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**Schlumberger**

Schlumberger Technology Corporation

Radiation & Explosive Compliance  
300 Schlumberger Drive, MD 121  
Sugar Land, TX 77478

August 10, 2011

Mr. Charles Cain  
United States Nuclear Regulatory Commission  
Region IV  
612 E. Lamar Blvd., Suite 400  
Arlington, Texas 76011-4125

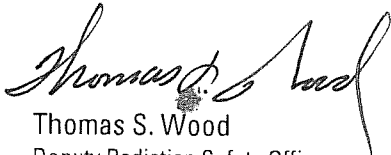
**RE: Source Abandonment for BHP Billiton Petroleum: OCS-G 20084 SB101 ST01**

Dear Mr. Cain,

This letter is to confirm the abandonment of an irretrievable logging source in a well in accordance with Part 39, Section 39.77(d). Information for this abandonment is attached.

If you have any questions or require additional information, please contact me at 281-285-7460.

Sincerely,



Thomas S. Wood  
Deputy Radiation Safety Officer  
Schlumberger Technology Corporation

Source Abandonment – BHP Billiton Petroleum  
Well: OCS-G 20084 SB101 ST01

Date of Occurrence: July 15, 2001

Source #1

Identification: 7.5 Ci, Am 241/Be, Neutron Source, Serial # Q1035  
Manufacturer: QSA Global, Inc.  
Model: NSR-T  
Depth: 20,979' MD

Source #2

Identification: 1.7 Ci, Cs 137, Density Source, Serial # A2520  
Manufacturer: QSA Global, Inc.  
Model: CDC.CY3 (GSR-Z)  
Depth: 20,886' MD

Well Identification: Company: BHP Billiton Petroleum (Americas) Inc.  
Well: OCS-G 20084 SB101 ST01  
API Number: 60-811-40579-00  
Field: Garden Banks 653

Seal Results: 219' of 16.8 ppg Class H Cement with 0.05 gal/sk D47 (Anitfoam) + 1% Red Dye by weight of cement + 0.06 gal/sk D145A (Dispersant) + 0.10 gal/sk D177 (Retarder) + 0.30 gal/sk D168 (Fluid Loss) was spotted in the annulus above the severed drill pipe from 20,719' to 20,496'. 260' of heavy weight drill pipe, collars, hydraulic jars and tool remain on top of the source from 20,979' – 20,719' and will serve as a mechanical deflection device to prevent inadvertent intrusion on the sources. Additionally, the whipstock set above the cement plug for the sidetrack will also serve as a mechanical deflection device.

Recovery Attempts: Multiple attempts from 07/12/11 to 07/15/11

Depth of Well: 21,101' MD (38.09° deviation)

Identification: Plaque as required by Part 39 ordered and will be attached to the well.

Reports: No other agency will receive a copy of this report.

Initial Telephone Contact: Mr. Chuck Cain, NRC Region IV on 07/12/11 @ 16:00 CDT.

## RADIATION FISHING & ABANDONMENT REPORT

☐ Offshore (OCS Waters) ☐ Land or State Lease Waters  
 Date: 13-July-2011 Time: 10:00 am  
 Company Name (Full Name): BHP Billiton Petroleum (Americas) Inc.  
 Well Name or (OCS-G No. or State Lease No.): OCS-G 20084 SB101 ST01  
 Offshore State of: Louisiana Rig Name: CR Lugis  
 API Number (If Available or CLSD): 60-811-40579-00 Field Name: Green Canyon 653 #10  
 Lease Location (legal): Green Canyon Block 653  
 County or Parish: N/A State: Louisiana  
 District: NGC D&M Sales Engr: Ron Blaisdell  
 TD: 21,101' MD Hole Size: 12 1/4" Deviation: 38.09 deg  
 Casing Depth: 21,060' MD Casing Size: 13 5/8"  
 Depth of Fish (Top): 20,719' (severed drill pipe) Bottom of Fish: 21,101' MD  
 Source Type (1): NSR-T Source Type (2): GSR-Z  
 Source Activity (1): 278 GBq (7.5 Ci) Source Activity (2): 63 GBq (1.7 Ci)  
 Serial No. (1): Q1035 Serial No. (2): A2520  
 Isotope (1): Am-241/Be Isotope (2): Cs-137  
 Depth (1): 20,979' MD Depth (2): 20,986' MD  
 Leak Test Date (1): 12-Apr-11 Leak Test Date (2): 12-Apr-11  
 Leak Test Results (1): See attached certificate Leak Test Results (2): See attached certificate  
 Tool String (Head to Bottom): Drill Pipe – SADN – MWD – StethoScope – ARC – PowerDrive - Bit

Date and Time Stuck: 12-Jul-11 @ 08:15  
 Date and Time Cement Pumped: 15-Jul-11 @ 01:30  
 Hole Conditions: Drilling out of casing, when became stuck

Fishing Attempts: Jarring attempts for ~60 hours with no movement in BHA.

Comments (what happened to get stuck?, etc.): 40' out of casing, drilling out cement when BHA became stuck. Could not rotate and could not move up or down.

**NOTE: Regulatory agencies should be contacted ONLY by the Schlumberger Technology Corporation (STC) Radiation Safety Officer or, if unavailable, his designee.**

Notified: ☒ NRC or ☐ State of : NRC – Region IV

Name:	Mr. Chuck Cain	Name:	
Date:	12-Jul-2011	Date:	
Time:	16:00 CDT	Time:	

## ABANDONMENT

The following is a summary of NRC and/or Agreement States regulations that **must** be followed when abandoning an irretrievable well logging source(s). The specific regulations are found in 10 CFR 39.15 and equivalent regulations in Agreement States.

An **irretrievable well logging source** means any licensed radioactive sealed source that becomes lodged in a well and cannot be retrieved after reasonable efforts have been made to recover the source(s).

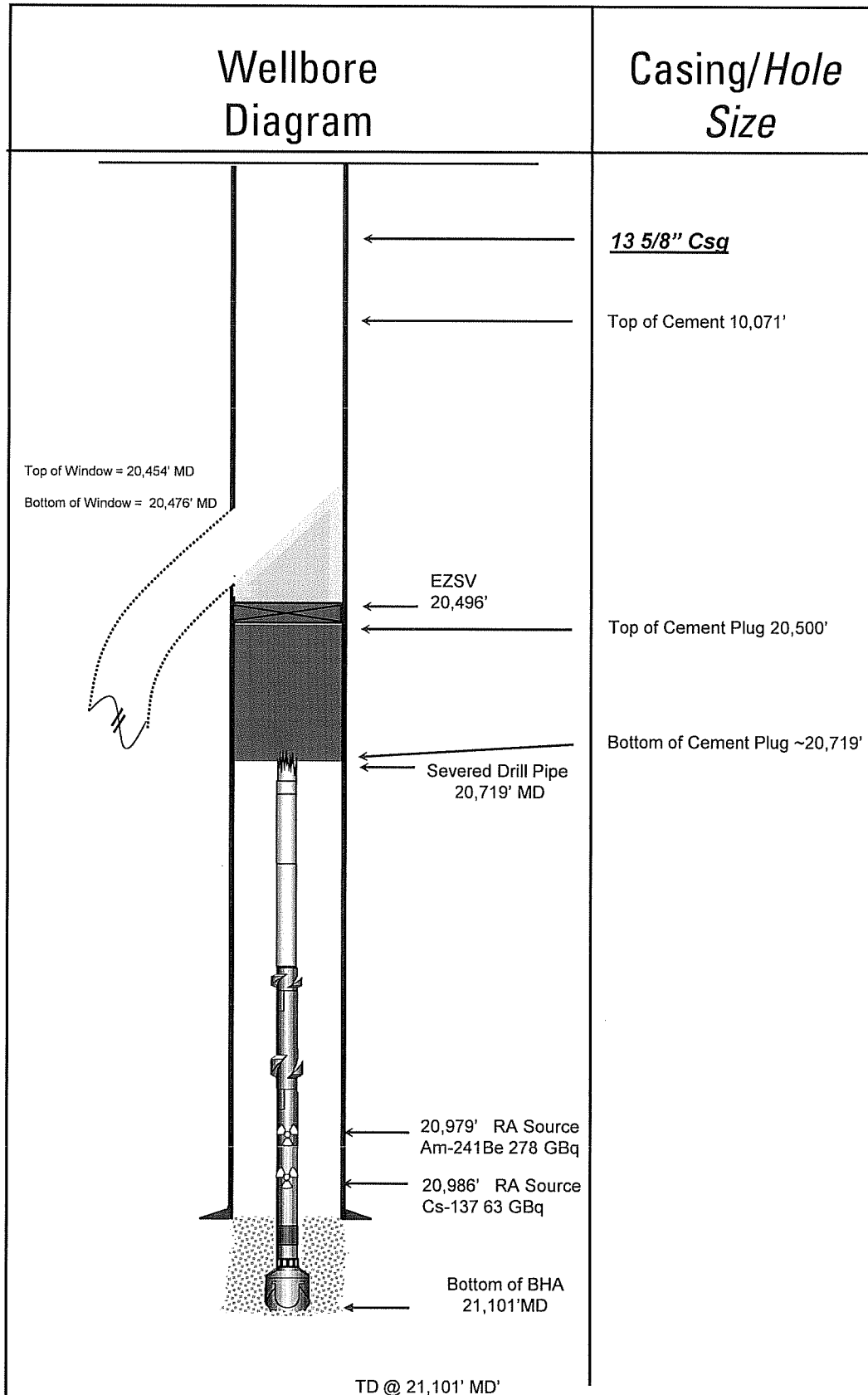
1. If a well logging source is irretrievable, the following requirements must be implemented.
  - a) The source(s) must be immobilized and sealed in place with a cement plug. The cement has to be dyed red in Texas as a condition of the Texas Railroad Commission (others occasionally).
  - b) A mechanical deflection device must be set at some point in the well above the cement plug to prevent inadvertent intrusion on the source, unless the cement plug and source(s) are not accessible to any subsequent drilling operations. The mechanical device can be devices such as a whipstock, old drill bit, etc. For LWD, drillpipe and/or collars left on top of the BHA usually are approved as a deflection device.
  - c) A permanent identification plaque, (supplied by the STC RSO) made of stainless steel (or brass, bronze and monel), must be mounted at the surface of the well unless the mounting of the plaque is not practical (i.e. subsea completion).
2. The STC RSO (or his designee) will notify the NRC or Agreement State of the abandonment plan developed by/with the client. The NRC or Agreement State must approve the abandonment plan prior to implementation. The federal and/or state oil and gas well permitting agency must also approve the abandonment plan. The contact with the well permitting agency is the responsibility of the well owner/client but we should advise him/her of that fact as a courtesy.
3. If any changes must be made to the abandonment plan submitted to the NRC or Agreement State, the STC RSO must be informed so that he/she can get approval of the modification, as appropriate. The actual abandonment must not begin until any abandonment plan or modification to that plan is approved by the appropriate agency.
4. The STC Radiation Safety Officer must file a written report with the NRC or Agreement State after the abandonment. The facility management shall file a written report **within 7 days** to the STC Radiation Safety Officer. The facility report should cover the final abandonment details such as:
  - a) Actual date of abandonment.
  - b) Any changes in the data sent with the approved abandonment plan.
  - c) Detailed Well Schematic depicting location and depth of tool(s), source(s), drill pipe, plugs, deflection device etc.
  - d) Any information pertinent to the abandonment that the STC RSO may not have for his/her final report.
  - e) If all data sent to the STC RSO is still applicable for the final report, an e-mail or fax is to be sent to the STC RSO confirming that fact so that he/she can be ensured that the data sent to the appropriate agency is totally accurate. Most facilities send a completely new report since many these documents often are incomplete or are poor quality fax reproductions.

If there are any questions regarding these procedures, discuss them with your Operations Manager.

**FACILITY MANAGEMENT MUST ENSURE THAT THE FINAL ABANDONMENT REPORT IS SUBMITTED TO THE STC RADIATION SAFETY OFFICER.**

# BHP Billiton Petroleum (Americas) Inc.

OCS-G 20084 SB101 ST01BP00





**Stuart Hunt**  
& Associates Ltd.

## SEALED RADIOACTIVE SOURCE LEAK TEST MEASUREMENT CERTIFICATE

**Company Name:** Schlumberger Canada Limited  
**Address:** Drilling & Measurements  
2 Panther Place  
Mount Pearl, Newfoundland  
A1N 5B1

**Certificate ID:** 001-00-011739  
**CNSC Licence Number:** 01821-6-14.0  
**Contact Person:** Andy Stamp  
**Telephone Number:** (709) 748-8204

### MEASUREMENT SYSTEM INFORMATION

**Measurement Date:** April 12, 2011  
**Measurement Method:** Gamma Counting –  
Packard COBRA II  
**Equipment Calibration Date:** April 12, 2011  
**Verification Date:** January 31, 2011

### MEASUREMENT DATA

<u>Radioisotope</u>	<u>Counting Efficiency</u>	<u>Background (CPM)</u>	<u>Minimum S-B</u>	<u>MDA (Bq)</u>
Americium-241/Be	77.4%	14.0	10.2	0.2
Cesium-137	11.9%	16.6	10.9	1.5

<u>Kit #</u>	<u>Source ID</u>	<u>Radioisotope</u>	<u>Gross CPM</u>	<u>Net DPM</u>	<u>Bq Value</u>	<u>Action Required</u>
1	NSRT-Q1035	Americium-241/Be	14.7	0.7	< 0.2	None Required
2	GSRZ-A2520	Cesium-137	16.0	0.0	< 1.5	None Required

\*Minimum S-B refers to the minimum number of counts above background that have to be recorded in order for the net CPM value to be considered significant at the 95% confidence level.

### CONCLUSIONS/ACTION REQUIRED

No evidence of removable radioactive contamination in excess of 200 becquerels is present.

**Name:** Marie-Josée Viens

**Signature:** *Marie-Josée Viens*



**Stuart Hunt**  
& Associates Ltd.

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### CONCLUSIONS/ACTION REQUIRED

No evidence of removable radioactive contamination in excess of 200 becquerels is present.

**Name:** Marie-Josée Viens

**Signature:** *Marie-Josée Viens*

## Daily Drilling Report

WELL NAME				SLOT NO		REPORT		DAYS ON WELL		DAYS FROM SPUD		DATE									
SHENZI SB101						49		48.85		42.25		7/14/2011									
DRILLING RIG		DRILLING SUPERVISOR				WELLSITE ENGINEER				POB		LAST CSG PRESSURE TST									
CR Luigs		P. DEVINE / J. MCCURLEY				C.DIXON				132		6/26/2011									
DEPTHS				DRILLED INTERVAL	HOURS ROT/IADC	AVG. ROP ROT/IADC	HOLE SIZE	MUD WEIGHT	LAST CASING												
WD	RTE	MD	TVD						SIZE	MD	TVD	LOT(EMW)									
4,237.0	81.0	24,930.00	22,729.37		/0.00	0 / 0	12.250(in)	13.60(ppg)	14,000(in)	21,060.20(ft)	19,676.00(ft)	15.30(ppg)									
DRILLS								BOP DATES			SAFETY MEETINGS										
FIRE		SPILL		MAN O'BRD		LIFEBOAT		PIT		EVACUATION		LAST BOP TEST		NEXT PRESSURE TEST		NEXT FUNCTION TEST		COMMITTEE MEETING		WEEKLY MEETING	
7/10/2011		7/2/2011		7/8/2011		7/10/2011		7/1/2011		7/10/2011		7/9/2011		7/23/2011		7/16/2011		4/24/2011		7/10/2011	
SAFETY DATA										OTHER / EXTRA											
BEHAVIORAL BASED AUDITS				BEHAVIORAL BASED CARDS				WRITTEN RISK ASSMNTS													
17				101				48													
PTW ISSUED		PTW AUDIT		PTW NOT AUDIT		STJ (TOFS)		AAR		HAZARD HUNT		TOTAL LIFTS		HANDS FREE LIFT							
13		15		0		16		48		1		58		58							
HSE SUMMARY																					
NO INCIDENTS, ACCIDENTS OR ENVIRONMENTAL ISSUES. T-TIME = 72hrs.																					
OPERATIONS SUMMARY																					
MAIN DERRICK																					
FROM - TO	CP	HRS	CODE	SUB	NPT	PHASE	MOC	DESCRIPTION OF OPERATIONS													
0:00 - 1:30	*	1.50	10	f		DRPRO2		RIH WITH WEATHERFORD SEVERING TOOL ON SCHLUMBERGER WIRELINE TO 20,700ft.													
1:30 - 2:30	*	1.00	10	d		DRPRO2		CONDUCTED WIRELINE CORRELATION LOG TO FIND DEPTH. RIH TO BELOW SHOT DEPTH AND PULLED 190klbs OVER NEUTRAL DRILL PIPE WEIGHT OF 710klbs. PERFORMED ON-DEPTH CORRELATION PASS. PERFORMED CREEP MEASUREMENT AT 1800fph. CREEP MEASUREMENT OF 1ft.													
2:30 - 3:00	*	0.50	10	f		DRPRO2		PULLED UP TO STOP DEPTH OF 20,758ft EQUALING A SHOT DEPTH OF 20,752ft. FIRED THE PIPE SEVERING EXPLOSIVES. UN-CLEAR ELECTRICAL INDICATION OF FIRE. NO CHANGE IN DP HOOKLOAD.													
3:00 - 3:30	*	0.50	13	f		DRPRO2		JARRED 3 TIMES. ATTEMPTED TO BREAK PIPE BY SLACKING OFF TO 650klbs AND PICKING UP TO 930klbs, EQUALING A MAX SLACK OFF WEIGHT OF 60klbs AND MAX OVERPULL OF 220klbs. NO LOSS IN HOOKLOAD NOTICED.													
3:30 - 5:30	*	2.00	10	a		DRPRO2		POOH WITH WIRELINE FROM 20,758ft TO 0ft. RIGGED DOWN IN PREPERATION FOR REMOVAL OF WIRELINE. ON SURFACE THE SEVERING PACKAGE INDICATED CHARGE DID FIRE. WIRELINE TOOLS LEFT IN HOLE INCLUDED THE CCL, SHOCK SUB , AND SEVERING GUN TOTALING 10.2ft.													
5:30 - 6:30	*	1.00	10	a		DRPRO2		RIGGED DOWN CEMENT CHIKSANS AND OTHER WIRELINE EQUIPMENT TO PREPARE TO WORK PIPE.													
6:30 - 9:30	*	3.00	5	a		DRPRO2		ESTABLISHED CIRCULATION DOWN DRILL PIPE WITH 28bpm. CIRCULATED BOTTOMS UP WITH 13.6ppg SOBM WHILE ATTEMPTING TO SEVER PIPE BY JARRING IN THE UP AND DOWN DIRECTIONS. ATTEMPTED TO SEVER DP BY APPLYING 50Kft-lbs RIGHT HAND TORQUE. OBSERVED SALT AND METAL SHAVINGS WHEN BOTTOMS UP REACHED THE SURFACE.													
9:30 - 11:00	*	1.50	10	a		DRPRO2		SCHLUMBERGER WIRELINE LOADED PIPE SEVERING GUN No2. INSTALLED WIRELINE IN TOP ENTRY SUB AND PICKED UP WIRELINE TOOLS. TOTAL LENGTH OF WIRELINE TOOLS WAS 30.9ft. TOTAL WEIGHT IN AIR OF 200lbs AND TOTAL WEIGHT IN MUD OF 160lbs.													
11:00 - 13:00	*	2.00	10	f		DRPRO2		TIH WITH WIRELINE FROM 0ft TO 20,719ft													
13:00 - 15:00	*	2.00	10	d		DRPRO2		RAN WIRELINE CORRELATION LOG TO CONFIRM DEPTHS WHILE PLACING 275klbs OVERPULL ON DP. EXAMINED AND CONFIRMED THE PLACEMENT OF THE JAR ON CCL LOG TO CONFIRM FIRING DEPTH.													
15:00 - 15:30	*	0.50	10	f		DRPRO2		PULLED TO WIRELINE STOP DEPTH OF 20,713ft EQUALING A FIRE DEPTH OF 20,719ft. FIRED THE WIRELINE CHARGE WITH 985klps P/U OR 275klps OVERPULL ON THE DP AT 20,719ft. NO CHANGE INDICATED ON DP HOOKLOAD. SAW 100lbs WIRELINE TENSION DROP FROM 5,530lbs TO 5,430lbs. ELECTRICAL INDICATION OF CHARGE DETONATION WAS WITNESSED. LOST COMMUNICATION WITH CCL AFTER DETONATION.													
15:30 - 17:00	*	1.50	10	f		DRPRO2		POOH WITH WIRELINE FROM 20,719ft TO 0ft. VISUALLY CONFIRMED WIRELINE DETONATION WHEN TOOLS CAME TO SURFACE. NO TOOLS LOST IN HOLE.													
17:00 - 18:00	*	1.00	10	a		DRPRO2		RIGGED DOWN WIRELINE SEVERING TOOL ASSEMBLY AND REMOVED WIRELINE FROM TOP ENTRY SUB ASSEMBLY.													
18:00 - 19:00	*	1.00	5	a		DRPRO2		ESTABLISHED CIRCULATION DOWN THE DP WITH 28bpm. PERFORMED JARRING OPERATIONS IN AN ATTEMPT TO FREE DP AT SEVERED POINT. MAX OVERPULL ALLOWED WAS 305klps INDICATING A HOOKLOAD OF 1,015klps. ATTEMPTED TO APPLY RIGHT HAND TORQUE TO DP BUT SWIVEL ASSEMBLY FAILED TO HOLD THE TORQUE.													
19:00 - 20:00	*	1.00	4	e	S	DRPRO2		RIGGED DOWN TOP ENTRY ASSEMBLY DUE TO FAILED STS SWIVEL AND LAID OUT ON SKATE. PICKED UP AND CONNECTED A DOUBLE OF DP.													
CURRENT STATUS		CIRCULATING BOTTOMS UP AFTER CEMENT PLUG JOB.												Well Costs							
24HR SUMMARY		TIH WITH WIRELINE TO SEVER PIPE. FIRED CHARGE AT 20,719ft. POOH WITH WIRELINE. JARRED AND TORQUED UNTIL PIPE PARTED. CIRCULATED BOTTOMS POOH WITH SEVERED PIPE AND PICK UP CASING SCRAPER ASSEMBLY. RIH AND DRESS CASING FOR WHIPSTOCK.										AFE		ACTUAL							
24HR FORECAST												DAILY				929,691.00					
												CUMULATIVE		101,868,785.00		59,600,870.00					

## Daily Drilling Report

WELL NAME	SLOT NO	REPORT	DAYS ON WELL	DAYS FROM SPUD	DATE
SHENZI SB101		49	48.85	42.25	7/14/2011

## OPERATIONS SUMMARY

## MAIN DERRICK

FROM - TO	CP	HRS	CODE	SUB	NPT	PHASE	MOC	DESCRIPTION OF OPERATIONS
20:00 - 20:30	*	0.50	13	f		DRPRO2		SLACKED OFF TO NEUTRAL WEIGHT OF 710kips AND APPLIED 50kft-lbs TORQUE TO DP. PIPE STALLED MOMENTARILY AND BROKE FREE.
20:30 - 22:30	*	2.00	5	a		DRPRO2		CIRCULATED BOTTOMS UP AT 20,719ft. WITNESSED SMALL PIECES OF SHALE, CEMENT, AND METAL SHAVINGS ON BOTTOMS UP.
22:30 - 23:00	*	0.50	7	a		DRPRO2		LAID OUT DOUBLE OF DP AND RIGGED UP SIDE ENTRY CEMENT STAND. ATTACHED CHIKSANS TO CEMENT STAND. PULLED UP TO 20,714ft.
23:00 - 23:15	*	0.25	13	i		DRPRO2		HELD THINK PLAN FOR CEMENT JOB.
23:15 - 0:00	*	0.75	7	i		DRPRO2		PUMPED 10bbls OF 15.3ppg MUDPUSHII SPACER WITH SURFACTANT. TESTED CEMENT LINES TO 5,000psi FOR 5min. PUMPED 50bbls MUDPUSHII SPACER WITH SURFACTANT AND 25bbls OF MUDPUSHII WITHOUT SURFACTANT.

## OFFLINE ACTIVITY

FROM - TO	CP	HRS	CODE	SUB	NPT	PHASE	MOC	DESCRIPTION OF OPERATIONS
18:00 - 18:30		0.50	4	e		DRPRO2		BUCK UP DOUBLE OF 34lb DP FROM 0ft TO 64ft.
18:30 - 21:00		2.50				DRPRO2		BUCKED DOWN ARTICULATING TOP ENTRY SUB ASSEMBLY FROM 87ft TO 0ft.

## MAIN DERRICK - FOR NEXT REPORTING PERIOD

FROM - TO	CP	HRS	CODE	SUB	NPT	PHASE	MOC	DESCRIPTION OF OPERATIONS
0:00 - 0:30	*	0.50	7	d		DRPRO2		MIXED AND PUMPED 60bbls OF 16.8ppg CLASS H CEMENT WITH 0.05gal PER SACK D47 (ANTIFOAM) + 1% RED DYE BY WEIGHT OF CEMENT (DYE) + 0.06gal PER SACK D145A (DISPERSANT) + 0.10 gal PER SACK D177 (RETARDER) + 0.30 gal PER SACK D168 (FLUID LOSS).
0:30 - 1:30	*	1.00	7	e		DRPRO2		PUMPED 21bbl OF MUDPUSHII WITHOUT SURFACTANT. RIGGED DOWN CHIKSAN FROM CEMENT HEAD. SWITCHED TO RIG PUMPS AND DISPLACED WITH 568bbls OF 13.6ppg SOBM. RECIPROCATING AND ROTATING WHILE DISPLACING. INITIAL PUMP PRESSURE WAS 1,045psi AND FINAL PRESSURE WAS 1,600psi. LIFT PRESSURE WAS 555psi.
								NOTE: THERE WERE 50bbls OF LOSSES WHILE PUMPING THE SPACER AND CEMENTING AND 51bbls OF LOSSES WHILE DISPLACING.
1:30 - 2:00	*	0.50	4	a		DRPRO2		POOH WITH 6 STANDS OF 6.625in DP FROM 20,714ft TO 20,130ft.
2:00 - 5:00	*	3.00	5	a		DRPRO2		CIRCULATING BOTTOMS UP AT 28bpm WITH 4,850psi. PERFORMED POST JAR INSPECTION ON TDS. SAW TRACE AMOUNTS OF CEMENT AT BOTTOMS UP AND NO RED DYE.
								NOTE: LOST 50bbls TO THE HOLE WHILE CIRCULATING BOTTOMS UP AND ANOTHER 33bbls ON CUTTINGS AND CEMENT.
5:00 - 6:00	*	1.00	4	e		DRPRO2		POOH WITH 6.625in DP FROM 20,130ft TO 19,500ft.

**BHP Billiton Petroleum Ltd**  
**Daily Drilling Report**

7/15/2011 6:01:48AM Page 3 of 4

WELL NAME	SLOT NO	REPORT	DAYS ON WELL	DAYS FROM SPUD	DATE
SHENZI SB101		49	48.85	42.25	7/14/2011

BIT DATA			MUD DATA						
BIT NO	1		TYPE 1: SYNTHETIC MUD				TIME/LOC		01:08
RUN NO:	1		TYPE 2				TIME/LOC		
SIZE (in)	12.250		DEPTH MD (ft)	21,101.00		POLYMER (lbm/bbl)		K+ (ppm)	
MANUF	SMITH		TEMP (°F)			SAND (%)		HGS/LGS (lbm/bbl)	273.2/57.1
TYPE	MDSI716LSBPXX		DENSITY (ppg)	13.60		SOLIDS (%)	24.80	CA+ (ppm)	0
IADC CODE	M423		ECD (ppg)			OIL (%)	52.5	LIME (lbm/bbl)	
SERIAL NO	JE1633		FUN VIS (s/qt)	85		H2O (%)	21.0	CaCl2 (%)	13.96
JETS	4X15 / 3X14		PV/YP (cp) (lb/100ft²)	39/29		MBT (lbm/bbl)		WPS (%)	
TFA (in²)	1.141		GELS (lb/100ft²)	12-22-25		PH	0	OIL/H2O (%)	71.0/28.0
DEPTH IN (ft)	21,060.00		APIWL (cc/30min)			Pm (cc)		ES (Volts)	474.0
DEPTH OUT (ft)	21,060.00		HTHP WL (cc/30min)	2.0		Pf/Mf (cc/cc)	/	Clom	35,000
DRILLED (Daily/Cum) (ft)	0.00 / 0.00		API FC (32nd")			NaCl (%)		Excess Lime	
HRS OB (Daily/Cum)	0.00 / 0.00		COMMENT 1						
ROP OB (Daily/Cum)			COMMENT 2						
WOB (MIN/MAX)	/		MUD VOLUME						
BIT RPM (MIN/MAX)	/		STRING (bbl)	ANNULUS (bbl)	PITS (bbl)	CHOKE/KILL (bbl)	RISER (bbl)	BOOST LINE (bbl)	TOTAL (bbl)
COND (I/O/L)			632.2	1,761.9	5,540.0	170.0	1,441.0	66.3	9,611.40
(BGOR)			PUMP DATA						
KREVS			NUMBER	LINER (in)	STROKE (in)	EFFICIENCY (%)	PRESSURE(PSI)	SPM	GPM
Bit 1 Comment	BIT DESIGNED WITH ONYX CUTTERS AND		1		14.00				
Bit 2 Comment			2	6.000	14.00	97.00	4,850.00	240.00	1,196.8
			3		14.00				
			4		14.00				

**LAST BHA DATA -- BHA NO: 12.25in Kickoff BHA -- BIT NO: 1 / 12.250 / 12.25in Sidetrack BHA**

ITEM	OD(In)	ID(In)	JTS	LENGTH / CUM(FT)		ITEM	OD(In)	ID(In)	JTS	LENGTH / CUM(FT)	
SMITH MDSI716LSBPXX	12.250			0.95	0.95	6-5/8 SPIRAL HWDP	8.000	4.500	4	122.05	428.08
PD900X5 W/GR	9.188	3.063		13.85	14.80	SMITH DRLG JAR	8.000	3.000		31.90	459.98
12.125in STAB	9.875	3.063		6.11	20.91	6-5/8 SPIRAL HWDP	8.000	4.500	8	245.15	705.13
ARCVISION	8.375	4.250		20.21	41.12	SMITH ACCELERATOR	8.000	3.000		33.40	738.53
StethoScope W/ 12in STABILIZER	8.375	4.250		34.97	76.09	6-5/8 SPIRAL HWDP	8.000	4.500	2	61.89	800.42
TELESCOPE 825	8.375	4.250		27.61	103.70	DRILQUIP WSRT	9.750	3.000		7.18	807.60
SADN W/ 12in STABILIZER	8.125	6.810		30.36	134.06	6-5/8 SPIRAL HWDP	8.000	4.500	1	31.03	838.63
MASHBURN FILTER	7.938	3.500		7.96	142.02	DART SUB	8.250	3.875		2.22	840.85
2 - 8.25in DCs	8.250	2.875	2	61.18	203.20						
12.125in IB SPIRAL STAB	7.750	2.813		7.24	210.44						
3 - 8.25in DCs	8.250	2.875	3	92.76	303.20						
6-5/8REGP x 6-5/8FHB	8.250	2.875		2.83	306.03						

WEIGHT(klp)				TORQUE(ft-lbf)			
UP	DWN	ROT	BELOW JARS	ON BTM	OFF BTM	ROT	

BULK								
	Unit	Start	Used	Received	Returned	Adjusted	Available	Comments
WASTE OIL	bbl	158.00		27.00			185.00	
POT WATER	bbl	6,686.00	275.00	376.00			6,787.00	
DRILL WATER	bbl	8,900.00	232.00				8,668.00	
BARITE	sx	11,259.00	647.00				10,612.00	
FUEL OIL	bbl	31,029.00	286.00				30,743.00	

## Daily Drilling Report

WELL NAME	SLOT NO	REPORT	DAYS ON WELL	DAYS FROM SPUD	DATE
SHENZI SB101		49	48.85	42.25	7/14/2011

## SUPPORT CRAFT

NAME	TYPE	COMMENTS
ALLIE CHQUEST	SUPPLY BOAT	AT SMITH
AMBER	SUPPLY BOAT	AT RCS
C-PERFORMER	SUPPLY BOAT	AT DD1
FAST SKIPPER	SUPPLY BOAT	ENROUTE TO DD1 ETA 0930
HARVEY CARRIER	SUPPLY BOAT	AT FOURCHON BASE
HELICOPTER S76	HELICOPTER	1 x S76
HELICOPTER S92	HELICOPTER	1 x S92
JASON McCALL	SUPPLY BOAT	AT FOURCHON BASE
SEACOR DAVIS	SUPPLY BOAT	AT STLP

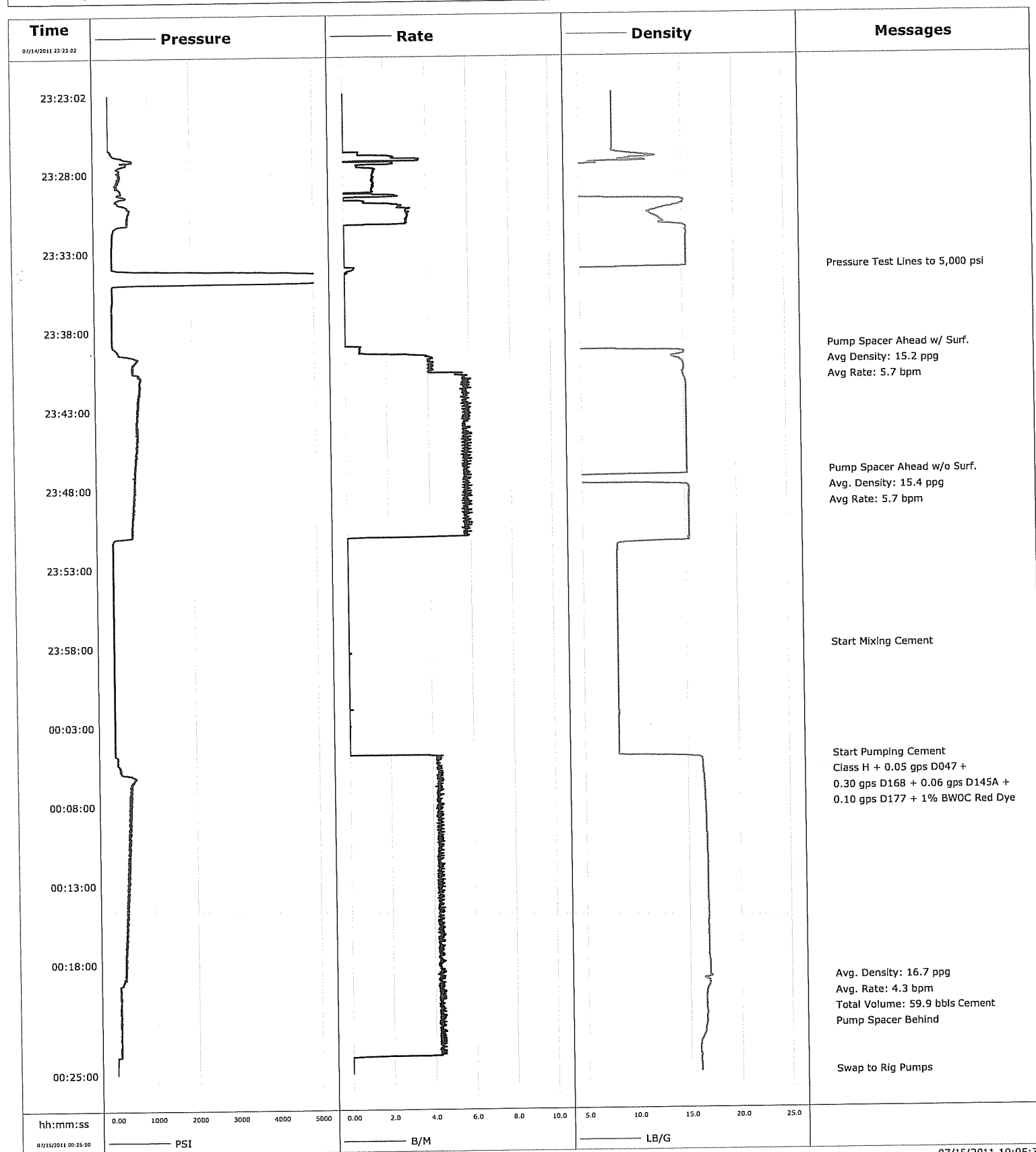
## SURVEY DATA

TYPE	VS AZIMUTH	MD	INCLINATION	AZIMUTH	TVD	N/S (-)	EW (-)	V. SECTION	DLS	BUR

## COMMENTS

WEATHER AND VESSEL MOTION: WIND:8kts SW, SEAS: 0-2ft, SWELL: 0-2ft, PITCH: 0.1°, ROLL: 0.1°, HEAVE: 0.4ft, CURRENT SPEED: 2.5kts, CURRENT DIRECTION: 220°

<b>Well</b>	Shenzi SB 101	<b>Client</b>	bhp Billiton
<b>Field</b>	GC 653 #10	<b>SIR No.</b>	Fish PnA
<b>Engineer</b>	Chris McDaniel	<b>Job Type</b>	Plug
<b>Country</b>	USA	<b>Job Date</b>	7-14-11





# Deepwater Cementing Program

<b>Company</b>	bhp Billiton
<b>Well Name</b>	Shenzi B1-1
<b>Casing String</b>	Abandonment Plug Program
<b>Prepared for</b>	Shenzi Drilling Team
<b>Prepared by</b>	Chris McDaniel – bhp Billiton In-House Engineer
<b>Date</b>	13 July 2011

**Schlumberger**



## FINAL Rev1:Shenzi B1-1 – Abandonment Plug

Corresponds to cfw file: shenzi b1-1 cemcade final st kop\_rev8.cfw

### Approvals

	Name	Signature	Date
Author	Chris McDaniel		
Schlumberger Review			
Schlumberger Approval	Travis Baughman – SLB FSM		
Customer Approval	Chad Hurta – Drilling Engineer		
Customer Approval	Andy Reed – Drilling Supervisor		

### Distribution List:

- Shenzi WI Drill Team: Chad Hurta – Drilling Engineer, Andy Reed – Drilling Supervisor, Scott Lind– Drilling Superintendent
- WS NGC: C. McDaniel – CL, T. Baughman – DESC, T. Sutton – FOM, CR Luigs Cementing Crew (M. Clymer, D. McDougal, B. Stiles, R. Edwards)

### Revision History

Date	Version	Description	Author
07/13/11	FINAL_Rev1	PnA CEMCADE Final_rev1	Chris McDaniel

### **MOC CONTACT INFORMATION (notify if changes made to this report)**

Travis Baughman – 412-719-6469  
Chris McDaniel – 832-350-2814

Client : bhp Billiton  
String : Abandonment Plug  
Country : US

Well : Shenzi B1-1  
District : Houston Offshore  
Loadcase : Abandonment Plug

**Schlumberger**

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## 2. Job Objective

---

- Provide competent cement plug to allow for tagging at or above 20,565' MD within 24 hours after placement.
- Pump red-dyed cement to mark radioactive source in hole to any future drilling operations.

Client : bhp Billiton  
String : Abandonment Plug  
Country : US

Well : Shenzi B1-1  
District : Houston Offshore  
Loadcase : Abandonment Plug

**Schlumberger**

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### 3. Client Provided Data / Design Assumptions

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- Well will be static with no flow detected prior to or during running casing.
- Provided Temperature Model matches that of actual downhole conditions.
- Provided Pore Pressure / Fracture Gradients match that of actual downhole conditions.

Client : bhp Billiton  
String : Abandonment Plug  
Country : US

Well : Shenzi B1-1  
District : Houston Offshore  
Loadcase : Abandonment Plug

**Schlumberger**

## CemCADE<sup>\*</sup> well cementing recommendation for Abandonment Plug

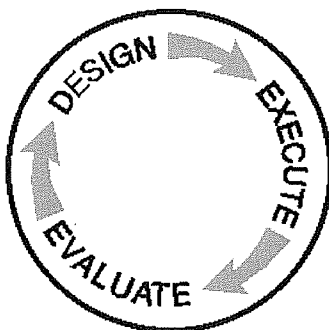
**Operator** : bhp Billiton  
Country : US  
State : LA

**Well** : **Shenzi B1-1**  
Field : GC 653

**Prepared for** : **Shenzi Drilling Team**  
Proposal No. : final  
Date Prepared : 07/13/2011

**Location** : **CR Luigs**  
Service Point : Houston Offshore  
Business Phone : 281-285-1050  
FAX No. : 281-285-1090

Prepared by : C. McDaniel  
Phone : 832-350-2814  
E-Mail Address : cmcdaniel@slb.com



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\* Mark of Schlumberger

Client : bhp Billiton  
String : Abandonment Plug  
Country : US

Well : Shenzi B1-1  
District : Houston Offshore  
Loadcase : Abandonment Plug



## Well Description

Configuration : Plug  
Stage : Single  
Rig Type : Floating Offshore  
Fluids Return to : RIG\_FLOOR  
Mean Sea Level : 81.0 ft  
Well Head Depth : 4303.0 ft  
Riser ID : 19.750 in  
Total MD : 21101.0 ft  
BHST : 153 degF  
Bit Size : 12 1/4 in

Previous String			
MD (ft)	OD (in)	Weight (lb/ft)	ID (in)
12760.0	13 5/8	88.2	12.372
21060.0	14	112.6	12.417

Drill Pipe						
MD (ft)	OD (in)	Weight (lb/ft)	ID (in)	Grade	Collapse (psi)	Burst (psi)
5909.0	6 5/8	34.0	5.483	S-135	12435	17019
15535.0	6 5/8	32.7	5.566	S-135	11183	16809
20294.0	6 5/8	27.7	5.793	S-135	4562	12066
20325.0	6 5/8	63.0	4.376	S-135		
20332.0	9 3/4	N/A	3.000	Wear Sleeve		
				Running Tool		
20394.0	6 5/8	63.0	4.376	S-135		
20427.0	8	N/A	3.000	Accelerator		
20672.0	6 5/8	63.0	4.376	S-135		
20704.0	8	N/A	3.000	Jar		
20765.0	6 5/8	63.0	4.376	S-135		

Directional Data has been included in the simulation but omitted from this report for brevity.

Max. Deviation Angle : 38 deg  
Max. DLS : 1.821 deg/100ft

Formation Data				
MD (ft)	Frac. (lbm/gal)	Pore (lbm/gal)	Name	Lithology
21020.0	16.70	12.45		Evaporite
21060.0	15.50	12.45	14" FIT	Shale
21101.0	15.05	12.30		Sandstone

Reference depth for pressure conversion to equivalent density or pressure gradient is RIG\_FLOOR

Ref: Drilling Program Shenzi SB101: Doc # SHE-BHP-03-DR-PR-0219: Section 1.11: PP vs. FG Curve Whole Well

Client : bhp Billiton  
String : Abandonment Plug  
Country : US

Well : Shenzi B1-1  
District : Houston Offshore  
Loadcase : Abandonment Plug



Geothermal Temperature Profile			
MD (ft)	TVD (ft)	Temperature (degF)	Gradient (degF/100ft)
0.0	0.0	80	0.0
81.0	81.0	80	-0.0
581.0	581.0	60	-3.4
1081.0	1081.0	50	-2.8
1581.0	1581.0	45	-2.2
2081.0	2081.0	42	-1.8
2581.0	2581.0	40	-1.6
3081.0	3081.0	39	-1.3
4303.0	4303.0	39	-1.0
10368.0	10367.5	115	0.3
21020.0	19643.0	153	0.4
24930.0	22605.7	188	0.5

Ref: Drilling Program Shenzi SB101: Doc # SHE-BHP-03-DR-PR-0219: Section 1.9: Temperature Profile

Supra Salt: 1.26°F / 100'

Salt: 0.41°F / 100'

Sub Salt 1.15°F / 100'

Sea Current Velocity (Default)		
MD (ft)	Temperature (degF)	Sea Current (ft/min)
81.0	80	10.13
581.0	60	10.13
1081.0	50	10.13
1581.0	45	10.13
2081.0	42	10.13
2581.0	40	10.13
3081.0	39	10.13
4303.0	39	10.13

Client : bhp Billiton  
String : Abandonment Plug  
Country : US

Well : Shenzi B1-1  
District : Houston Offshore  
Loadcase : Abandonment Plug



## Fluid Sequence

<b>Original fluid</b>	13.9 DH ppg Accolade k : 6.73E-3 lbf.s^n/ft2	13.90 lb/gal n : 0.716	Ty : 9.38 lbf/100ft2
<b>Displacement Volume</b>	613.1 bbl (Including Spacer Behind)		
<b>Drill Pipe Volume</b>	625.5 bbl		
<b>TOC</b>	20365.0 ft (After DP is removed)		

Name	Volume (bbl)	Ann. Len (ft)	Top (ft)	Fluid Sequence		Rheology	
				Density (lb/gal)			
15.30 ppg w Surf MPII	60.0	560.0	19509.2	15.30	k:1.34E-2 lbf.s^n/ft2	n:0.638	Ty:14.29 lbf/100ft2
15.30 ppg w/out Surf MPII	25.0	233.3	20069.2	15.30	k:1.81E-2 lbf.s^n/ft2	n:0.536	Ty:10.34 lbf/100ft2
16.8 ppg Plug	59.9	462.4	20302.6	16.80	k:4.44E-2 lbf.s^n/ft2	n:0.682	Ty:0.01 lbf/100ft2
15.30 ppg w/out Surf MPII	21.3		19518.6	15.30	k:1.81E-2 lbf.s^n/ft2	n:0.536	Ty:10.34 lbf/100ft2
13.9 DH ppg Accolade	591.8		10.3	13.90	k:6.73E-3 lbf.s^n/ft2	n:0.716	Ty:9.38 lbf/100ft2

Cement volume based on 400' Plug after POOH

Displacement volume include underdisplacement of 3.5 bbls.

This is the recommended displacement for balance after POOH.

### Static Security Checks :

Frac	1077 psi	at 21101.0 ft
Pore	1602 psi	at 21065.0 ft

Client : bhp Billiton  
String : Abandonment Plug  
Country : US

Well : Shenzi B1-1  
District : Houston Offshore  
Loadcase : Abandonment Plug



## Fluid Description

### 13.9 DH ppg Accolade DESIGN

Rheo. Model : HERSCHEL\_B.

Density : 13.90 lb/gal  
k : 6.73E-3 lbf.s<sup>n</sup>/ft<sup>2</sup>  
n : 0.716  
Ty : 9.38 lbf/100ft<sup>2</sup>  
Gel Strength : 22.41 lbf/100ft<sup>2</sup>

#### **MUD**

Mud Type : SBM  
Water Type : Fresh

#### **VOLUME FRACTION**

Solids : 25.3 %  
Oil : 51.5 %  
Water : 23.2 %

### 15.30 ppg w Surf MPII DESIGN

Rheo. Model : HERSCHEL\_B.

Density : 15.30 lb/gal  
k : 1.34E-2 lbf.s<sup>n</sup>/ft<sup>2</sup>  
n : 0.638  
Ty : 14.29 lbf/100ft<sup>2</sup>

#### **Spacer Mixing Instructions**

**NOTE: Do not prepare spacer more than 24 hours prior to job.**

**Recipe Prepares 60 bbls.**

**Add 44.3 bbls Water to 50 bbl Batch Mixer.**

**Add 12 gal D047**

**Add 200 lbs D182.**

**Let D182 hydrate for at least 30 minutes.**

**Weight up to 15.3 ppg using Barite (±22,800 lbs)**

#### **Spacer QA/QC Instructions:**

**After spacer is mixed, take rheology readings on a sample and compare to:**

RPM	Dial Reading
200	57
100	42
6	17
3	15

Client : bhp Billiton  
String : Abandonment Plug  
Country : US

Well : Shenzi B1-1  
District : Houston Offshore  
Loadcase : Abandonment Plug

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**15.30 ppg w/out Surf MPII DESIGN**

Rheo. Model : HERSCHEL\_B.

Density : 15.30 lb/gal  
k :  $1.81E-2 \text{ lbf.s}^n/\text{ft}^2$   
n : 0.536  
Ty : 10.34 lbf/100ft<sup>2</sup>

**Spacer Mixing Instructions**

**NOTE: Do not prepare spacer more than 24 hours prior to job.  
Recipe Prepares 60 bbls.**

**Add 41.4 bbls Water to 50 bbl Batch Mixer.  
Add 12 gal D047  
Add 186 lbs D182.  
Let D182 hydrate for at least 30 minutes.  
Weight up to 15.7 ppg using Barite ( $\pm 23,000$  lbs)**

**Prior to job add 60 gal of B166 & B167.**

Client : bhp Billiton  
String : Abandonment Plug  
Country : US

Well : Shenzi B1-1  
District : Houston Offshore  
Loadcase : Abandonment Plug

**Schlumberger**

### 16.8 ppg Plug DESIGN

Rheo. Model : HERSCHEL\_B.

Density : 16.80 lb/gal  
k : 4.44E-2 lbf.s^n/ft2  
n : 0.682  
Ty : 0.01 lbf/100ft2  
Gel Strength : 20.28 lbf/100ft2

#### DESIGN

##### BLEND

Name : H  
Dry Density : 197.27 lb/ft3  
Sack Weight : 94 lb

##### SLURRY

Mix Fluid : 4.072 gal/sk  
Yield : 1.02 ft3/sk  
Solid Fraction : 46.7 %

Job volume : 59.9 bbl  
Quantity : 329.50 sk

##### BASE FLUID

Type : Fresh water  
Density : 8.32 lb/gal  
Base Fluid : 3.562 gal/sk

Additives		
Code	Conc.	Function
D168	0.300 gal/sk blend	Fluid loss
D145A	0.060 gal/sk blend	Dispersant
D177	0.100 gal/sk blend	Retarder
D047	0.050 gal/sk blend	Antifoam
Red Dye	1% BWOC	Dye

Thickening Time	70 Bc	at	05:42 hr:mn
Compressive Strength	500 psi	at	PENDING hr:mn

As a method of warning for any future drill operations in or near this wellbore, the cement placed above the radioactive source in order to isolate and abandon the fish will be dyed red. If drilled up, the cement returns to surface will caution drillers that a radioactive source has been abandoned beneath this plug.

Add Red Dye @ 5.5 lbs / bbl Cement Slurry

-- Equals --

29.3 lbs / Displacement Tank

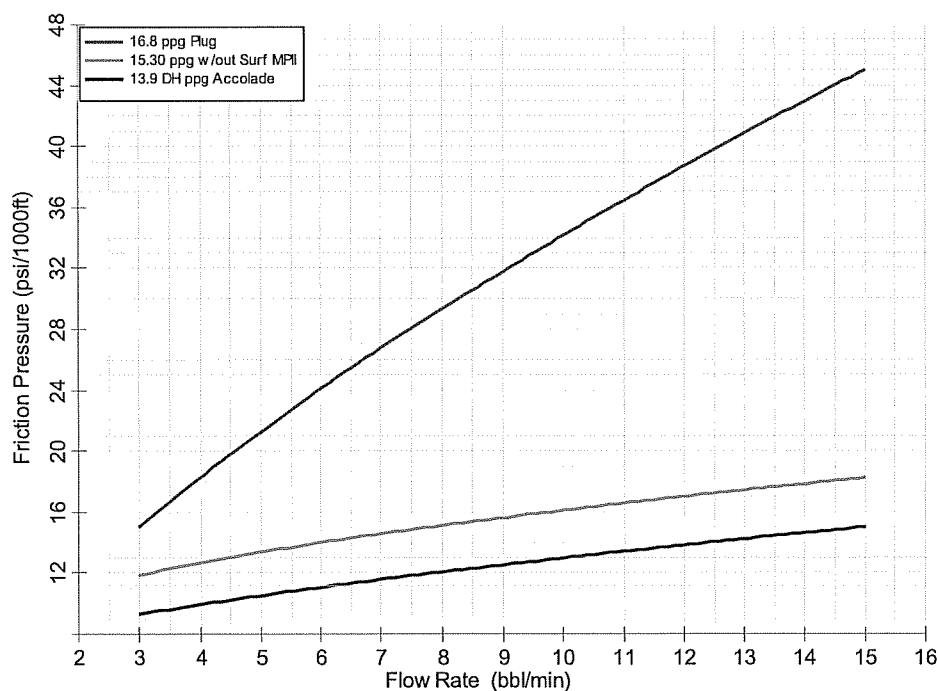
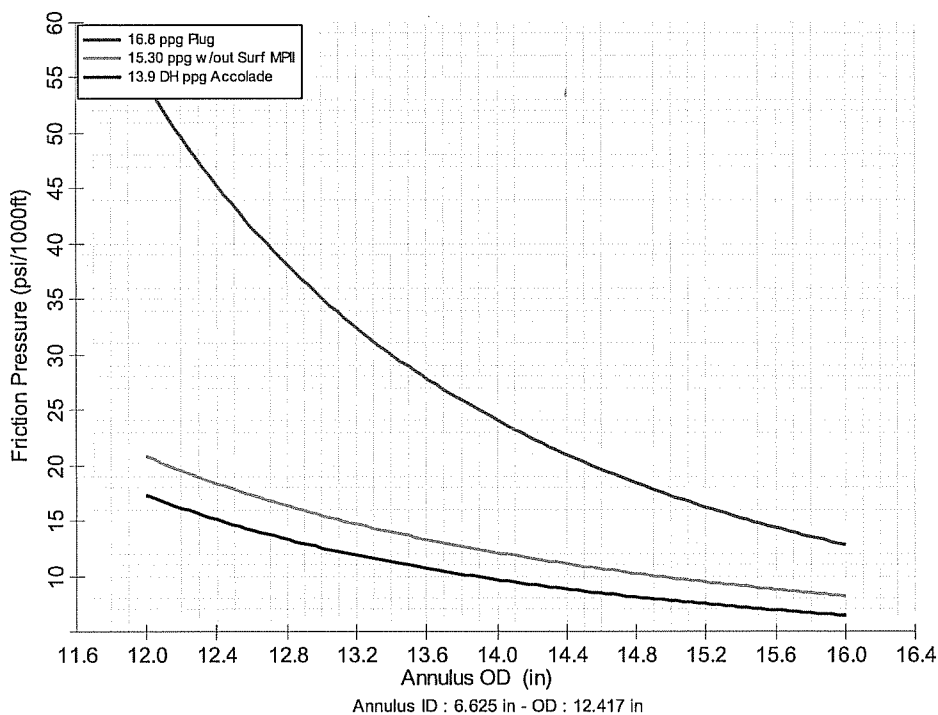
Client : bhp Billiton  
String : Abandonment Plug  
Country : US

Well : Shenzi B1-1  
District : Houston Offshore  
Loadcase : Abandonment Plug

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## Rheologic Hierarchy

Annulus ID : 6.625 in  
Flow Rate : 15.0 bbl/min



Client : bhp Billiton  
String : Abandonment Plug  
Country : US

Well : Shenzi B1-1  
District : Houston Offshore  
Loadcase : Abandonment Plug



## Pumping Schedule

Primary Silo for Cementation: Silo 4

Name	Flow Rate (bbl/min)	Volume (bbl)	Pumping Schedule		Inj. Temp. (degF)	Comments
			Stage Time (min)	Cum.Vol (bbl).		
15.30 ppg w Surf MPII	2.0	10.0	5.0	10.0	80	Break Circulation
Pause	0.0	0.0	10.0	0.0	80	Test Lines to 5,000 psi
15.30 ppg w Surf MPII	7.0	50.0	7.1	60.0	80	Pump Spacer Ahead
15.30 ppg w/out Surf MPII	7.0	25.0	3.6	25.0	80	Pump Spacer Ahead
Pause	0.0	0.0	10.0	0.0	80	Clean Unit / Prepare Chemicals
16.8 ppg Plug	5.0	59.9	12.0	59.9	80	Mix and Pump Slurry
15.30 ppg w/out Surf MPII	5.0	21.3	4.3	21.3	80	Pump Spacer Behind
Pause	0.0	0.0	5.0	0.0	80	Swap to Rig Pumps
13.9 DH ppg Accolade	15.0	591.8	39.5	591.8	80	Rig Displace

Total 01:36 758.1 bbl  
hr:mn

\*Total Job Time: 01:36 hr:mn

\*Total Cementing Time: 01:01 hr:mn

Cement Thickening Time: 05:42 hr:mn

WOC: PENDING

\*Job times do not include time to trip out of cement plug.

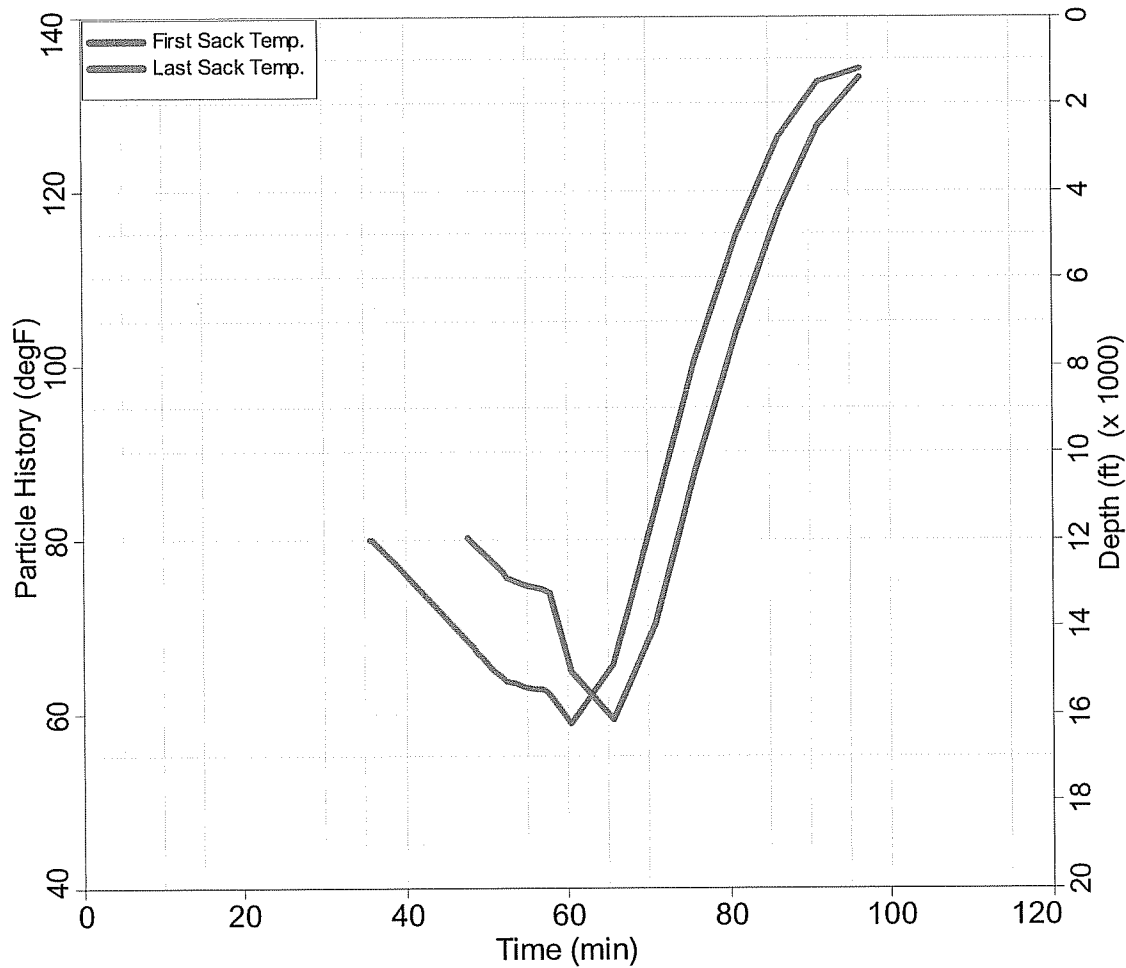
Dynamic Security Checks :		
Frac	789 psi	at 21101.0 ft
Pore	1501 psi	at 21065.0 ft

Client : bhp Billiton  
String : Abandonment Plug  
Country : US

Well : Shenzi B1-1  
District : Houston Offshore  
Loadcase : Abandonment Plug

**Schlumberger**

## Temperature



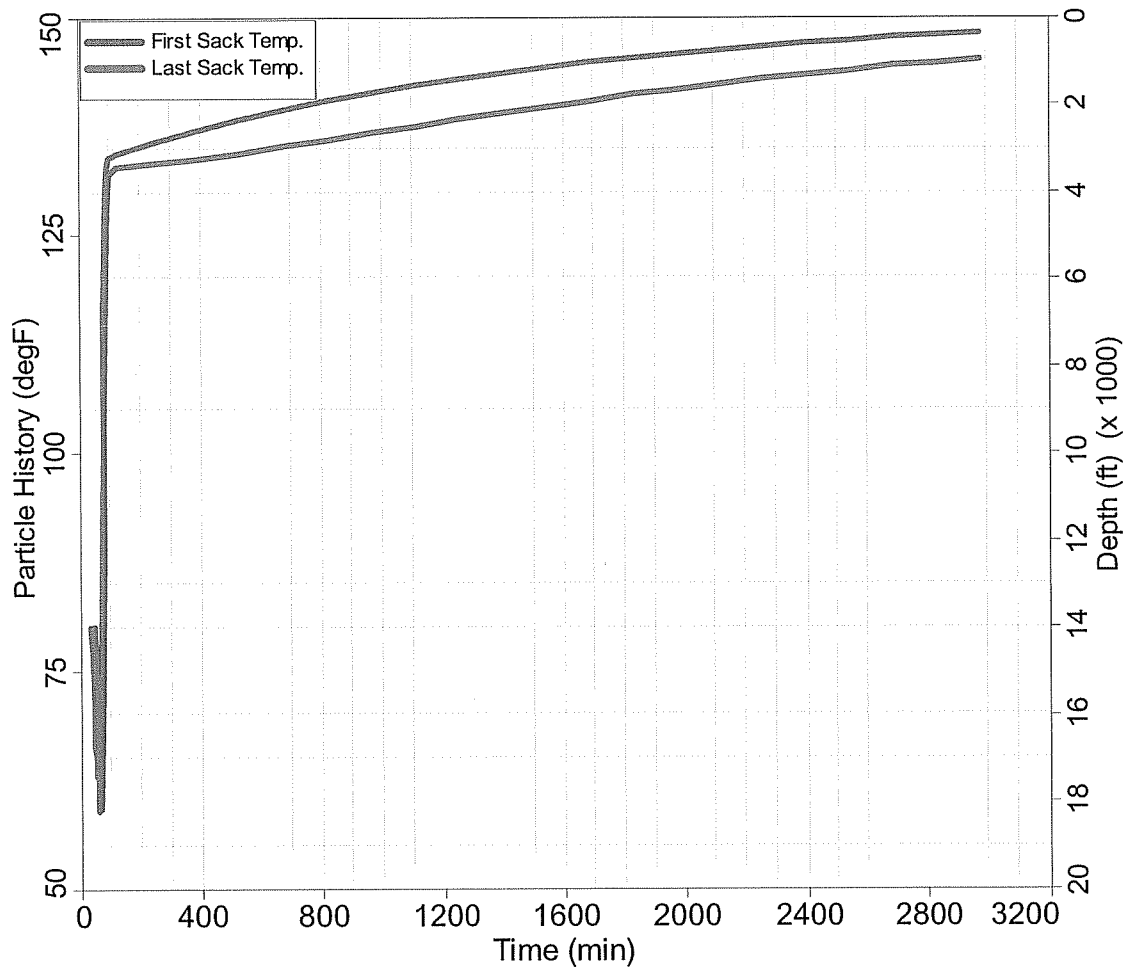
"Temperature Profile" allows us to understand the temperature experienced by the slurry as it travels down the wellbore in 'placement.' The graph above shows the temperature particle history of the first and last sacks pumped. These values allow an understanding of high and low temperature variance throughout the job. This information is used to simulate the temperature changes during the laboratory testing of cement properties.

Client : bhp Billiton  
String : Abandonment Plug  
Country : US

Well : Shenzi B1-1  
District : Houston Offshore  
Loadcase : Abandonment Plug

**Schlumberger**

## Temperature Recovery



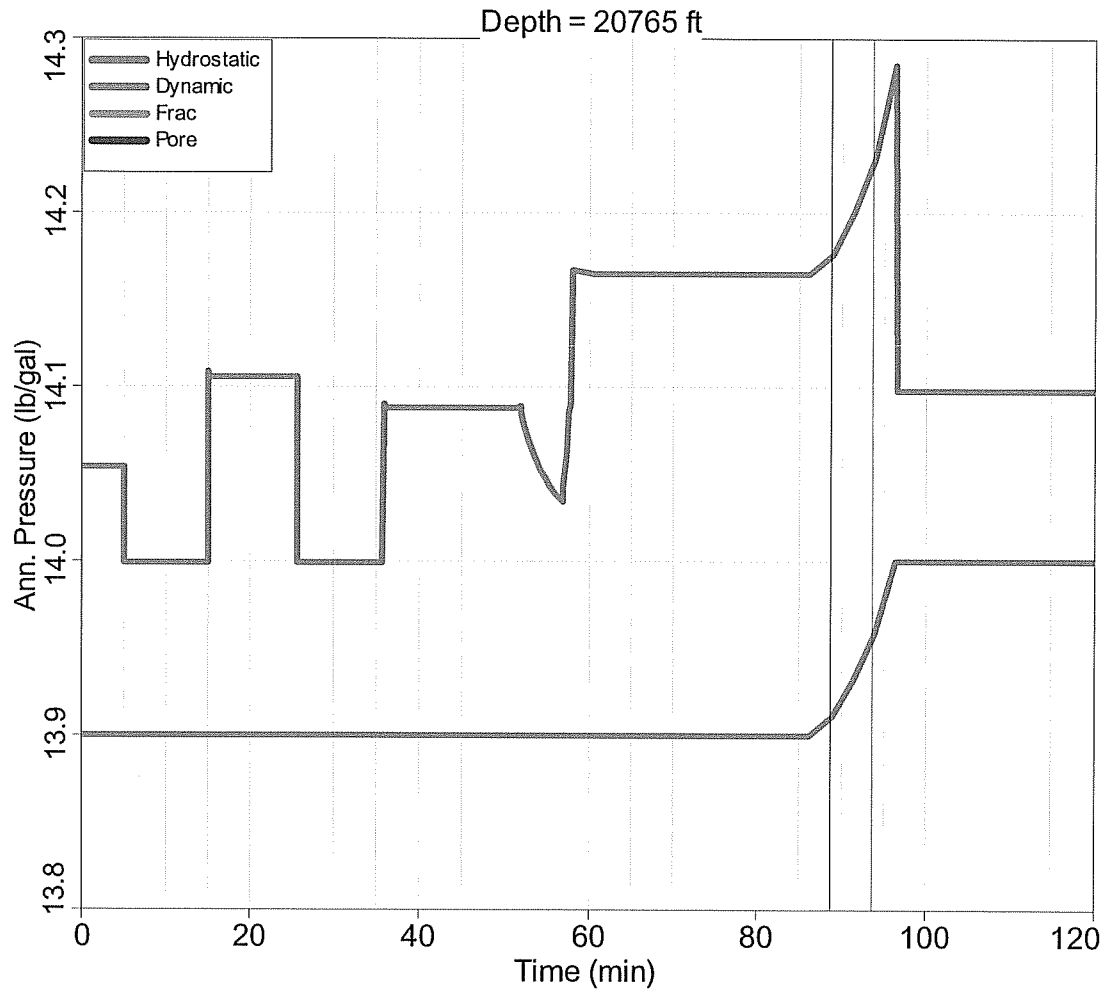
“Temperature Recovery” allows us to understand the temperature experienced by the slurry as it remains static, post placement. This information is used to simulate the temperature changes during the laboratory testing of cement properties, specifically, compressive strength development.

Client : bhp Billiton  
String : Abandonment Plug  
Country : US

Well : Shenzi B1-1  
District : Houston Offshore  
Loadcase : Abandonment Plug

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## ECD @ Base of Plug

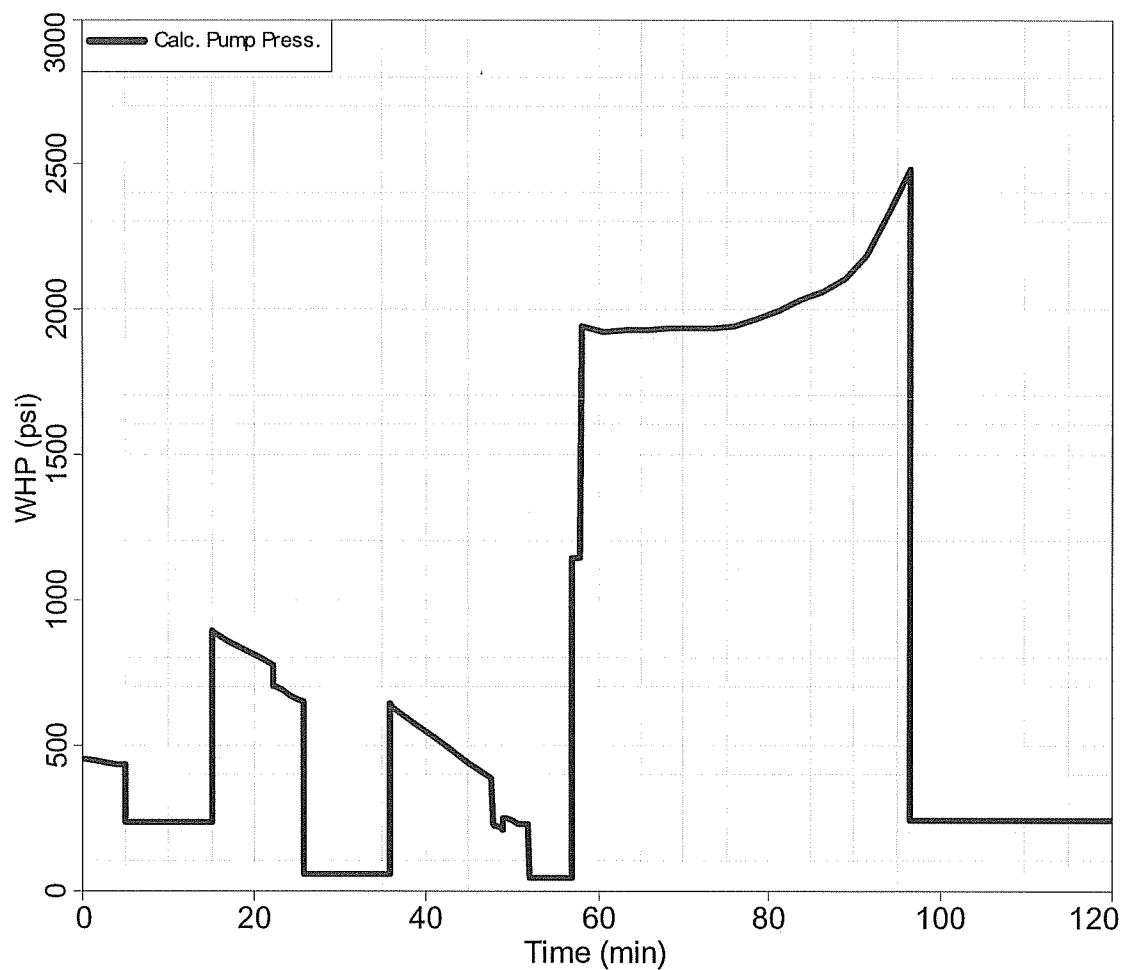


Client : bhp Billiton  
String : Abandonment Plug  
Country : US

Well : Shenzi B1-1  
District : Houston Offshore  
Loadcase : Abandonment Plug

**Schlumberger**

## Cement Pump Pressure



Client : bhp Billiton  
String : Abandonment Plug  
Country : US

Well : Shenzi B1-1  
District : Houston Offshore  
Loadcase : Abandonment Plug

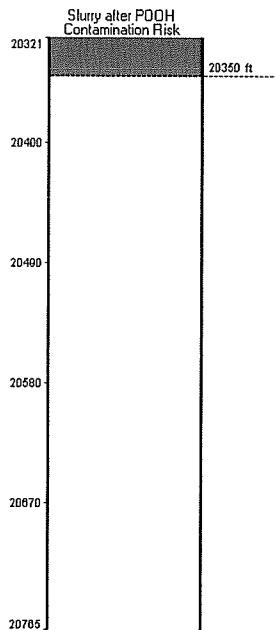
**Schlumberger**

## Plug Placement

### Base Plug #1:

Design TOC: 20365' MD

Anticipated TOC: 20350' MD



Plug Placement Simulation Results show that a 400' Plug will have 0 bbls of uncontaminated cement with no mechanical separation in place.  
Majority of contamination is from Spacer.

Client : bhp Billiton  
String : Abandonment Plug  
Country : US

Well : Shenzi B1-1  
District : Houston Offshore  
Loadcase : Abandonment Plug



## Contingency Plan(s)

Possible Situation HSE	Contingency Plan
Injury Emergency	<ul style="list-style-type: none"> <li>• Apply the Emergency Response Plan of the location (Contact Rig Medic and assess the injury). Contact FSM immediately</li> </ul>
Environmental Spill	<ul style="list-style-type: none"> <li>• Minor spills: Contain and clean up after job. Major spills: Assess if job need to be discontinued, or if people are available to stop, contain and clean up spill during operation.</li> </ul>
Possible Situation SQ	Contingency Plan
High Pressure line leak	<ul style="list-style-type: none"> <li>• Tight connection. Change packing. Change out leaking piece for back-up.</li> </ul>
Centrifugal Pump Failure	<ul style="list-style-type: none"> <li>• Lost prime due to air being injected to C-Pump. Stop pump &amp; Check the lubrication system</li> <li>• Lost prime due to foam generation in the fluid: Check fluid level. Add Antifoam to fluid(D047 or D206).</li> </ul>
Triplex Pump Failure	<ul style="list-style-type: none"> <li>• Not able to circulate or increase Pressure. Check Overpressure Shut-Down. Re-prime the pump. Use second Triplex – then service the triplex ASAP</li> <li>• Packing leaks: Small: Tighten plungers (Not all units). Large: Use second Triplex</li> </ul> <p><b>Note: If pump rate need to be reduced check available Thickening Time for slurry</b></p>
Unit Engine Failure	<ul style="list-style-type: none"> <li>• Immediately change to second engine.</li> <li>• Assess the failure and contact town if unable to repair within 20-30 mins.</li> </ul> <p><b>Note: If pump rate need to be reduced check available Thickening Time for slurry</b></p>
Bulk Delivery Failures	<ul style="list-style-type: none"> <li>• Compressor failure. Assess failure – restart compressor. Use back-up compressor if available.</li> <li>• Plugged delivery hose. Operate valves and move hose. Close the discharge delivery valve on the silo. Blow air into the delivery hose or hoses. Identify the hose that is plugged and replace</li> <li>• Plugged discharge valve. Operate valve. Bleed off air pressure in the silo. Blow air into the discharge valve of the plugged silo</li> <li>• Not able to pressure up silo. Jets may be plugged – fill air from top side through the air valve placed on the vent line</li> </ul>
Density variations	<ul style="list-style-type: none"> <li>• Sensor failure. Check density with pressurized mud balance</li> <li>• Mixing problems: Reduce or increase mixing rate. Reduce foam in fluid. Check mix water. Check same LOT for chemicals are used as per lab test. High viscous slurry, change bulk silo to verify bulk quality</li> <li>• Observe C-pump pressure: Low constant pressure is an indication of air entrainment – Apply more defoamer. Fluctuating pressure is an indication of settling – Adjust dispersant concentration down.</li> </ul>
Mix Water delivery problems	<ul style="list-style-type: none"> <li>• Check and change defective hoses &amp; valves.</li> <li>• Check C-pump – see C-pump cont. plans</li> <li>• Gravity feed to Disp. Tank – if possible</li> </ul>

Client : bhp Billiton  
String : Abandonment Plug  
Country : US

Well : Shenzi B1-1  
District : Houston Offshore  
Loadcase : Abandonment Plug


**Schlumberger**

## Spacer Reports

**Schlumberger**

### Laboratory Spacer Test Report-4.5lb D182

Fluid No : NLA 39151005		Client : BHP Billiton		Location / Rig : CR Luigs		Signatures	
Date : Jun-30-2011		Well Name : Shenzi B1-1		Field : GC 653			
Job Type	12.25"	Depth	22060.0 ft	TVD	20463.0 ft		
BHST	163 degF	BHCT	135 degF	BHP	14500 psi		
Starting Temp.	(degF)	Time to Temp.	(hr:mn)	Heating Rate	(degF/min)		
Starting Pressure	(psi)	Time to Pressure	(hr:mn)	Schedule	( )		
<b>Composition</b>							
Density	15.30 lb/gal	Type	MUDPUSH II	Water/Spacer (vol)	68.95 %		
Porosity	74.18 %	Solid Vol. Fraction	25.82 %				
<b>Code</b>	<b>Concentration</b>	<b>Component</b>	<b>Lot Number</b>				
Fresh water							
D047	0.200 gal/bbl of spacer	Antifoam					
D182	4.500 lbm/bbl of base fluid	Turb. Spacer					
B166	1.000 gal/bbl of spacer	Solvent					
B167	1.000 gal/bbl of spacer	Surfactant					
D031	381.64 lb/bbl of spacer	weight agent					
<b>Rheology</b>							
(rpm)	(deg)	(deg)					
300	76.0	83.0					
200	61.0	65.5					
100	44.0	48.5					
60	35.0	39.5					
30	27.0	31.0					
6	16.0	19.0					
3	13.0	16.0					
<b>Temperature</b>	80 degF	135 degF					
<b>Pressure</b>	(psi)	(psi)					
	Pv: 53.533 cP	Pv: 56.693 cP					
	Tr: 24.25 lb/100ft2	Tr: 27.38 lb/100ft2					
<b>Comments</b>							

  
Luke Lefort  
Thu Jun 30 2011 08:40:38

Schlumberger Private

Client : bhp Billiton  
String : Abandonment Plug  
Country : US

Well : Shenzi B1-1  
District : Houston Offshore  
Loadcase : Abandonment Plug

**Schlumberger**

**Schlumberger**

### Laboratory Spacer Test Report

Fluid No : NLA 39151003	Client : BHP Billiton	Location / Rig : CR Luigs	Signatures
Date : Jun-29-2011	Well Name : Shenzi B1-1	Field : GC 653	

Job Type : BHST	12.25"	Depth : BHCT	22060.0 ft	TVD : BHP	20463.0 ft
	163 degF		135 degF		14500 psi

#### Composition

Density : 15.30 lb/gal	Type : MUDPUSH II	Water/Spacer (vol) : 73.8 %
Porosity : 74.3 %	Solid Vol. Fraction : 25.7 %	

Code	Concentration	Component	Lot Number
Fresh water			
D047	0.200 gal/bbl of spacer	Antifoam	
D182	4.500 lb/bbl of base fluid	Turb. Spacer	
D031	379.79 lb/bbl of spacer	weight agent	

#### Rheology

(rpm)	(deg)	(deg)
300	70.0	60.0
200	57.0	50.0
100	42.0	37.5
60	35.0	31.5
30	27.0	25.5
6	17.0	16.0
3	15.0	14.0

Temperature : 81 degF	135 degF
Pressure	

Pv : 46.895 cP	Pv : 37.857 cP
Tv : 24.59 lb/100ft2	Tv : 23.53 lb/100ft2

*Adam Mize*

Adam Mize  
Wed Jun 29 2011 19:31:58

Schlumberger Private

Client : bhp Billiton  
String : Abandonment Plug  
Country : US

Well : Shenzi B1-1  
District : Houston Offshore  
Loadcase : Abandonment Plug

**Schlumberger**

# Cement Report

**Schlumberger**

## Laboratory Cement Test Report-12.25in OH KOP

Fluid No : NLA 39212001	Client : bhp Billiton	Location / Rig : CR Luigs	Signatures
Date : Jul-13-2011	Well Name : B1-1	Field : GC 653	

Job Type : 12.25"	Depth : 22060.0 ft	TVD : 20463.0 ft
BHST : 163 degF	BHCT : 135 degF	BHP : 14500 psi
Starting Temp. : 80 degF	Time to Temp. : 01.25 hr.mn	Heating Rate : 0.65 degF/min
Starting Pressure : 400 psi	Time to Pressure : 01.25 hr.mn	

**Composition**

Slurry Density : 16.80 lb/gal	Yield : 1.02 ft <sup>3</sup> /sk	Mix Fluid : 4.072 gal/sk
Solid Vol. Fraction : 46.7 %	Porosity : 53.3 %	Slurry type : Conventional

Code	Concentration	Base Reference	Component	Density	Lot Number
H		94 lb of BLEND	Blend	197.27 lb/ft <sup>3</sup>	LTN 505
Fresh water	3.562 gal/sk		Base Fluid		
D047	0.050 gal/sk		Antifoam		LTN 429
D168	0.300 gal/sk		Fluid loss		LTN 429
D145A	0.060 gal/sk		Dispersant		LTN 436
D177	0.100 gal/sk		Retarder		LTN 429

**Rheology (Average readings)**

(cp)	(cp)	(cp)
300	296.0	297.0
200	216.0	230.0
100	123.0	144.0
60	83.0	96.5
30	51.0	53.5
6	21.0	12.0
3	14.0	10.0

10 sec Gel		11
10 min Gel		19
Temperature	81 degF	135 degF
	Pv: 272.536 cP Ty: 28.34 lb/100ft <sup>2</sup>	Pv: 268.732 cP Ty: 40.73 lb/100ft <sup>2</sup>

**Thickening Time**

Consistency	Time
30 Bc	(hr.mn)
70 Bc	05:42 hr.mn
100 Bc	05:49 hr.mn

**Free Fluid**

0.0 mL/250mL	in 2 hrs
At 135 degF and 40 deg incl.	
Sedimentation	None

**Fluid Loss**

API Fluid Loss	38 mL
19 mL in 30 min at 135 degF	and 1000 psi

**Comments**

General Comment : Drill water = 274 ppm Cl
Thickening Time Comment : 6L-0076; Motor Schedule applied

*Adam Mize*

Adam Mize  
Wed Jul 13 2011 06:31:50

Schlumberger Private

Client : bhp Billiton  
String : Abandonment Plug  
Country : US

Well : Shenzi B1-1  
District : Houston Offshore  
Loadcase : Abandonment Plug

**Schlumberger**

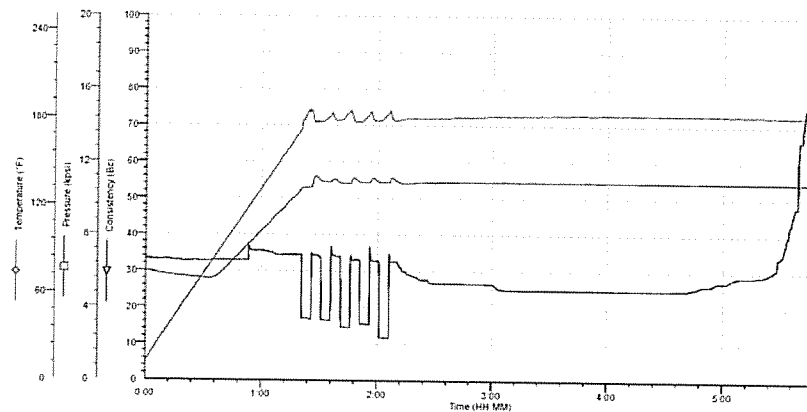
**Schlumberger**

Well ID Shenzi SB101 T1LA32212  
Customer bhp Billiton  
Instrument Name Cops EL  
Instrument Serial 6L

Cement Class Class H  
Cement Mfr. Buzz LTH 555  
Density 16.6  
BHCT 135  
BHST 103  
Job Type PnA

Thickening Time 100Bc 5:49:30  
70Bc 5:42:10  
35Bc 0:00:00

Comments Class H = 0.05 gps D047 + 0.30 gps D168 + 0.06 gps D145A + 0.10 gps D177



**CHANDLER**  
ENGINEERING

Test File Name: Shenzi SB101 PnA Plug T1EL-0076.txt  
Printed: 7/13/2011 2:24:13 PM

Page 1

MEMORY TRANSMISSION REPORT

TIME : 08-11-'11 11:17  
FAX NO.1 : 281-285-8526  
NAME : Schlumberger

FILE NO. : 109  
DATE : 08.11 11:16  
TO : 919857272165  
DOCUMENT PAGES : 2  
START TIME : 08.11 11:16  
END TIME : 08.11 11:17  
PAGES SENT : 2  
STATUS : OK

\*\*\* SUCCESSFUL TX NOTICE \*\*\*

Schlumberger Technology Corporation  
Radiation/Explosive Compliance

300 Schlumberger Drive, MD-121  
Sugar Land, Texas 77478  
Tel 281-285-7460  
Fax 281-285-8526

**Schlumberger**

**Fax**

**Date: August 11, 2011**

**To: Ernie Jilek**

**Fax: 985-727-2165**

**From: Tom Wood**

**Tel: 281-285-7460  
Fax: 281-285-0229**

**Subject: Abandonment Plaque**

**Pages: 2 (including cover)**

Ernie,

Request for abandonment plaque for bhp Billiton, well information follows.

Regards,

  
Tom

This transmission is intended only for the use of the individual or entity to which it is addressed and may contain information that is privileged and confidential. If you are not the intended recipient, you are hereby notified that any disclosure, distribution or copying of this information is strictly prohibited. If you have received this transmission in error, please notify us immediately by telephone and return the original documents to us at the address above via the United States Postal Services.

**Schlumberger Technology Corporation**  
Radiation/Explosive Compliance

300 Schlumberger Drive, MD-121  
Sugar Land, Texas 77478  
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Fax 281-285-8526

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Ernie,

Request for abandonment plaque for **bhp Billiton**, well information follows.

Regards,



Tom

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Schlumberger Technology Corporation  
Radiation Safety & Compliance

300 Schlumberger Drive, MD-121  
Sugar Land, Texas 77478  
Tel 281-285-7460  
Fax 281-285-8526

**Schlumberger**

Graphics N' Metal  
1200 Clausel Street  
Mandenville, LA. 70448  
(504) 669-6082  
(985) 727-2165 (Fax)

August 11, 2011

Attn: Ernie Jilek,

Please construct the standard abandonment plaque with the following information:

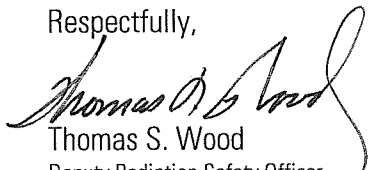
Company: bhp Billiton  
Well Name: OCS-G 20084 SB101 ST01  
Field: Green Canyon 653  
API#: 60-811-40579-00  
Date of Abandonment: July 12, 2011  
Well Depth: 21,101' MD  
Plug Back: 20,500' MD  
Top of Fish: 20,719' MD  
Sources Abandoned:

278 GBq, Am-241, Neutron Source @ 20,979' MD  
63 GBq, Cs-137, Density Source @ 20,986' MD

Special Instructions: DO NOT RE-ENTER THIS WELL BEFORE CONTACTING  
REGION IV OF THE NUCLEAR REGULATORY COMMISSION  
OR SCHLUMBERGER TECHNOLOGY CORPORATION

Please forward to me the completed plaque and invoice.

Respectfully,

  
Thomas S. Wood  
Deputy Radiation Safety Officer  
Schlumberger Technology Corporation

**Thomas Wood**

---

**From:** Thomas Wood  
**Sent:** Thursday, August 11, 2011 11:35 AM  
**To:** 'Ernie Jilek'  
**Subject:** Abandonment Plaque  
**Attachments:** bhp Billiton.pdf

Ernie,

Request for abandonment plaque for **bhp Billiton**, well information follows.

Thanks and regards,

Tom

Thomas S. Wood  
Deputy Radiation Safety Officer  
Schlumberger Technology Corporation  
300 Schlumberger Drive, MD-121  
Sugar Land, Texas 77478

Phone: +1 (281) 285-7460  
Fax: +1 (281) 285-8526  
Cell: +1 (281) 725-0802