Proposal No: 1001144059J

NEXEN PETROLEUM USA

OCS G22968 ST00BP01 #001

ENSCO 8502 Rig
API # 60-811-40581-0001
WILDCAT Field
GC BLOCK504
Green Canyon County, NORTHERN GULF OF MEXICO
December 28, 2011

Well Proposal

Prepared for:
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Powered by
PowerVision

Operator Name: NEXEN PETROLEUM
Well Name: OCS G22968 ST00BP01 #001
Job Description: 9-7/8" Tack n Sqz @ 23,387' MD/23,384' TVD
Date: December 28, 2011

Proposal No: 1001144059J

WELL DATA

ANNULAR GEOMETRY

ANNULAR I.D. (in)	DEPTH(ft)	
	MEASURED	TRUE VERTICAL
12.400 CASING	18,517	18,517
10.682 CASING	21,900	21,899
12.250 HOLE	23,387	23,384

SUSPENDED PIPES

DIAMETER (in)		WEIGHT (lbs/ft)	DEPTH(ft)	
O.D.	I.D.		MEASURED	TRUE VERTICAL
9.875	8.625	62.8	23,387	23,384

	Drill Pipe 6.625 (in) OD, 5.375 (in) ID, 40 (lbs/ft) set @	4,064 ft
	Drill Pipe 6.625 (in) OD, 5.581 (in) ID, 33.988 (lbs/ft) set @	18,017 ft
	Liner 9.875 (in) OD, 8.625 (in) ID, 62.8 (lbs/ft) set @	23,387 ft
	Depth to Top of Liner	18,017 ft
STAGE: 1	**Float/Landing Collar set @**	22,811 ft
	Mud Density	15.20 ppg
	Mud Type	Synthetic
	Est. Static Temp.	166 ° F
	Est. Circ. Temp.	116 ° F

VOLUME CALCULATIONS

549 ft	x	0.2866 cf/ft	with	0 %	excess	=	157 cf
1 ft	x	0.2866 cf/ft	with	0 %	excess	=	0 cf
576 ft	x	0.4057 cf/ft	with	0 %	excess	=	234 cf (inside pipe)
			TOTAL SLURRY VOLUME			=	391 cf
						=	70 bbls

STAGE: 2	**Top Sqz Ref. Depth**	18,018 ft
	Mud Density	15.20 ppg
	Mud Type	Synthetic
	Est. Static Temp.	136 ° F
	Est. Circ. Temp.	95 ° F

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WELL DATA (Continued)

Verify all wellbore tubulars with casing tally and company representative on location.

Baroid Synthetic Based Mud

Estimated Tops of Cement: 22,837' MD
Float Collar Set at +/- 22,878' MD

Geological Risk:
Base of Salt +/- 22,326' TVD
Potential Lost Circulation or Kicks due to Geological Uncertainty in Rubble Zone

BHST of 166 deg F provided by customer

WellTEMP Simulations BHCT
Shoe: 95 deg F
Hot Spot: 116 deg F

NOTE: Recommended to Caliper the casing every 10 joints and report variance.

WFT Sub-Sea Release Dual Wiper Plug System
WFT Centralizer Subs & Spiral Gliders

Estimated Liner Hanger Restriction for Cementing: 3.86 in2 flow by area

Operator Name: NEXEN PETROLEUM
Well Name: OCS G22968 ST00BP01 #001
Job Description: 9-7/8" Tack n Sqz @ 23,387' MD/23,384' TVD
Date: December 28, 2011

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FLUID SPECIFICATIONS

STAGE NO. 1

Weighted Spacer — 115.0 bbls Seal Bond 50 + 2 gal/bbl US-2 + 18 lbs/bbl Potassium Chloride + 3 gal/bbl SS-2 @ 15.8 ppg

FLUID	VOLUME CU-FT		VOLUME FACTOR		AMOUNT AND TYPE OF CEMENT
Lead Slurry	157	/	1.21	=	130 sacks Premium Plus H Cement + 0.07% bwoc Static Free + 1.1 lbs/sack Potassium Chloride + 0.04 gps FP-12L + 0.15 gps CD-32L + 0.4 gps FL-67L + 0.015 gps SR-34L + 1.78 gps BA-90L, drum + 26.6% Fresh Water
Tail Slurry	234	/	1.21	=	194 sacks Premium Plus H Cement + 0.07% bwoc Static Free + 1.1 lbs/sack Potassium Chloride + 0.04 gps FP-12L + 0.15 gps CD-32L + 0.4 gps FL-67L + 0.01 gps SR-34L + 1.78 gps BA-90L, drum + 26.7% Fresh Water

Disp-Weighted Spacer — 15.0 bbls Sealbond 50 + 2 gal/bbl US-2 + 18 lbs/bbl Potassium Chloride + 3 gal/bbl SS-2 @ 15.8 ppg

Displacement — 867.7 bbls SBM @ 15.2 ppg

CEMENT PROPERTIES

	SLURRY NO.1	SLURRY NO.2
Slurry Weight (ppg)	16.20	16.20
Slurry Yield (cf/sack)	1.21	1.21
Amount of Mix Water (gps)	3.00	3.01
Amount of Mix Fluid (gps)	5.39	5.39
Estimated Pumping Time - 70 BC (HH:MM)	5:47	5:29
Free Water (mls) @ 116 ° F @ 90 ° Angle	0.0	0.0
Fluid Loss (cc/30min) at 1000 psi and 116 ° F	26.0	20.0
COMPRESSIVE STRENGTH		
3 hrs @ 95 ° F (psi)		50
4 hrs @ 95 ° F (psi)		500
24 hrs @ 95 ° F (psi)		5902
5 hrs @ 116 ° F (psi)	50	
7 hrs @ 116 ° F (psi)	500	
24 hrs @ 116 ° F (psi)	4502	

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FLUID SPECIFICATIONS (Continued)

STAGE NO. 2

Weighted Spacer — 115.0 bbls Sealbond 50 + 2 gal/bbl US-2 + 18 lbs/bbl Potassium Chloride + 3 gal/bbl SS-2 @ 15.8 ppg

FLUID	VOLUME CU-FT		VOLUME FACTOR		AMOUNT AND TYPE OF CEMENT
Squeeze Slurry	557	/	1.21	=	460 sacks Premium Plus H Cement + 0.07% bwoc Static Free + 1.1 lbs/sack Potassium Chloride + 0.04 gps FP-12L + 0.15 gps CD-32L + 0.4 gps FL-67L + 0.01 gps SR-34L + 1.78 gps BA-90L, drum + 26.7% Fresh Water
Slurry	109	/	1.21	=	90 sacks Premium Plus H Cement + 0.07% bwoc Static Free + 1.1 lbs/sack Potassium Chloride + 0.04 gps FP-12L + 0.15 gps CD-32L + 0.4 gps FL-67L + 0.03 gps SR-34L + 1.78 gps BA-90L, drum + 26.5% Fresh Water

Disp-Weighted Spacer — 15.0 bbls Sealbond 50 + 2 gal/bbl US-2 + 18 lbs/bbl Potassium Chloride + 3 gal/bbl SS-2 @ 15.8 ppg

Displacement — 1.0 bbls SBM @ 15.2 ppg

CEMENT PROPERTIES

	SLURRY NO.1	SLURRY NO.2
Slurry Weight (ppg)	16.20	16.20
Slurry Yield (cf/sack)	1.21	1.21
Amount of Mix Water (gps)	3.01	2.99
Amount of Mix Fluid (gps)	5.39	5.39
Estimated Pumping Time - 70 BC (HH:MM)	5:29	11:36
Free Water (mls) @ 95 ° F @ 90 ° Angle	0.0	0.0
Fluid Loss (cc/30min) at 1000 psi and 95 ° F	20.0	20.0
COMPRESSIVE STRENGTH		
3 hrs @ 95 ° F (psi)	50	
4 hrs @ 95 ° F (psi)	500	
10 hrs @ 95 ° F (psi)		50
11 hrs @ 95 ° F (psi)		500
24 hrs @ 95 ° F (psi)	5902	5092

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FLUID SPECIFICATIONS (Continued)

NOTE: Job Planned for a Tack and Squeeze

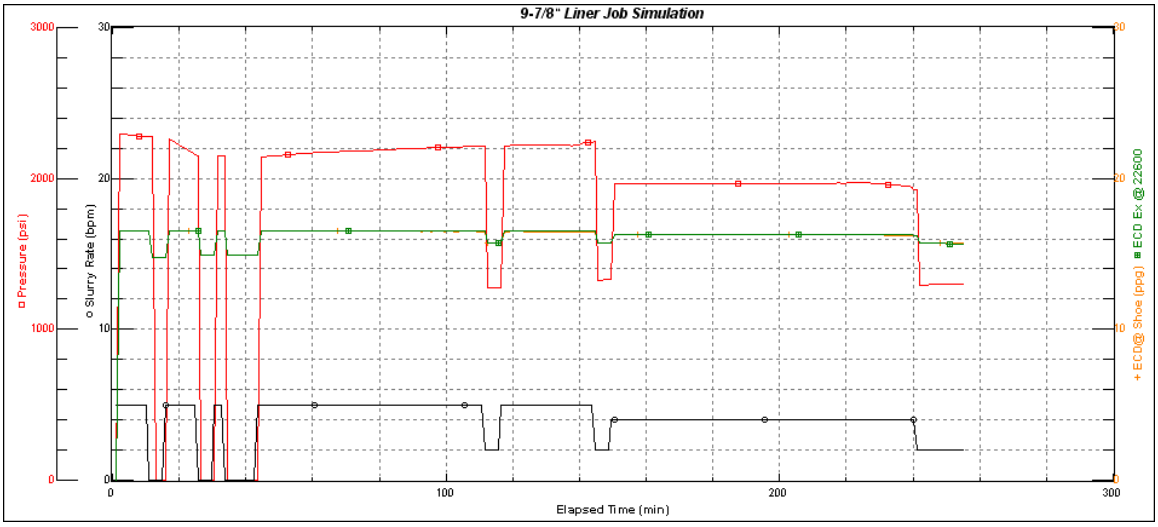
Spacer fluids and volumes used will be the same as the primary cement job to mimic same mud displacement efficiencies.

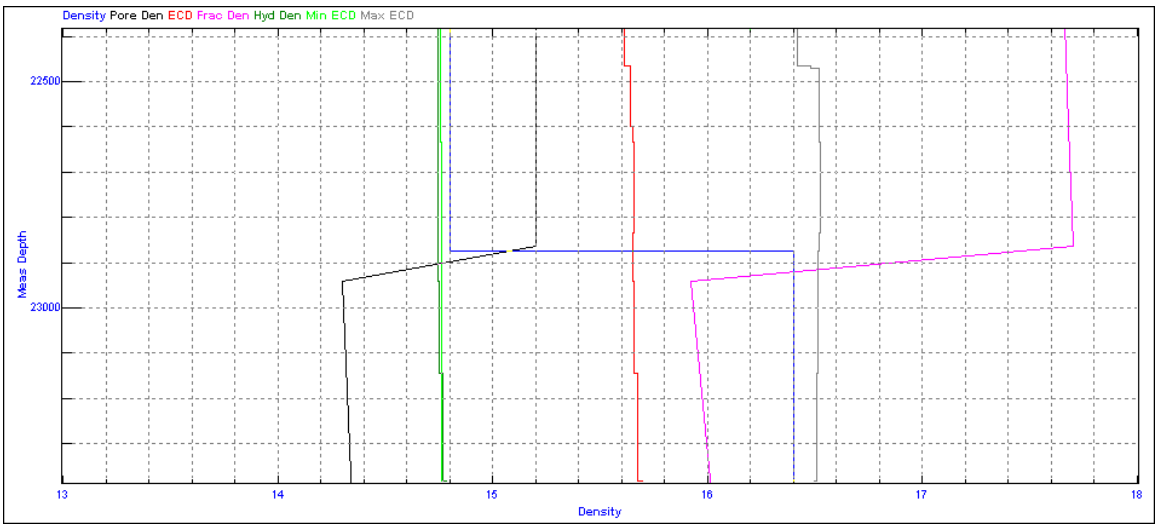
1. 5 bbls of the Tail Slurry will be placed behind the top dart.
2. All fluids will be optimized/tested by the Region Laboratory as the above design are only estimates.
3. Mud-Spacer-Cement compatabilties/wettability will be performed prior to cementing.
4. Fluid caliper will be run to compare values of caliper tool results.
5. 10% Mud Contamination test will be performed for both TT and UCA.
6. Remember to cut back the water requirement to account for volume of surfactant package.
7. KCl will be added to Sealbond 50 after hydration.
8. Rig will displace.
9. Estimated COMPRESSIBILITY during displacement: 25 bbls

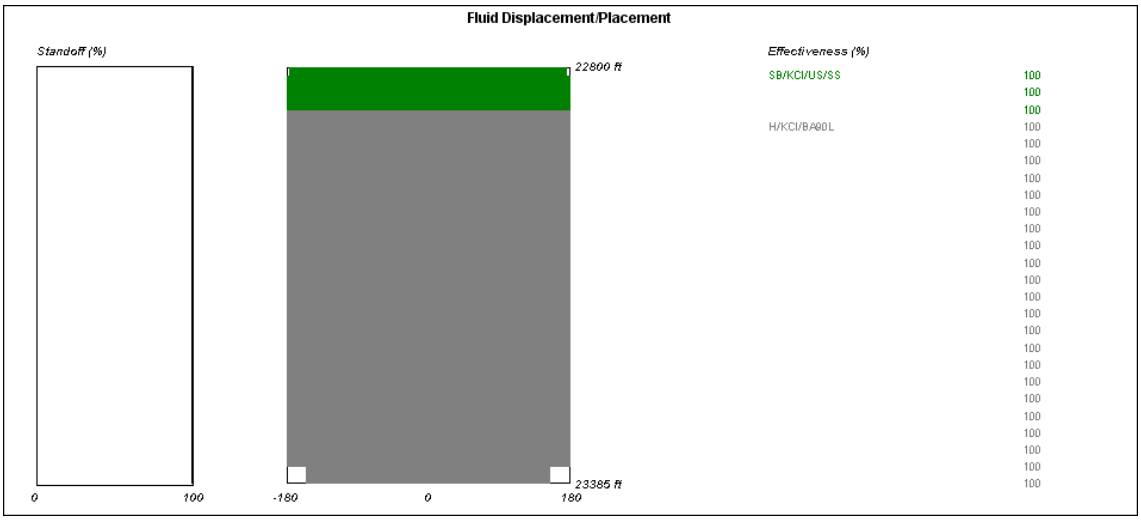
NOTE: Cement design will be tested on temperature ramp as defined by WellTEMP. Due to large temperature drop across column, a shoe track slurry in addition to a annular fill slurry will be run, tested at different temperatures to improve WOC time.

Testing will be in compliance with

API 10-B2
API 10-B3
API 65-1
API 65-2







** In the graphic above it demonstrates excellent mud displacment efficiencies. These same cementing fluids will be used for the cement squeeze down the annulus, therefore will obtain same mud removal**

Operator Name: NEXEN PETROLEUM
Well Name: OCS G22968 ST00BP01 #001
Job Description: 7-5/8" Liner @ 27,543' MD/27,000' TVD
Date: December 28, 2011

Proposal No: 1001144059J

WELL DATA

ANNULAR GEOMETRY

ANNULAR I.D. (in)	DEPTH(ft)	
	MEASURED	TRUE VERTICAL
12.400 CASING	18,017	18,017
8.625 CASING	23,387	23,384
9.875 HOLE	27,543	27,000

SUSPENDED PIPES

DIAMETER (in)		WEIGHT (lbs/ft)	DEPTH(ft)	
O.D.	I.D.		MEASURED	TRUE VERTICAL
7.625	6.625	39	27,543	27,000

Drill Pipe 6.625 (in) OD, 5.0 (in) ID, 69 (lbs/ft) set @	3,300	ft
Drill Pipe 6.625 (in) OD, 5.375 (in) ID, 40 (lbs/ft) set @	8,300	ft
Drill Pipe 6.625 (in) OD, 5.581 (in) ID, 33.988 (lbs/ft) set @	11,488	ft
Drill Pipe 5.875 (in) OD, 5.045 (in) ID, 26.4 (lbs/ft) set @	16,488	ft
Drill Pipe 5.0 (in) OD, 4.276 (in) ID, 19.5 (lbs/ft) set @	21,991	ft
Drill Pipe 5.0 (in) OD, 3.0 (in) ID, 60.1 (lbs/ft) set @	22,887	ft
Liner 7.625 (in) OD, 6.625 (in) ID, 39 (lbs/ft) set @	27,543	ft
Depth to Top of Liner	22,887	ft
Float/Landing Collar set @	27,092	ft
Mud Density	15.40	ppg
Mud Type	Synthetic	
Est. Static Temp.	201	° F
Est. Circ. Temp.	143	° F

VOLUME CALCULATIONS

1,499 ft	x	0.2148 cf/ft	with	10 %	excess	=	354 cf	
1 ft	x	0.2148 cf/ft	with	0 %	excess	=	0 cf	
451 ft	x	0.2394 cf/ft	with	0 %	excess	=	108 cf	(inside pipe)
			TOTAL SLURRY VOLUME			=	462 cf	
						=	82 bbls	

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WELL DATA (Continued)

Verify all wellbore tubulars with casing tally and company representative on location.

Baroid Synthetic Based Mud: 15.4-ppg (Estimated)

Estimated Tops of Cement: 26,043' MD

Geological Risks:
Potential Lost Circulation or Kicks due to Geological Uncertainty
Top of Potential Sands and/or Hydrocarbon Zones

BHST of 201 deg F provided by customer

WellTEMP Simulations BHCT
Shoe: 115 deg F
Hot Spot: 143 deg F

NOTE: Recommended to Caliper the casing every 10 joints and report variance.

BHI Liner Hanger System with SSR Plugs
Assumed WFT Centralizer/Subs

Estimated Liner Hanger Restriction for Cementing: 3.86 in2 flow by area

Operator Name: NEXEN PETROLEUM
Well Name: OCS G22968 ST00BP01 #001
Job Description: 7-5/8" Liner @ 27,543' MD/27,000' TVD
Date: December 28, 2011

Proposal No: 1001144059J

FLUID SPECIFICATIONS

Weighted Spacer — 115.0 bbls Seal Bond 50 + 2 gal/bbl US-2 + 18 lbs/bbl Potassium Chloride + 3 gal/bbl SS-2 @ 15.8 ppg

FLUID	VOLUME CU-FT		VOLUME FACTOR		AMOUNT AND TYPE OF CEMENT
Slurry	354	/	1.21	=	293 sacks Premium Plus H Cement + 0.07% bwoc Static Free + 1.1 lbs/sack Potassium Chloride + 0.04 gps FP-12L + 0.15 gps CD-32L + 0.4 gps FL-67L + 0.05 gps SR-34L + 1.78 gps BA-90L, tote + 26.4% Fresh Water
Tail Slurry	108	/	1.21	=	90 sacks Premium Plus H Cement + 0.07% bwoc Static Free + 1.1 lbs/sack Potassium Chloride + 0.04 gps FP-12L + 0.15 gps CD-32L + 0.4 gps FL-67L + 0.055 gps SR-34L + 1.78 gps BA-90L, tote + 26.3% Fresh Water

Disp-Weighted Spacer — 15.0 bbls Seal Bond 50 + 2 gal/bbl US-2 + 18 lbs/bbl Potassium Chloride + 3 gal/bbl SS-2 @ 15.8 ppg

Displacement — 710.4 bbls SBM @ 15.4 ppg

CEMENT PROPERTIES

	SLURRY NO.1	SLURRY NO.2
Slurry Weight (ppg)	16.20	16.20
Slurry Yield (cf/sack)	1.21	1.21
Amount of Mix Water (gps)	2.97	2.97
Amount of Mix Fluid (gps)	5.39	5.39
Estimated Pumping Time - 70 BC (HH:MM)	5:35	4:45
Free Water (mls) @ 143 ° F @ 90 ° Angle		0.0
Free Water (mls) @ 143 ° F @ 45 ° Angle	0.0	
Fluid Loss (cc/30min) at 1000 psi and 143 ° F	20.0	20.0
COMPRESSIVE STRENGTH		
5 hrs @ 115 ° F (psi)		50
7 hrs @ 115 ° F (psi)		500
24 hrs @ 115 ° F (psi)		3990
6 hrs @ 143 ° F (psi)	50	
10 hrs @ 143 ° F (psi)	500	
24 hrs @ 143 ° F (psi)	3875	

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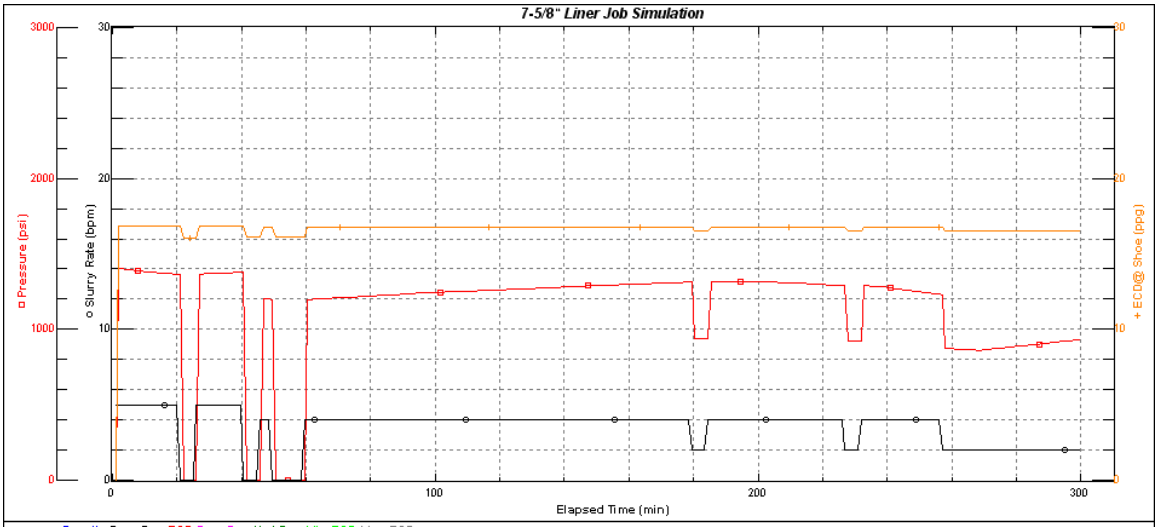
FLUID SPECIFICATIONS (Continued)

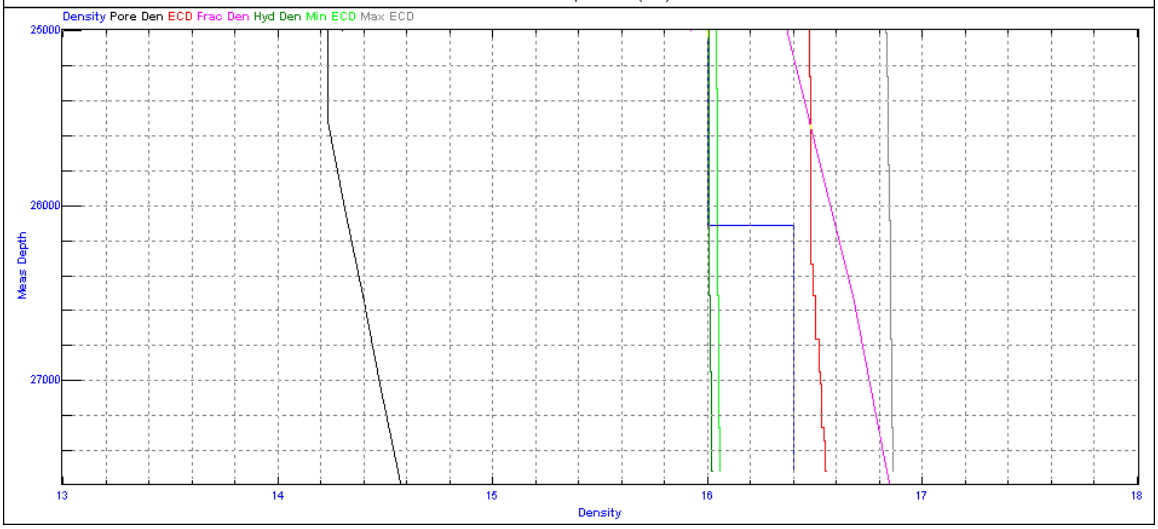
1. All fluids will be optimized/tested as the above design are only estimates.
2. Mud-Spacer-Cement compatabilties/wettability will be performed prior to cementing.
3. Fluid caliper will be run to compare values of caliper tool results.
4. 10% Mud Contamination test will be performed for both TT and UCA.
5. Remember to cut back the water requirement to account for volume of surfactant package.
6. KCl will be added to Sealbond 50 after hydration.
7. Rig will displace.
8. Estimated COMPRESSIBILITY during displacement: 21 bbls

NOTE: Cement design will be tested on temperature ramp as defined by WellTEMP. Due to large temperature drop across column, a shoe track slurry will be run in addition to an annular fill slurry.

Testing will be in compliance with

API 10-B2
API 10-B3
API 65-1
API 65-2


7-5/8" Liner Job Simulation
□ Pressure (psi)
o Slurry Rate (bpm)
+ ECD@ Shoe (ppg)
Elapsed Time (min)
3000
2000
1000
0
30
20
10
0
100
200
300


Density Pore Den ECD Frac Den Hyd Den Min ECD Max ECD
Meas Depth
Density
25000
26000
27000
13
14
15
16
17
18

Key Cementing Parameters for Isolation of Flow Zones in Offshore Wells

Operator: Nexen Petroleum, USA
Well Name: GC 504 #1 BP01 "Kakuna"
Casing String: 9-7/8" Liner
Date: 28-Dec-11

Plan Score: 92.9 %

Performance Score: 0 %

Parameter	Recommended Criteria	Max Points	Plan Score	Performance Score	Actual Parameter Value
Risk Assessment & Awareness Training					
Site Evaluation	Site is evaluated for flow hazards	5	5		
Assess Flow Potential	Hole Interval is evaluated for flow potential	10	10		
Pre-Job Awareness	Annular flow risk issues discussed in pre-spud AND pre-cement job safety meetings	10	10		
Lost Circulation Risk	ECD window adequate for successful drilling and cementing program	10	10		
	Section Total	**35**	**35**	**0**	**0**
Critical Drilling Fluid Parameters					
Rheology	Yield point and static gel strength conducive to cuttings suspension & removal and ECD management	4	4		
Density	Appropriate for well control - prevention of both kicks and losses	4	4		
Fluid Loss	Adequate to provide a thin, compact filter cake	4	4		
	Section Total	**12**	**12**	**0**	**0**
Critical Well Parameters					
Hole Diameter	Hole diameter sufficient to run adequate centralization	4	4		
Gauge hole	Diameter no more than 10% over bit	4	4		
Deviation/dogleg severity	Trajectory allows running casing & adequate centralization	4	4		
Top of Cement	Adequate TOC above shallowest potential flow zone	6	4		
Trapped Annular Pressure	Assess risk of trapped annular pressure in designing TOC	4	4		
Well control	There is no flow, no losses (well stable) before or during conditioning and cementing	6	6		
Rathole	Rathole length (below casing shoe) is minimized, filled with high density mud, or appropriate barrier capable of supporting cement	2	2		
	Section Total	**30**	**28**	**0**	**0**
Critical Operational Parameters					
Lost Circulation	Full returns are maintained and fracture initiation pressure is not exceeded at any time during conditioning and cementing	4	4		
Running Casing	Casing is run in such a way as to minimize pressure surges that can cause losses	4	4		
BOP & Diverter Testing	BOP & diverters function-tested	4	4		
Annular monitoring preparation	Annular monitoring plan and equipment in place	4	4		
Static Time	Non-circulating time is < 5 minutes from start of mud circulation until completion of cementing operation. Pressure test lines before conditioning.	4	0		
End of inner-string (inner-string cementing only)	Within 80 feet of upper-most float valve if not a stab-in job	0	0		
	Section Total	**20**	**16**	**0**	**0**
Critical Mud Removal Parameters					
Mixing and Placement Rate	Circulation rate in annulus before and during cementing meets mud removal criteria established by computer simulation and does not exceed the maximum rate that was achieved during pre-job circulation.	6	6		
Centralization	Centralization is optimized for mud removal through critical zones and centralizers are run according to engineered design	10	10		
Spacer	Optimize density, rheology, and volume.	5	5		
Fluid compatibility	Mud: Spacer and Spacer:Lead Slurry are compatible. Preferentialy water-wetting for sections drilled with NAF.	5	5		
Circulation Volume	Sufficient to obtain desired fluid properties. Minimum of one hole volume.	4	1		
Mud Rheology	Rheology and static gel strength conducive to good mud removal and ECD control	5	5		
Float equipment	Floats run to prevent flow back into casing	4	4		
Wiper plugs	Top & bottom plug used. Bottom plug run between spacer and cement	5	5		
Pipe Movement	Pipe is moved to enhance mud displacement	8	0		
Tracers employed	Annular tracer method employed (See Comment)	0	0		
	Section Total	**52**	**41**	**0**	**0**
Critical Cement Slurry Parameters					
Temperature for Cement Testing	Realistic test temperatures established by measurement, local correlations, thermal modelling software, and/or other accepted industry methods	6	6		
Lead:Tail setting profiles	Lead slurry has longer thickening time and slower gel strength development than tail slurry	0	0		
Gel Strength	Gel strength development (Critical Gel Strength Period) meets time requirements. (See Comment)	4	4		
Rheology	Rheology appropriate for mud removal criteria and ECD limits	4	4		
Fluid Loss	Fluid loss control is appropriate for the flow potential (See Comments)	4	4		
Density	Cement density appropriate for well conditions	4	4		
Stability	Slurry stability (Free fluid, sedimenation and foam stability meet criteria)	4	4		
Compatability	Lead and tail slurry are compatible with one another	4	4		
Mechanical Parameters	Cement mechanical parameters appropriate for anticipated stresses	4	4		
Cement blend verification tests	According to quality plan (vendor's or operator's)	4	4		
	Section Total	**38**	**38**	**0**	**0**
Job Execution Problems (Penalty Points)					
Density Control	Density not maintained at +/- 0.2 lb/gal of design	-10	0		
Unplanned Shutdowns	Unplanned shutdowns > 5 minutes (e.g.: bulk delivery problems, fluid delivery problems, equipment malfunction, etc.)	-5	0		
Special blend mixing	Special blend procedures not adhered to	-4	0		
Liquid additive system	LA system not calibrated or not delivering accurately	-4	0		
Float Equipment Holding	Float equipment does not hold and pressure is left on casing while WOC	-10	0		
Nitrogen Injection (foamed cement)	Foamed cementing done without using automated, process controlled injection equipment	-4	0		
Foamer and nitrogen at proper ratio	For foamed cement, foamer and/or nitrogen ratios not within +/-5% of design	-4	0		
	Section Total	**-41**	**0**	**0**	**0**
Mechanical Barrier Considerations					
Applicability and Risk	Use of subsurface mechanical barriers has been properly evaluated	5	5		
Type of barrier	Appropriate barrier for well design and conditions is utilized	35	35		
	Section Total	**40**	**40**	**0**	**0**
Mechanical Barrier Problems (Penalty Points)					
Set in appropriate location	Packer is not set in an appropriate location	-5	0		
Cementing program designed to accommodate operation	Cement slurry properties and placement methods are not designed to accommodate operational considerations for use of mechanical barriers	-5	0		
Successful indicator(s)	No positive indication of tool operation and setting	-5	0		
	Section Total	**-15**	**0**	**0**	**0**
Post Primary Cementing Job Parameters					
Annular monitoring	Annulus is monitored and kept full during WOC	4	4		
WOC before nippling down	WOC before nippling down BOP stack until criteria are met	0	0		
Pressure test casing	Casing is pressure-tested when cement plugs are landed	4	4		
Annular Top Out Procedure	Performed based on requirements and conditions	0	0		
Cement Top	Cement returns are observed or calculated and measured top of high performance cement is above flow zone	4	4		
	Section Total	**12**	**12**	**0**	**0**
	Worksheet Total	**239**	**222**	**0**	**0**

Explanations of Point Values in Red-Type:

1.) Top of Cement	Because this is an exploration well, the plan is to cement this liner with only 550' of fill for the "tack". However, if hydrocarbons are present in this hole section, the top of cement will be adjusted to cover the shallowest potential flow zone. Only four points were granted out of 6 because its a "tack" and "squeeze". The squeeze volume pumped will be sufficient to fill the casing-casing annulus.
2.) Static Time	The current plan is to circulate just enough mud to ensure that the float equipment is clear of debris, shut down and test lines, and then begin pumping the cement job. Testing lines generally takes more than five minutes. However, the time that the well is static while testing lines is rather insignificant because the gel strengths of the synthetic-base mud system used in this hole section lines are easily broken.
3.) Centralization	The plan is to run rotating bow spring centralizer subs to ensure good mud removal across the shoe. Additional centralizers will be available to be placed across any potential flow zones to help provide the proper isolation. As a result, the full amount of points were granted. Contingency centralizer subs should be provided for the casing-casing overlap.
4.) Circulating Volume	The current plan is to circulate just enough mud to ensure that the float equipment is clear of debris prior to pumping cement. As a result, only one point was granted. However, if hydrocarbons are present, the cement job will begin when the well is properly conditioned.
5.) Pipe Movement	There are no plans to reciprocate and/or rotate the casing during this job. As a result, more consideration was made to proper centralization and fluid properties.

Key Cementing Parameters for Isolation of Flow Zones in Offshore Wells

Operator: Nexen Petroleum, USA
Well Name: GC 504 #1 BP01 "Kakuna"
Casing String: 7-5/8" Liner
Date: 28-Dec-11

Plan Score: 93.7 %

Performance Score: 0 %

Parameter	Recommended Criteria	Max Points	Plan Score	Performance Score	Actual Parameter Value
Risk Assessment & Awareness Training					
Site Evaluation	Site is evaluated for flow hazards	5	5		
Assess Flow Potential	Hole Interval is evaluated for flow potential	10	10		
Pre-Job Awareness	Annular flow risk issues discussed in pre-spud AND pre-cement job safety meetings	10	10		
Lost Circulation Risk	ECD window adequate for successful drilling and cementing program	10	10		
	Section Total	**35**	**35**	**0**	**0**
Critical Drilling Fluid Parameters					
Rheology	Yield point and static gel strength conducive to cuttings suspension & removal and ECD management	4	4		
Density	Appropriate for well control - prevention of both kicks and losses	4	4		
Fluid Loss	Adequate to provide a thin, compact filter cake	4	4		
	Section Total	**12**	**12**	**0**	**0**
Critical Well Parameters					
Hole Diameter	Hole diameter sufficient to run adequate centralization	4	4		
Gauge hole	Diameter no more than 10% over bit	4	4		
Deviation/dogleg severity	Trajectory allows running casing & adequate centralization	4	4		
Top of Cement	Adequate TOC above shallowest potential flow zone	6	6		
Trapped Annular Pressure	Assess risk of trapped annular pressure in designing TOC	4	4		
Well control	There is no flow, no losses (well stable) before or during conditioning and cementing	6	6		
Rathole	Rathole length (below casing shoe) is minimized, filled with high density mud, or appropriate barrier capable of supporting cement	2	2		
	Section Total	**30**	**30**	**0**	**0**
Critical Operational Parameters					
Lost Circulation	Full returns are maintained and fracture initiation pressure is not exceeded at any time during conditioning and cementing	4	4		
Running Casing	Casing is run in such a way as to minimize pressure surges that can cause losses	4	4		
BOP & Diverter Testing	BOP & diverters function-tested	4	4		
Annular monitoring preparation	Annular monitoring plan and equipment in place	4	4		
Static Time	Non-circulating time is < 5 minutes from start of mud circulation until completion of cementing operation. Pressure test lines before conditioning.	4	0		
End of inner-string (inner-string cementing only)	Within 80 feet of upper-most float valve if not a stab-in job	0	0		
	Section Total	**20**	**16**	**0**	**0**
Critical Mud Removal Parameters					
Mixing and Placement Rate	Circulation rate in annulus before and during cementing meets mud removal criteria established by computer simulation and does not exceed the maximum rate that was achieved during pre-job circulation.	6	6		
Centralization	Centralization is optimized for mud removal through critical zones and centralizers are run according to engineered design	10	10		
Spacer	Optimize density, rheology, and volume.	5	5		
Fluid compatibility	Mud: Spacer and Spacer:Lead Slurry are compatible. Preferentialy water-wetting for sections drilled with NAF.	5	5		
Circulation Volume	Sufficient to obtain desired fluid properties. Minimum of one hole volume.	4	1		
Mud Rheology	Rheology and static gel strength conducive to good mud removal and ECD control	5	5		
Float equipment	Floats run to prevent flow back into casing	4	4		
Wiper plugs	Top & bottom plug used. Bottom plug run between spacer and cement	5	5		
Pipe Movement	Pipe is moved to enhance mud displacement	8	0		
Tracers employed	Annular tracer method employed (See Comment)	0	0		
	Section Total	**52**	**41**	**0**	**0**
Critical Cement Slurry Parameters					
Temperature for Cement Testing	Realistic test temperatures established by measurement, local correlations, thermal modelling software, and/or other accepted industry methods	6	6		
Lead:Tail setting profiles	Lead slurry has longer thickening time and slower gel strength development than tail slurry	0	0		
Gel Strength	Gel strength development (Critical Gel Strength Period) meets time requirements. (See Comment)	4	4		
Rheology	Rheology appropriate for mud removal criteria and ECD limits	4	4		
Fluid Loss	Fluid loss control is appropriate for the flow potential (See Comments)	4	4		
Density	Cement density appropriate for well conditions	4	4		
Stability	Slurry stability (Free fluid, sedimenation and foam stability meet criteria)	4	4		
Compatability	Lead and tail slurry are compatible with one another	4	4		
Mechanical Parameters	Cement mechanical parameters appropriate for anticipated stresses	4	4		
Cement blend verification tests	According to quality plan (vendor's or operator's)	4	4		
	Section Total	**38**	**38**	**0**	**0**
Job Execution Problems (Penalty Points)					
Density Control	Density not maintained at +/- 0.2 lb/gal of design	-10	0		
Unplanned Shutdowns	Unplanned shutdowns > 5 minutes (e.g.: bulk delivery problems, fluid delivery problems, equipment malfunction, etc.)	-5	0		
Special blend mixing	Special blend procedures not adhered to	-4	0		
Liquid additive system	LA system not calibrated or not delivering accurately	-4	0		
Float Equipment Holding	Float equipment does not hold and pressure is left on casing while WOC	-10	0		
Nitrogen Injection (foamed cement)	Foamed cementing done without using automated, process controlled injection equipment	-4	0		
Foamer and nitrogen at proper ratio	For foamed cement, foamer and/or nitrogen ratios not within +/-5% of design	-4	0		
	Section Total	**-41**	**0**	**0**	**0**
Mechanical Barrier Considerations					
Applicability and Risk	Use of subsurface mechanical barriers has been properly evaluated	5	5		
Type of barrier	Appropriate barrier for well design and conditions is utilized	35	35		
	Section Total	**40**	**40**	**0**	**0**
Mechanical Barrier Problems (Penalty Points)					
Set in appropriate location	Packer is not set in an appropriate location	-5	0		
Cementing program designed to accommodate operation	Cement slurry properties and placement methods are not designed to accommodate operational considerations for use of mechanical barriers	-5	0		
Successful indicator(s)	No positive indication of tool operation and setting	-5	0		
	Section Total	**-15**	**0**	**0**	**0**
Post Primary Cementing Job Parameters					
Annular monitoring	Annulus is monitored and kept full during WOC	4	4		
WOC before nippling down	WOC before nippling down BOP stack until criteria are met	0	0		
Pressure test casing	Casing is pressure-tested when cement plugs are landed	4	4		
Annular Top Out Procedure	Performed based on requirements and conditions	0	0		
Cement Top	Cement returns are observed or calculated and measured top of high performance cement is above flow zone	4	4		
	Section Total	**12**	**12**	**0**	**0**
	Worksheet Total	**239**	**224**	**0**	**0**

Explanations of Point Values in Red-Type:

1.) Top of Cement	Because this is an exploration well, the plan is to cement this liner with only 1,500' of fill. However, if hydrocarbons are present in this hole section, the top of cement will be adjusted to cover the shallowest potential flow zone. As a result, the full amount of points were granted.
2.) Static Time	The current plan is to circulate just enough mud to ensure that the float equipment is clear of debris, shut down and test lines, and then begin pumping the cement job. Testing lines generally takes more than five minutes. However, the time that the well is static while testing lines is rather insignificant because the gel strengths of the synthetic-base mud system used in this hole section lines are easily broken.
3.) Centralization	The plan is to run rotating bow spring centralizer subs to ensure good mud removal across the shoe. Additional centralizers will be available to be placed across any potential flow zones to help provide the proper isolation. As a result, the full amount of points were granted
4.) Circulating Volume	The current plan is to circulate just enough mud to ensure that the float equipment is clear of debris prior to pumping cement. As a result, only one point was granted. However, if hydrocarbons are present, the cement job will begin when the well is properly conditioned.
5.) Pipe Movement	There are no plans to reciprocate and/or rotate the casing during this job. As a result, more consideration was made to proper centralization and fluid properties.