves are holding, bleed the pressure in the CT down to zero and monitor for 15 minutes for pressure build up.
4. Consider at this stage whether to kill the well.
5. Use a hacksaw to start the cut until you are sure there is no trapped pressure in the CT.
6. Cut the CT
7. Remove as much of the buckled CT as possible leaving any undamaged CT showing above the Stuffing Box intact so that it may be rejoined later.
8. Bleed the pressure from above the CT rams and undo the connection below the injector.
9. Slowly raise the injector until it is clear of the damaged CT.
10. Cut away any damaged CT, dress the CT and install an inline connector.
11. Run some fresh CT down through the injector until it is just out of the Stuffing Box.
12. Lower the injector until immediately over the pipe sticking out of the BOP.
13. Attach the pipe to the inline connection attached to the pipe sticking up out of BOP.
14. Pump off the inside chain tension and rotate the chains slowly in the OOH direction, while lowering the injector until the connection below the injector can be fastened.
15. Pump up the inside chain tension and pull weight equal to the weight of the CT suspended below the slips plus 2,000 lbf for friction or CERBERUS prediction, whichever is greatest.
16. Equalize the pressure across the CT rams.
17. Unlock the pipe and slip rams.
18. Open the slip and pipe rams and POOH.
19. If the down hole check valves do not hold then the CT will have to be cut.


**CT STUCK IN HOLE PROCEDURES**

There are various scenarios by which CT can be deemed as a stuck in hole situation. The following procedures are to be used as generic guidelines prior to the compilation of a signed off chemical cutting program applicable to the current situation.

In the event of being stuck in hole, several factors would have to be taken into consideration, the first of which would be whether the CT is stuck in hole on a platform, or a semi-submersible, as the procedures to be followed may vary greatly between the two options.

Other factors to be considered are:

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- Type of well, i.e., flowing oil or gas well, water injector etc.
- The type of BHA being used, i.e., perforating guns, milling assembly, plug etc.
- The type of operation being carried out when the CT became stuck.

In all of the above cases, the CT would be defined as being “stuck” when the pipe cannot be retrieved from the well bore without the pipe exceeding its 80% minimum yield rating, or without exceeding 80% stress of the weak link release rating. The lower of these two factors should always be used when attempting large pulls.

Regardless of the specifics involved, the following procedures should be adopted:

1. Inform the client representative of the situation.
2. Inform the Onshore Engineer.
3. From the information available, and taking into account the well conditions, try to determine the reason for the pipe/BHA being stuck.
4. Attempt to pull free by applying a steady pull to a maximum of 80% of the CT yield. If in doubt as to what this figure is, consult Engineering Department before proceeding.
5. When applying the maximum pull, hold the maximum value for a minimum of 10 minutes and observe the trend (if any) on the weight indicator and chart. Measure the amount of pipe extension that is required when this pull is applied. The figure can be used to determine where the CT is stuck. As a rule of thumb, the depth that the pipe is held at will be the extension of the CT (in feet) when pulled to 80% of yield divided by 0.002. This can be determined using CERBERUS.

The following are options that may be appropriate depending on the particular circumstances:

1. If possible, flow the well, or increase well flow in an effort to remove debris in the well bore that may be holding the CT/BHA. Maintain maximum circulation through the CT at the same time. This is particularly relevant if well cleanout or drilling operations have been performed.
2. Circulate acid across the BHA in an attempt to remove any acid soluble material that may be holding the CT.
3. Pump fluid down the backside of the CT to the formation in an attempt to dislodge debris from around the BHA. Potential CT collapse must be considered if engineering this scenario.
4. Displace CT contents to a lighter fluid (base oil) or gas (Nitrogen) to increase buoyancy and allow greater end force to be applied at BHA.
5. Underbalance the well in the case of differentially stuck CT.
6. Cool the well if the CT is helically stuck in corkscrewed Production Tubing.
7. Pump down the CT / completion annulus to try and move the source of hold-up.
8. Displace slugs of Nitrogen with water to create a surge effect at the BHA.
9. Pump friction reducer, IM Lube in seawater at 2-3% by volume, down the CT and into the well. Ideally, one well volume will be pumped.
10. After consultation with the client representative and the on-call Engineer, activate the emergency disconnect mechanism in the BHA to allow the CT to be released. The release mechanism should only be implemented after all avenues have been explored.
11. When attempting maximum pull, do not work the CT violently across the gooseneck by frequent intervals.
12. The number of cycles across the gooseneck must be logged, and if in doubt of the CT fatigue condition, the Engineer must be consulted and the cycles entered into the CERBERUS FATIGUE program, to determine the number of cycles left available.

After consultation with the client representative, kill the well and commence preparations for External/Internal cutting operations.

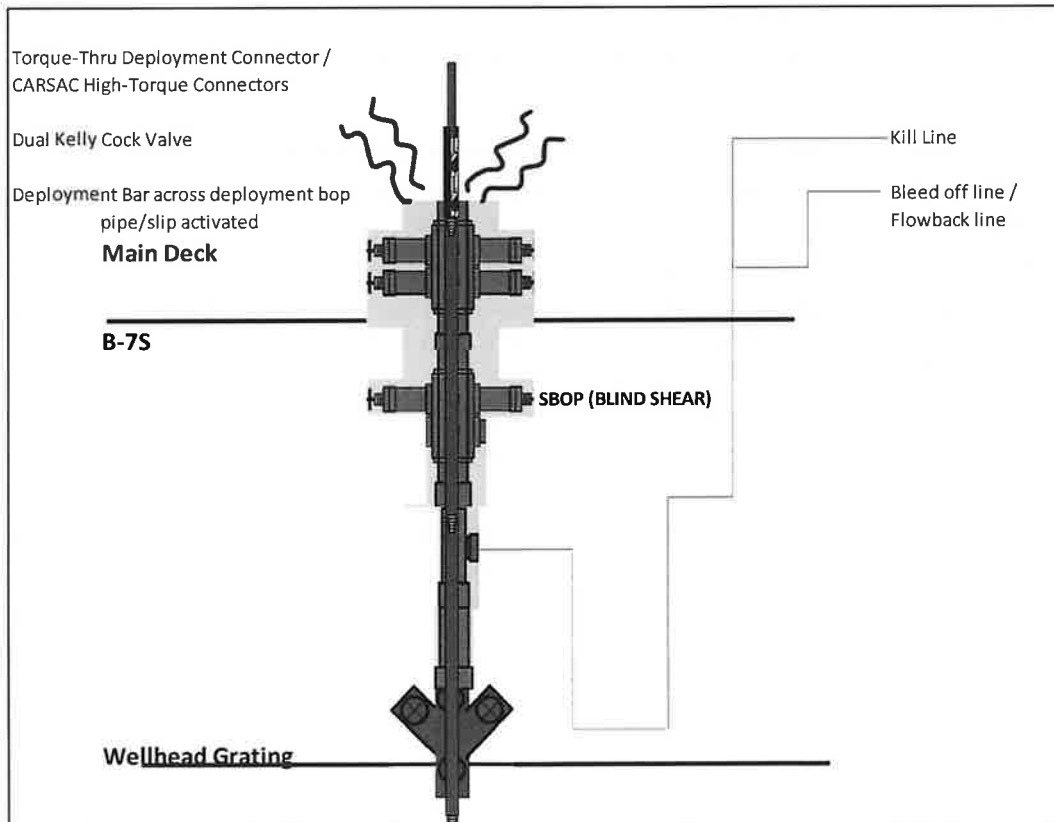
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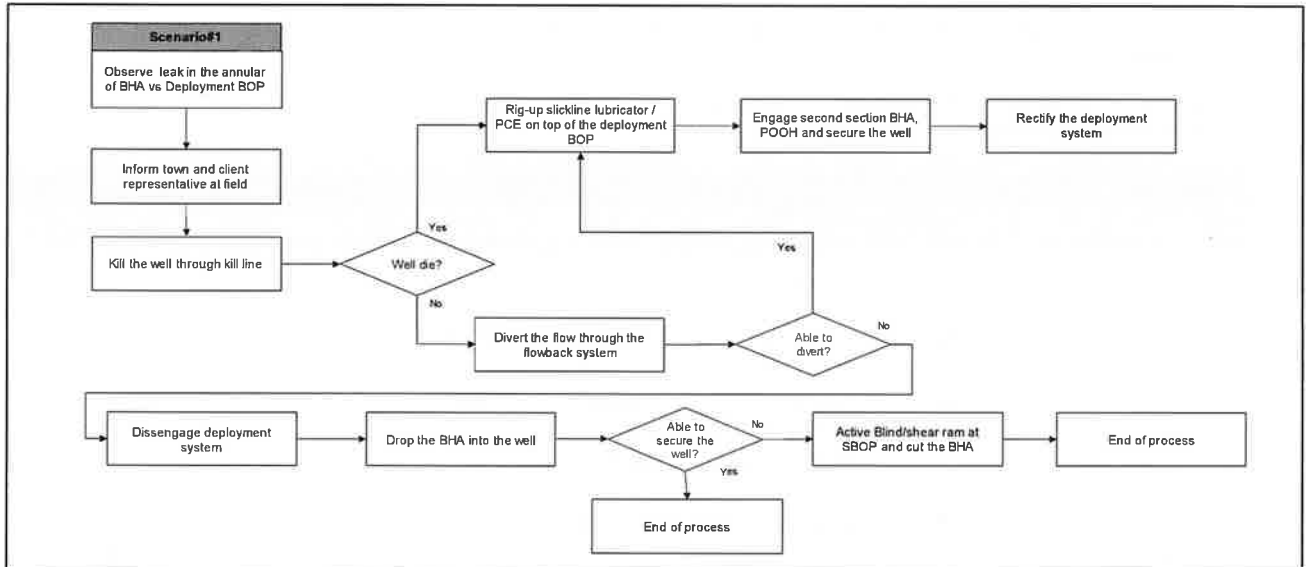
**CT Deployment System Emergency Respond Plan**

Scenario 1: - Leak at annular section when CT BHA is across the deployment BOP after slickline deploy the 2<sup>nd</sup> Section BHA

Section #2 BHA fully deployed across deployment BOP. Pipe/Slip ram engaged and holding. C-Clamp and Dog Clamp in position.

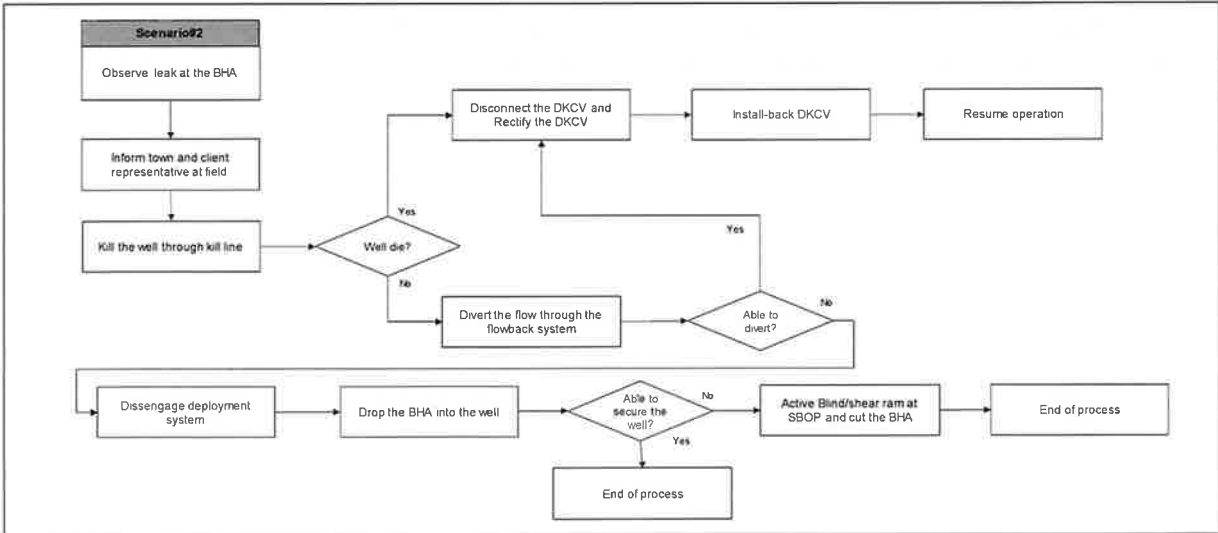
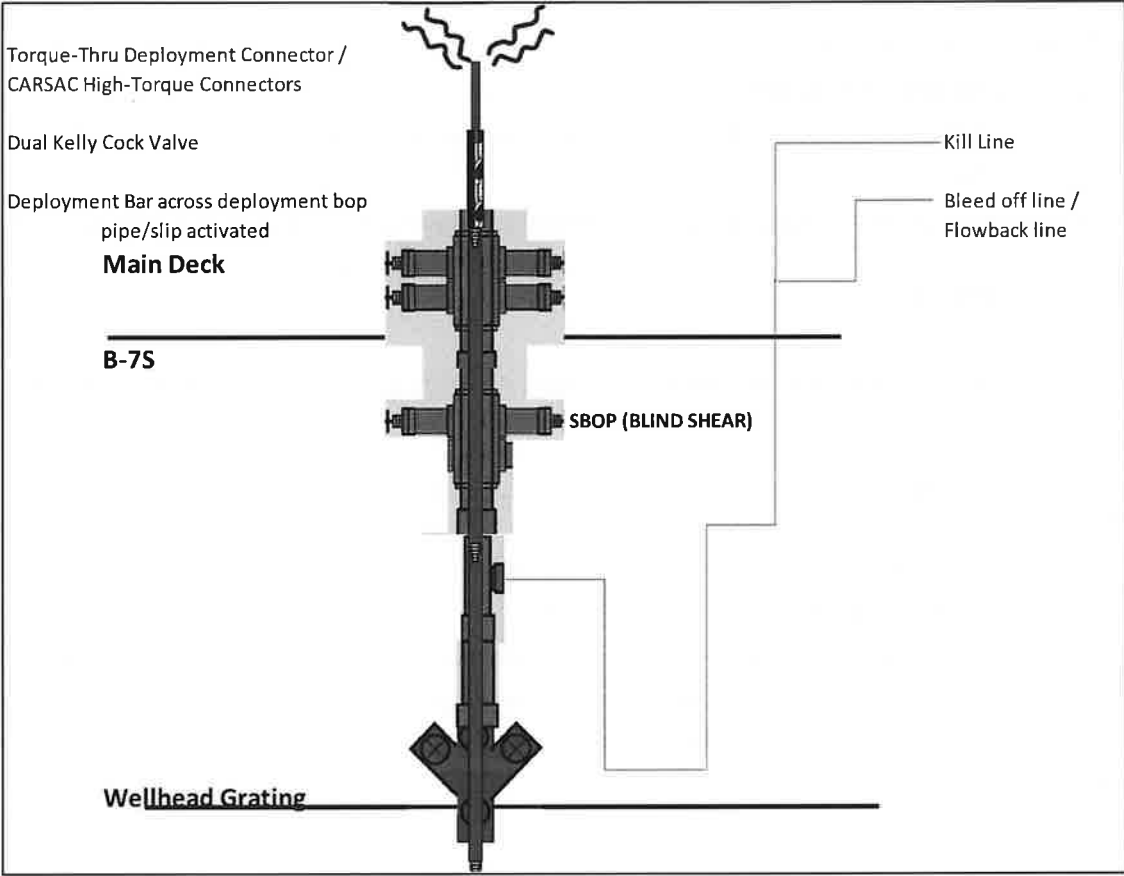
Section	Items		Description	BHA OD, Inch	Length, ft	Deploy by
1	1	DB	Dimple End Connector	1.687	2.6	CT
	2	DB	CT MHA	1.687		
2	3	DB	Torque-Thru Deployment Connector / CARSAC High-Torque Connectors	1.687	102.2	Slickline
	4	DB	Dual-ball Kelly cock valve	1.687		
	5	DB	Deployment bar	1.5		
	6	DB	Straight bar	1.687		
	7	DB	MultiJet Nozzle	1.687		






1. Observed fluid (liquid and/or gaseous) release from annular of CT BHA vs deployment BOP.
2. Slowly start pumping kill fluid thru the pumping tee below the Safety Head (Blind/Shear BOP). Attempt to fill up the well completion tubing to reduce and/or stop the ingress of wellbore fluid. Simultaneously alert nearby personnel and inform town.
3. Attempt to kill the well through the kill line via flow tee.
4. If able to successfully kill the well,
  - 4.1. Rig-up slickline lubricator / PCE on top of the Deployment BOP.
  - 4.2. Pressure test PCE stack.
  - 4.3. On successful pressure test, RIH slickline and make up slickline BHA to 2<sup>nd</sup> section CT BHA,
  - 4.4. POOH BHA to surface (above deployment BOP) and close the well Xmas tree crown valve and master valve
  - 4.5. Identify and rectify the annular leak.
5. If the well cannot be killed with available fluid system, divert the flow of return from the flow tee at top of wellhead grating to flowback facility. Continue to next step if redirecting of the flow is successful and annular leakage ceases.: -
6. Mix heavier circulation fluid and reattempt step #2 & #3.
  - 6.1. If the well cannot be killed and the flow cannot be diverted, then move forward to the steps below: Withdraw Deployment BOP Pipe/Slip Ram.
  - 6.2. Permit the BHA to gravitate and descend into the wellbore past the Xmas tree of the well.
7. Shut the master valve followed by the crown valve to ensure the well is secure. If the BHA is unable to be dropped beyond the Xmas tree, activate Blind/Shear ram on the Safety Head and shear the BHA in the PCE stack across the Safety Head.

Scenario 2: - Leak inside CT BHA after slickline have successfully deployed Section #2 CT BHA. Addressing leak bypassing the DKCV



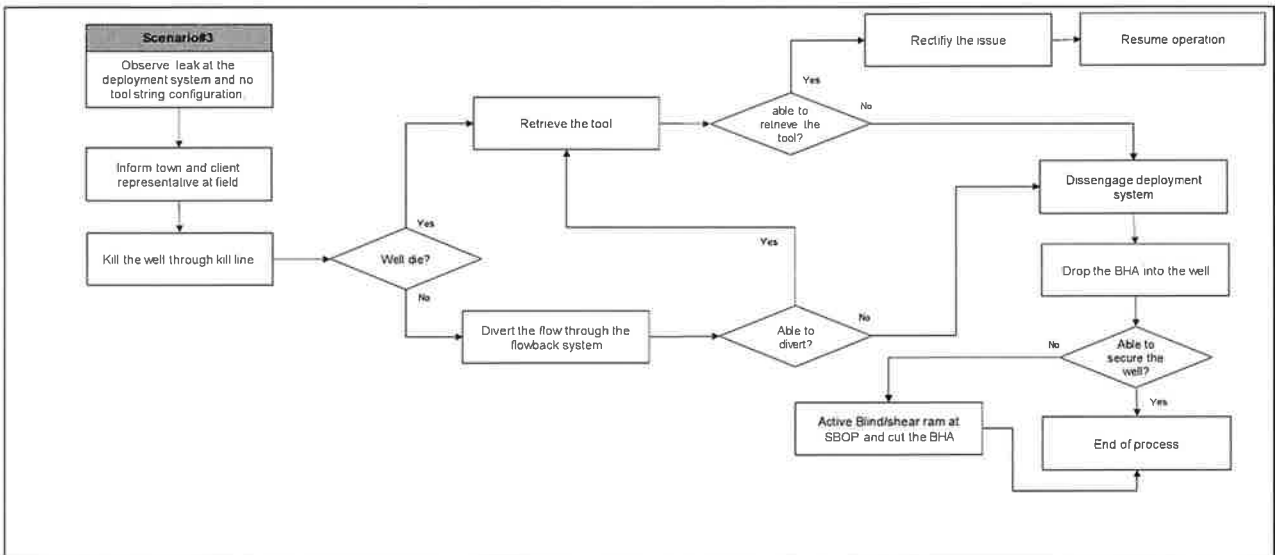
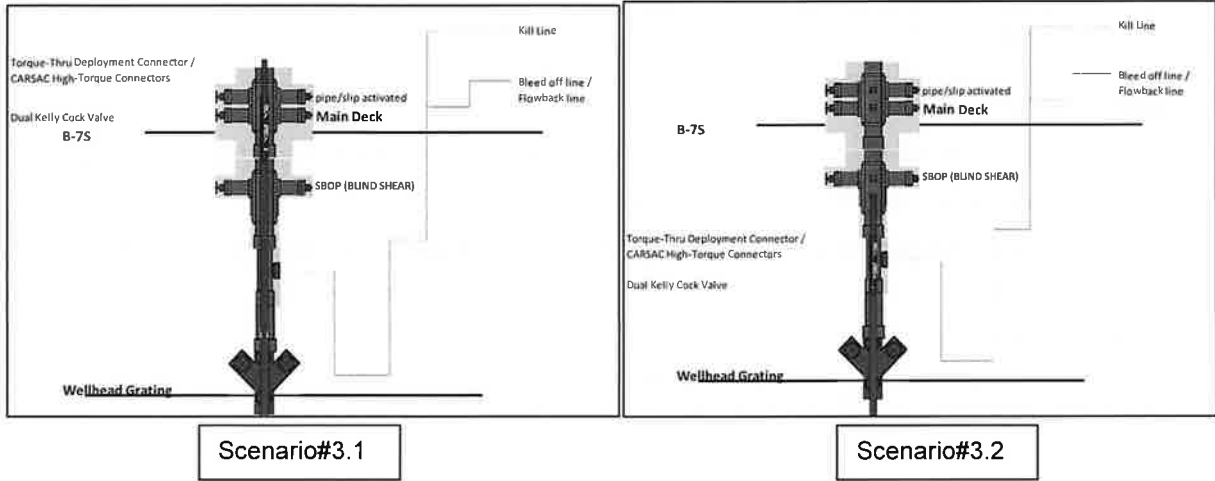
8. Observed fluid (liquid and/or gaseous) release from CT BHA.

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9. Slowly start pumping kill fluid thru the pumping tee below the Safety Head (Blind/Shear BOP). Attempt to fill up the well completion tubing to reduce and/or stop the ingress of wellbore fluid. Simultaneously alert nearby personnel and inform town.
10. Attempt to kill the well through the kill line via flow tee
11. If able to successfully kill the well,
  - 11.1. Rig-up slickline lubricator / PCE on top of the Deployment BOP.
  - 11.2. Pressure test PCE stack.
  - 11.3. On successful pressure test, RIH slickline and make up slickline BHA to 2<sup>nd</sup> section CT BHA,
  - 11.4. POOH BHA to surface (above deployment BOP) and close the well Xmas tree crown valve and master valve
  - 11.5. Identify and rectify the annular leak.
12. If the well cannot be killed with available fluid system, divert the flow of return from the flow tee at top of wellhead grating to flowback facility. Continue to next step if redirecting of the flow is successful and annular leakage ceases.: -
13. Mix heavier circulation fluid and reattempt step #9 & #10. If well killing is successful, proceed to step #15 else to step #14
14. If the well cannot be killed and the flow cannot be diverted, then move forward to the steps below:
  - 14.1. Withdraw Deployment BOP Pipe/Slip Ram.
  - 14.2. Permit the BHA to gravitate and descend into the wellbore past the Xmas tree of the well.
  - 14.3. Shut the master valve followed by the crown valve to ensure the well is secure
15. Once well is secured proceed with steps below:
  - 15.1. Disconnect the DKCV
  - 15.2. Rectify the DKCV
  - 15.3. Install DKCV
  - 15.4. Resume operation
16. If the BHA is unable to be dropped beyond the Xmas tree, activate Blind/Shear ram on the Safety Head and shear the BHA in the PCE stack across the Safety Head.

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**Scenario 3: - BHA slip after slickline deploy the 2<sup>nd</sup> Section BHA**



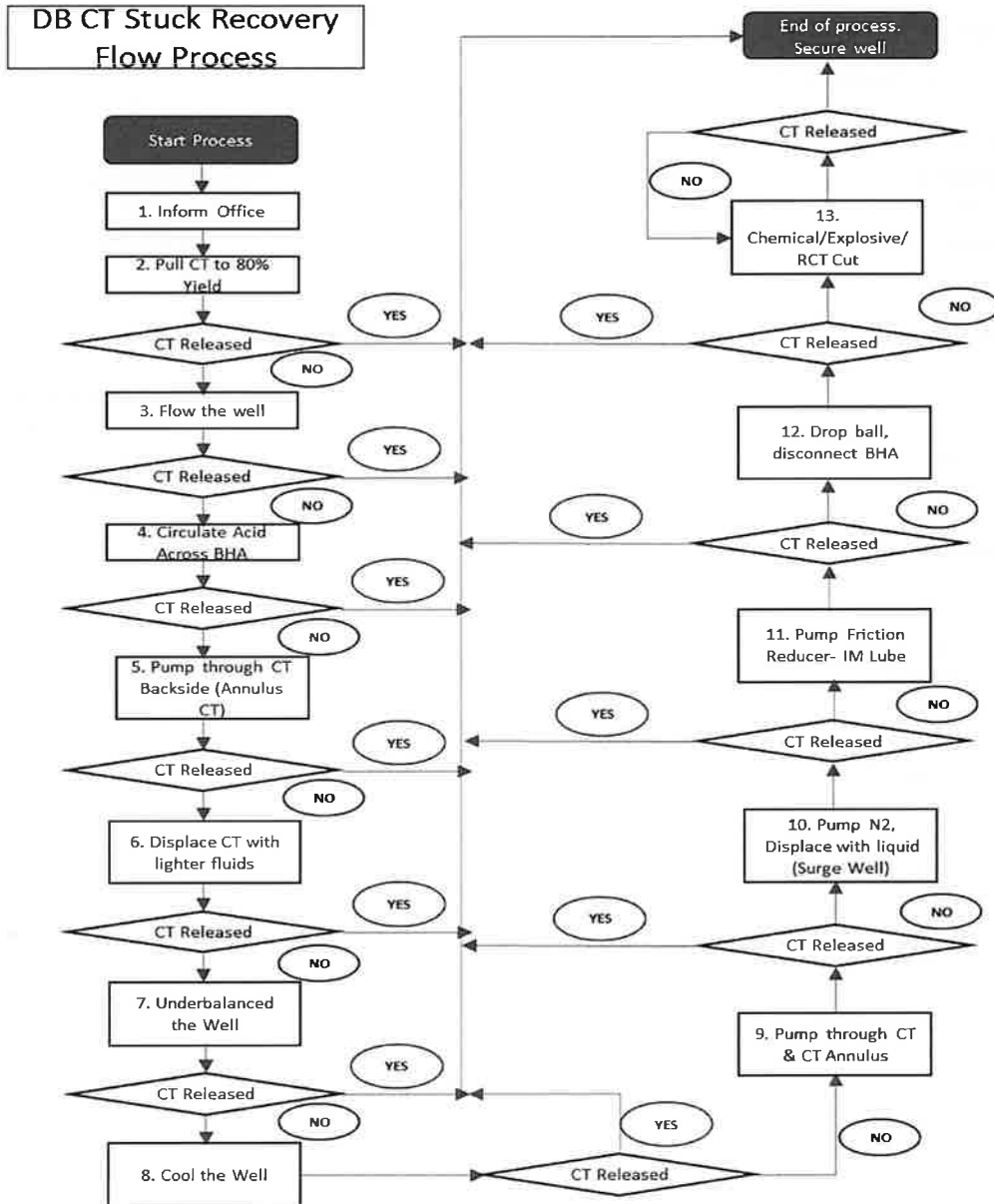
17. Observed fluid (liquid and/or gaseous) release at deployment system. (No BHA observe at deployment system).
18. Slowly start pumping kill fluid thru the pumping tee below the Safety Head (Blind/Shear BOP). Attempt to fill up the well completion tubing to reduce and/or stop the ingress of wellbore fluid. Simultaneously alert nearby personnel and inform town.
19. Attempt to kill the well through the kill line via flow tee
20. If able to successfully kill the well,
  - 20.1. Retrieve the tool
  - 20.2. If unable to retrieve the tool, disengage the BHA from deployment system and secure the well by close the crown valve / master valve
  - 20.3. If unable to close the crown valve / master valve, active blind/shear ram at SBOP and secure the well

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21. If the well cannot be killed with available fluid system, divert the flow of return from the flow tee at top of wellhead grating to flowback facility. Continue to next step if redirecting of the flow is successful and annular leakage ceases.
22. Mix heavier circulation fluid and reattempt step #19 & #20. If well killing is successful, proceed to step #24 else to step #23
23. If the well cannot be killed and the flow cannot be diverted, then move forward to the steps below:
  - 23.1. Withdraw Deployment BOP Pipe/Slip Ram.
  - 23.2. Permit the BHA to gravitate and descend into the wellbore past the Xmas tree of the well.
  - 23.3. Shut the master valve followed by the crown valve to ensure the well is secure
24. Secure the well.
25. If the BHA is unable to be dropped beyond the Xmas tree, activate Blind/Shear ram on the Safety Head and shear the BHA in the PCE stack across the Safety Head.


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**STUCK CT COIL RECOVERY PROCESS**



**Precautionary Steps to avoid Stuck while Cleanout in Dual string Completion:**

- 1) To monitor pressure trending all the times during operation and record for any abnormalities. If there is continue pressure increasing trend during cleanout, proceed to pick up coil to the previous pull test depth and perform flow rate test.
- 2) In the event of coil entangle on the Long string, proceed to pick up coil and simulate pumping lost prime scenario to create vibration and tip of coil wobble to release from entanglement.

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**APPENDIX VI – CIRCA SIMULATION**

Flow Summary

SUMMARY OF FLOW RESULTS

Produced Fluids  
 Pressure known at:  
 Production Mode:  
 Fluid Composition:

Perforations  
 No Production  
 Oil and Gas

Circulated Fluids  
 Fluid Composition:  
 Liquid:  
 Solids:  
 Gas:  
 Circulation Point:  
 HHP Required :

Nitrified Water  
 1.10 bbl/min  
 0.00 bbl/min  
 300.0 scf/min  
 1545.00 m  
 79.86 KW

COMPLETION:


Wellhead Pressure.....	130.2 psi g
Hydrostatic pressure loss.....	954.0 psi
Friction pressure loss.....	514.1 psi
Kinetic pressure loss.....	-0.6 psi
Restriction pressure loss.....	2.2 psi
Equivalent Circulation Density[ECD]...	7.06 lb/gal (US)

Perforation Pressure.....	1600.0 psi g
Hydrostatic pressure loss.....	386.6 psi
Friction pressure loss.....	0.1 psi

Bottom Hole Pressure.....	1986.7 psi g
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FROM CIRCULATION POINT TO WELLHEAD:

Liquid transit time.....	9 min
Gas transit time.....	8 min
Annular volume.....	21.1 bbl
Volume below circulation point.....	41.1 bbl
Total liquid volume.....	53.1 bbl

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Total gas volume..... 9.1 bbl  
(Surface equivalent)..... 2475.1 scf

**WORKSTRING:**

Liquid: 1584.0 bbl/day  
Gas: 0.43 MMscf/day  
Pressure at reel rotating joint..... 3958.9 psi g  
Friction pressure loss on reel..... 1940.7 psi

Pressure inside WS at Gooseneck..... 2018.3 psi g  
Hydrostatic pressure loss..... -1104.6 psi  
Friction pressure loss..... 1012.9 psi  
Equivalent Circulation Density[ECD]... 1.46 lb/gal (US)

BHA total pressure loss ..... 487.3 psi  
BHA Hydrostatic loss ..... -18.5 psi  
BHA Friction loss ..... 226.6 psi  
BHA Kinetic loss ..... 6.8 psi  
**Nozzle** ..... 272.3 psi


Circulation Point pressure ..... 1622.8 psi g

**FROM REEL ROTATING JOINT TO CIRCULATION POINT:**

Liquid transit time..... 12 min  
Gas transit time..... 15 min  
Displacement Volume..... 11.1 bbl  
Internal Volume..... 18.6 bbl  
Internal liquid volume..... 13.2 bbl  
Internal gas volume..... 5.4 bbl  
(Surface equivalent)..... 4440.1 scf

Length of Workstring on reel..... 2130.78 m

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Ctran Summary

SUMMARY OF HOLE CLEANING RESULTS

Initial Condition:

% of fill interval occupied by solids before cleanout ...	100.0 %
Top of fill .....	1515.01 m
Deepest Circulation point .....	1545.00 m
Bottom of fill .....	1545.00 m
Initial Volume of Solids.....	3.4 bbl
Initial Mass of Solids.....	1740.4 lb
Solids type:	Mud Residue/Formation Fines
Fluid Description:	Nitrified Water

Penetration Hole Cleaning Mode:

Penetration rate.....	1.0 ft/min
Penetration time.....	1.64 hr
Solids volume in the well after penetration .....	2.7 bbl
Solids mass in the well after penetration .....	1398.9 lb

Circulation Hole Cleaning Mode:

Hole circulation time .....	3.28 hr
Solids volume in the well after circulation.....	0.5 bbl
Solids mass in the well after circulation.....	259.3 lb

Wiper Trip Hole Cleaning Mode:

Wiper Trip Scheme:	User Specified rate, Tomado not
Wiper trip time .....	0.21 hr
Solids volume in the well after wiper trip .....	0.5 bbl
Solids mass in the well after wiper trip .....	259.3 lb


Volume of Fluids Pumped During Penetration, Circulation & Wiper Trip:

Gas volume .....	92441.7 scf
Liquid Volume .....	339.0 bbl
Penetration, Circulation & Wiper Trip time .....	5.14 hr

Circulation results at point of Maximum Solids Head:


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**Flow State**


Measured Depth[Flow] <i>m</i>	Temperature	Completion Pressure	Workstring Pressure	Concentric Pressure	Completion Liquid Velocity ft/min	Workstring Liquid Velocity ft/min	Concentric Liquid Velocity ft/min
0.0	95.0	130.2	2018.3	0.0	1619	1163	0
4.0	95.4	135.5	2019.4	0.0	1635	1163	0
29.0	97.7	166.2	2026.2	0.0	1420	1164	0
54.0	100.1	195.0	2032.9	0.0	1277	1165	0
79.0	102.5	222.6	2039.7	0.0	1172	1166	0
104.0	104.8	249.4	2046.4	0.0	1091	1168	0
129.0	107.2	275.7	2053.1	0.0	1231	1169	0
132.0	107.4	279.2	2053.9	0.0	1019	1170	0
157.0	109.8	305.1	2060.5	0.0	967	1171	0
182.0	112.1	330.9	2067.1	0.0	923	1172	0
207.0	114.5	356.5	2073.7	0.0	885	1173	0
232.0	116.8	382.2	2080.3	0.0	852	1174	0
257.0	119.2	407.8	2086.9	0.0	824	1175	0
282.0	121.5	433.5	2093.6	0.0	956	1176	0
303.1	123.5	455.5	2099.2	0.0	778	1177	0
328.1	125.9	481.4	2105.8	0.0	758	1178	0
353.0	128.2	507.4	2112.4	0.0	739	1179	0
378.0	130.6	533.4	2119.0	0.0	722	1180	0
403.0	132.9	559.4	2125.3	0.0	706	1183	0
428.0	135.2	585.4	2131.5	0.0	692	1187	0
453.0	137.5	611.5	2137.3	0.0	681	1191	0
478.0	139.8	637.6	2142.6	0.0	670	1195	0
503.0	142.0	663.6	2147.5	0.0	660	1201	0

<b>DIMENSION BID</b>	<b>DIMENSION BID COILED TUBING SERVICES</b>		
	DULANG B-7S	SCO	

**Flow State (continued)**


Measured Depth[Flow] <i>m</i>	Temperature	Completion Pressure	Workstring Pressure	Concentric Pressure	Completion Liquid Velocity ft/min	Workstring Liquid Velocity ft/min	Concentric Liquid Velocity ft/min
528.0	144.1	689.4	2151.8	0.0	781	1206	0
534.1	144.6	695.9	2152.7	0.0	650	1209	0
559.1	146.7	721.5	2156.2	0.0	642	1213	0
584.1	148.7	746.5	2159.0	0.0	636	1217	0
609.1	150.6	771.0	2161.1	0.0	630	1222	0
634.1	152.5	794.9	2162.6	0.0	625	1225	0
659.1	154.3	818.2	2163.4	0.0	621	1228	0
684.0	156.0	841.0	2163.5	0.0	617	1230	0
709.0	157.7	863.2	2163.1	0.0	613	1232	0
734.0	159.3	885.2	2162.3	0.0	609	1233	0
759.0	160.9	907.3	2161.4	0.0	604	1234	0
784.0	162.6	929.5	2160.5	0.0	599	1236	0
809.0	164.2	951.7	2159.7	0.0	594	1237	0
834.0	165.9	973.9	2158.8	0.0	590	1239	0
859.0	167.5	996.2	2157.8	0.0	702	1240	0
867.1	168.0	1003.5	2157.4	0.0	585	1240	0
892.1	169.7	1025.7	2156.3	0.0	581	1242	0
917.1	171.3	1048.0	2155.1	0.0	577	1243	0
942.0	172.9	1070.2	2153.8	0.0	574	1244	0
967.0	174.5	1092.5	2152.5	0.0	571	1246	0
992.0	176.1	1114.7	2151.1	0.0	567	1247	0
1017.0	177.7	1137.0	2149.6	0.0	565	1248	0
1042.0	179.3	1159.2	2148.0	0.0	562	1250	0

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<b>DIMENSION BID</b>	<b>DIMENSION BID COILED TUBING SERVICES</b>		
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**Flow State (continued)**

Measured Depth[Flow] <i>m</i>	Temperature	Completion Pressure	Workstring Pressure	Concentric Pressure	Completion Liquid Velocity ft/min	Workstring Liquid Velocity ft/min	Concentric Liquid Velocity ft/min
1067.0	180.9	1181.5	2146.4	0.0	559	1251	0
1092.0	182.5	1203.8	2144.7	0.0	556	1253	0
1117.0	184.1	1226.2	2143.1	0.0	663	1254	0
1128.0	184.8	1236.3	2142.3	0.0	552	1255	0
1153.0	186.5	1258.8	2140.6	0.0	549	1256	0
1178.0	188.1	1281.2	2138.8	0.0	547	1257	0
1203.0	189.6	1303.7	2137.0	0.0	544	1259	0
1228.0	191.2	1326.1	2135.0	0.0	542	1260	0
1253.0	192.8	1348.6	2133.0	0.0	540	1261	0
1278.0	194.4	1371.0	2130.9	0.0	538	1263	0
1303.0	196.0	1393.5	2128.8	0.0	643	1264	0
1315.0	196.7	1404.5	2127.7	0.0	536	1265	0
1340.0	198.3	1426.9	2125.5	0.0	534	1266	0
1365.0	199.9	1449.3	2123.1	0.0	532	1267	0
1390.0	201.5	1471.9	2120.8	0.0	530	1269	0
1415.0	203.0	1494.5	2118.5	0.0	527	1271	0
1440.0	204.6	1517.3	2116.3	0.0	524	1272	0
1465.0	206.2	1540.2	2114.2	0.0	626	1274	0
1468.0	206.4	1543.1	2113.9	0.0	522	1274	0
1493.0	208.0	1566.2	2111.8	0.0	622	1276	0
1513.0	209.3	1584.9	2110.1	0.0	682	1277	0
1514.0	209.4	1586.1	2110.1	0.0	515	1277	0
1514.2	209.4	1587.1	2110.0	0.0	83	1277	0

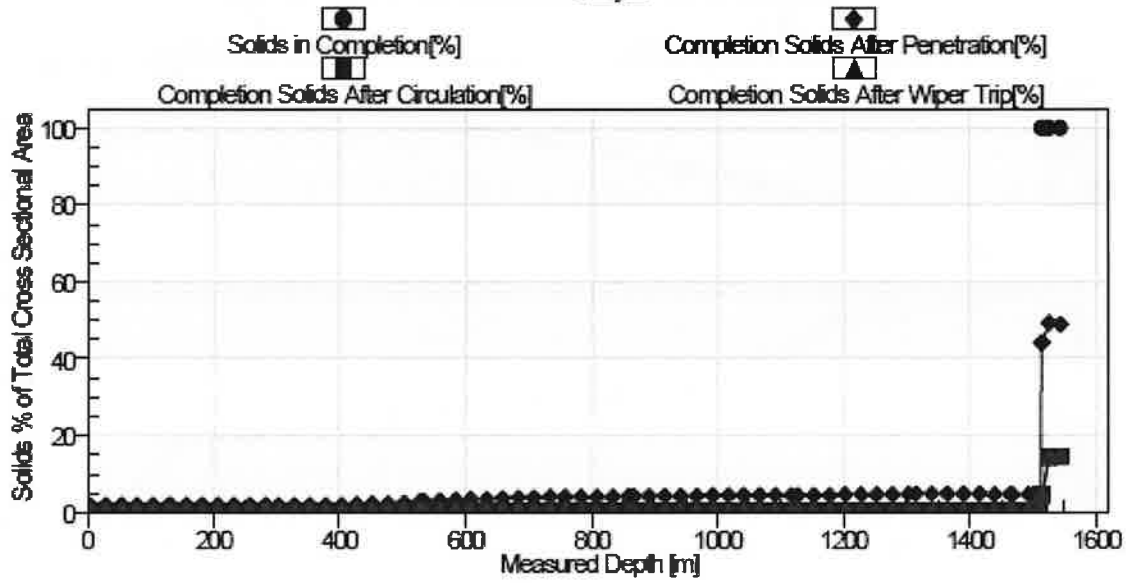
<b>DIMENSION BID</b>	DIMENSION BID COILED TUBING SERVICES		
	DULANG B-7S	SCO	

**Flow State (continued)**

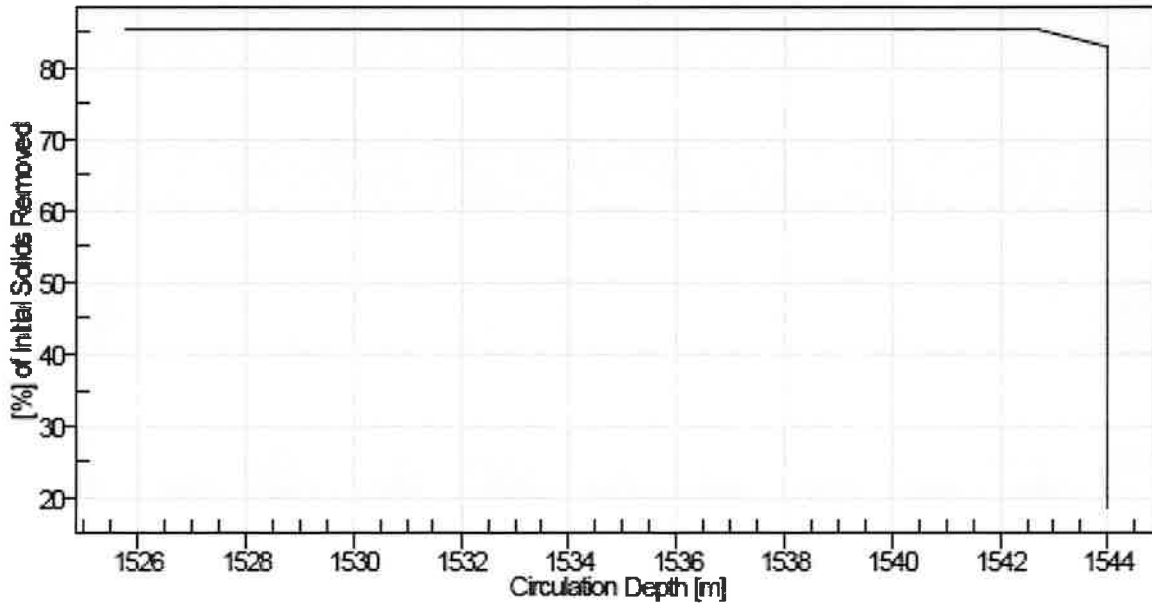
Measured Depth[Flow] <i>m</i>	Temperature	Completion Pressure	Workstring Pressure	Concentric Pressure	Completion Liquid Velocity ft/min	Workstring Liquid Velocity ft/min	Concentric Liquid Velocity ft/min
1515.0	209.5	1588.0	2098.1	0.0	85	3157	0
1526.0	210.2	1600.0	2024.6	0.0	84	3179	0
1544.7	211.4	1622.4	1897.2	0.0	89	3222	0
1545.0	211.4	1622.8	1895.1	0.0	88	13353	0
1558.1	212.3	1635.3	0.0	0.0	0	0	0
1583.1	214.0	1659.4	0.0	0.0	0	0	0
1608.1	215.7	1683.6	0.0	0.0	0	0	0
1633.1	217.3	1707.9	0.0	0.0	0	0	0
1658.1	219.0	1732.3	0.0	0.0	0	0	0
1683.1	220.7	1757.0	0.0	0.0	0	0	0
1708.1	222.5	1781.9	0.0	0.0	0	0	0
1733.0	224.2	1807.1	0.0	0.0	0	0	0
1758.0	226.0	1832.6	0.0	0.0	0	0	0
1783.0	227.8	1858.2	0.0	0.0	0	0	0
1808.0	229.5	1883.8	0.0	0.0	0	0	0
1833.0	231.3	1909.6	0.0	0.0	0	0	0
1858.0	233.1	1935.4	0.0	0.0	0	0	0
1883.0	234.9	1961.1	0.0	0.0	0	0	0
1908.0	236.7	1986.7	0.0	0.0	0	0	0

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**Solids Bulk Cross Sectional Area**  
Cran Analysis



**Solids Removed versus Circulation point**  
Cran Analysis



# DIMENSION BID

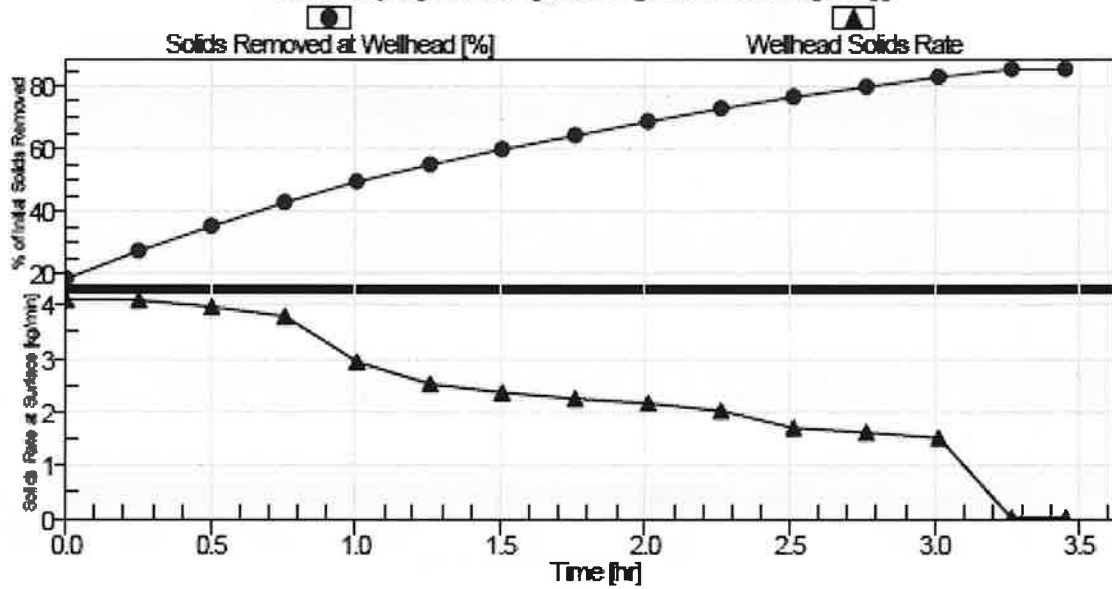
DIMENSION BID  
COILED TUBING SERVICES



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## Solids Removal after Penetration to Target Depth C'Iran Analysis [Transient response during Circulation and Wiper Trip]



## Tripping Speed to be used while Pulling Out of Hole

C'Iran Analysis

