

From: Hafle, Mark E
Sent: Fri Apr 02 00:47:33 2010
To: Morel, Brian P
Subject: FW: Macondo - Information Request
Importance: Normal
Attachments: Will K Plan.pdf

Brian,

Here is something I've been hoping would go away... it hasn't

Can you pull some details from the well program that resembles the attached Will K plan and we can review and send on Tuesday.

Thanks.

Mark

From: Beirne, Michael
Sent: Thursday, April 01, 2010 5:03 PM
To: Hafle, Mark E
Subject: FW: Macondo - Information Request

Mark,
MOEX is pushing to get the requested information in bullets points 2 and 3. Regarding bullet point 2, I sent him a note telling him that we do not have a more detailed well plan but perhaps may be able to answer some specific questions and you can see their reply.

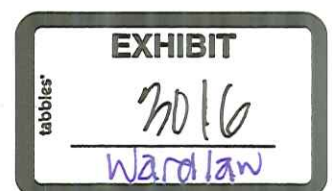
If we do not have anything let me know and I will tell them just that.

Have a good weekend.

Thanks,
Mike

From: Naoki Ishii [mailto:naoki_ishii@moexus.com]
Sent: Thursday, April 01, 2010 11:13 AM
To: Beirne, Michael
Cc: Wardlaw, O. Kirk
Subject: RE: Macondo - Information Request

Mike,



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BP-HZN-2179MDL01293808

I am sorry but don't remember very well. If I forward this email to Tokyo now, Tokyo would be mad.
Attached is a copy of the drilling plan for Will-K. Please try to collect information on the followings for the Macondo.

1. Well Design details (refer to 4.3 in the attached)
2. Well Plan (refer to 4.5 in the attached)

Once you provide something with us, I will ask Tokyo if they need more or not.

Thanks,
Ishii

From: Beirne, Michael [mailto:Michael.Beirne@bp.com]
Sent: Thursday, April 01, 2010 10:43 AM
To: Naoki Ishii
Cc: Wardlaw, O. Kirk
Subject: RE: Macondo - Information Request

Ishii,
Can you provide more detail on the information Kanno-san requested (see your second bullet point below)? I do not believe we have a more detailed well plan but perhaps may be able to provide specific detail.

Thanks,
Mike

From: Naoki Ishii [mailto:naoki_ishii@moexus.com]
Sent: Wednesday, March 31, 2010 9:56 AM
To: Beirne, Michael
Cc: Wardlaw, O. Kirk
Subject: FW: Macondo - Information Request
Importance: High
Mike,

Could you follow up this except No.1? Regarding No. 2 in particular, Tokyo would like to receive something as soon as possible. Thank you for your understanding and assistance.

Regards,
Ishii

From: Naoki Ishii [mailto:naoki_ishii@moexus.com]

Sent: Monday, March 15, 2010 2:00 PM
To: 'Beirne, Michael'; 'Kanno, Hiroto (MOECO)'
Cc: 'Wardlaw, O. Kirk'
Subject: Macondo - Information Request

Mike,

Thank you for your time last Friday. I assume that you are on the way to New Orleans but would like to follow up our discussion as follows.

1. Macondo status & way forward

We are looking forward to receiving a written report on BP's views on the current subsurface well condition and next plan.

2. Macondo well plan

We would like to receive a pre-spud well drilling plan for Macondo as the one we were given for Will-K. If BP did not prepare a pre-spud well plan for Macondo unlike Will-K, please give us more information on the drilling plan that Kanno-san requested last Friday.

3. Rig Contract

As Kanno-san mentioned in the meeting, we don't need the rig contract itself if you would provide us with detailed information on costs. We would like to know the followings.

① Mariana's pre-spud cost including mobilization and anchoring costs? (What is the actual amount charged to the joint account?)

② Mariana's repair cost including demobilization cost? (The cost to move Mariana from Macondo to Pascagoula is the only cost for us to bear, isn't it? If so, how much was it?)

③ Horizon's mobilization cost? (The cost to move Horizon from Kodiak to Macondo is our cost, isn't it? If so, how much was it?)

④ Horizon's demobilization cost? ⑤ (This is not our cost, isn't this?)

Please let me know if you need further clarification.

Kanno-san,

Please correct me if I misunderstand you.

Thanks,
Ishii

From: Naoki Ishii [mailto:naoki_ishii@moexus.com]
Sent: Thursday, January 14, 2010 10:10 AM
To: 'Kanno, Hiroto (MOECO)'
Cc: 'Murachi, Yoji (MOECO)'; 'naito_shinjiro@moeco.co.jp'; 'Tsuji, Yutaka (MOECO)'; 'Sato, Tomoaki (MOECO)'; 'Ishii, Nobuo (MOECO)'
Subject: FW: Horizon Contract

From: Beirne, Michael [mailto:Michael.Beirne@bp.com]
Sent: Thursday, January 14, 2010 8:51 AM
To: Naoki Ishii
Subject: Horizon Contract

Ishii,

I sent a note to our drilling group regarding the Horizon contract. As you are aware, the drilling contracts are highly confidential and it is not customary to share with other companies, including co-owners.

BP would like to get more detail on the specific reasons MOEX would like to view the contract. We understood the unique situation with the Marianas but would like more detail on the specific reasons for the MOEX's desire to view the Horizon contract.

We appreciate your understanding and will be happy to discuss in further detail.

Best regards,

Michael J. Beirne

Offshore Land Negotiator

BP Exploration & Production Inc.

Gulf of Mexico

200 WestLake Park Blvd.

Houston, TX 77079

Direct 281-366-1634

Mobile 832-330-8754

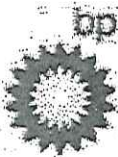
Fax 281-366-7569

michael.beirne@bp.com

Nothing contained in this communication, or in any other written or oral communications with BP Exploration & Production Inc. or its affiliates (collectively "BP") concerning the matters addressed above, shall create an obligation on BP to conclude a transaction covering such matters. Unless and until a written agreement covering the matters addressed above is executed by BP's authorized representative having express authority to bind BP to a transaction of such size and nature, BP has no obligation (legal or otherwise) concerning such matters. You should not rely on this communication or any other written or oral communications with BP as the basis for taking any action, foregoing any opportunity or incurring any costs, in anticipation of concluding a transaction with BP.

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BP-HZN-2179MDL01293811



DRILLING OPERATIONS PROGRAM



WILL K. PROSPECT

HIGH ISLAND BLOCK A-119

OCS-G 26519 WELL #1

BP Exploration and Production, Inc.

Rowan Bob Palmer

1.0 Table of Contents

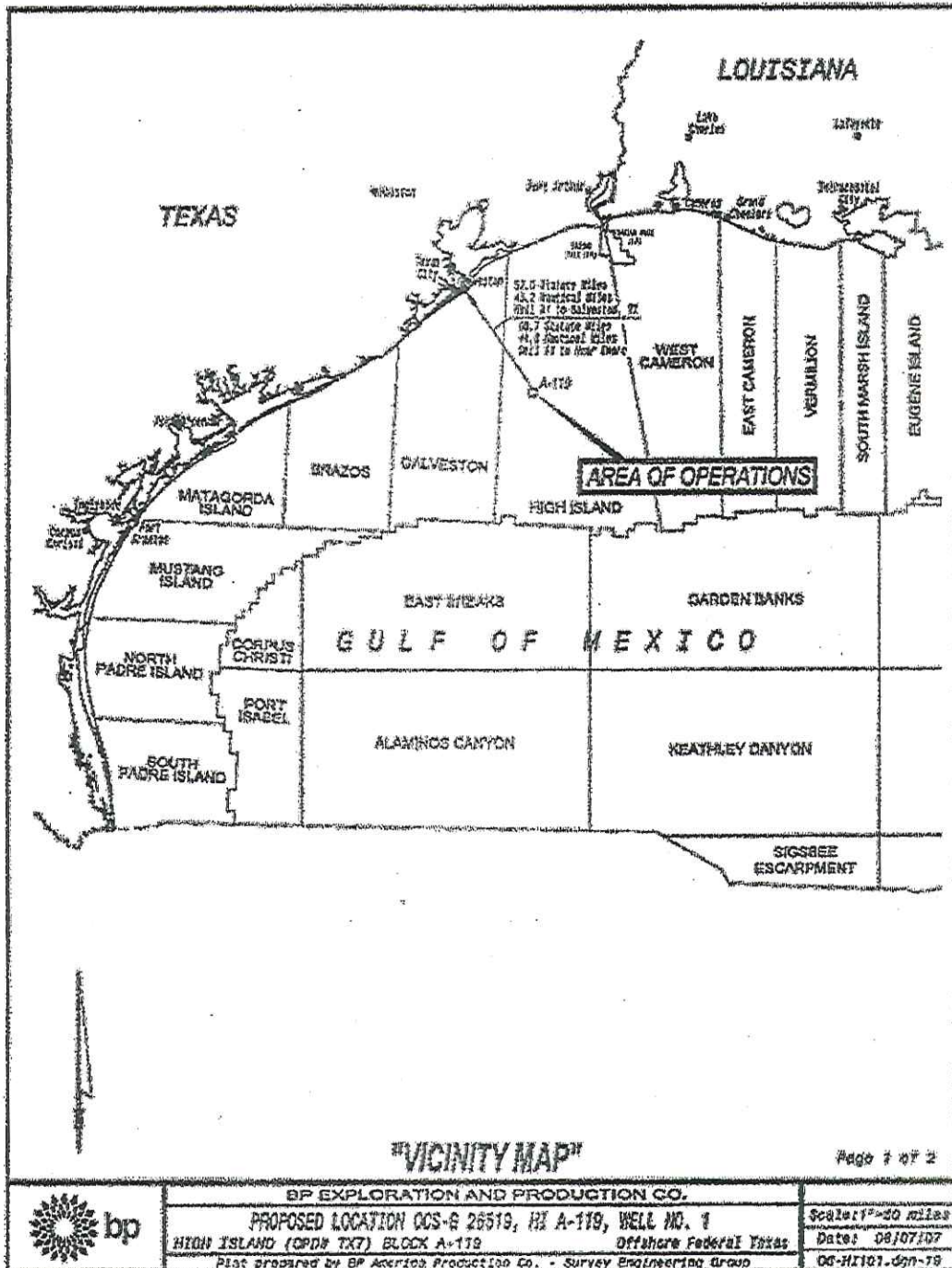
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2.0 Well / Location Information

Operator / Working Interest: BP Exploration and Production, Inc. / 75%
 Working Interest Partners: Amerada Hess (10%), Moeco (15%)
 Well Name: OCS-G 26619 High Island Blk.A-119, Well No.1
 Common Name: Will K. Prospect
 API Well Number: Issued by MMS after APD approval.
 NPDES Discharge Permit: HI A-119 coverage under Permit No. GMG290110, Outfall # 782
 Water Depth: 100 ft
 MSL - RT (Drill Floor): 147.5 ft
 RT - ML (Sea Floor): 247.5 ft
 Authorized Total Depth: ~ 27,000 ft (SSTVD)
 Authorized Cost / Days: \$180.1 MM USD (Gross) / 315 Days
 AFEE (SAP Code / Pay key Code):
 Regulatory Agency: MMS Lake Jackson District, Lake Jackson, TX
 Surface and Bottom Hole Coordinates:

	SNL	BSL
BP HI A-119 'A' Platform - Slot 'A'		
FNL of HI A-119 (ft)	831.07	831.07
FEL of HI A-119 (ft)	4,186.90	4,186.90
X Coordinate (ft)*	3,503,288.91	3,503,288.91
Y Coordinate (ft)*	339,728.93	339,728.93
Latitude	28° 41' 05.206" N	28° 41' 05.206" N
Longitude	94° 18' 36.639" W	94° 18' 36.639" W
* Texas South Control (feet), NAD 27		
Surface Location Tolerance:		100' Radius
Bottom Hole Location Tolerance:		2,500' Radius

2.1 Location Map

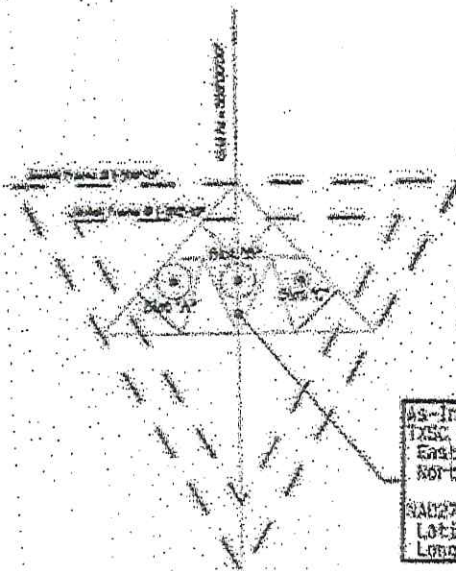


W1/K Pro-apid
Meeting Pro-read

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Kurt Andras

2.2 As-Built Platform Slot Locations



As-Installed Platform Center
JACK NAD27, US survey ft
East (X) = 3,583,299'
North (Y) = 339,724'
NAD27 Lat/Long
Latitude = 28°41'03.15"
Longitude = -94°19'55.53"

Note: Conductor slots are based on relating the As-Installed location to the design structural drawings by AIMS, Advanced Industrial & Marine Services, Inc. for the BP EAP - HIA119 "A" Platform, Yellow Rose 3 Pile, 3 Slot Well Protector Platform.

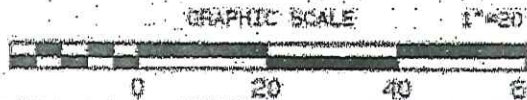
Jacket Center location by
Cochran Technologies
May 30, 2007
Signed by: Ronnie E. Dean, RPLS
K&D Log No: 0026_HIA119A structures

As-Built Slot	HI A119 Block rise FAL 1 FAL	SPCS TX-South Central Zone NAD27 - US Survey ft NAD27 East	NAD27 Lat/Long Latitude Longitude	NAD27 Lat/Long Latitude Longitude
"A"	347.07ft x 4196.00ft	330728.30ft 330303.91ft	28°41'08.20" -94°19'55.53"	28°41'08.118" -94°19'55.255"
"B"	336.89ft x 4196.00ft	330728.11ft 330303.91ft	28°41'08.20" -94°19'55.53"	28°41'08.118" -94°19'55.255"
"C"	330.72ft x 4196.00ft	330728.20ft 330303.91ft	28°41'08.20" -94°19'55.53"	28°41'08.118" -94°19'55.255"

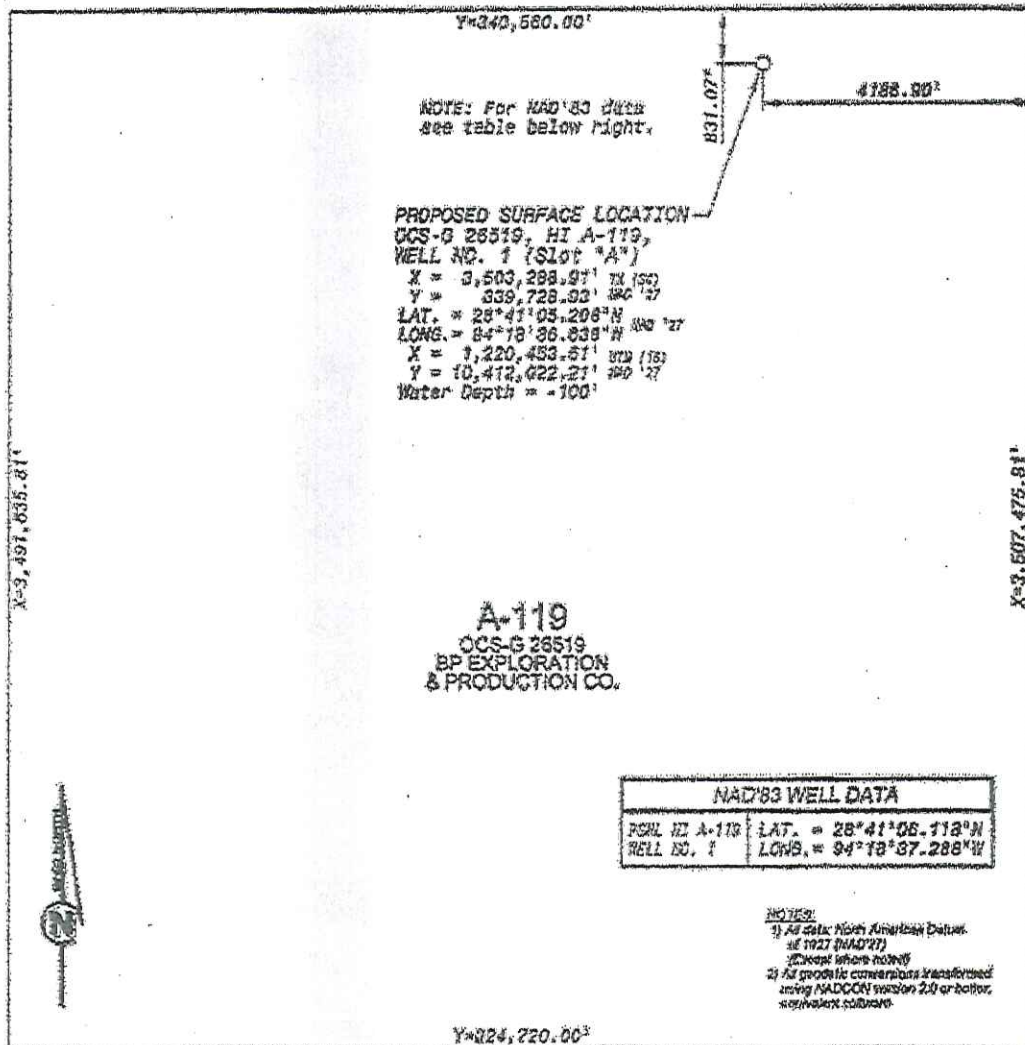
I, Brian G. Auble hereby certify
that the data hereon is correct
to the best of my knowledge.

Brian G. Auble
August 6, 2007
Texas Registered Professional Land Surveyor No. 4770
an employee of A. J. America, Inc.
601 North Loop West Blvd
Houston, TX 77079
(281) 668-4452

As-Built
Calculated Conductor Slot Locations
Based on
As-Installed Center Jacket Position
for
HI A119 Platform "A"



2.3 APD Location Plat



<p>"DIGITAL COPY" ORIGINAL SIGNED AUGUST 7, 2007</p> <p>BRIAN D. AUTIO 08/07/07 Registered Professional Land Surveyor State of Texas Registration No. 4770 Employee of BP America Prod. Co., Inc. (281) 368-4452</p>		<p>I, BRIAN D. AUTIO, hereby certify that the PROPOSED location of the BP EXPL. & PROD. OCS-G 26519, HI A-119, WELL NO. 1 is as follows: Surface: 4188.80' from the East Line and 831.07' from the North Line of High Island Block A-119.</p>	
<p>CONFIDENTIAL INFORMATION</p>		<p>Sheet 2 of 2</p>	
<p>BP EXPLORATION AND PRODUCTION</p> <p>PROPOSED LOCATION OCS-G 26519, HI A-119, WELL NO. 1 HIGH ISLAND (OPDN TX2) BLOCK A-119 OFFSHORE FEDERAL</p> <p>Plot prepared by BP America Production Co. - Survey Engineering Group</p>		<p>Scale: 1" = 2000'</p> <p>Date: 08/07/07 Drawn by: RWD 08-HIT01-000-19</p>	

3.0 Geological Information

3.1 Prospect Summary

The Will K. Prospect is located approximately 51 statute miles offshore in the High Island area of the Offshore Texas shelf - Gulf of Mexico. The prospect is primarily a four-way structural trap as shown by the Eocene (E30) structure map (Figure 4.1) on the 3D seismic data. The well is designed as a play fairway test for the mid-Oligocene through lower Eocene sections having a proposed bottom hole location within the minimum structural closure (500 ft) on BP acreage.

This well is designed to test the 'Deep Gas' play at depths greater than -21,100 ft SSTVD (sub-weld section) below the present-day GoM shelf. The primary objective is to drill and evaluate as much of the sub-weld Oligocene and Eocene sections as well bore conditions allow. This will be limited to the depth where the static BHST reaches 500° F which is the current limit for formation evaluation using wireline logging tools. Based on the estimated temperature gradient, the 500° F limit will be reached at -27,000 ft SSTVD, the AFE total well depth.

The primary target is the Eocene section located between the depths of -25,125 ft SSTVD (E30) to -27,000 ft SSTVD (E10). This target interval has a generous target radius of 2,500 ft, which should help eliminate time and expense for any "target-related" correction runs to +/- 17,500' or the depth at which the MWD tools are lost.

If we are able to reach the projected -27,000' SSTVD TD and both the BHST is well below 500° F and hole conditions are favorable, there is a possibility that we may drill ahead to evaluate more of the Eocene interval (E10 through E4). However, any drilling below -27,000' SSTVD would require an AFE supplement.

Given the HTHP conditions of this well, evaluation of the rock properties is critical, and obtaining data on reservoir effectiveness is a priority. Therefore, the open hole evaluation program includes one "Heads Up" conventional core in either the 12-1/4" or 9-1/2" open hole sections in addition to quad combo open hole logs and 3XV HTHP pressure / sample electric line surveys. Selection of this core point will be based on paleo data, ROP and gas analysis with Geoservices' "Reserval XL".

Major geologic risks for this prospect include:

- * Multiple shallow faults intersect the Will K. well bore from +/- -7,250 ft TVDSS to -14,150 ft SSTVD. Although most of these faults have little throw, they present drilling hazards given the large hole sizes.
- * Lack of offset drilling data / unknown pore pressure from +/- 15,000 ft to TD. The closest offset wells, HI A-93 #1 and HI A-94 #1 are shallow wells 5 miles to the northwest and 6 miles to the northeast of the Will K. location, respectively.
- * Abnormal pressure starts early at +/- -5,600 ft SSTVD.
- * > 1.63° per 100 ft static temperature gradient with estimated BHST of 500° F at -27,000 ft SSTVD.
- * Upper Salt section +/- 200 - 300 ft thick located at +/- -15,250 ft SSTVD. If salt is mobile, it could present problems keeping the 16-1/2" hole open while drilling and/or running 14" intermediate casing.
- * Salt Weld at -21,100 ft SSTVD. Salt may or may not be present. Concerns include a possible pore pressure ramp and / or rubble zones and lost circulation.
- * Time - depth conversion errors - there is a range of +/- 1,000' depth uncertainty below the salt weld at -21,100' SSTVD.
- * Effective stress / pore pressure may approach frac gradient
- * Inability to properly evaluate prospect due to:
 - o HTHP logging tool limitations
 - o Inability to get conventional cores

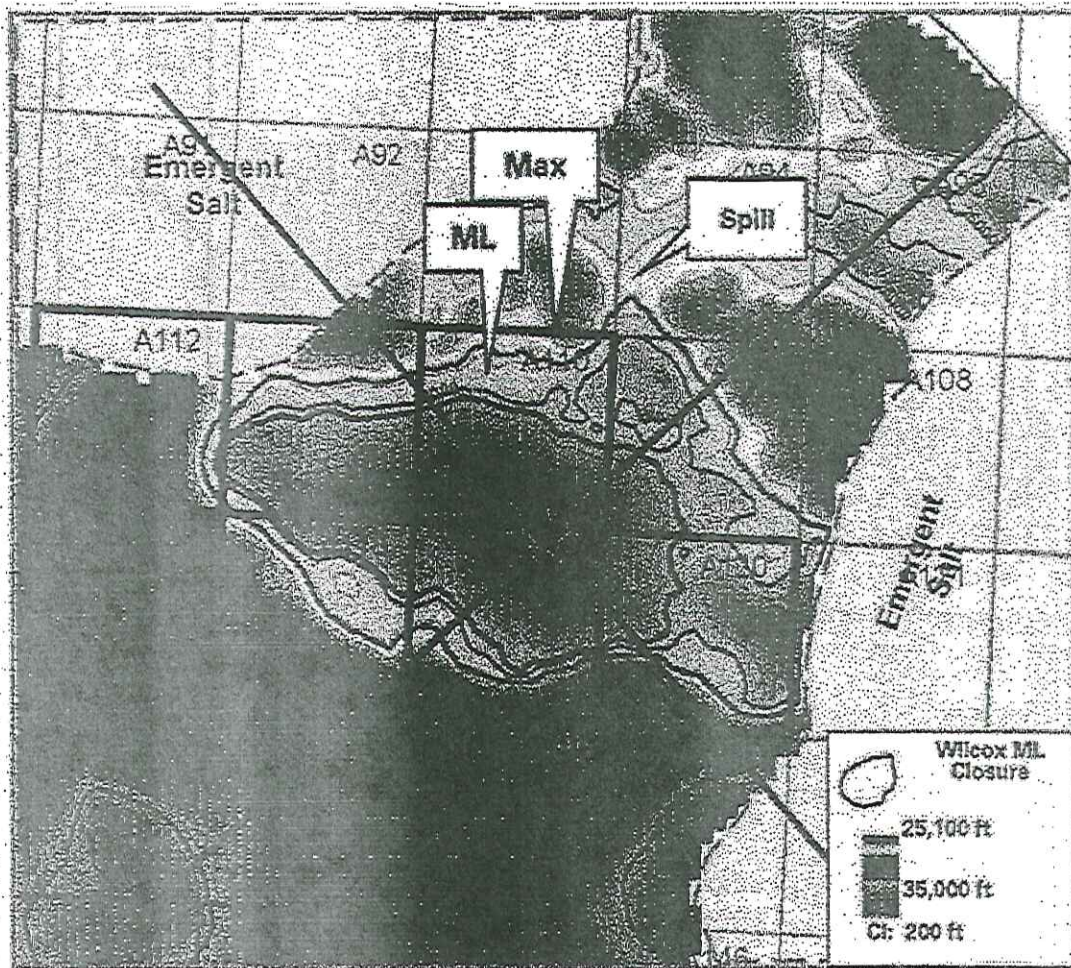
- Reservoir presence / effectiveness.

Economic success has been defined as the discovery of > 500 md-ft of pay within a complete-able interval. A successful well program will gather sufficient data (wire line logs, fluid sampling, temperature, pressure, sidewall and/or "Heads Up" full whole core, cuttings, interval velocities, gas composition) to support an efficient appraisal study.

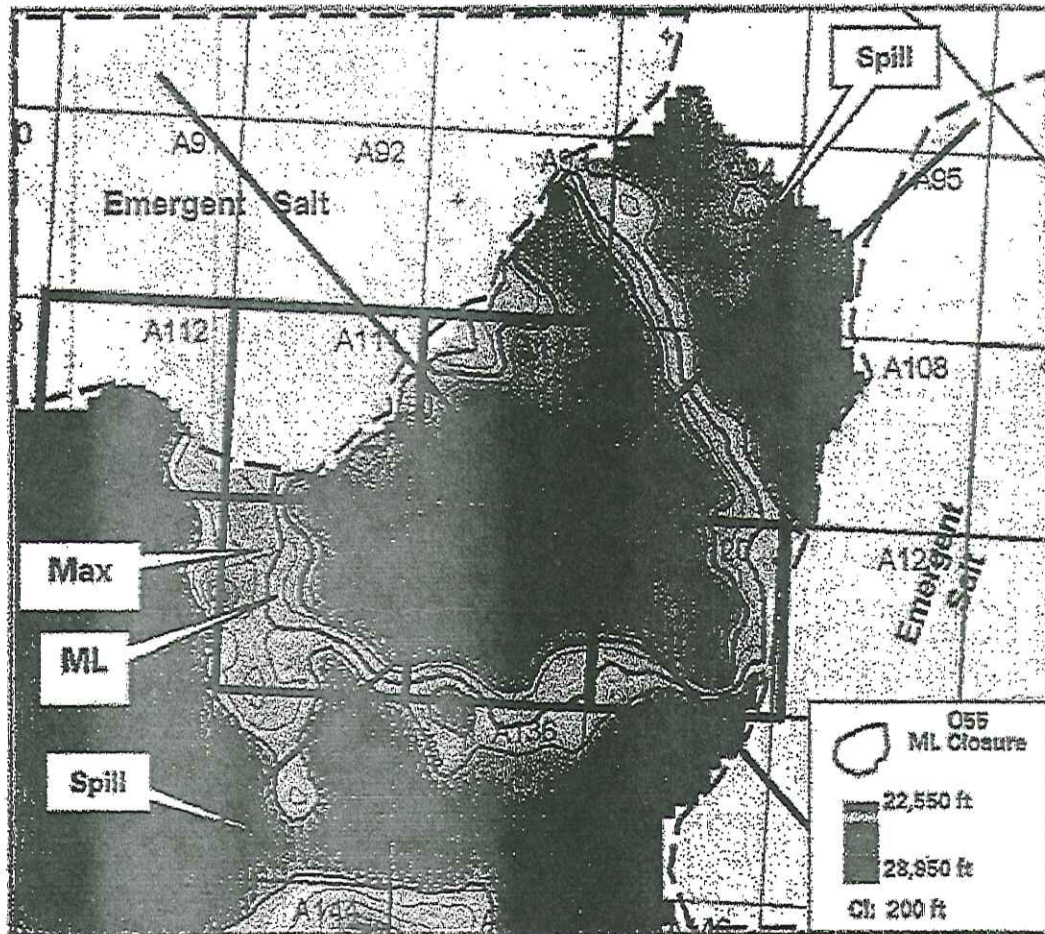
If successful, the Will K. production is anticipated to be gas with the possibility of some H₂S (est. from 10-20 ppm likely to 400 ppm maximum). Maximum bottom hole temperatures and pressures for this prospect are estimated at 500° F and 24,850 psi, respectively.

In the event the well is not commercial, the goal is to gather sufficient data to better define and/or condemn this play fairway and understand the drill-ability issues for future Deep Gas wells.

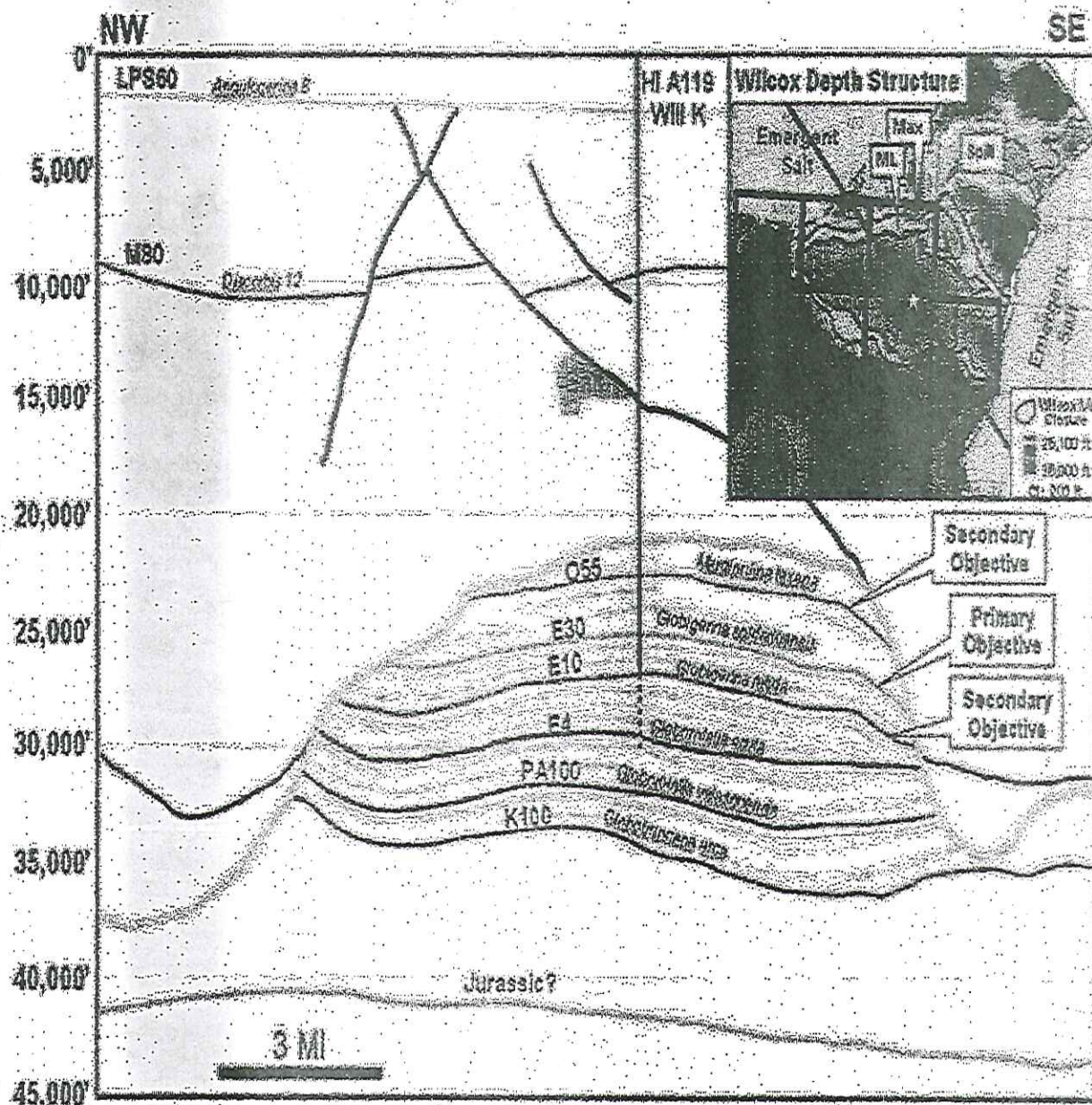
3.1.1 Figure 4.1 E30 Eocene Structure Map



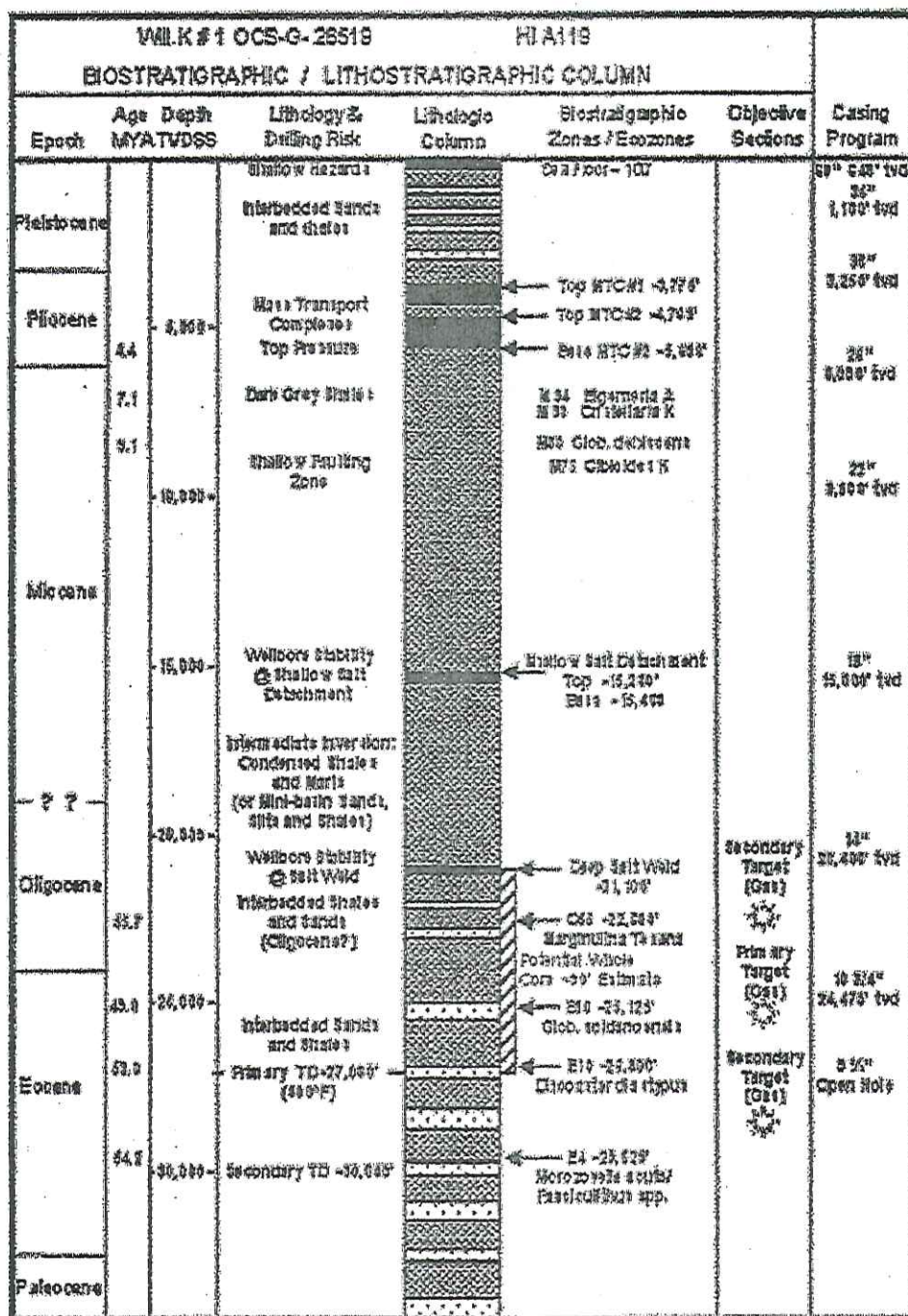
3.1.2 Figure 4.2 O55 Oligocene Structure Map



3.1.3 Figure 4.3 NW - SE Geologic Cross Section



3.1.4 Figure 4.4 Will K. Biostratigraphic / Lithostratigraphic Column



Will K Pre-spud
Meeting Pre-read

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3.2 Shallow Gas

Unit		Depth Interval (ft SSTVD)	Gas Risk
A	Alternating silty fine sands and clays	100 ft - 217 ft	Negligible
B	Mostly clays with silty sand layer at top and numerous slit partings and seams	217 ft - 1,642 ft	Negligible
C	Clays and interbedded sands	1,642 ft - 3,702 ft	Negligible
D	Clays with some sands and channeling	3,702 ft - 6,457 ft	Negligible

3.3 Shallow Zone Hazards & Target Intervals

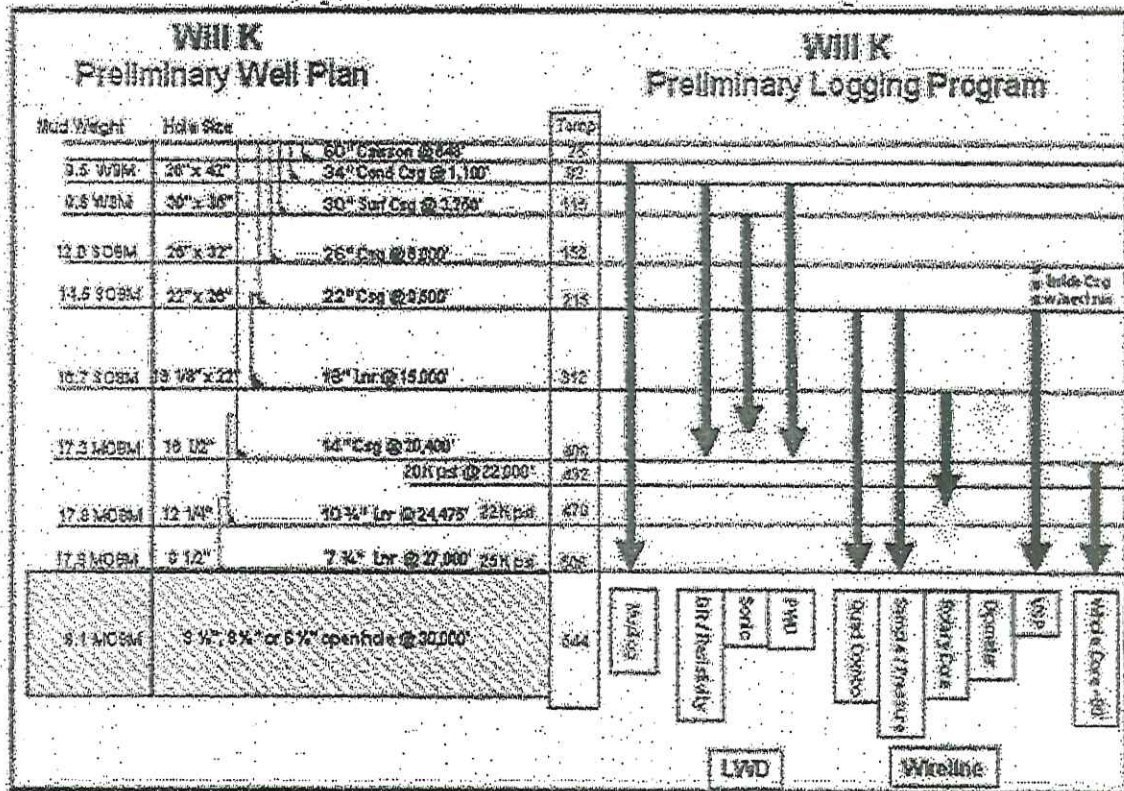
Reference / Marker	SSTVD	MD/TVD	Uncertainty	Est. TVD Thickness	Lithology / Comments
Drill Floor Datum	(-148)	-0-		NA	
Mean Sea Level	0	148'		NA	Water (DF-MSL = 147.5')
Sea Floor (Mud line)	100'est	248' est.		NA	Estimated Mud line.
Mass Transport Complexes					
MTC 1	3,776'	3,323'	+/-220'	545'	Shale and Sand.
MTC 2	4,763'	4,911'	+/-230'	393'	Shale and sand, expect pressure to build
MTC 3	10,140'	10,288'	+/-300'	750'	Shale most likely, well misses major expanded section
Shallow Faulting					
Fault WK_sh04c	7,290'	7,438'	+/-260'	NA	Small throw
Fault WK_sh03c	8,340'	8,488'	+/-290'	NA	Small throw
Fault WK_sh03b	9,475'	9,623'	+/-310'	NA	Small throw
Fault WK_sh03	10,142'	10,290'	+/-330'	NA	Small throw
Fault WK_sh02	10,550'	10,698'	+/-340'	NA	Small throw
Fault WK_sh03f	11,625'	11,773'	+/-360'	NA	Small throw
Fault WK_sh15	13,050'	13,198'	+/-430'	NA	Small throw
Fault WK_sh01 to Salt Detachment	14,180'	14,328'	+/-400'	1,100'	Large fault throw with steeply rotated beds between fault and Salt Detachment; potential for rubble zones
Salt Detachment	15,280'	15,428'	+/-540'	0' - 300' salt	Thin salt may be penetrated
Intermediate Inversion	15,280'	15,428'	+/-540'	5,620'	Unknown age and lithology; probably shales and marls but may contain sands and silts; narrowest frac gradient in well plan
Salt Weld	21,180'	21,248'	+/-820'	Unknown	Main paleosalt weld; salt and rubble zone may or may not be present
Objectives					
Mid-Oligocene?	21,180'	21,248'	+/-820'	1,500'	Secondary Objective
O55 Horizon	22,600'	22,748'	+/-1,550'	2,525'	Secondary Objective
E30 Horizon	25,126'	25,273'	+/-1,300'	1,675'	Primary Objective
E10 Horizon	26,800'	26,948'	+/-1,450'	> 200'	Secondary Objective
Approved Total Depth	27,000'	27,155'			Est. 5000' FBHST

* Note: See Detailed Shallow Hazards Report.

3.4 Offset Well Data

Well	Operator	Year Drilled	Prospect	TD / TVD	Age @ TD	Comments
HI A93 #1	General At RES	1993		4,595' / 4,011'	P90	Closest overburden offset, 5 miles to N-NW
HI A94 #1	Pogo	1996		3,801' / 2,505'	Pleistocene	6 miles to NE
HI A411 #1	Sun Expl	1985		9,900' / 9,497'	Pliocene	17 miles to SE
HI A89 #1	Chevron	1988		10,400'	M75	Checkshot / velocity calibration well, 13 miles to W-NW
HI A83 #1	Amerada Hess	1984		16,024' / 13,553'	M57	14 miles to NW
HI A86 #1	Superior	1984		18,911' / 18,858'	M57	12 miles to NW
HI 10 #1	Shell	2004	Joseph	25,552'	PA??	55-100' "Yegua" pay, ~2,000' rally "Wilcox"
WC 48 #2ST	El Paso	2003		23,150' / 21,336'	E80+	Did not reach E80 horizon
ST 193 #1	Exxon	2006	Blackbeard	30,067'	M20	Drilling learnings incorporated into Will K
ST 174 #1	Shell	2004	Shark	25,766'	M57	Deep shelf well

3.5 Open Hole Evaluation Program



Mud Logging Program:

Mud logging (recording drilling parameters) will begin at the mud line, and continue through total well depth. Wet and dry cuttings samples will be collected at 30 ft intervals from below the caisson to total depth.

Going Program:

One "Heads Up" core is included in AFE for either the 12-1/4" or 9-1/2" open hole section.

4.0 Drilling Summary

4.1 Operations Executive Summary

The BP Will K. #1 will be a vertical well drilled to -27,000 ft. SSTVD in High Island Block A-119 with the Rowan Gorilla VIII (Bob Palmer). The well will be drilled from the BP HI A-119 'A' platform located 831' FNL and 4,187' FEL of Block A-119 in approximately 100 feet of water. The primary target for the Will K. Prospect is the Eocene E30 through E10 sand interval from +/- 25,125 ft. SSTVD to -27,000 ft. SSTVD TD.

One of the biggest challenges designing and planning this well was the lack of offset wells within a 5 mile radius of BP's HI A-119 'A' surface location. The closest offset well is the HI A-93 #1 (General Alt. Res.) drilled in 1993 at a location 5 miles to the north-northwest of Will K; however, it was only drilled to 4,011' TVD. The two deepest wells in the area are the Superior HI A-86 #1, a vertical well drilled to a TD of 18,911' MD in 1984 and the Amerada Hess HI A-88 #1 - a directional well drilled to 13,663' TVD. However, both of these wells are located at least 12 miles away from the Will K.

The BP HI A-119 #1 will be a high temperature, high pressure, exploration well (HTHP) with anticipated bottom hole temperature of 500°F, and pressures in excess of 24,850 psi at -27,000' SSTVD TD. There is a potential risk of encountering H₂S (est. from 10 - 20 ppm most likely to 400 ppm maximum) drilling the Oligocene and Eocene formations below the salt weld; however, due to the limited well control within a 5 mile radius of Will K, precautionary contingencies will be incorporated and in effect before drilling below the 30" surface casing point at +/- 3,250' TVD as per the H₂S Contingency Plan in Section 11.7.

This well has been designed with 8 casing strings (80", 34", 30", 26", 22", 18" liner, 14", 10-3/4" liner) and one contingent 7-5/8" drilling liner. In addition to projected drill ahead MW-ECD vs. frac gradient margins, casing points were based on the following:

- * 34" Surface: MMS required string. Depth based on adequate frac gradient to support cementing 30" to surface.
- * 30" Surface: MASP based on frac at shoe / gas to surface limited to 2,220 psi - working pressure rating for 'A' section 30" ANSI 900 top flange.
- * 26" Intermediate 1: The setting depth of 6,000' will place the first intermediate casing string in abnormal pressure, cover up the sand sections / mass transport complexes and provide a good shale casing seal.
- * 22" Intermediate 2: Depth of this string primarily limited by weight and StressCheck burst design factor limit of 1.1 based on GKP and 1/3 BHP load cases. The top 7,000' of this string was special order P-110 OCTG pipe from US Steel which was required to meet minimum design factors for these BP load cases and an API pipe burst of 8,750 psi which was more in line with the 21-1/4" 10M BOP rating.
- * 18" Drilling Liner: Length of liner limited by slip crushing load of 840.8 KIPS for 6-5/8" 34# drill pipe using the rig's PS-30 slips and / or 660 KIP load rating of Drill-Quip running tool. Shoe will be set above the Upper Salt section at +/- 15,428' RKB.
- * 14" Intermediate 3: Shoe set above the Salt Weld at +/- 21,248' RKB. Also, project timing required using BP 14" casing inventory which is limited to +/- 20,400'.
- * 10-3/4" Drilling Liner: Depth TBD based on pore pressure vs. frac gradient margin, presence of hydrocarbon bearing zones and ability to drill 12-1/4" hole. Currently planned for 24,475' RKB.
- * Contingent 7-5/8" Liner: Available as needed to reach TD depending upon actual pore pressure / frac gradient margin encountered.

4.2 Drilling Risks

Major drilling risks for this well include the following:

- * Welding and driving a 60", 2" wall thickness caisson to 400' below the mud line.
- * Drilling large hole sizes -- hole cleaning, ECD management, keeping hole open to run casing.
- * Under-reaming with large conventional DTU /XTU under-reamers from surface to 9,500' -- potential slow ROP, vibration issues, tool failures and fishing jobs.
- * Large OD 34" conductor / 30" surface casing strings will require:
 - o Custom Velco 36-1/2" ID 500 psi diverter & 40" overshot / packer built especially for the Will K. project / Rowan Bob Palmer. BP will build a custom 60" x 40" diverter riser to enable NU this diverter system on the 60" caisson. The riser will have 4 access tubes for 2-3/8" grout strings for the 60" x 34" annulus.
 - o Serial #1 Drill-Quip 60" landing ring / 34" casing hanger system to enable running and cementing 34" conductor casing without ND the diverter / eliminate a wellhead spool. The 60" landing ring will be installed at the surface.
- * Running several large-OD, flush-joint intermediate casing strings (26", 22", 14") with buoyed weights of 1,300 -- 1,700 KIPS.
- * Serial #1 casing tools (i.e. 30" 1000 ton / 22" 1,250 ton) required for large OD, heavy casing strings.
- * Large volume, inner-string cement jobs for the 34", 30", 26" and 22" casing strings.
- * Drilling with abnormally high levels of background gas from +/- 10,000 ft. RKB to TD.
- * Potential narrow window between pore pressure and fracture gradient drilling below +/- 15,000' RKB which could result in running out of casing strings before reaching TD.
- * Drill-Quip BigBore II 22" x 18" liner hanger system
 - o Tight tolerance between 18.25" ID landing ring installed in 22" casing string and 18-1/8" PDC bit
 - o Tight tolerance between 18.25" ID landing ring and 18" flush joint liner -- requires auto-fill float equipment and drill pipe diverter tool for surge reduction.
 - o Reliance on 5,000 psi packoff at 18" TOL for primary pressure seal.
- * Potential plastic upper salt section at +/- 15,428' RKB could cause problems keeping hole open while drilling and / or running 14" intermediate casing.
- * High temperatures / pressures will:
 - o Require surface mud coolers from 3,250' to TD to:
 - * Attempt to keep flow line mud temperature $\leq 190^{\circ}$ F
 - * Extend MWD-LWD / wire line logging tool life
 - o Exclude the use of LWD sonic below the depth where the BHCT reaches 300° F
 - o Exclude the use of MWD / LWD / PWD as early as +/- 17,500' or the depth where the BHCT reaches 350° F -- no real time logs or pore pressure prediction below this point
 - o Require development of new HTHP magnetic steering and pipe recovery tools.
- * Potential pressure ramp / lost circulation while drilling below the salt weld at +/- 21,248' RKB
- * Slow rates of penetration drilling hard formations in Oligocene through Eocene:
 - o Will result due to the use of diamond impregnated bits and turbines.
 - o Will result in substantial rotating hours and potential for 14" casing wear
 - o Could result in BHA failures due to vibration / shock which cannot be monitored in real time w/ LWD.

- Possible H₂S in Oligocene / Eocene and exposure to high grade, Q-125 / VM-140 tubulars
- HTHP kick detection / well control.
- Drilling blind in sub-weld sections
- Estimated 500° F BHST will push limits of Schlumberger's electric line quad combo and 3XV HTHP pressure / sample tool.
- Well plan includes obtaining one "Heads Up" conventional core in either the 12-1/4" or 9-1/2" TD hole section.

Due to the heavy intermediate casing strings to be run, BP invested \$4MM with Rowan to upgrade the Bob Palmer to 2,500 KIP hoisting / rotary static load capacity and 3,750 KIP combined hook and setback load. Other major rig upgrades / improvements included adding a 1,500 HP AC top drive motor for better torque output, PG-30 drill pipe slips and Cameron DVS blind-shear rams w/ tandem boosters for the rig's 18-3/4" 15M BOP stack.

Based on experience gained during BP's '06 hurricane season and loss of platforms and wells a tripod structure was pre-installed on location to support the well in the event of a hurricane at a cost of \$7MM. In addition to protecting the minimum estimated +/- \$181.4 MM well investment, it also eliminated the need for a mud line suspension system (and potential pressure integrity - related issues) and provided a safe deck / work area for BOP NU. The tripod-supported 60" caisson has been designed to handle up to 8,000 KIPS bearing load and support all planned BOP stacks if the rig must be evacuated for a hurricane.

4.3 Well Design Challenges

This well design presented numerous engineering challenges as follows:

- **Casing/Wellhead**

A Cameron 15 KSI system has been designed exclusively for this project with the 'A' section NU on the 30" surface casing. This wellhead design will include several serial #1 pieces including a special base plate design with split shims, a non-API flange 26-3/4" SM flange (top of 'B' section) and 26" and 22" mandrel fluted casing hangers with P-Seal pack-offs. The system will also include custom serial #1 running tools.

- **Mud**

Water base mud will be used to drill both the conductor and surface hole sections to 3,250'. Mud coolers will be used from +/- 3,250' to TD in an attempt to keep the surface flow line temperature $\leq 190^{\circ}\text{F}$ at the high projected circulating rates.

Synthetic oil base mud (SOBM) will be used to drill from 3,250' to 15,000' for better hole quality and to allow us to dispose of drill solids overboard. The ability to dispose of cuttings on site is critical since it would be almost impossible to "skip & ship" the large volume of cuttings that will be generated in these hole sections with LTMO or diesel oil based mud systems.

From 15,000' to TD, the drilling operations will be converted to "zero discharge", and low-toxicity mineral oil (LTMO) base mud will be used to drill to TD. Cuttings / waste will be collected in cuttings boxes and "skipped & shipped" onshore for proper disposal. Please refer to Section 5.3.8 below for a complete mud program summary.

Testing mud at these high temperatures will be a challenge. BHI has worked with Chandler to develop the 7600 HTHP viscometer rated to 600 $^{\circ}\text{F}$ and 40,000 psi. This viscometer was validated with side by side tests with the Fann 75 with LTMO mud to temperatures $> 300^{\circ}\text{F}$ and pressures approaching 15,000 psi. It has been used to derive LTMO data for BHI's Advantage Hydraulics software for temperatures of up to 525 $^{\circ}\text{F}$ and 33,000 psi.

- **Cement**

Halliburton has designed conventional lead and tail slurries for the conductor and surface casing with TXI leads mixed at +/- 12 ppg and tail cements mixed at 14 ppg. The 26" will also have TXI lead and tail slurries mixed at 13 ppg and 14 ppg, respectively. The 14 ppg TXI tails will have an estimated 24 hour compressive strengths of 300, 1,200 and 2,000 psi for the 34", 30" and 26" strings, respectively. Use of the TXI cement for both lead and tail cements has the advantage of allowing us to completely fill the rig's 11,200 ft³ p-tanks and use 100% of the contents if required to cement these large annular volumes.

The 22" and 14" intermediate casing will be cemented with a Class H slurries with silica for temperature stability and appropriate fluid loss additives and retarders. Slurry weights will vary from minimum weight of 16 ppg to a maximum weight of 0.5 ppg over mud weight.

The challenge for these cement jobs will be both the large cement and mud displacement volumes. We plan to cement the conductor, surface and first two intermediate casing strings using the inner string method. The 14" intermediate and 10-3/4" drilling liner will be cemented conventionally. Please refer to Section 5.3.9 below for a complete mud program summary.

Halliburton has the following HTHP cement testing capabilities:

- Fann 50 (20ksi / 500 $^{\circ}\text{F}$)
- HTHP consistometer (29.8 ksi / 580 $^{\circ}\text{F}$).

- Bits

The main bit strategies for Will K. are as follows:

- o Drill both the conductor and surface hole sections with two passes: 30" pilot hole run followed by DTU under-reamer run to help clean hole and to prevent over-loading surface solids control equipment.
- o Use milled tooth bits / conventional under-reamers (DTU & XTU) to drill to 9,500' to minimize torque, vibration and "stick-slip".
- o UWD from 3,250' - 15,000' RKB to minimize mud weight vs. pore pressure over-balance while reaming.
- o Push PDC bits with rotating BHAs as long as possible in deeper hole sections before switching to diamond impreg bits and turbines. This transition may occur as early as the 12-1/4" hole section.

The proposed bit program summary is as follows:

- o 0' - 9,500': UWD with milled tooth bit / under-reamer combinations
- o 9,500' - 15,000': 18-1/8" PDC bits with rotary steerable and 22" PDC Rhino Reamer
- o 15,000' - +/-24,475': PDC bits with PDM motors as long as temperature permits (i.e. 375° F BHCT) and packed BHAs thereafter.
- o +/-24,475' - 27,000': Diamond impregnated bits with turbines

Please refer to Section 11.4 for the detailed bit program and hydraulics recommendations.

- Directional Control

MWDs / rotary steerable tools and / or PDMs will be used to monitor and assist in maintaining a vertical to a minimum depth of +/- 17,500' or the depth at which BHCT reaches 350° F. Bottom hole assemblies (BHAs) and associated equipment necessary to make well bore correction runs such as rotary steerable tools, bent housing PDMs and turbines will be kept at rig site till we reach the depth at which we are no longer able to obtain MWD directional surveys to insure that the well will be within the 2,500' target radius at TD.

Beyond this point, the well will be drilled with packed BHAs since correction runs will not be possible due to the +/- 350° F temperature rating of these tools. The well will be surveyed with MWD tools until the BHCT reaches +/- 350° F. At this point, we will obtain drift surveys every 1,000' minimum while drilling and at minimum 100' intervals with Scientific Drilling's HTHP magnetic multi-shot tool while POH on trips.

- Evaluation

The open-hole well bore will be logged with LWDs from the 34" conductor casing shoe to the maximum temperature at which the tools will operate in the 18-1/2" hole section (Weatherford's tools are spec'd to 356° F). Formation evaluation with wire line logs will be conducted from the 22" intermediate casing shoe at +/- 9,500' to TD. Consult Section 9.3 of this DOP for a detailed description of the wire line log evaluation and coring programs.

- Well Bore Suspension

This well has been designed as an expendable well, and will be either permanently plugged and abandoned (P&A) or temporarily abandoned (T&A) at the conclusion of formation evaluation.

4.4 Exit Strategy

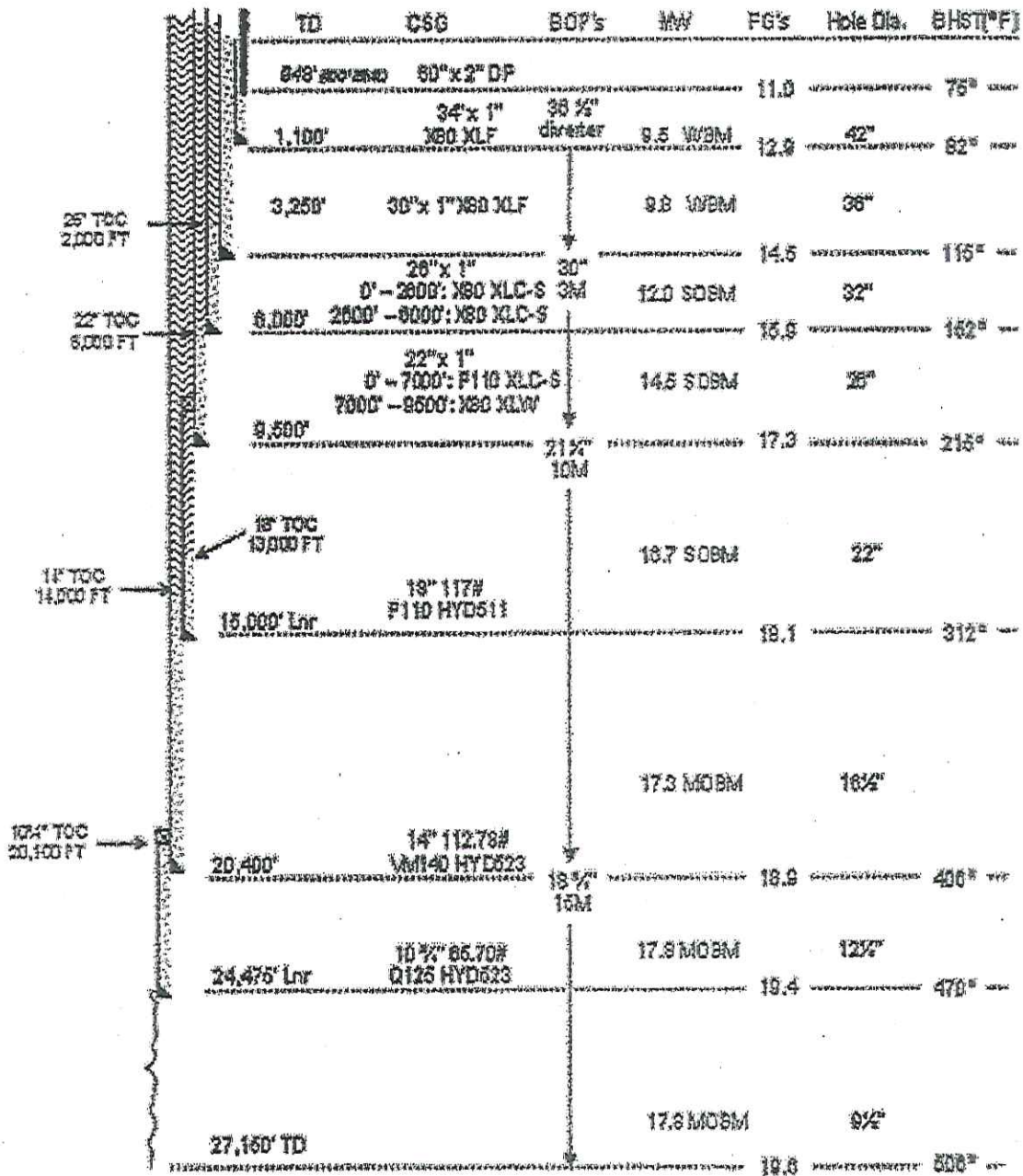
As documented in Section 4.1 above, this well has many challenges and virtually no offset data below +/-15,000' RKB. As a result, predicting the future below this point will be difficult, and there are certain events that could happen that would prevent drilling the well to the planned -27,000' SSTVD. Therefore, an Exit Strategy has been developed for this well.

The major events / exit points that could result in abandoning the well are as follows:

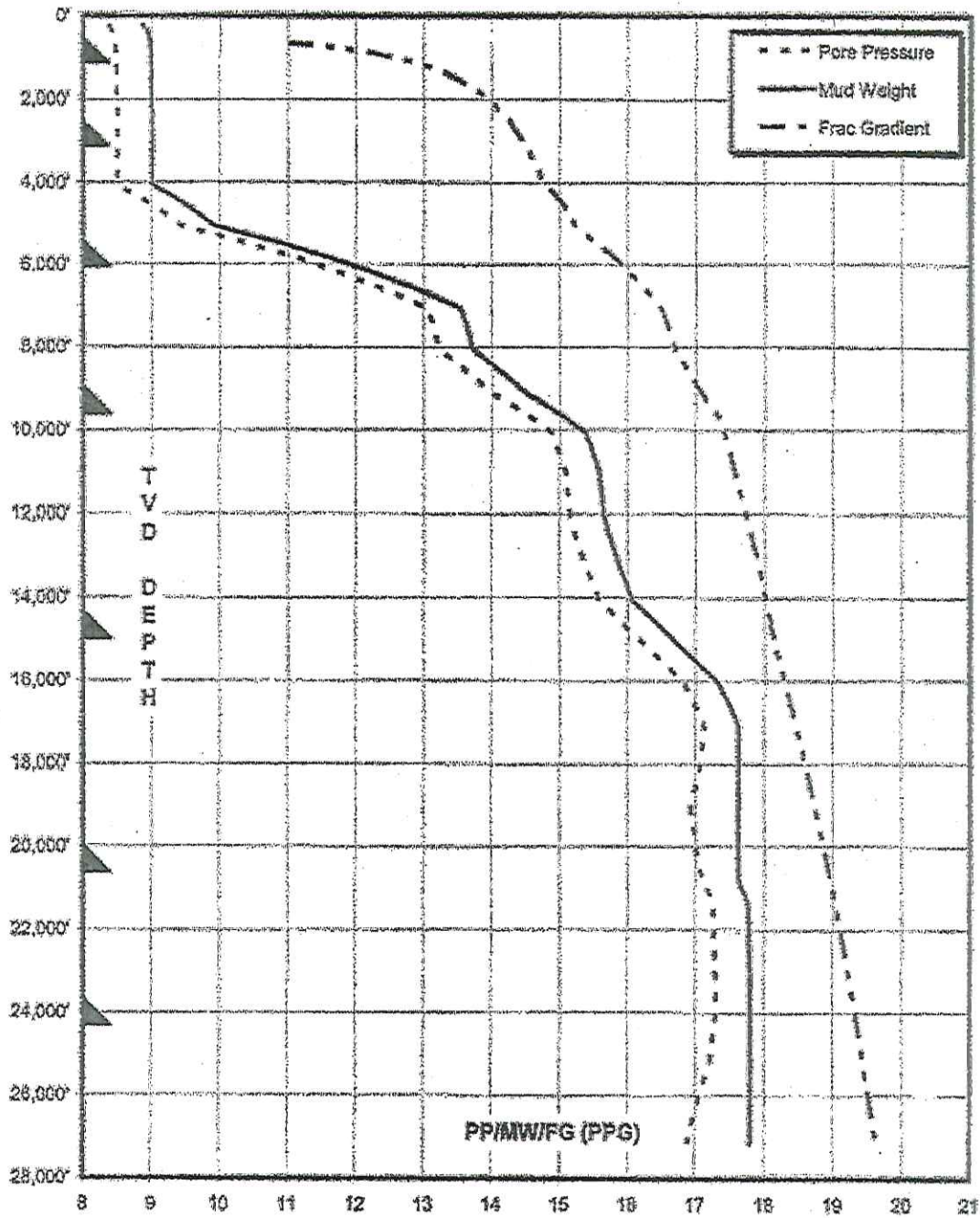
1. BHST reaches 500° F prior to reaching planned TD at -27,000 ft SSTVD.
2. Flow line mud temperature cannot be controlled below 190° F with 4 mud coolers and minimum circulating rates required to clean hole.
3. Free H₂S detected in oil base drilling mud or H₂S cannot be maintained at an acceptable level with scavengers.
4. Inability to reach sub-weld within closure.
5. Unmanageable well control event.
6. Unmanageable casing wear for 14" intermediate due to slow ROP and resulting rotating hours.

4.5 General Well Plan

4.5.1 Well Bore Schematic



4.5.2 Predicted Pore Pressure / Frac Gradient

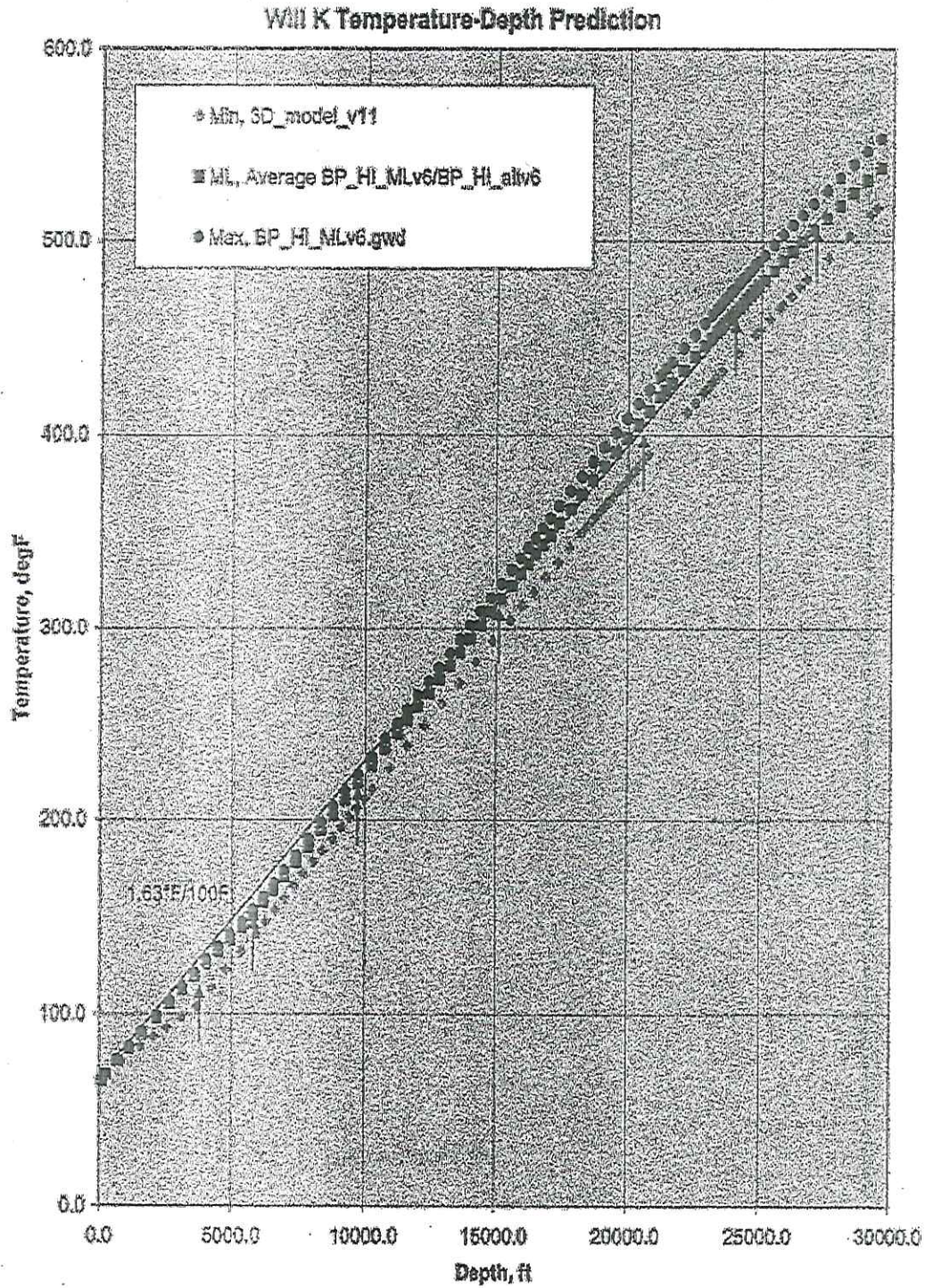


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4.3.3 Predicted Static Formation Temperature Plot



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4.5.4 Casing Program

Interval	Hole Size	Casing OD	Weight (lb/ft)	Grade	Thread	Depth (MD/TVD) (ft)
Caisson	Driven	60"	1240.00	60 KSI	PE	+/- 648
Conductor	42"	34"	352.40	X-80	XLF	+/- 1,100
Surface	36"	30"	309.72	X-80	XLF	+/- 3,250
Intermediate 1	32"	26"	267.00	X-80	XLC-S	2,600
		26"	267.00	X-65	XLC-S	2,600 +/- 6,000
Intermediate 2	26"	22"	224.28	P-110	XLC-S	7,000
		22"	224.28	X-80	XLW	7,000 +/- 9,500
Liner 1	22"	18"	117.00	P-110	Hydri 511	+/- 9,175 - 15,000
Intermediate 3	18-1/2"	14"	112.78	VM-140	Hydri 523	+/- 20,400
Liner 2	12-1/4"	10.750"	66.70	HCC-125	Hydri 523	+/- 20,100 - 24,475
Contingent Liner 4	8.5 - 9.5"	7.625"	39.00	HCC-125	Hydri 523	**

4.5.5 Casing / Connection Dimensions / Properties

Interval	Weight (lb/ft)	Weight (lb/ft)	Grade	Weight (lb/ft)	Weight (lb/ft)	Weight (lb/ft)	Weight (lb/ft)	Thread	Depth (MD/TVD) (ft)	Depth (MD/TVD) (ft)
34	1,100	352.40	X-80	32,000	31,813	4,120	1,270	XLF	5,308	5,308
30	3,600	309.72	X-80	28,300	27,813	4,670	1,850	XLF	4,665	4,966
26	2,600	267.00	X-80	24,300	23,813	5,390	2,670	XLC-S	4,408	4,408
26	3,400	267.00	X-65	24,300	23,813	4,380	2,430	XLC-S	3,581	3,581
22	7,000	224.28	P-110	20,000	19,813	8,750	4,480	XLC-S	4,369	4,369
22	2,600	224.28	X-80	20,000	19,813	6,360	3,870	XLW	5,278	5,278
18	5,900	117.00	P-110	16,750	16,563	6,680	2,110	HYD 511	2,330	2,762
14	20,400	112.78	VM-140	12,400	12,244	14,000	9,030	HYD 523	3,427	3,461
10.34	4,375	66.70	Q-125	9,500	9,500	12,110	7,920	HYD 523	1,725	1,814
7.58	3,825	39.00	Q-125	8,625	8,600	14,340	12,060	HYD 523	1,040	1,155

4.5.6 Wellhead Program

4.5.6.1 Summary

Cameron	'A' Section: Type HCS-3 - 30" SOW x 30" ANSI 900 RTJ w/ 2 - 4-1/8" 5M outlets 60" base plate and spill support shims designed to support 8.0 million pounds compressive load
	'B' Section: Type HCS-3 - 30" ANSI 900 RTJ x 26-3/4" 5M OEC w/ 2 - 4-1/8" 5M outlets - one w/ VR plug / companion flange, one w/ 2 gate valves. 30" x 26" mandrel fluted casing hanger w/ P-Seal packoff assembly
	'C' Section: Type HCS-3 - 26-3/4" 5M OEC x 21-1/4" 10M API w/ 2 - 2-1/16" 10M outlets - both w/ 2 gate valves. 26-3/4" x 22" mandrel fluted casing hanger w/ P-Seal packoff assembly
	'D' Section: Type HCS-3 - 21-1/4" 10M API x 18-3/4" 15M API w/ 2 - 1-13/16" 15M outlets - one w/ VR plug / companion flange, one w/ 2 gate valves. 21-1/4" 'S' Bowl x 14" casing hanger slips w/ Canh seal packoff

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4.5.7 Directional Survey Program

Hole Section	Survey Type	Frequency
30" x 42"	Multi-shot gyro	Multi-shot every stand while POH prior to running 34" conductor casing.
30" x 36"	MWD	Every stand while drilling
26" x 32"	MWD	Every stand while drilling
22" x 26"	MWD	Every stand while drilling
18-1/8" x 22"	MWD	Every stand while drilling
16-1/2"	MWD / Magnetic Multi-Shot	Every Stand to 350° BHCT then Scientific Drilling's HTHP magnetic multi-shot every stand while POH prior to running open hole e-line logs at TD.
12-1/4"	Magnetic Multi-Shot	Every Stand to 350° BHCT then Scientific Drilling's HTHP magnetic multi-shot every stand while POH prior to running open hole e-line logs at TD.
8-1/2"	Magnetic Multi-Shot	Every Stand to 350° BHCT then Scientific Drilling's HTHP magnetic multi-shot every stand while POH prior to running open hole e-line logs at TD.

4.5.8 Mud Program Summary

COLORADO WILL K #1 - DRILLING FLUIDS PROGRAM		Casing Size	Hole Size	Mud Type	Mud Properties	Mud Volumes	Flow Rates
<p>26" TOC 4,000 FT</p> <p>22" TOC 6,000 FT</p> <p>18" TOC 9,000 FT</p> <p>14" TOC 14,000 FT</p> <p>10 3/4" TOC 20,100 FT</p>	TD 6481.420' BH 6481.420' (6481.420' to 6481.420')	60" X 2"		Spud Mud	Sea Water, RHG, DKO Sweeps	2100 bbl DKO	>2500
	1,100' Cor	34"	30" 30" X 42"	Sea Water, RHG, CEL, BLOCSE PB-ETEX	9.8 ppg, PV 4-10; YP 20-40; <15 API (final run); Sea Pad Mud	1300 bbl DKO	2500+
	3,250'	30"	30" 30" X 36"	Sea Water, RHG, CEL, BLOCSE PB-ETEX DKO Sweeps	9.5 - 10.0 ppg, PV 8- 18; YP 25-40; <15 API when opening; Weighted Pad Mud	2400 bbl DKO	2500+
	6,000'	28"	28" X 32"	SEA GT 3000 FRED LOGIC	11 - 12.0 ppg, PV 20- 25; YP 20-30; HFHT <8cc	8000 bbl premix; Build 4200 bbl	2200
	9,500'	22"	22" X 26" Rotary Steerable	SEA GT 3000 FRED LOGIC	13-14.5 ppg, PV 25- 35; YP 15-25; HFHT <8cc; LGS <7%	3000 bbl premix; Build 4200 bbl	1400
	15,000' Lwr	18"	18 1/8" X 22" Rotary Steerable	SEA GT 3000 HFHT SYN-TEC	15-16.0 ppg, PV 30- 40; YP 12-18; HFHT <5cc; 16K-22K ppm Chlorides WPS	1600 bbl premix; Build 6130 bbl	600
	20,400'	14"	16 1/2"	LTD ESCAD 110 MAGNATEC	16.3-17.3 ppg, PV 33- 43; YP 10-18; HFHT <9cc; ES >1000; WPS <150,000; Excess lime > 2ppm; 16 hr static age shear <200	7500 bbl premix; Build 6537 bbl	700
	24,475' Lwr	10 3/4"	12 1/4"	LTD ESCAD 110 MAGNATEC	17.3 - 17.7 ppg, PV 34-45; YP 10-18; HFHT <3cc; WPS < 150,000 ppm	1833 bbl	650
25,000' To 27,000'	8 1/2" SET or 7 3/4"	9 1/2"	LTD ESCAD 110 MAGNATEC	17.7 - 17.9 ppg, PV 35 - 48; YP 10-14; HFHT <2cc; WPS < 220,000; Excess lime > 2ppm; 16 hr static age shear <200	1220 bbl	580	

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4.5.9 Cement Program Summary

FLORADO WELL K.H. - CEMENT PROGRAM	ID: Csg. X CH	Spacer	Cnt (Slurries)	Additives	Yield	SKS	LOC
TO							
25' TOC 1,000 FT	56" X 42"	Tuned @ 10.5 ppg	Lead: TXI @ 12.0 ppg Tail: TXI @ 14.0 ppg	25% SSA-1, 3% Microband + fluid loss, retarder, etc.	Lead: 2.05 ft/sk Tail: 1.49 ft/sk	Lead: 2090 Tail: 1340	Lead: Surface Tail: 800' RKB
3,250'	32" X 36"	100 lbs Tuned @ 10.5 ppg	Lead: TXI @ 12.0 ppg Tail: TXI @ 14.0 ppg	25% SSA-1, 3% Microband + fluid loss, retarder, etc.	Lead: 2.35 ft/sk Tail: 1.49 ft/sk	Lead: 3650 Tail: 870	Lead: Surface Tail: 800' RKB
6,000'	28" X 32"	Tuned @ 0.3 ppg > MW	Lead: TXI @ 12.0 ppg Tail: TXI @ 14.0 ppg	25% SSA-1, 3% Microband + fluid loss, retarder, etc.	Lead: 1.77 ft/sk Tail: 1.49 ft/sk	Lead: 4370 Tail: 590	Lead: 5700' RKB Tail: 2900' RKB
22" TOC 6,000 FT	24" X 28"	100 lbs Tuned @ 0.3 ppg > MW	Tail: CLH @ 16.0 ppg	25% SSA-1, 15% Microsand, 3% Microband + fluid loss, retarder, etc.	Tail: 1.57 ft/sk	Tail: 3043	Tail: 6000' RKB
18" TOC 9,000 FT	20" X 22"	100 lbs Tuned @ 0.3 ppg > MW	Tail: CLH @ 17.5 ppg	20% SSA-2, 20% Microsand, 15% Salt, 15 lb/sk Micromax FF + fluid loss, retarder, etc.	Tail: 1.52 ft/sk	Tail: 1540	Tail: 13,000' RKB
14" TOC 14,000 FT	16 3/4" X 18 1/2"	100 lbs Tuned @ 0.3 ppg > MW	Tail: CLH @ 18.0 ppg	15% SSA-1, 25% Microsand, 15% Salt, 5% Silicafix, 24 lb/sk Micromax FF, 8 lb/sk HI Dense #4 + fluid loss, retarder, etc.	Tail: 1.68 ft/sk	Tail: 1750	Tail: 14,000' RKB
10 3/4" TOC 20,100 FT	12 1/4"	100 lbs Tuned @ 0.4 ppg > MW	Tail: CLH @ 19.0 ppg	15% SSA-2, 10% SSA-2, 15% Microsand, 15% Salt, 5% Silicafix, 46 lb/sk Micromax FF, 15 lb/sk HI-Dense #4 + fluid loss, retarder, etc.	Tail: 1.75 ft/sk	Tail: 810	Tail: 14,000' RKB
24,475 LW	9 1/2"	100 lbs Tuned @ 0.3 ppg > MW	Tail: CLH @ 19.0 ppg	15% SSA-2, 10% SSA-2, 15% Microsand, 15% Salt, 5% Silicafix, 46 lb/sk Micromax FF, 15 lb/sk HI-Dense #4 + fluid loss, retarder, etc.	Tail: 1.75 ft/sk	Tail: 350	Tail: 24,175' RKB
25,000 TO 27,000'							

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4.5.10 MMS Notes

The Will K. Exploration Plan was approved April 19, 2007 with the following comments:

Exploration Plan includes approvals for three surface well locations in High Island Block A-119 Will K. Prospect surface location will be located at Site 'A' on the EP.

- > Well is classified as "**H₂S Unknown**" below 4,000ft TVD by the MMS. Therefore, H₂S monitoring and emergency breathing equipment will be rigged up, and all personnel on board the rig will be H₂S certified as per the Will K. H₂S Contingency Plan - before drilling out the 30" surface casing shoe
- > Since the NOx emissions were calculated using historic fuel consumption rates, BP must maintain records of the total monthly drilling rig fuel consumption, and provide these records to the MMS upon request.
- > Any deviation in the approved plan that would cause the emissions exemption level for NOx to be exceeded will require a revised EP.
- > Notice of Rig Move and commencement of operations notification required 24 hours in advance.

BP's Application for Drilling Permit (APD) has been submitted to the MMS Lake Jackson District.

4.5.11 Days vs. Depth Curve

