MICRO
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15227

22 NOV 2005

In Reply To: MS 5232

Mr. Jim W. Bryan
Kerr-McGee Oil & Gas Corporation
16666 Northchase
Houston, Texas 77060-6001

Dear Mr. Bryan:

Reference is made to the following application that has been reviewed by the Minerals Management Service:

Application Type: New Right-of-Way Pipeline
Application Date: July 19, 2005
Supplemental Data Date(s): November 10, 2005, November 16, 2005

Work Description: Create 200-foot wide right-of-way and install, operate, and maintain the following:

A 6-inch X 9-inch pipe-in-pipe pipeline 4.29 miles in length to transport bulk oil from Block 768 PLET 1A through Block 724 to Block 680 SPAR, all in the Green Canyon Area.

Assigned Right-of-Way Number: OCS-G26897
Assigned Pipeline Segment Number: 15227
Assigned Pipeline Casing Segment Number: 15228

Pursuant to 43 U.S.C. 1334(e) and 30 CFR 250.1000(d), your application is hereby approved.

The approval is subject to the following:

1) Our review indicates that the routes to be taken by boats and aircraft in support of your proposed activities are located in or could traverse Military Warning Area W-92. Therefore, please be advised that you will contact the Naval Air Station, Air Operations Department, Air Traffic Division/Code 52, New Orleans, Louisiana 70146-5000 [(504) 678-3100 or (504) 678-3101] concerning the control of electromagnetic emissions and use of boats and aircraft in Military Warning Area W-92.

2) Our review indicates that the routes to be taken by boats and aircraft in support of your proposed activities are located in or could traverse the Military Warning Area W-59. Therefore, please be advised that you will contact

the Naval Air Station-JRB 159 Fighter Wing, 400 Russell Avenue, Building 285, New Orleans, Louisiana 70143-0027 [(504) 391-8696 or (504) 391-8697; fax (504) 391-8671] concerning the control of electromagnetic emissions and use of boats and aircraft in Military Warning Area W-59.

Your request to use navigational positioning equipment to comply with Notice to Lessees and Operators No. 98-20, Section IV.B, is hereby approved.

Segment No.	MAOP (psig)	MAOP Determination
15227	6000	Hydrostatic Test Pressure

Please be reminded that, in accordance with 30 CFR 250.1008(a), you must notify the Regional Supervisor at least 48 hours prior to commencing the installation or relocation of a pipeline or conducting a pressure test on the pipeline. Commencement notification(s) should be faxed to (504) 736-2408.In accordance with 30 CFR 250.1008 (b), you are reminded to submit a report to the Regional Supervisor within 90 days after completion of any pipeline construction. Also in accordance with a Letter to Lessees dated April 18, 1991, a copy of the as-built plat(s) must be submitted to the National Ocean Service, N/CS26 Room 7317, 1315 E-W Highway, Silver Spring, MD 20910-3282

Sincerely,

Org. sgn A. Gobert

Donald C. Howard
Regional Supervisor
Field Operations

bcc: 1502-01 Segment No. 15227, ROW OCS-G26897 (MS 5232)
1502-01 ROW OCS-G26897 (Microfilm) (MS 5033)
MS 5260 Houma District w/flow schematic
MS 5232 Cartography

15227
MMCRD

KERR-McGEE OIL & GAS CORPORATION

July 29, 2005

Regional Director, Field Operations
Attn: Mr. Manny Gagliano
Minerals Management Service
1201 Elmwood Park Blvd
New Orleans, LA 70120

Re: Ticonderoga Pipelines; S-15227, 15228, 15229, 15230, 15231
Proof of Notification

Dear Mr. Gagliano:

Please find enclosed proof of notification to Noble Energy, Inc concerning the crossing of a block they operated by the proposed pipelines referenced above.

If you have any questions or concerns, or need additional information, please contact me at 972-516-1177 or by e-mail at wanda.parker@wjpenterprises.com.
Very truly yours,

Wanda June Parker

Wanda June Parker, P. E.
Deepwater Regulatory Manager
Worldwide Facilities Engineering

Lease Blocks Crossed
Notification List

Confirmation Number 2301 3460 0001 5856 XXXX	Delivery Confirmation	Block	OCS G-	Operator Name	Address	City	State	Zip	Attn
NA	NA	GC 768	21817	Kerr-McGee					
NA	NA	GC 724., S/2	21814	Kerr McGee					
8673	July 20, 2005	GC 724, N/2	21814	Noble Energy, Inc	100 Glenborough, Suite 100	Houston	TX	77067	Mr. Dan Mills
NA	NA	GC 680	22987	Kerr-McGee					

Note: GC 768, the S/2 of GC 724 and GC 680 are operated by Kerr-McGee; therefore, notification is not required. Noble is the designated operator of the N/2 of GC 724.

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Status: **Delivered**

Your item was delivered at 9:19 am on July 20, 2005 in HOUSTON, TX 77067. The item was signed for by G GOINS.

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MMS
15227

KERR-McGEE OIL & GAS CORPORATION

November 16, 2005

Regional Supervisor, Field Operations
Attn: Mr. Manny Gagliano (MS 5232)
Minerals Management Service
1201 Elmwood Park Blvd
New Orleans, LA 70123

Re: Ticonderoga Pipelines, S-15227 and S-15228 15229, 15230
Riser Design

Gentlemen:

As stated in the pipeline applications submitted on July 19, 2005, the subject SCRs are installed on the Constitution spar platform through pull tubes routed through the truss section of the spar and inside the centerwell and hung off from the spar deck, 50 ft above the mean water line. With this design, no flex joint or titanium stress joint is required. Kerr-McGee recognizes that many SCR's installed on floating platforms in the Gulf of Mexico utilizes flex joints and titanium stress joints; however, Kerr-McGee believes the design of the Ticonderoga SCRs utilizing installation through pull tubes is prudent, adequate and appropriate for the project. Further, Kerr-McGee has successfully utilized this same design methodology (pull tubes in lieu of flex joints and titanium stress joints) on other SCR's installed on spars in the Gulf of Mexico including the following:

- Red Hawk Spar: S-14565 and S-14566
- Boomvang Spar: S-13281 and S-13284
- Nansen Spar: S-13280 and S-13283

If you have any questions or concerns, or need additional information, please contact me at 972-516-1177 or by e-mail at wanda.parker@wjpenterprises.com. Also, please fax a copy of any correspondence to 972-516-1188.

Very truly yours,

Wanda June Parker

Wanda June Parker, P. E.
Deepwater Regulatory Manager
Worldwide Facilities Engineering

Concurred by:

Mike Beattie
Project Manager – Facilities

Minerals Management Service
RECEIVED
NOV 16 2005
NOV 17 2005
Office of Field Operations
Pipeline Section

15227
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232

Gagliano, Manny

From: wanda.parker@wjpenterprises.com [wjpenterprises@comcast.net]
Sent: Wednesday, November 16, 2005 1:05 PM
To: Gagliano, Manny
Subject: Ticonderoga
Attachments: Red Hawk Subsea Well Lease Term Pipeline Application-Rev 0.doc

Manny, here is the text of the pipeline application for the Red Hawk tiebacks (s-14565 and 14566) that were also installed through pulltubes and hung off from the topsides without the use of a stress joint and flex joint.

Segment 14198, the Phoenix export pipeline was also installed on Red Hawk without the use of a stress joint and flex joint. I was able to down load that application from the MMS website, so I assume it is available to you.

--
Wanda June Parker
WJP Enterprises
972-516-1177 (O)
972-516-1188 (f)
972-679-5554 (cell)
wanda.parker@wjpenterprises

Ticonderoga SCR and Pulltube Design Methodology Summary

The Ticonderoga SCRs are designed to installed thru pulltubes located on the Spar hull and hung off from the spar deck of the Spar topsides. The spar deck is located 50 ft above the Mean Water Level. The SCR exists the pull tube near the soft tank of the spar. This is shown on Drawing 202221-000-DW-354-4502, Rev 1. Since the pipelines are hung off from the topsides versus the keel of the spar, a stress joint or flex joint does not need to be utilized.

Detailed design of the SCRs and pull tubes was conducted by Technip. The following is a summary of the design methodology utilized for the project.

Riser analysis is carried out using the non-linear time domain analysis program ABAQUS. A suite of postprocessors developed by Technip are used for assessment of response. The relevant software used in this project is as follows:

- ABAFER Riser wave interference subroutines for ABAQUS
- ABATERP Reads MLTSIM motions into ABAQUS for riser analysis
- DYNAFAT Post processor of ABAQUS for dynamic fatigue analysis using Rainflow counting method
- DYNAWEAR Dynamic wear for pulltube guides
- SHEARRUN Predict VIV motions and fatigue damage in connection with SHEAR7
- RSTRESS Post processor of ABAQUS for riser stresses
- STRESSJ Preliminary design of cantilever section for pulltubes
- VIVFAT Assessment for riser fatigue due to SPAR VIM response

The following table defines the load case matrix for SCR strength analysis. It covers SCR installation, hydrotest, normal operation, design extreme, and survival conditions. Each case includes in-plane (taut and slack) and one out-of-plane Spar offset to the riser plane. The load cases conservatively use shut-in pressure combined with design content to result in the maximum hoop stressed for the flowline. However, separate design and shut-in conditions are considered for the cases which result in high utilization ratio for Von Mises strength check. Selected window which covers Spar motion for 200 sec will be used in the strength analysis. The selected window captures maximum and minimum Spar heel angle and offset motion which govern SCR and pulltube design.

Case	Design Environment		Spar Condition	Riser Condition		Selected Window
	Wave	Current		Pressure	Content	Max / Min
Installation						
1	1-yr winter storm (w/rig)	Assoc. w/wave	Intact	Empty	Empty	heel, offset
2	Assoc. w/current	10-yr loop (w/rig)	Intact	Empty	Empty	offset
Hydrotest						
3	1-yr winter storm (w/rig)	Assoc. w/wave	Intact	Hydrotest	Sea Water	heel, offset
4	Assoc. w/current	10-yr loop (w/rig)	Intact	Hydrotest	Sea Water	offset
Operation						

5	10-yr winter storm (w/rig)	Assoc. w/wave	Intact	Shut-in	Design	heel, offset
6	Assoc. w/current	10-yr loop (w/rig)	Intact	Shut-in	Design	offset
7	10-yr winter storm (w/o rig), off. drill	Assoc. w/wave	Intact	Shut-in	Design	heel, offset
8	Assoc. w/current	10-yr loop (w/o rig), off. drill	Intact	Shut-in	Design	offset
		Extreme				
9	50-yr hurricane wind (w/rig)	Assoc. w/wave	Intact	Shut-in	Design	heel, offset
10	50-yr hurricane wave (w/rig)	Assoc. w/wave	Intact	Shut-in	Design	heel, offset
11	100-yr hurricane wind (w/o rig)	Assoc. w/wave	Intact	Shut-in	Design	heel, offset
12	100-yr hurricane wave (w/o rig)	Assoc. w/wave	Intact	Shut-in	Design	heel, offset
13	Assoc. w/current	100-yr loop (w/rig)	Intact	Shut-in	Design	offset
		Survival				
14	50-yr hurricane wind (w/rig)	Assoc. w/wave	1 line dam.	Shut-in	Design	heel, offset
15	50-yr hurricane wave (w/rig)	Assoc. w/wave	1 line dam.	Shut-in	Design	heel, offset
16	100-yr hurricane wind (w/o rig)	Assoc. w/wave	1 line dam.	Shut-in	Design	heel, offset
17	100-yr hurricane wave (w/o rig)	Assoc. w/wave	1 line dam.	Shut-in	Design	heel, offset
18	10-yr hurricane wind (w/rig)	Assoc. w/wave	Comp dam.	Shut-in	Design	heel, offset

FEA Modeling

A Finite Element Analysis (FEA) model for the SCR system is created in ABAQUS. The model includes SCR, pulltube, seafloor and the spar CG. Essential details of this system are modeled from the upper hang-off point on the Spar down to the flowline end of the SCR on the seabed.

Three dimensional hybrid beam elements, which allow for accurate modeling of slender beams such as SCRs and pipelines, are to be used for pulltube/SCR models. Fine meshes are to be used in the areas with higher stress gradients such as pulltube exit and SCR touchdown region. SCR total length is determined from catenary equations. For inplace strength analysis, buoyant weight of the riser is used, and pressure effects are included during the post processing. Contact between jacket pipe and the flowline will be modeled using multi-point constraint (MPC) option available in ABAQUS.

Pull-in chain is also modeled by beam elements with very low bending stiffness. The pullin chain is suspended inside the pulltube initially and connects to the pullhead of the SCR. Pull-in chain contacts the pulltube similar to the riser. Pre-strain in the SCR is modeled by pulling the SCR through the pulltube up to its hangoff point.

The Spar motion (displacement boundary conditions) is defined at the center of gravity of the Spar platform. Hull and pulltube contact locations are attached to the center of gravity with rigid elements. Spring elements are used to connect the rigid elements to the pulltube. Only lateral restraint is provided by the spring element. Pulltube at hangoff elevation is modeled with a spring in the vertical direction.

The seafloor is to be modeled as a continuous contact surface with appropriate friction and stiffness at seabed elevation with or without slope. Seafloor contact elements are defined on the riser that allows the riser to contact and transmit forces to and from the seafloor. Soil stiffness has negligible effect on the design of the pulltube and SCR in the pulltube region.

Pulltube-to-SCR interaction is modeled with tube-to-tube contact elements. The contact elements allow for normal interaction relationship between the surfaces as well as friction between the contact surfaces. The contact elements are defined on the SCR while the pulltube is defined as a slide line over which the contact elements are restrained. The annulus between the SCR and the pulltube is specified as initial clearance between the contact elements and the sliding surface. Normal interaction between the SCR and the pulltube is modeled with non-linear force displacement relationship representing the characteristics of the coating material on the SCR in general.

Strength Analysis

Strength analysis is carried out to determine the acceptability of riser response under installation, normal operation, extreme and survival load conditions. Key issues addressed in the strength analysis are:

- Maximum stresses;
- Interface loads at the pulltubes and guide supports and riser interface with flowline on the seabed.

Strength analysis is performed both statically and dynamically. The static analysis was essentially a screening exercise whose purpose is to check if the sized pulltube and SCR are feasible.

Dynamic strength analysis is performed by running the FE model dynamically for 200 seconds around the selected peak occurrences of heel or offset, using motion time history generated from MULTISIM. Motion headings most onerous to the SCR / pulltube system (in-plane & out-of-plane) are selected for strength analysis.

Motion Fatigue Analysis

First and second order fatigue analysis is carried out using time domain random sea Analyses. Fatigue damage is determined using rainflow counting analysis.

The effects of the static offset, the wave first and second order platform motions, waves and currents acting directly on the riser, are considered in the analysis.

Fatigue life is calculated in eight points around each welded joint cross-sections chosen along the hot spots or critical regions. The eight circumferences are 45° apart along the extreme fiber of the cross section. The fatigue damage is factored by its probability of occurrence and summed using the Miner rule.

Rainflow counting is a stress cycle counting approach. To reduce the number of analysis runs to be carried out, reduced fatigue scatter diagram is derived from the original scatter diagram.

Riser VIV Analysis

The most severe VIV damage to an SCR normally occurs in the touch down zone. The analysis considers separate cases of the current direction in-line with and normal to the riser plane. The first case excites out-of-plane modes and the second case excites inplane modes. The governing case determines the requirement of strake coverage. Both long term and short term VIV analyses are performed with the single slope DoE-E curve. Shear7 Version 4.2f is used to evaluate VIV fatigue damage. The steps in the analysis are as follows:

Step 1 – Mode Analysis
For the PIP production SCR, an equivalent single pipe ABAQUS model will be created to generate modal information including natural frequencies, modes, and mode curvatures. ShearRun (v4.2f), an in-house program in conjunction with ABAQUS, is used to extract in-plane and out-plane modal data in the Shear7 format. The mode shapes are usually generated considering riser in neutral position. Fatigue damages coming from the complete set of current profiles are usually added considering the TDP on the same position. This procedure may lead to an over-conservative result. Therefore methodologies to distribute the damage at the TDP will be investigated.

Step 2 – Shear7 Input Current Profiles
Current data are based on the Constitution metocean data in the design basis [9]. The current profiles include eddy and deepwater submerged currents. They are used for long term and short term fatigue analyses, respectively. The current is converted into Shear7 required format.

Step 3 – Shear7 Input Parameters
Shear7 input files are set up using the design data presented in Section 6.2.13 of this report.

Step 4 – Overall VIV fatigue damage
The VIV fatigue damage corresponding to each current profile is found by running Shear7. Cumulative damage is obtained by summing the damages from all current profiles and accounting for the associated annual occurrence probability of each individual current profile. The governing damage and its position are found from the overall fatigue damage distribution along the riser arc length.

Pulltube VIV Analysis

Current induced VIV fatigue damage to the pulltube was analyzed with the two-slope ABS 2002 curve. Preliminary frequency analysis is performed for the pulltube with and without the riser coupling. Analysis is to be performed for Cross flow VIV and in-line

VIV. The in–line VIV of the pulltube is calculated in accordance to DNV recommended practice of DNV-RP-F105. The analysis consisted of the following steps:
1. Average current within the depth range of pulltube was used in the analysis.
2. Reduced velocities for each of the current profiles were calculated.
3. In–line response amplitude (A/D) was calculated by constructing response model.
4. RMS stress range was obtained by means of mode curvature.
5. Finally the fatigue life was calculated in years by summing up all the damages associated with omni-directional probability.

The approximation approach using Shear7 is used to evaluate the requirement of strake coverage. The Strouhal number and bandwidth are derived from the DNV rule.

Spar VIM Analysis Requirements

Vortex shedding vibrations during current events can occur for Constitution SPAR. SPAR VIV response characteristics were studied using model tests. SPAR VIV can induce VIV to the SCRs attached to it, thus contributing to the overall fatigue damage of the attached SCRs. SCR touchdown / sag bend and hang-off / pulltube exit (for pulltube system) regions are susceptible to the highest fatigue damage.

Eddy current probability distribution was evaluated from the Met Ocean report. In the absence of specific data, total eddy current occurrence is set at 100% of the time.
SCR fatigue requires analysis of the riser using ABAQUS and VIVFAT (TOI's In-House Program), which computes the fatigue damage at each riser node based on the kinematics of the riser hang-off point.

The following outline the steps for VIM motion to SCR fatigue analysis.
• Time domain simulation of Spar response with quasi-static mooring lines captured with look-up tables and SCRs simulated by catenary lines
• Wave and wind forces applied explicitly
• VIM motion superimposed by adding transverse and in-line forces which result in same A/D values determined from model test (A/D criteria)
• Identify the Spar VIM response caused by current perpendicular to riser plane
• Apply VIM data at riser hang off location in riser plane and calculate riser response and associated fatigue damage

Installation Analysis

Installation analyses shall be conducted to determine limiting conditions for installation and hand-over procedures. These limits shall be reviewed in conjunction with the metocean data to determine seasonal requirements for installation and the acceptability of proposed installation procedures.

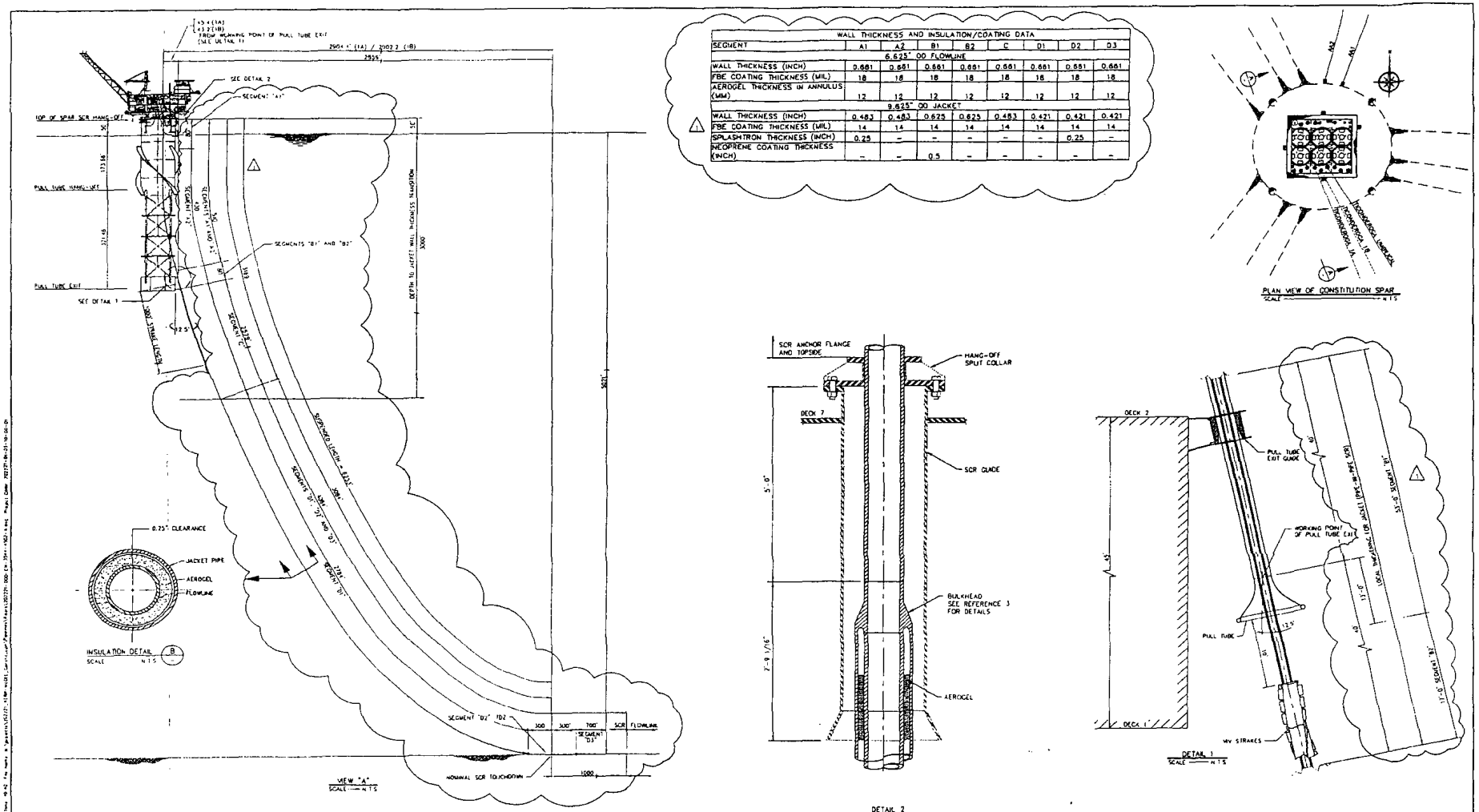
Interference Analysis

Interference analysis considers the wake effects. The mean flow velocity is reduced at the

downstream cylinder, which leads to a reduction in the drag load. There is a mean lift force on the downstream cylinder, which always pulls it towards the center of the wake. The mean lift and drag forces acting on the downstream cylinder depend on the separation between the two cylinders and the cylinder diameter. The drag coefficient and mean lift coefficient of the cylinders are established by running the SHEAR7 program. The in-house computer program ABAFER, which links ABAQUS and SHEAR7, considers all these factors and are used to perform the analysis.

15227
Micka

WALL THICKNESS AND INSULATION/COATING DATA								
SEGMENT	A1	A2	B1	B2	C	D1	D2	D3
	6.625" OD FLOWLINE							
WALL THICKNESS (INCH)	0.881	0.881	0.881	0.881	0.881	0.881	0.881	0.881
FBE COATING THICKNESS (MIL)	18	18	18	18	18	18	18	18
AEROGEL THICKNESS IN ANNULUS (MM)	12	12	12	12	12	12	12	12
	9.625" OD JACKET							
WALL THICKNESS (INCH)	0.483	0.483	0.625	0.625	0.483	0.421	0.421	0.421
FBE COATING THICKNESS (MIL)	14	14	14	14	14	14	14	14
SPLASHTRON THICKNESS (INCH)	0.25	–	–	–	–	–	0.25	–
NEOPRENE COATING THICKNESS (INCH)	–	–	0.5	–	–	–	–	–



NOTES:
1. THE RISER CONFIGURATION IS BASED ON THE RISER IN EMPTY AT INSTALLATION CONDITION.

REFERENCE DRAWINGS:
1. 202221-000-DW-3646-2603 PULLTUBE FOR 1A NICONDEROGA SCR
2. 202221-000-DW-3646-2605 PULLTUBE FOR 1B NICONDEROGA SCR
3. 202221-300-DW-1507 SCR TOP TRANSITION BUMPER

REV.	DATE	BY	DESCRIPTION	CHKD	ENG APP'D	REV.	DATE	BY	DESCRIPTION	CHKD	ENG APP'D
A	10/07/04	PJC	ISSUED FOR REVIEW AND COMMENT	RG	MC SR						
B	12/21/04	PJC	ISSUED FOR REVIEW AND COMMENT	CJC	MC SR						
C	12/30/04	PJC	ISSUED FOR REVIEW AND COMMENT	CJC	MC SR						
D	1/4/05	GFC	APPROVED FOR CONSTRUCTION	DHR	MC SR						
1	3/16/05	GFC	REVISED AS NOTED	DHR	MC SR						

Technip
TECHNIP OFFSHORE, INC.

DESIGN	DRAWN	CHECKED	ENGINEER	SCALE
PJC	BKR	MC	SR	1"=10'
DATE	DATE	DATE	DATE	
09/30/04	3/4/05	3/4/05	3/4/05	

KERR-McGEE OIL & GAS CORPORATION

CONSTITUTION
GREEN CANYON BLOCK 680

TICONDEROGA SCR AREA PLAN AND PROFILE FOR 6" x 9" OPTION

CLIENT DRAWING NO. —
DRAWING NUMBER 202221-000-DW-3544-4502
REV 1

ROW G-26897
S-15227
S-15228
MICRO

KERR-McGEE OIL & GAS CORPORATION

July 19, 2005

Regional Supervisor, Field Operations
Attn: Mr. Alex Alvarado, MS 5232
Minerals Management Service
1201 Elmwood Park Blvd
New Orleans, LA 70123-2394

Re: Application for a 6" X"9" Pipe-in-Pipe Bulk Oil Right-of-Way Pipeline (Ticonderoga Pipeline 1A) to be Installed in and/or Through Green Canyon Blocks 768, 724, and 680 OCS Federal Waters, Gulf of Mexico, Offshore, Louisiana

Gentlemen:

Pursuant to the authority granted to the Secretary of the Interior in 43 U.S.C. 1334(e) and Section 5(e) of the Outer Continental Shelf Lands Act (67 Stat. 462) (43 U.S.C. 1331), as amended (92 Sta. 629), and in compliance with the regulations contained in Title 30, CFR Part 250, Subpart J, Kerr-McGee Oil and Gas Corporation is filing this application in quadruplicate for a right-of-way two hundred (200) feet in width for the construction, maintenance, and operation of a 10-inch bulk oil right-of-way pipeline to be installed in and/or through Green Canyon 768, 724 and 680 OCS Federal Waters, Gulf of Mexico, Offshore Louisiana. Kerr-McGee agrees that said right-of-way, if approved, will be subject to the terms and conditions of said regulations.

The proposed Ticonderoga Pipeline 1A will transport bulk oil from a subsea development located in GC 768 to a proposed floating spar platform, Constitution spar, Green Canyon 680, Platform A operated by Kerr-McGee.

The proposed right-of-way is 22,641.78 feet (4.29 miles) in length. The right-of-way commences at the 1A PLET located in GC 768 in 5255 feet of water to the SCR touchdown point in GC 680 which is located in 5020 ft of water.

Enclosed is a check in the amount of $2425 covering the application fee of $2350 as required in 30 CFR 250.1010(b) and the first year's rental of $75 (5 miles at $15/mile) as required in 30 CFR 250.1009(c)(2).

Kerr-McGee Oil and Gas Corporation will be the operator of the pipeline installed in the right-of-way. Kerr-McGee's corporate qualifications have been filed with the Minerals Management Service in New Orleans, as operator 02219. In accordance with 30 CFR 250.1009(b)(1)(i), Kerr-McGee will maintain a $300,000 bond that guarantees

compliance with all terms and conditions of the rights-of-way Kerr-McGee holds in the Gulf of Mexico OCS region.

An original and three copies of the completed Nondiscrimination in Employment form are attached.

Kerr-McGee agrees that if archaeological resources should be discovered while conducting operations within the right-of-way, Kerr-McGee shall immediately halt operations within the area of discovery and report the discovery to the Regional Director. If investigations determine that the resource is significant, the Regional Director will inform Kerr-McGee on how to protect the resource.

Kerr-McGee hereby agrees to keep open at all reasonable times for inspection by the Minerals Management Service the area covered by the right-of-way and all improvements, structures, and fixtures thereon and all records relative to the design, construction, operation, maintenance, and repairs, or investigations on or with regard to such area.

The information required in 30 CFR 250.1007 is attached to this cover letter for the pipeline.

In accordance with 30 CFR 250.1010(c), a list of every designated oil and gas lease operator, right-of-way holder and easement holder whose lease, right-of-way or easement is intersected by the proposed pipeline right-of-way is attached. Proof of delivery showing date delivered as evidence of service upon such operators will be forwarded to your office when received. In order to expedite the permitting process, we have requested a letter of no objection from the designated operator. When obtained, these letters will be forwarded to your office.

The proposed pipeline right-of-way does not adjoin or subsequently cross state submerged lands. No safety fairways are crossed. The pipeline is located within Military Warning Area W-92. Agreements will be entered into concerning the control of electromagnetic emissions and use of boats and aircraft within the Military Warning Area.

Kerr-McGee agrees to allow the occupancy and the use by the United States, its lessees, or other right-of-way holders of any part of the right-of-way grant not actually occupied or necessarily incident to its use for any necessary operators involvement in the management, administration, or the enjoyment of such other granted rights.

In accordance with NTL 2002-G15, a consistency certification and supporting documentation has been sent to the state of Louisiana. A copy of the consistency certification is enclosed. Proof of delivery will be forwarded to your office.

The anticipated construction start date for the pipeline is November 1, 2005 with completion scheduled for December 15, 2005.

Kerr-McGee appreciates your review and approval of this application. Please contact our regulatory consultant, Wanda Parker, WJP Enterprises, at 972-516-1177 or

wanda.parker@wjpenterprises with all questions or comments regarding this application. Please fax a copy of the approval letter to 972-516-1188 when it is available.

Very truly yours,

Jim W. Bryan
Attorney-in-Fact

UNITED STATES
DEPARTMENT OF THE INTERIOR
MINERALS MANAGEMENT SERVICE
NONDISCRIMINATION IN EMPLOYMENT

As a condition precedent to the approval of the granting of the subject pipeline right-of-way, the grantee, Kerr-McGee Oil and Gas Corporation hereby agrees and consents to the following stipulation, which is to be incorporated into the application for said right-of-way.

During the performance of this grant, the grantee agrees as follows:

> During the performance under this grant, the grantee shall fully comply with paragraphs (1) through (7) of section 202 of Executive Order 11246, as amended (reprinted in 41 CFR 60-1.4(a)), which are for the purpose of preventing discrimination against persons on the basis of race, color, religion, sex or national origin. Paragraphs (1) through (7) of section 202 of Executive Order 11246, as amended, are incorporated in this grant by reference.

July 18, 2005

Lease Blocks Crossed
Notification List

Confirmation Number 2301 3460 0001 5856 XXXX	Delivery Confirmation	Block	OCS G-	Operator Name	Address	City	State	Zip	Attn
NA	NA	GC 768	21817	Kerr-McGee					
NA	NA	GC 724., S/2	21814	Kerr McGee					
8673		GC 724, N/2	21814	Noble Energy, Inc	100 Glenborough, Suite 100	Houston	TX	77067	Mr. Dan Mills
NA	NA	GC 680	22987	Kerr-McGee					

Note: GC 768, the S/2 of GC 724 and GC 680 are operated by Kerr-McGee; therefore, notification is not required. Noble is the designated operator of the N/2 of GC 724.

PROJECT DESCRIPTION

Kerr-McGee Oil and Gas Corporation is the operator of the Ticonderoga Project which is a two well subsea development in Green Canyon 768 in 5,255 ft of water which will be tied back to the proposed Kerr-McGee Constitution spar to be located in Green Canyon 680 in 4,970 ft of water. The Constitution spar (GC 680, Platform A) is currently planned to be installed commencing in August, 2005. The two subsea wells in Green Canyon 768 will be tied back to the Constitution spar utilizing dual bulk oil rigid right-of-way pipelines, SCRs, Pipeline End Termination Manifolds (PLEMS), Pipeline End Termination Units (PLETS) and rigid well jumpers. A control umbilical and Subsea Umbilical Termination Assembly (SUTA) will also be utilized. The two well jumpers and pigging loop jumper are lease term pipelines. The dual pipelines and umbilical are right-of-way pipelines. The 1A bulk oil ROW pipeline is the subject of this application. Separate applications for the 1B bulk oil ROW pipeline and umbilical and for the lease term jumpers are being filed concurrent with this application.

Production from the subsea wells will flow from the well through individual well jumpers to the PLTE or PLEM and back to the spar through one or both of the dual pipelines. The pipelines have been designed as bi-directional pipelines to accommodate pigging.

The installation of the subsea pipelines is currently anticipated to commence in November, 2005. First production from the subsea wells is anticipated to occur in mid December, 2005.

The proposed project was described in detail in a preliminary Deep Water Operations Plan (DWOP) dated February 2, 2005 and approved by MMS by letter dated March 21, 2005. A Development Operations Coordination Document (DOCD), Control Number N-8324, was filed with MMS on January 24, 2005. Please refer to those documents for additional general information about the project.

PLATS

A plan and profile pipeline route map has been prepared in accordance with the LTL dated April 18, 1991 for 1A pipeline.

- Proposed 6" X 9" Pipe-in Pipe from PLET 1A to the proposed GC 680, Platform A (Constitution Spar)

In accordance with NTL 98-09, a diskette is provided with the digital data.

SCHEMATIC

A schematic diagram is enclosed showing the safety system for the subsea tieback system, including the well jumpers and pigging loop. (Drawing 83090-50-J-DW-201)

METHOD OF INSTALLATION

A dynamically positioned vessel will be used to install the proposed associated right-of-way pipelines, PLEM, PLET well jumpers, pigging loop and umbilical. A suction pile will be used to initiate pipelay, but it will be recovered following installation.

ONSHORE BASE

Support activities during the installation and operational life of the pipelines will be from Kerr-McGee's existing shorebase in Cameron, Louisiana. No new facilities or personnel will be required for these activities.

MAXIMUM WORST CASE DISCHARGE

The maximum worst case discharge scenario for the right-of-way pipeline is based on complete failure of the pipeline at the PLET:

Release Detection Time: 2 minutes
Time to Shut-in subsea well following detection: 4 minuets
Maximum Flowrate: 70,000 BOPD
Spill Size to well Shut-In = 70,000 Bbls/day X 6 minX hr/60 min X day/24 hr = 292 Bbls

Max Spill Volume After Shut-in:
Riser: π X (2.982 in X ft/12 in)^2 X 7253 ft X bbl/5.61 ft^3 =251 bbls
Flowline: π X (3.928 in X ft/12 in)^2 X 21651 ft X bbl/5.61 ft^3 = 1299 bbls

Total Max Volume:
292 + 251 + 1299 = 1842 bbls

Response to an oil spill from the ROW pipeline will be in accordance with Kerr-McGee's Regional Oil Spill Contingency Plan.

SHALLOW GEOHAZARD DATA

A site specific high resolution geohazards survey was conducted by C&C Technologies, August 2004 "Engineering and Hazard Study Proposed 1A and 1B 6.625" Bulk Oil Flowline Routes and 1U Umbilical Route, Constitution Development Project, Block 768 to Block 680 Green Canyon Area. The report is being submitted with the 1A right-of-way pipeline application. This area was also covered by the shallow hazard report and assessment for the surface location of the subsea wells that was submitted with the Exploration Plan (Control Number N-7895).

The water depth along the proposed pipeline route ranges from 5255 ft near the subsea wells to 4870 ft near the Constitution spar. No faulting or venting was noted along the proposed pipeline routes. A total of thirty-nine unidentified sonar targets were delineated in the survey area, probably associated with field development operations. The closest contact to the proposed pipelines is Contact No. 10 which is located in GC 680 approximately 360 ft west of the proposed pipeline route and will not propose a hazard to the pipelines. All unidentified sonar contacts will be avoided.

DEEPWATER CHEMOSYNTHETIC COMMUNITIES

The proposed pipelines are located in water depths greater than 400 meters; therefore, there is the possibility of chemosynthetic communities to be present. Please see the map included in the

shallow hazard report referenced above which shows bathymetry, seafloor and shallow geological features and areas that could be disturbed by the proposed pipeline activities. A dynamic lay barge will be used; therefore, no anchors are proposed to be utilized. No faults or subsea vents were noted along the pipeline route; therefore, the potential for chemosynthetic communities is low.

In accordance with NTL 2000-G20, the following summary statement is provided:

(1) NO DISTURBANCES WITHIN 500 FEET OF CHEMOSYNTHETIC COMMUNITIES

Proposed ROW Pipeline 1A:
Features or areas that could support high-density chemosynthetic communities are not located within 500 feet of any seafloor disturbances resulting from our proposed pipeline construction (including those caused by anchors, anchor chains, and wire ropes, if applicable).

MARKING OF HAZARDS
In lieu of the requirement to buoy all existing pipelines and other potential hazards within 150 meters (490 feet) of the operation as required in NTL 98-20, a state-of-the-art positioning system (e.g. differential global positioning systems) will be utilized on the pipeline laying vessel to ensure any hazards are avoided. A plat with a minimum scale of 1:12,000 depicting the location of the proposed activity, any existing pipelines and other hazards in the area will be provided to the key personnel on the pipeline-lay barges and anchor-handling vessels associated with the operations.

PIPELINE CROSSINGS, SUBSEA TAPS AND VALVES
No pipelines are planned to be crossed by the proposed pipeline.

BURIAL REQUIREMENTS
The pipeline will be installed in water depths greater than 200 feet; therefore, jetting or burial is not required.

FAIRWAY OR ANCHORAGE AREA CROSSINGS
No fairways or anchorage areas will be crossed by the proposed pipelines; therefore, a Corps of Engineers permit will not be required.

PRODUCT TO BE TRANSPORTED
Bulk oil

SPECIFIC GRAVITY OF THE PRODUCT
Specific Gravity is 0.89

DESIGN CAPACITY

The pipeline has been designed for a maximum flowrate of 70,000 BOPD/390 MCFPD.

DESCRIPTION OF PIPELINE SECTIONS

The following pipeline sections are contained in this application.

Pipeline Section		Approximate Length (feet)	Material	Grade	O. D. (in)	I. D. (in)	W. T. (in)
SCR A1	Carrier Pipe	80	Steel, SMLS	X-65	6.625	5.964	0.661
	Jacket Pipe	80	Steel, SMLS	X-65	9.625	9.142	0.483
SCR A2	Carrier Pipe	430	Steel, SMLS	X-65	6.625	5.964	0.661
	Jacket Pipe	430	Steel, SMLS	X-65	9.625	9.142	0.483
SCR B1	Carrier Pipe	10	Steel, SMLS	X-65	6.625	5.964	0.661
	Jacket Pipe	10	Steel, SMLS	X-65	9.625	9.000	0.625
SCR B2	Carrier Pipe	60	Steel, SMLS	X-65	6.625	5.964	0.661
	Jacket Pipe	60	Steel, SMLS	X-65	9.625	9.000	0.625
SCR B3	Carrier Pipe	10	Steel, SMLS	X-65	6.625	5.964	0.661
	Jacket Pipe	10	Steel, SMLS	X-65	9.625	9.000	0.625
SCR C1	Carrier Pipe	2579	Steel, SMLS	X-65	6.625	5.964	0.661
	Jacket Pipe	2579	Steel, SMLS	X-65	9.625	9.142	0.625
SCR D1	Carrier Pipe	2764	Steel, SMLS	X-65	6.625	5.964	0.661
	Jacket Pipe	2764	Steel, SMLS	X-65	9.625	9.204	0.421
SCR D2	Carrier Pipe	600	Steel, SMLS	X-65	6.625	5.964	0.661
	Jacket Pipe	600	Steel, SMLS	X-65	9.625	9.204	0.421
SCR D3	Carrier Pipe	700	Steel, SMLS	X-65	6.625	5.964	0.661
	Jacket Pipe	700	Steel, SMLS	X-65	9.625	9.204	0.421
Flowline	Carrier Pipe	21651	Steel, SMLS	X-65	6.625	6.055	0.570
	Jacket Pipe	21651	Steel, SMLS	X-65	9.625	9.204	0.421

RISER PROTECTION

The pipeline SCRs will be installed through pull tubes routed inside the truss section of the spar and inside the centerwell; therefore, no additional riser protection has been provided. The SCRs will be hung off from the spar deck, 50 ft above the mean water level.

DESCRIPTION OF THE PLET DESIGN

The 1A PLET will be a gravity based structure with a mudmat and provision for pipeline expansion. The 1A PLET will terminate the 1A flowline with a 5-1/8-inch ROV operated gate valve for isolating the flowline. In addition, the 1A PLET will have a FMC supplied Max-8 5-1/8-inch bore vertical connection hub used for connecting the rigid pigging loop to the PLEM (for pigging access and future tie-in). All equipment on the PLET is rated for 10,000 psig and have a minimum internal bore of 5-1/8-inch for the 6-inch nominal equipment. The PLET piping will match the flowline MAOP of 6,000 psi (at the water surface) and be hydrotested to 7500

psig. The PLET piping, valve, and hub will be thermally insulated. The PLET's main header pipe bends will have 5D minimum bend radii to accommodate pigging operations. The PLET piping and valve are integrally welded. The PLET will be designed to resist flowline thermal expansion loads with compliance or slide mechanisms.

MARINE CATHODIC PROTECTION SYSTEM

The cathodic protection system for the pipeline and SCR has been designed for a minimum life expectancy of 20 years and calculated using DNV RP F103. The following summarizes the design of the cathodic protection system:

Pipeline

To be installed on the pipeline:

Type:	Alum-Zinc-Indium (Galvotec III)
Size & Weight:	Bracelet Anodes, 15-in long X 1.75 in thick, 72.2 lbs each
Spacing Interval	800

Riser

649.8 lbs of Galvotec III anodes as described above will be congregated at the base of the riser within the 500 ft section prior to touchdown.

PLET and Jumpers

460 lbs of Gavotec III anodes will be installed on the PLET to protect the PLET and the jumpers connected to the PLET.

EXTERNAL PIPE COATING SYSTEM

On the carrier pipe of the pipe-in-pipe system, 0.018 in of FBE will be utilized. On the outer pipe (jacket pipe), 0.014 in of FBE will be utilized with Splashtron used on Sections A2, B2 and D2 on the SCR.

INTERNAL COATING OR PROTECTIVE MEASURES

There will be no internal coatings applied to the interior bore of the proposed pipelines. A corrosion allowance of 0.1 inch has been provided for the carrier pipe. No corrosion allowance has been provided for the jacket pipe.

Internal corrosion is not expected to be a problem. Provisions have been made for injecting chemical corrosion inhibitor through the wellhead via the control umbilical should such measures become necessary.

THERMAL INSULATION

Thermal insulation with a maximum U value of 0.25 BTU/hr-ft^2-°F will be installed on the carrier pipe for both the flowline and SCR. The insulation will be the Aspen Aerogel wrap on coating. Please see the attached brochure on Aspen Aerogel.

SPECIFIC GRAVITY OF PIPE

Pipeline Section	Air Weight Empty, (lb/ft)	Submerged Weight Empty (lb/ft)	Specific Gravity Empty
SCR A1	95.9	60.1	2.68
SCR A2	91.1	58.6	2.8
SCR B1	103.8	71.3	3.19
SCR B2	113.9	74.5	2.89
SCR B3	103.8	71.3	3.19
SCR C1	91.1	58.6	2.8
SCR D1	85.4	52.9	2.63
SCR D2	90.2	54.4	2.52
SCR D3	85.4	52.9	2.63
Flowline	80.1	47.6	2.46

MAXIMUM SOURCE PRESSURE

The maximum source pressure (MSP) is expected to be the maximum SITP of the subsea wells which is expected to not exceed 4800 psi.

MAXIMUM OPERATING PRESSURE

The anticipated maximum operating pressure of the line is 2670 psig at sea level.

MAXIMUM ALLOWABLE OPERATING PRESSURE & CALCULATIONS

The proposed MAOP for the flowline and SCR is 6,000 psi (at sea level; 6631 psi at the subsea wellhead) which is equal to or higher than the maximum expected SITP of the subsea wells of 4800 psi.

Carrier Pipe Design Pressure

$$P = \frac{2 \times S \times t}{D} \times F \times E \times T$$

S = SMYS = 65,000 psi
t = wall thickness = .57 in
D = outside diameter = 6.625 in
F = design utilization factor = 0.72
E = longitudinal joint factor = 1.0 for API 5L seamless line pipe
T = temperature derating factor = 1.0 (Max. Temp. = 140 °F)

$$P = \frac{2 \times (65000\,psi) \times (.57in)}{6.625} \times 0.72 \times 1 \times 1$$

P = 8053 psig

Jacket Pipe Design:

Kerr-McGee requests approval to utilize RP1111 for the design of the jacket pipe. The jacket pipe is designed in accordance with RP 1111, Section 4.3.1 such that the flowline leak containment pressure will not exceed 90% of the pipe specified burst pressure as follows:

$$Pb = .45 * (S + U) * \ln\left(\frac{OD}{OD - 2t}\right)$$

$$Pb = .45 * (66{,}000 + 77{,}000) * \ln\left(\frac{9.625}{9.625 - 2 * .421}\right)$$

$$Pb = 5891 \text{ psi}$$

Valves, Flanges and Fittings Design Pressure

All valves and flanges are rated for 10,000 psi API.

FIELD HYDROSTATIC PRESSURE TESTING CERTIFICATION

The right-of-way pipelines, SCR, PLEM, PLET and pigging loop, will be tested as an integral unit in the field, following installation.

Hydrostatic Test Media:		Sea Water
Test Duration:		8 Hours Minimum
Hydrostatic Test Pressure:	(HTP)	7500 PSIG (at sea level)

Calculation:

HTP = 1.25 x Lowest Maximum Design Pressure
HTP = 1.25 x 6000
HTP = 7500 PSIG

ADDITIONAL DESIGN CONSIDERATIONS

Buckle Arrestor

Carrier Pipe

The water depth, Wa_d, requiring buckle arrestors (buckle propagation depth) is calculated per API RP 1111 (1999) as follows:

$$WD_p = 0.8 \times 2.25 \times 24 \times S \left[\frac{t}{OD}\right]^{2.4}$$

where 0.8 is the design factor and 2.25 is a factor to convert hydrostatic pressure to water depth.

Calculation:

$$WD_p = 0.8 \times 2.25 \times 24 \times 65{,}000\ psi \left[\frac{0.57''}{6.625}\right]^{2.4} = 7792\ ft$$

Wa_d = 7792 ft > Design Water Depth of 5255 ft

No buckle arrestors are required.

Jacket Pipe

$$WD_p = 0.8 \times 2.25 \times 24 \times 65{,}000\ psi \left[\frac{0.421''}{9.625}\right]^{2.4} = 1536\ ft$$

Wa_d = 1536 ft < Design Water Depth of 5255 ft

Buckle arrestors are required

Based on the calculations shown above, the jacket pipe will be provided with buckle arrestors, but not buckle arrestors will be required for the carrier pipe.

Spanning

Maximum allowable span lengths are to be determined for PIP flowlines such that static stresses allowed by ASME B31.8 can be maintained and also to prevent fatigue damage due to vortex induced vibration (VIV). The loads considered for static stresses are due to submerged self weight, thermal expansion, internal and external pressures, waves, currents and residual seabed tension. Span length limit due to VIV fatigue are to be evaluated in accordance with DNV RP F105. A post installation survey will be conducted. If necessary, engineering solutions will be utilized to mitigate any spans which exceed the maximum allowable length.

Collapse Pressure

Carrier Pipe

Pipe collapse pressure (P_c) due to external pressure is calculated using the equations in API RP 1111 (1999).

$$P_c = \frac{P_y P_e}{\sqrt{P_y^2 + P_e^2}}$$

$$P_y = \frac{2(S)t}{D}$$

$$P_e = 2\,E\frac{(t/D)^3}{(1-\nu^2)}$$

Then the following condition must be satisfied:

$$P_c > \frac{P_{hmax}}{F_c}$$

Where:

E	= Pipe elastic modulus
ν	= Pipe poisson's ratio
P_{hmax}	= Hydrostatic pressure at maximum water depth
F_c	= 0.7 for seamless pipe

Calculations:

$$P_y = \frac{2\times(65{,}000\ psi)\times(0.57")}{6.625} = 11{,}185\ psi$$

$$P_e = 2\times(30{,}000{,}000\ psi)\times\frac{\{(0.57")/6.625"\}^3}{(1-0.3^2)} = 41993\ psi$$

$$P_c = \frac{(11185\ psi)\times(41993\ psi)}{\sqrt{(11185\ psi)^2+(41993\ psi)^2}} = 10{,}808\ psi$$

$$\frac{P_{h\max}}{F_c} = \frac{(5255\ ft)\times\left(64\frac{lb}{ft^3}\right)}{\left(144\frac{in^2}{ft^2}\right)\times 0.7} = 3336\ psi$$

$$P_c = 10{,}808\ psi > \frac{P_{h\max}}{F_c} = 3336\ psi \quad \therefore OK$$

Jacket Pipe

$$P_y = \frac{2\times(65{,}000\ psi)\times(0.421")}{9.625} = 5686\ psi$$

$$P_e = 2 \times (30{,}000{,}000\ psi) \times \frac{\{(0.421") / 9.625"\}^3}{(1 - 0.3^2)} = 5518\ psi$$

$$P_c = \frac{(5686\ psi) \times (5518\ psi)}{\sqrt{(5686\ psi)^2 + (5518\ psi)^2}} = 3960\ psi$$

$$\frac{P_{h\max}}{F_c} = \frac{(5255\ ft) \times \left(64 \frac{lb}{ft^3}\right)}{\left(144 \frac{in^2}{ft^2}\right) \times 0.7} = 3336\ psi$$

$$P_c = 3960\ psi > \frac{P_{h\max}}{F_c} = 3336\ psi \qquad \therefore OK$$

Fatigue

The minimum acceptable fatigue life is 200 years which is 10 times the design life.

Approximately 260 ft of 16D/0.25D VIV strakes will be added to the area of the SCR from the pull tube bell-mouth (+45'-0") to +310'-0". The primary benefit of the strakes will be to resist VIV due to submerged or cold core currents.

LOUISIANA COASTAL ZONE CONSISTENCY CERTIFICATION

In accordance with NTL 2002-G15, a consistency certification and supporting documentation has been sent to the state of Louisiana. A copy of the consistency certification is enclosed.

CONSTRUCTION INFORMATION AND SCHEDULE

Schedule:

1. Estimated Starting Date: November 1, 2005
2. Estimated Completion Date: December 15, 2005
3. Number of Days: 10

CONTACT PERSON

Wanda Parker
c/o Kerr-McGee Oil and Gas Corporation
16666 Northchase
Houston, TX 77060

972-516-1177 (office)
972-516-1188 (fax)
972-679-5554 (cell)
wanda.parker@wjpenterprises.com

COASTAL ZONE MANAGEMENT
CONSISTENCY CERTIFICATION

Right-of Way Pipeline Application

From Green Canyon Block 768 to Green Canyon Block 680

22,641.78 ft in length

The proposed activities described in detail in this Plan comply with the State of Louisiana approved Coastal Management Program and will be conducted in a manner consistent with such Program. All of Louisiana's relevant enforceable policies were considered in certifying consistency.

Kerr-McGee Oil and Gas Corporation

Cary V. Bradford

July 18, 2005

TICONDEROGA
SUBSEA TIEBACK PLAN

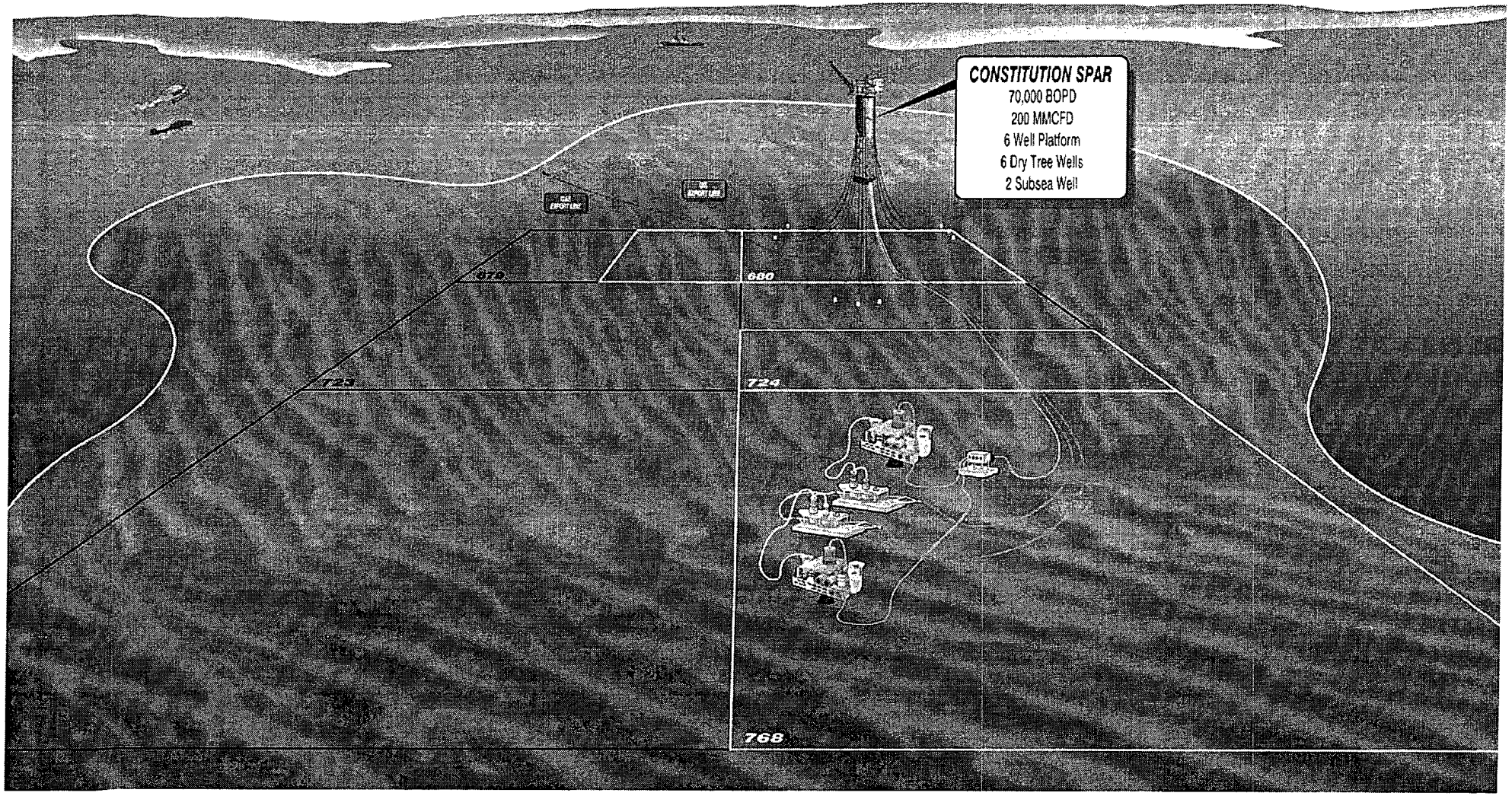


Figure 1

VICINITY MAP

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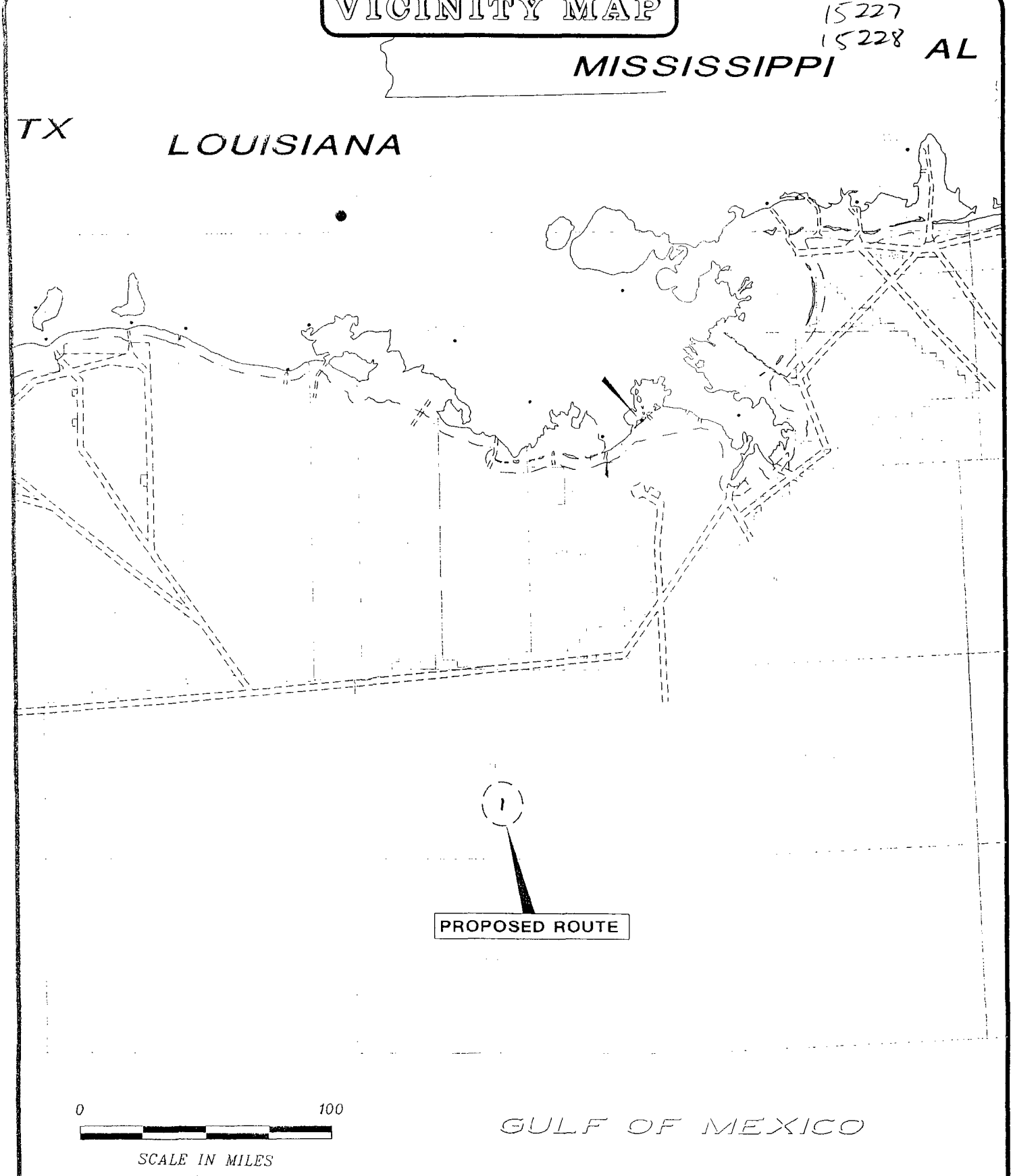

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KERR-McGEE
OIL & GAS CORPORATION
16666 Northchase
Houston, Texas 77060

PROPOSED 1A 6.625" BULK OIL PIPELINE
Block 768 PLET 1A-C1 to Block 680 SPAR
Green Canyon Area

C&C Technologies
SURVEY SERVICES

JOB No: 4590-4743, 8008	REVISED: 1/25/2005 6/16/2005	DATE: Aug. 20, 2004
FILENAME: PRM8008CVR.DWG		SHEET 1 of 4

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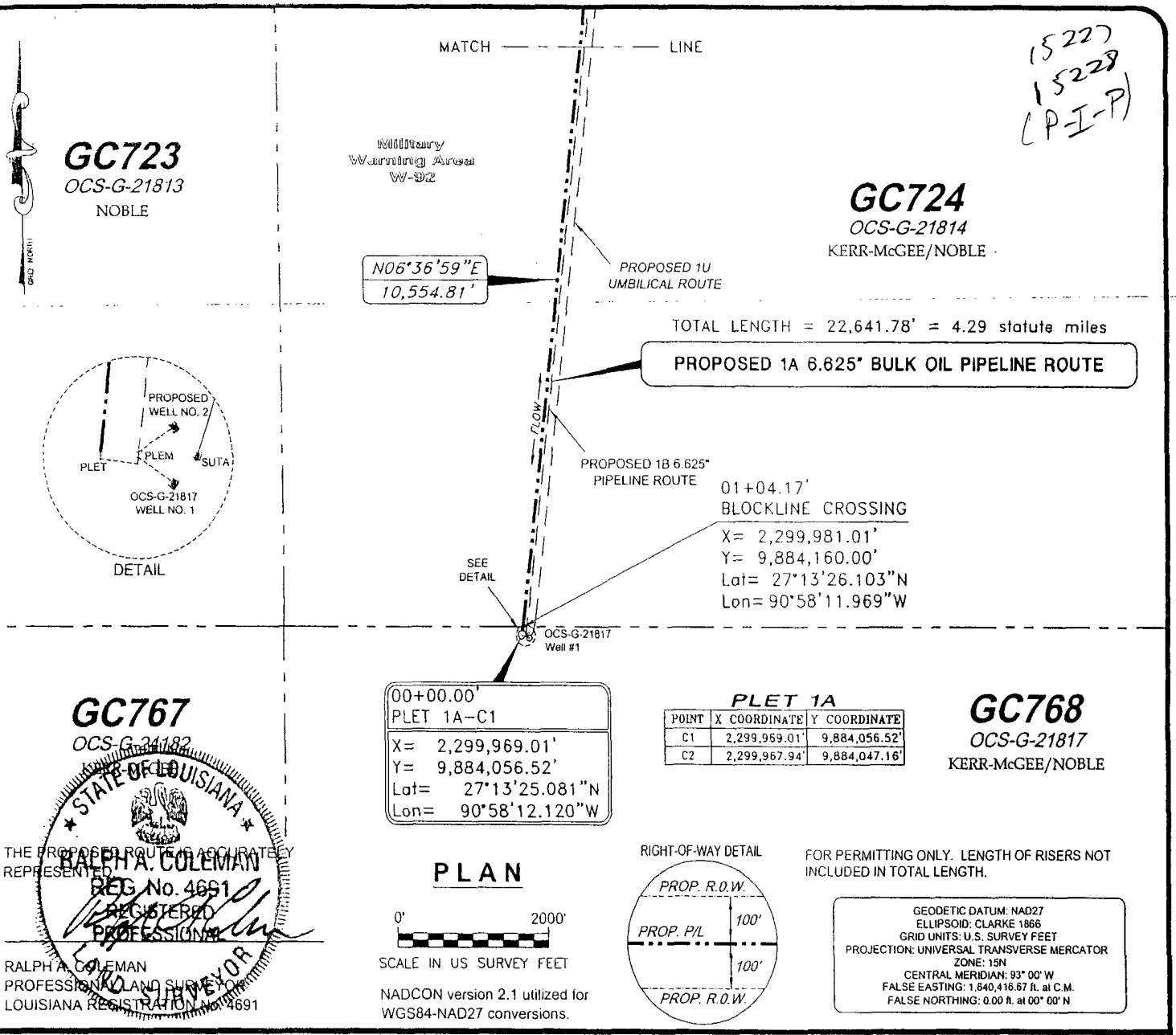


PLET 1A

POINT	X COORDINATE	Y COORDINATE
C1	2,299,969.01'	9,884,056.52'
C2	2,299,967.94'	9,884,047.16'

THE PROPOSED ROUTE IS ACCURATELY REPRESENTED.

STATE OF LOUISIANA
RALPH A. COLEMAN
REG. No. 4691
REGISTERED PROFESSIONAL LAND SURVEYOR

RALPH A. COLEMAN
PROFESSIONAL LAND SURVEYOR
LOUISIANA REGISTRATION No. 4691

PLAN

0' 2000'

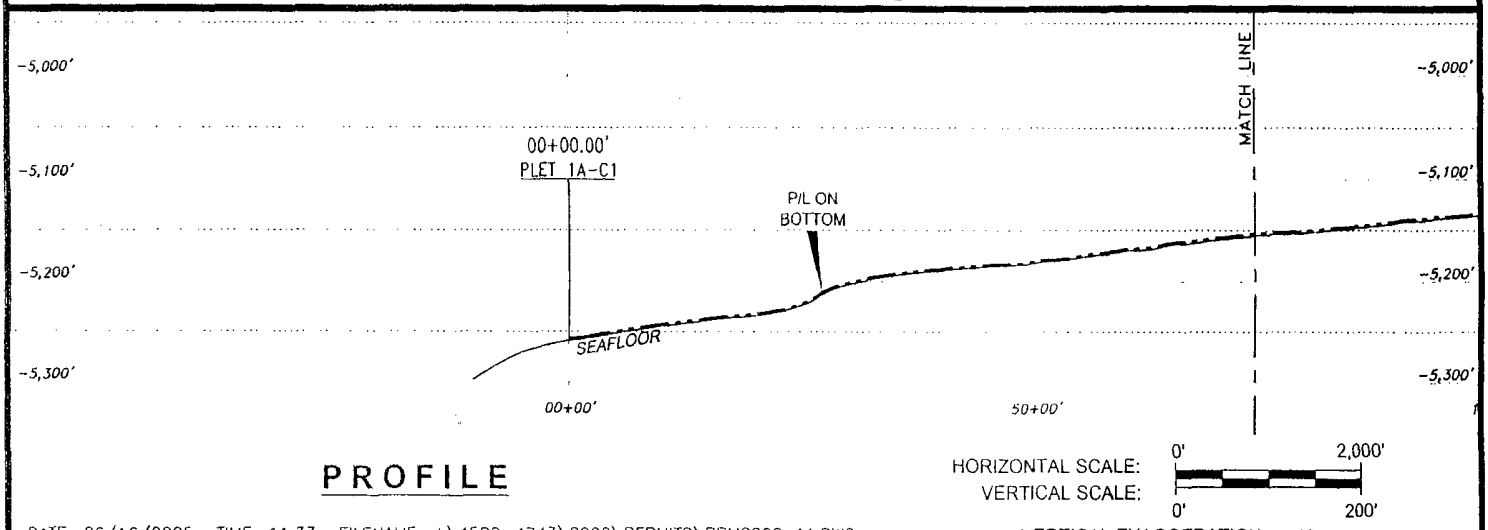
SCALE IN US SURVEY FEET

NADCON version 2.1 utilized for WGS84-NAD27 conversions.

RIGHT-OF-WAY DETAIL

FOR PERMITTING ONLY. LENGTH OF RISERS NOT INCLUDED IN TOTAL LENGTH.

GEODETIC DATUM: NAD27
ELLIPSOID: CLARKE 1866
GRID UNITS: U.S. SURVEY FEET
PROJECTION: UNIVERSAL TRANSVERSE MERCATOR
ZONE: 15N
CENTRAL MERIDIAN: 93° 00' W
FALSE EASTING: 1,640,416.67 ft. at C.M.
FALSE NORTHING: 0.00 ft. at 00° 00' N



PROFILE

HORIZONTAL SCALE: 0' 2,000'
VERTICAL SCALE: 0' 200'

VERTICAL EXAGGERATION = 10

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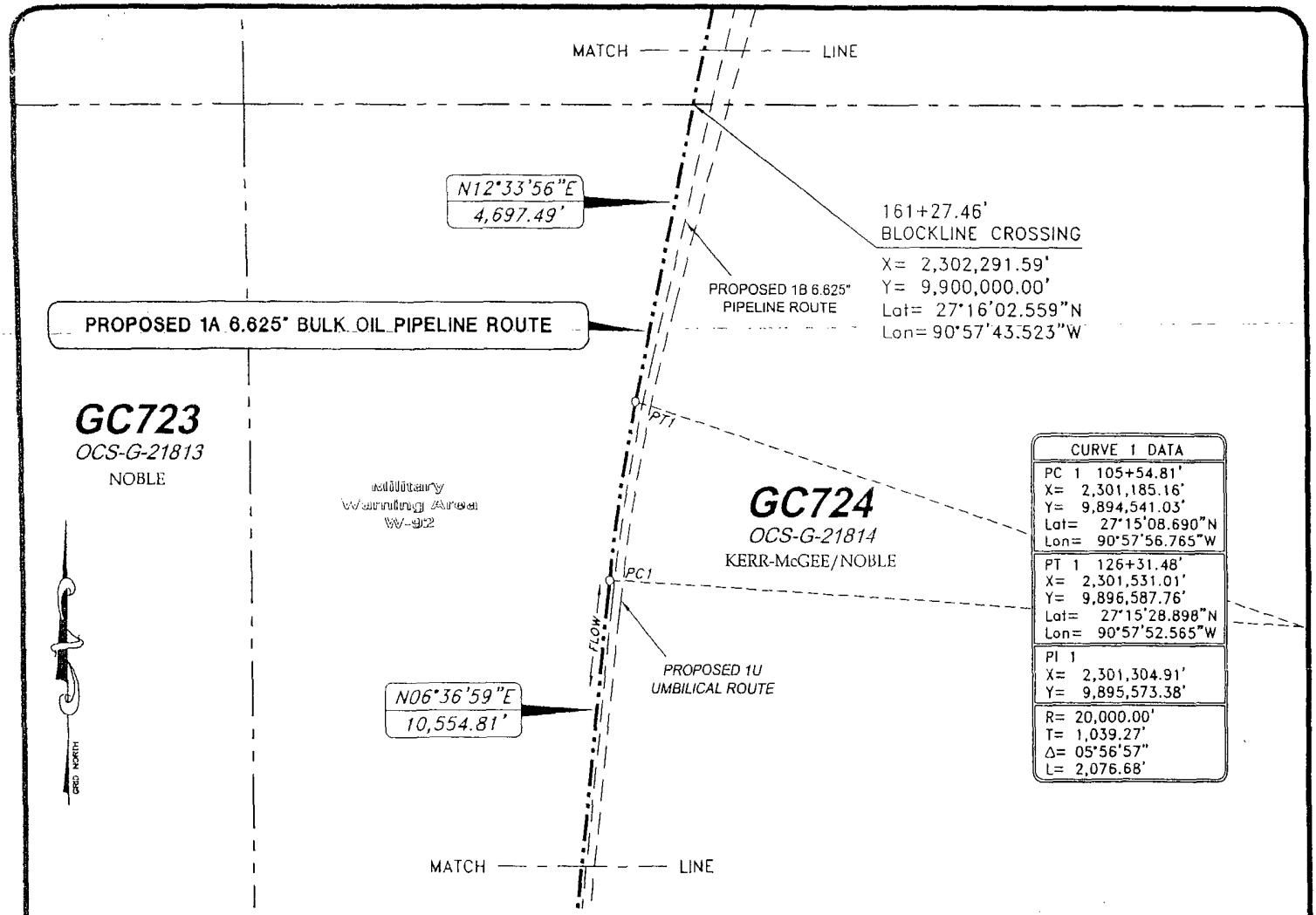
KERR-McGEE OIL & GAS CORPORATION
16666 Northchase
Houston, Texas 77060

PROPOSED 1A 6.625" BULK OIL PIPELINE ROUTE
Block 768 PLET 1A-C1 to Block 680 SPAR
Green Canyon Area

PREPARED BY:	JOB No: 4590-4743, 8008	REVISED: 01/25/2005 06/16/2005	DATE: 08/20/2004
C&C Technologies SURVEY SERVICES 730 E. KALISTE SALOOM ROAD, LAFAYETTE, LA (337) 261-0660	FILENAME: PRM8008_1A.DWG		SHEET 2 of 4



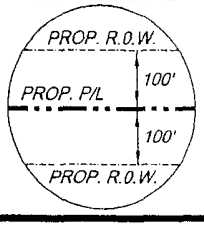
PLAN

0' 2000'

SCALE IN US SURVEY FEET

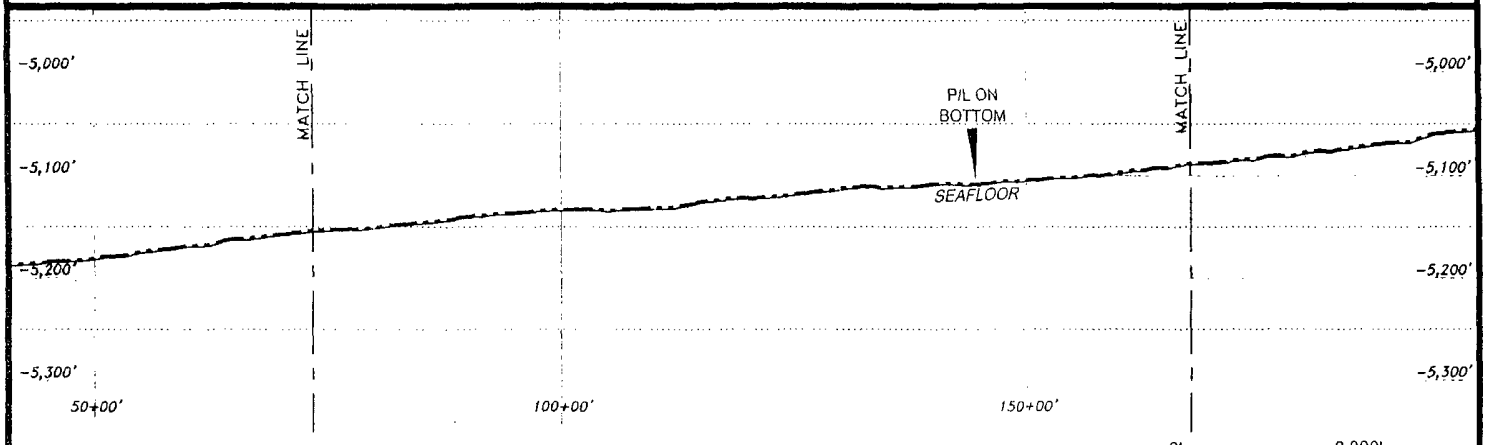
NADCON version 2.1 utilized for WGS84-NAD27 conversions.

RIGHT-OF-WAY DETAIL



FOR PERMITTING ONLY. LENGTH OF RISERS NOT INCLUDED IN TOTAL LENGTH.

GEODETIC DATUM: NAD27
ELLIPSOID: CLARKE 1866
GRID UNITS: U.S. SURVEY FEET
PROJECTION: UNIVERSAL TRANSVERSE MERCATOR
ZONE: 15N
CENTRAL MERIDIAN: 93° 00' W
FALSE EASTING: 1,640,416.67 ft. at C.M.
FALSE NORTHING: 0.00 ft. at 00° 00' N



PROFILE

HORIZONTAL SCALE: 0' 2,000'

VERTICAL SCALE: 0' 200'

VERTICAL EXAGGERATION = 10

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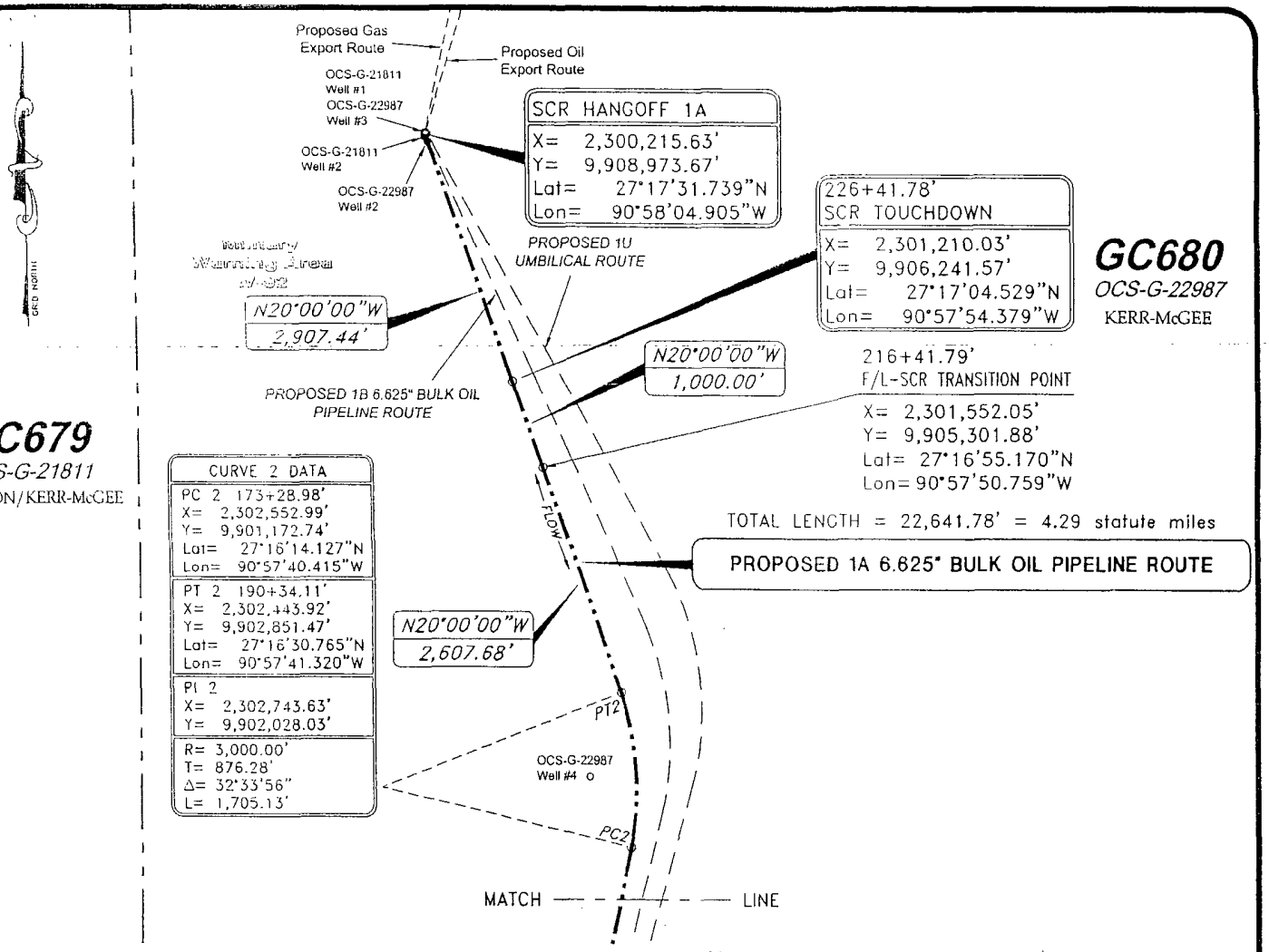
KERR-McGEE OIL & GAS CORPORATION
16666 Northchase
Houston, Texas 77060

PROPOSED 1A 6.625" BULK OIL PIPELINE ROUTE
Block 768 PLET 1A-C1 to Block 680 SPAR
Green Canyon Area

PREPARED BY: C&C Technologies SURVEY SERVICES
730 E. KALISTE SALOOM ROAD, LAFAYETTE, LA (337) 261-0660

JOB No: 4590-4743, 8008	REVISED: 01/25/2005 06/16/2005	DATE: 08/20/2004
FILENAME: PRM8008_1A.DWG		SHEET 3 of 4



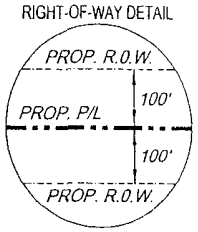
PLAN

0' 2000'

SCALE IN US SURVEY FEET

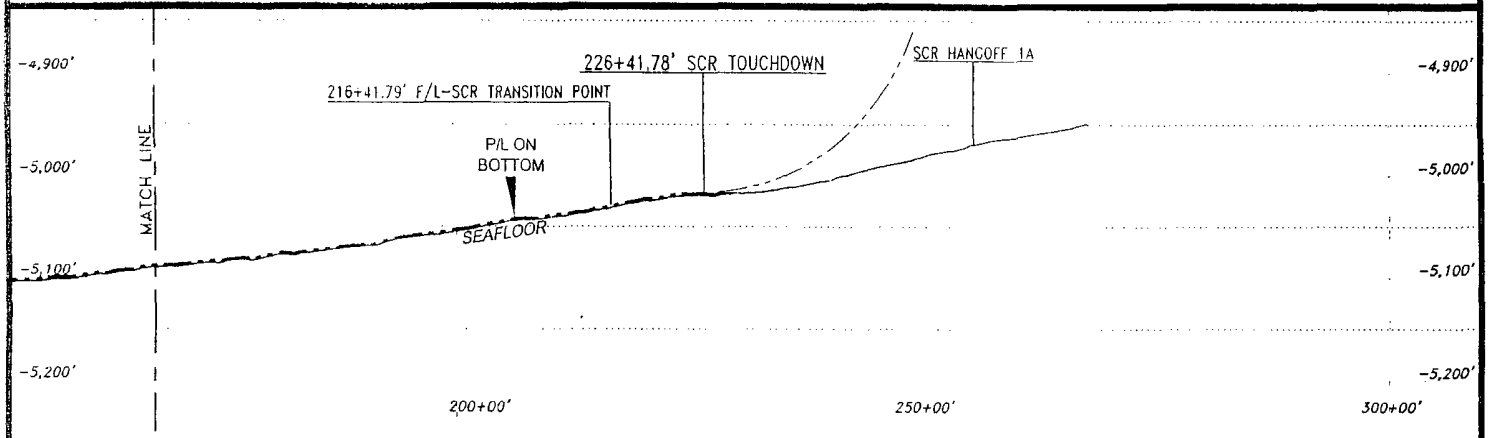
NADCON version 2.1 utilized for WGS84-NAD27 conversions.

RIGHT-OF-WAY DETAIL



FOR PERMITTING ONLY. LENGTH OF RISERS NOT INCLUDED IN TOTAL LENGTH.

GEODETIC DATUM: NAD27
ELLIPSOID: CLARKE 1866
GRID UNITS: U.S. SURVEY FEET
PROJECTION: UNIVERSAL TRANSVERSE MERCATOR
ZONE: 15N
CENTRAL MERIDIAN: 93° 00' W
FALSE EASTING: 1,640,416.67 ft. at C.M.
FALSE NORTHING: 0.00 ft. at 00° 00' N



PROFILE

HORIZONTAL SCALE: 0' 2,000'
VERTICAL SCALE: 0' 200'

VERTICAL EXAGGERATION = 10

DATE: 06/16/2005 TIME: 11:34 FILENAME: J:\4590-4743\8008\PERMITS\PRM8008_1A.DWG

KERR-McGEE OIL & GAS CORPORATION
16666 Northchase
Houston, Texas 77060

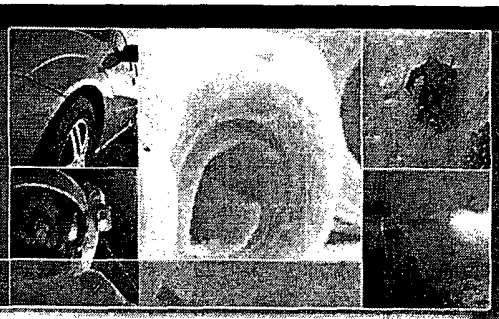
PROPOSED 1A 6.625" BULK OIL PIPELINE ROUTE
Block 768 PLET 1A-C1 to Block 680 SPAR
Green Canyon Area

PREPARED BY: C&C Technologies SURVEY SERVICES
730 E. KALISTE SALOOM ROAD, LAFAYETTE, LA (337) 261-0660

JOB No: 4590-4743, 8008	REVISED: 01/25/2005 06/16/2005	DATE: 08/20/2004
FILENAME: PRM8008_1A.DWG		SHEET 4 of 4

ASPEN AEROGELS

Extreme protection for extreme environments



Spaceloft™

AR5101, AR5103

Spaceloft™ materials are flexible aerogel nanoporous insulation blankets designed to meet the demanding requirements of industrial and cryogenic applications. The unique properties of very low thermal conductivity, good flexibility and ease of use have made Spaceloft essential for those seeking the ultimate in thermal protection. Using patented technology the Spaceloft materials combine a silica aerogel with reinforcing fibers to deliver proven thermal performance in an environmentally safe and non toxic product.

Spaceloft – AR5100 series may be used to insulate oil and gas flowlines, cryogenic tanks, pipes, and equipment containing and transporting liquefied gases such as oxygen, nitrogen, hydrogen, and argon. It provides maximum thermal protection with minimal weight. Spaceloft has extremely low thermal conductivity and low outgassing properties under vacuum conditions.

Benefits

- Light Weight
- Low Thermal Conductivity
- Excellent Low Temperature Properties
- Easy to Apply and Handle
- Flexible
- Non-Toxic

Applications

- Cryogenic tanks, pipes, equipment
- Liquefied gas transport
- Pipeline Insulation
- Fuel Systems
- Refrigeration

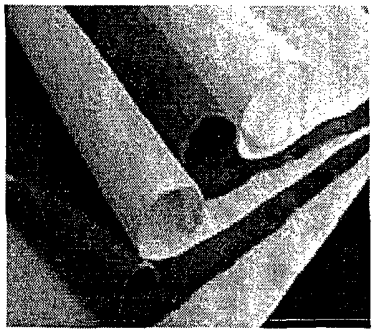
Product Form

Flexible Blanket

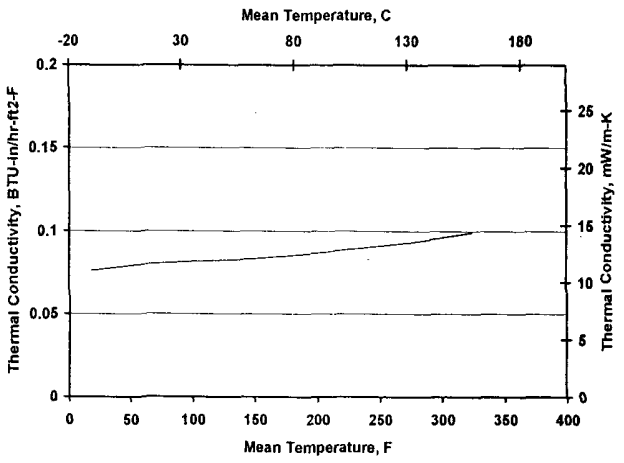
- Thickness:
  AR5101 - 1/16 in
  AR5103 - 1/4 in
- Width
  Up to 59 inches
- Lengths:
  Up to 200 feet

Material Properties

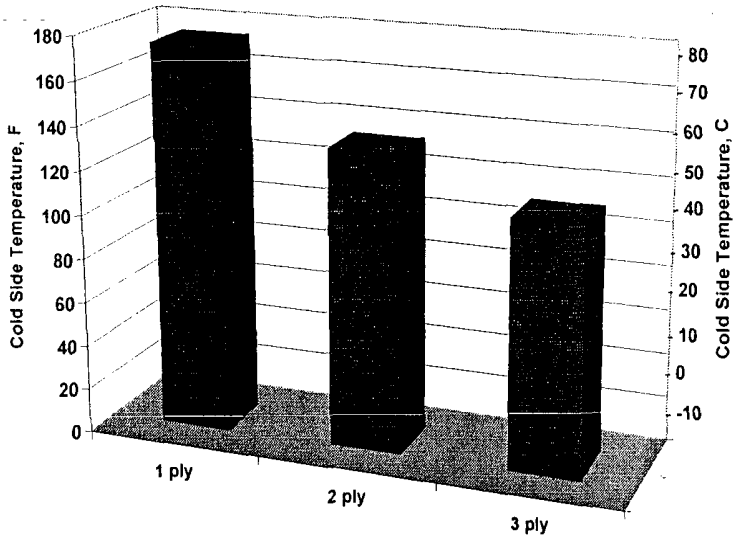
	AR5101	AR5103
Thickness	0.094 inch (2.4 mm)	0.24 inch (6.1 mm)
Maximum Use Temperature	390 °F (200 °C) (continuous)	
Color	Black	
Density	6.3 lb/ft^3 (0.11 g/cc)	
Hydrophobic	Yes	
Tensile Strength	12.1 psi (83 kPa)	
Specific Heat 100°F (38°C)	.25 BTU/lb-°F (1.046 J/g-K)	
Thermal Conductivity Mean Temp 100°F (38°C)	BTU-in/hr-ft^2-°F (mW/m-K) 0.089 (13.0)	



Spaceloft Products



ASPEN AEROGELS



Handling Characteristics

Spaceloft can be cut using conventional textile cutting tools including scissors, and electric scissors. The material can be dusty and it is recommended gloves and dust mask be worn when handling material. See MSDS for complete health and safety information. For thicker solutions, layering may be used.

Bonding and Limiting Dust

In most instances the flexible aerogel blankets can be applied without bonding. In applications where bonding is required, it is recommended that the Spaceloft materials be stitched to a fabric or encapsulated. Encapsulation helps to contain the material, prevent contamination of the insulation and assist in its attachment to a surface. Encapsulation can be done in numerous ways. For more information, contact Aspen Aerogels, Inc.

Other Available Materials

Aspen Aerogels, Inc. produces several series of flexible aerogel blanket materials for thermal insulation, blast mitigation, energy absorption, and fire protection. Please contact Aspen Aerogels, Inc for additional information on these other products.

S-15227
S-15228

State of Louisiana

KATHLEEN BABINEAUX BLANCO
GOVERNOR

SCOTT A. ANGELLE
SECRETARY

DEPARTMENT OF NATURAL RESOURCES
OFFICE OF COASTAL RESTORATION AND MANAGEMENT

August 10, 2005

Wanda June Parker P. E.
Worldwide Facilities Engineering
16666 Northchase
Houston, Texas 77060-6001

RE: **C20050410,** Coastal Zone Consistency
Kerr-McGee Oil & Gas Corp.
Minerals Management Service
Federal License or Permit
Installation of a 6" X 9" Pipe-in-Pipe Bulk Oil Right-of-Way Pipeline from Green Canyon 768 (Pipeline 1A) to Green Canyon 680 SPAR Platform, Gulf of Mexico, **Offshore Louisiana**

Dear Ms. Parker:

The above referenced project has been reviewed for consistency with the approved Louisiana Coastal Resources Program (LCRP) as required by Section 307 of the Coastal Zone Management Act of 1972, as amended. The project, as proposed in the application, is consistent with the LCRP.

If you have any questions concerning this determination please contact Brian Marcks of the Consistency Section at (225)342-7939 or 1-800-267-4019.

Sincerely,

David W. Frugé
Administrator

DWF/JH/bgm

cc: Alex Alvarado, MMS Pipeline Section
Bonnie Johnson, MMS 5412
Ronnie Duke, NOD-COE

S-15227
S-15228

100 Glenborough Drive
Suite 100
Houston, TX 77067-3610

Tel: 281.872.3100
Fax: 281.876.6208
www.nobleenergyinc.com

Offshore Division

noble energy

August 4, 2005

Kerr-McGee Oil & Gas Corporation
16666 Northchase
Houston, Texas 77060
Attn: Ms. Wanda Parker
Deepwater Regulatory Manager
Worldwide Facilities Engineering

RE: Kerr-McGee Oil & Gas Corporation
Letter of No Objection
Proposed Right-of-Way Bulk Oil Pipeline Crossing
Green Canyon Block 724, OCS-G 21814
Ticonderoga Pipeline 1A (To Be Installed In or Through GC Blocks 768, 724 and 680)
Offshore Gulf of Mexico

Dear Ms. Parker:

Reference is made to Kerr-McGee Oil & Gas Corporation's attached letters dated July 19, 2005 regarding the proposed oil pipeline which crosses Noble Energy, Inc. operated Lease OCS-G 21814, Green Canyon Block 724, Offshore Gulf of Mexico.

Noble Energy, Inc. has no objection to Kerr-McGee Oil & Gas Corporation's proposed oil pipeline insofar as said pipeline crosses Noble Energy, Inc.'s leasehold interest in and to Green Canyon Block 724 as described in Kerr-McGee Oil & Gas Corporation's letter, subject to Kerr-McGee Oil & Gas Corporation's compliance with the following requirements:

1. Kerr-McGee Oil & Gas Corporation shall secure all permits and/or approvals from all governmental agencies, either Federal, State or local, that might have jurisdiction over any part of the construction, operations, testing and maintenance of the proposed pipeline modifications at the subject location.

2. Kerr-McGee Oil & Gas Corporation's construction and operation of the pipeline shall be conducted in such a manner as not to interfere with any of the operations of Noble Energy, Inc., its co-lessees, successors, assignees, transferees and sublessees.

3. Kerr-McGee Oil & Gas Corporation will protect, hold harmless and indemnify Noble Energy, Inc. against all claims, demands, causes of action and judgments in favor of any party for personal injury, death or property damage arising directly or indirectly from the construction, operation, maintenance or removal of the subject pipeline.

4. In the event of any assignment by Kerr-McGee Oil & Gas Corporation of the right-of-way acquired for the purpose of constructing or modification of said pipeline, it is understood and agreed that the assignee will assume responsibility for the performance required by this agreement.

5. Kerr-McGee Oil & Gas Corporation will not object to the installation of future pipelines and cables over the subject pipeline, subject to Noble Energy, Inc. first submitting detailed drawings and specifications to Kerr-McGee Oil & Gas Corporation.

6. Within one-hundred and twenty (120) days after installation of the proposed pipeline, an as-built survey (reproducible plan and profile drawings) showing the actual location with coordinates of the subject pipeline will be sent to this office of Noble Energy, Inc. to the attention of Mr. Bruce Henrici.

7. Kerr-McGee Oil & Gas Corporation shall notify Mr. Bruce Henrici, Noble Energy, Inc.'s Construction Engineer, Domestic Division at (281) 876-6161 followed by wire or letter confirmation, at least thirty (30) days in advance of commencing this or any subsequent construction or repair on the above mentioned pipeline; however, emergency maintenance operations may be conducted without prior approval by Noble Energy, Inc. provided that notification of such activity shall be made to Noble Energy, Inc. as soon as reasonably practical. Additionally, Kerr-McGee Oil & Gas Corporation will provide said Construction Engineer, Domestic Division, with a second notice at least forty-eight (48) hours in advance of commencing the subject operation, also followed by wire or letter confirmation.

Please indicate your agreement with the foregoing by executing in the space provided below and return one (1) executed copy of this letter to the undersigned.

Very truly yours,

NOBLE ENERGY, INC.

Daniel S. Mills
Senior Negotiations Advisor
Deepwater Gulf of Mexico

AGREED TO AND ACCEPTED THIS _____ DAY OF _____, 2005.

Kerr-McGee Oil & Gas Corporation

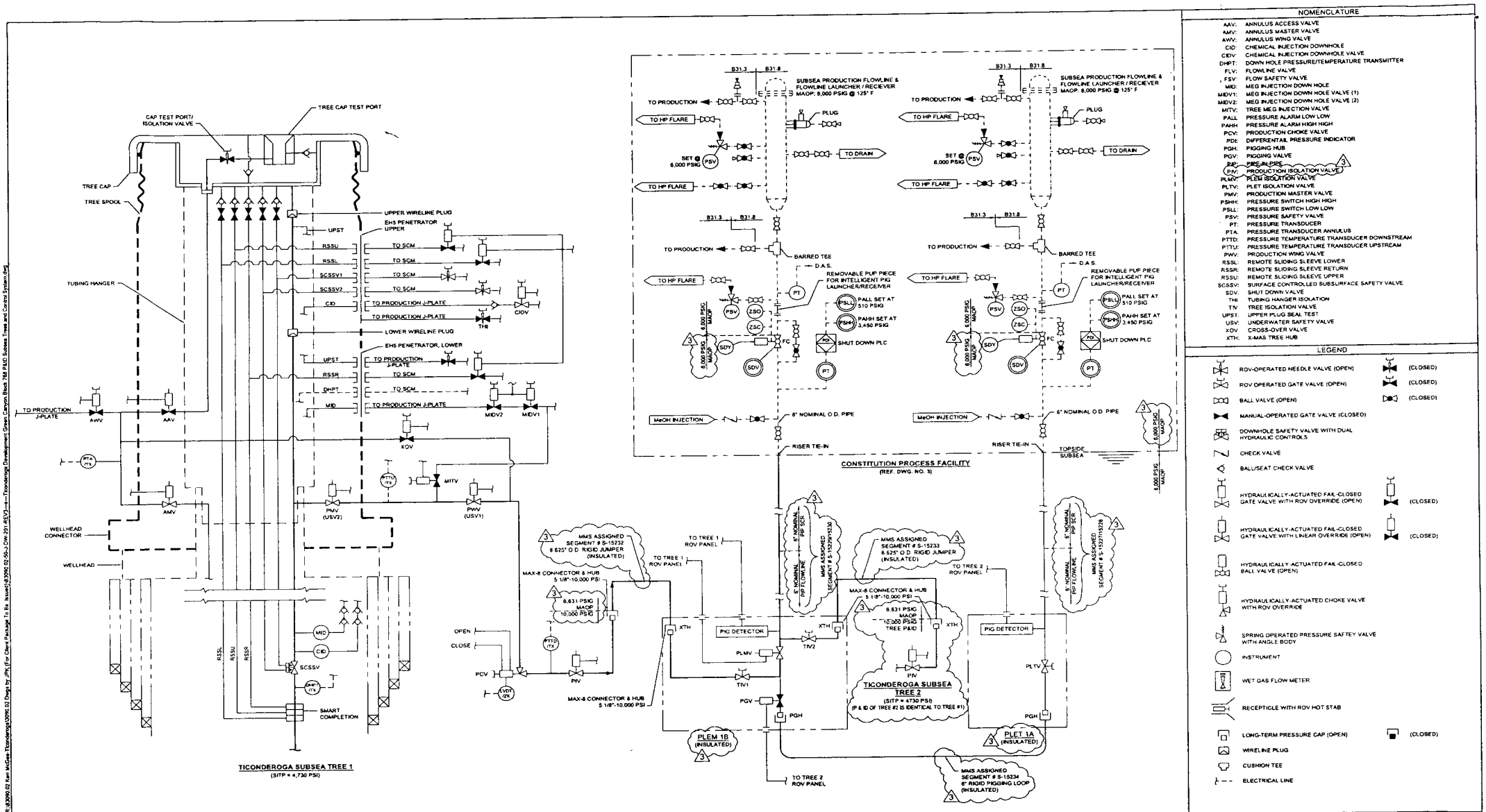
By: _____

Name: _____

Title: _____

dsm/08-05/PipelineCrossing.GC724.TiconderogaPipeline1A

cc: Joe Zimmerman
Kevin Nance
Bruce Henrici
Jan Carroll
Pam Tullos
Phyllis Greer



NOMENCLATURE

AAV:	ANNULUS ACCESS VALVE
AMV:	ANNULUS MASTER VALVE
AWV:	ANNULUS WING VALVE
CID:	CHEMICAL INJECTION DOWNHOLE
CIDV:	CHEMICAL INJECTION DOWNHOLE VALVE
DHPT:	DOWN HOLE PRESSURE/TEMPERATURE TRANSMITTER
FLV:	FLOWLINE VALVE
FSV:	FLOW SAFETY VALVE
MID:	MEG INJECTION DOWN HOLE
MIDV1:	MEG INJECTION DOWN HOLE VALVE (1)
MIDV2:	MEG INJECTION DOWN HOLE VALVE (2)
MITV:	TREE MEG INJECTION VALVE
PALL:	PRESSURE ALARM LOW LOW
PAHH	PRESSURE ALARM HIGH HIGH
PCV:	PRODUCTION CHOKE VALVE
PDI:	DIFFERENTIAL PRESSURE INDICATOR
PGH:	PIGGING HUB
PGV:	PIGGING VALVE
PIP:	PIPE-IN-PIPE
PIV:	PRODUCTION ISOLATION VALVE
PLMV:	PLEM ISOLATION VALVE
PLTV:	PLET ISOLATION VALVE
PMV:	PRODUCTION MASTER VALVE
PSHH:	PRESSURE SWITCH HIGH HIGH
PSLL:	PRESSURE SWITCH LOW LOW
PSV:	PRESSURE SAFETY VALVE
PT:	PRESSURE TRANSDUCER
PTA:	PRESSURE TRANSDUCER ANNULUS
PTTD:	PRESSURE TEMPERATURE TRANSDUCER DOWNSTREAM
PTTU:	PRESSURE TEMPERATURE TRANSDUCER UPSTREAM
PWV:	PRODUCTION WING VALVE
RSSL:	REMOTE SLIDING SLEEVE LOWER
RSSR:	REMOTE SLIDING SLEEVE RETURN
RSSU:	REMOTE SLIDING SLEEVE UPPER
SCSSV:	SURFACE CONTROLLED SUBSURFACE SAFETY VALVE
SDV:	SHUT DOWN VALVE
THI	TUBING HANGER ISOLATION
TIV	TREE ISOLATION VALVE
UPST:	UPPER PLUG SEAL TEST
USV:	UNDERWATER SAFETY VALVE
XOV:	CROSS-OVER VALVE
XTH:	X-MAS TREE HUB

LEGEND

- ROV-OPERATED NEEDLE VALVE (OPEN) (CLOSED)
- ROV OPERATED GATE VALVE (OPEN) (CLOSED)
- BALL VALVE (OPEN) (CLOSED)
- MANUAL-OPERATED GATE VALVE (CLOSED)
- DOWNHOLE SAFETY VALVE WITH DUAL HYDRAULIC CONTROLS
- CHECK VALVE
- BALL/SEAT CHECK VALVE
- HYDRAULICALLY-ACTUATED FAIL-CLOSED GATE VALVE WITH ROV OVERRIDE (OPEN) (CLOSED)
- HYDRAULICALLY-ACTUATED FAIL-CLOSED GATE VALVE WITH LINEAR OVERRIDE (OPEN) (CLOSED)
- HYDRAULICALLY-ACTUATED FAIL-CLOSED BALL VALVE (OPEN)
- HYDRAULICALLY-ACTUATED CHOKE VALVE WITH ROV OVERRIDE
- SPRING OPERATED PRESSURE SAFTEY VALVE WITH ANGLE BODY
- INSTRUMENT
- WET GAS FLOW METER
- RECEPTICLE WITH ROV HOT STAB
- LONG-TERM PRESSURE CAP (OPEN) (CLOSED)
- WIRELINE PLUG
- CUSHION TEE
- ELECTRICAL LINE

NO.	REFERENCE DRAWING TITLE	REF. DWG. NO.	REV	DATE	BY	ENG	CHK	PM	QA	CLIENT	DESCRIPTION
1	DRAWING INDEX, NOTES AND LEGEND	83090-50-A-DW-201	3	08/23/05	JS	RH	HP	RH		BB	RE-ISSUED FOR DESIGN
2	SUBSEA LAYOUT GA	83090-50-P-DW-202	2	01/31/05	AG	JM	HP	AB		BB	RE-ISSUED FOR DESIGN
3	P&ID SUBSEA GAS FLOWLINES & HEATERS (BY: MUSTANG ENGINEERING, INC.)	4012 (MEI PROJ. NO. 4307)	1	10/21/04	JS	JM	HP	AB		BB	RE-ISSUED FOR DESIGN
			0	9/16/04	JS	JM	HP	AB		BB	ISSUED FOR DESIGN
			A	8/24/04	JS	JM	HP	AB			ISSUED FOR INTERNAL REVIEW

DRAWN BY	J. STRANGE — DATE 8/9/04
ENGINEER	H. PALANY — DATE 8/9/04
PROJECT ENGINEERING MANAGER	R. HART — DATE 8/9/04
SCALE	NONE

DWG. TITLE

TICONDEROGA DEVELOPMENT
GREEN CANYON BLOCK 768
PIPING AND INSTRUMENTATION DIAGRAM (P&ID)
SUBSEA TREES AND CONTROL SYSTEM

CLIENT: KERR-McGEE OIL & GAS CORP.

J P KENNY

CAD file: 83090.02-50-J-DW-201-REV3 — JOB no. 83090.02

DWG no. 3090-50-J-DW-201 — REV 3

Ticonderoga

Sep 13, 2005 - 3:57pm — File Path: R:\83090.02 Kerr McGee-Ticonderoga\3090.02 Dwgs by JPK (For Client Package To Be Issued)\83090.02-50-J-DW-201.REV3 — Ticonderoga Development (Green Canyon Block 768 P&ID Subsea Trees and Control System).dwg

15220