

From: Vidrine, Don J
Sent: Fri Apr 16 11:24:58 2010
To: Kaluza, Robert
Subject: FW: Bp Nile P&A Load Out
Importance: Normal
Attachments: Nile Load Out.xlsx; bp Nile #1 ST3 VK 914 estimated cost2.xls; Horizon Riser Clean-out.doc; Nile P&A Procedure.docx

From: Lindner, Leo T (MI DRILLING FLUIDS, INC)
Sent: Thursday, April 15, 2010 9:44 AM
To: Vidrine, Don J
Subject: FW: Bp Nile P&A Load Out

From: Detiveaux, Christopher [mailto:CDetiveaux@miswaco.com]
Sent: Monday, April 12, 2010 10:55 AM
To: Lindner, Leo T (MI DRILLING FLUIDS, INC)
Subject: FW: Bp Nile P&A Load Out

Leo,

Here is the load outs and the procedures for the riser clean out and the Nile P&A. Let me know if you have any thoughts or questions.

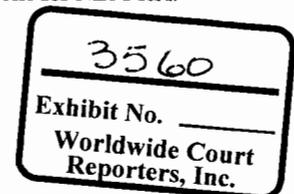
Thanks,

Christopher Detiveaux, Sr.
MI-SWACO
Project Engineer - Wellbore Productivity
(713) 392-4422 - cellphone
cdetiveaux@miswaco.com

From: Detiveaux, Christopher
Sent: Wednesday, March 31, 2010 10:36 AM
To: Port2completions, C; Melancon, Timothy; Olivier, Rocky
Cc: Gaspard, Minos; Smith, Patrick; Guidry, CJ; House, Seth; Maxie, Doyle
Subject: FW: Bp Nile P&A Load Out

All,

I just spoke with the Bp engineer in regards to the Horizon Riser Clean-Up and the Nile P&A. He said if things go well, that they could be calling for the tools, chemicals and personnel for the Riser Clean-Out as early as Monday, April 5th. It was originally stated that they would pick up the Horizon Riser Clean Out chemicals and tools in one trip and then pick up the remaining fluid, chemicals and filtration equipment after they begin moving the rig to the Nile location (would take ~ 4 days for riser clean-up and moving of rig). I will verify this and let everyone know. Please notice that the load-out has two tabs at the bottom, one for the Horizon Riser clean-up and one for Nile P&A.



All items are being charged to the Nile P&A AFE like I said in the below email, log-it 101283. This is a prior flowing well and Bp has stated that all personnel must have FRC clothing. If you have any questions, please give me a call or email me. I will pass along any changes/updates as they occur. We currently have the drilling fluids on this rig and the lead mud engineers will stay out and work nights, to assist our completion engineer with their knowledge of the rig and personnel.

Thanks,

Christopher Detiveaux, Sr.
MI-SWACO
Project Engineer - Wellbore Productivity
(713) 392-4422 - cellphone
cdetiveaux@miswaco.com

From: Detiveaux, Christopher
Sent: Tuesday, March 02, 2010 10:15 AM
To: Gaspard, Minos; Smith, Patrick; Guidry, CJ
Cc: Port2completions, C
Subject: Bp Nile P&A Load Out

Gents,

This job is scheduled for late March/early April (It keeps getting delayed) load out and I will keep you updated with any changes. Please notice there are two tabs on the bottom of the spreadsheet. We will call for the Horizon Riser Clean Out Load-Out first. The Log-It for this well is 101283 and the AFE is X7-004NX-E:ABANDON. Seth House will handle the clean-out tools. As the date get closer and firmer, I will send out a notice and let the plant know which boats we will be utilizing. Please let me know if you have any questions.

Christopher Detiveaux, Sr.
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HORIZON RISER CLEAN-OUT LOAD OUT

This is an equipment load out list. We will organize this by section, i.e. well bore cleanout etc. So, we need to know what equipment and tools are required for each section

Sor Ref #	Quantity	Qty	Item	Serial No.	Part No.	Length (ft)	Width (ft)	Height (ft)	How Packaged	Estimated Weight (lb)	Comments/Status
	M-I SWACO	3	Safe-Surf O			48"	40"	48"	Pallet	1,972	12-55 gal drums
	M-I SWACO	4	Flo-Vis L			48"	40"	48"	Pallet	1,472	96 5-gal cans Flo-Vis L
	M-I SWACO	10	ECF-1840			48"	42"	75"	Tote Tank	4,600	10-550 gallon tote tanks
	M-I SWACO	1	Tool Basket Containing: Riser Brush and SABS Including pump joints and xo's			50'	4'	3'	Basket	10,500	Total basket w/tools
	M-I SWACO		1 Completion Fluid Engineers								
	M-I SWACO		1 Clean-Out Tool Hand								

BP-H2N-2179MVL00312861



Nile #1 ST 3
GOM - Deepwater

OCSG 8785
Vioska Knoll 914 #1 ST 3
Estimated Well Cost

	Product	Quantity	Package	Unit Cost	Total Unit Cost
Completion fluids, salts & Base Oil					
1.	11.4 ppg CaCl	3500	barrels	21.96	76,860.00
3.					

Estimated cost of completion fluids, salts & base oil 76,860.00

	Product	Quantity	Package	Unit Cost	Total Unit Cost
Additives					

1.	Safe-Surf O	275	gallons	23.47	6,454.25
2.	Safe-Solv OM		gallons	18.28	
3.	Safe-Cor	385	gallons	7.85	3,022.25
4.	Myacide 25G	12	5 gallon pails	135.00	1,620.00
5.	Safe-Vis OGS	20	5 gallon pails	360.15	7,203.00
6.	Safe-Defoam	10	5 gallon pails	146.63	1,466.30
7.	Safe-Scav CA	10	15 pound sacks	157.64	1,576.40
8.	Flo Vis L	50	5 gallon pails	314.82	15,741.00
9.	ECF-1840	2940	gallons	31.17	91,639.80

Estimated cost of additives 128,723.00

	Product	Quantity	Package	Unit Cost	Total Unit Cost
Filtration					

1.	1500 square foot D. E. Filtration Units	12	each	1,320.00	15,840.00
2.	Additional Hoses, Connections, Pumps	12	each	500.00	6,000.00
5.	Filtration Standby	5	each	275.00	1,375.00

Estimated cost of filtration 23,215.00

	Product	Quantity	Package	Unit Cost	Total Unit Cost
Personnel					

1.	Fluid Engineering	30	each	950.00	28,500.00
2.	Fluid Engineering	30	each	950.00	28,500.00
3.	Compliance Engineering	30	each	1,000.00	30,000.00

Estimated cost of filtration 87,000.00

	Product	Quantity	Package	Unit Cost	Total Unit Cost
Clean-Out Tools & Personnel					

1.	Riser Brush	5	each	565.00	2,825.00
2.	SABS	5	each	598.00	2,990.00
3.	Tool Hand	5	each	1,908.00	9,540.00
4.	Redress for Tools	2	each	1,250.00	2,500.00

Estimated cost of Clean-Out Tools 17,855.00

Estimated Purchases \$333,653.00

BP-H2N-2179MDL00312862



RIG CLEAN UP

PROCEDURE:

1. Clean the shaker area thoroughly, especially the ditch lines from the sand traps to the pit room. Large amounts of water should be pumped through all centrifugal pumps at the shaker area including the desanders, desilters, centrifuge and degasser.
2. After the initial clean up has been completed 250 bbls of water treated with 138 gallons Safe Surf O (0.55 gpb) should be pumped through all of the surface equipment. This includes the pumps and pump manifolds, chemical hopper, barite hopper and any other seldom used lines that may affect the completion fluid. Capture the 250 bbl Safe Surf O flush for proper disposal.
3. Clean and dry all pits, then bring the completion fluid onboard. The take on hose must be dry and not contaminated with mud or seawater.
4. After displacing the hole, clean the shaker area again. At this point, cleaning the flow line from the slip joint to shakers should be cleaned as well. Do not allow any cleaning water to get down the ditch to the pit room.

DRAFT

RIG CLEAN UP CHECK LIST

A. AREAS TO CLEAN

1. *Strongly suggest removing all of the drilling mud from the rig.*
2. *Clean the suction, return, settling, and reserve pits.*
3. *Clean the sand traps.*
4. *Clean the ditches and troughs.*
5. *Clean the trip tank.*
6. *Clean the shaker area including all solids equipment and lines.*
7. *Clean the mixing hoppers.*
8. *Clean the cement unit.*
9. *Clean mud bucket and its related lines.*
10. *Any other pits or equipment that may come into contact with the completion fluid.*

B. ITEMS TO FLUSH OUT

1. All mud pumps and suction lines.
2. *All centrifugal pumps and lines.*
3. *Chemical and weight mixing lines.*
4. *Lines from the pit room to the trip tank.*
5. *Lines from the rig floor to the trip tank.*
6. *Choke, choke manifold and kill lines.*
7. *Standpipes.*
8. *Degassing and solids control equipment.*
9. *Lines to the cement unit and/or other pumping equipment.*
10. *Casing fill up line.*
11. *Lines to and from the filtration line.*
12. *Take on and return lines to and from the boat.*
13. *Any other lines that the completion fluid may contact.*

NOTE: A VALVE ON THE END OF THE TAKE ON HOSE, THE END THAT IS ON THE BOAT, IS STRONGLY RECOMMENDED. THE VALVE SHOULD BE ABLE TO BE CLOSED TO PREVENT FLUIDS FROM SPILLING INTO ANY ADJACENT WATERS OR ENVIRONMENTALLY SENSITIVE AREAS.

DERRICKMAN'S CHECKLIST

<i>EQUIPMENT</i>	<i>CHECK (?)</i>	<i>EQUIPMENT</i>	<i>CHECK (?)</i>
<i>Pits - (All where Drilling Fluid will be stored)</i>		<i>Rig Pumps</i>	
<i>Sand Traps</i>		<i>Choke Lines</i>	
<i>Degasser</i>		<i>Upper Kill Line</i>	
<i>Mud Cleaner</i>		<i>Lower Kill Line</i>	
<i>Mud Ditches</i>		<i>Reverse Circulating Line</i>	
<i>Pumps</i>		<i>Overboard Lines</i>	
<i>Header Box</i>		<i>Pit Gun Lines (All)</i>	
<i>Shakers</i>		<i>Transfer Lines: -</i>	
<i>Gumbo</i>		<i>To & From All Pits</i>	
<i>Poor Boy</i>		<i>To & From Filter Unit</i>	
<i>Trip Tank</i>		<i>Diverter</i>	
<i>Trip Tank Fill Line</i>		<i>Equalizing Lines</i>	
<i>Trip Tank Overflow Line</i>		<i>Lines to Drill Floor</i>	
<i>Standpipe Manifold</i>		<i>Hole Fill Pump</i>	
<i>Top Drive</i>		<i>Pop Off Lines</i>	
<i>Chiksans</i>		<i>Bleed Off Lines</i>	
<i>Choke Manifold</i>		<i>Kill Pump</i>	
<i>Buffer Tank</i>		<i>Solids Handling Equip</i>	
<i>Choke & Kill Manifold</i>		<i>Hose to Boat</i>	
<i>Mud Pump Charging Pumps</i>		<i>Relief Overboard (Cmt.)</i>	
<i>General Service Pump</i>		<i>Mud Cleaner Pump</i>	
<i>H.P. Suction Manifold</i>			

Riser Clean-Out

1. Build a pumpable volume of spacers as follows in Table 1 and Table :

Table 1: Spacer I - 200-bbls High Viscosity Spacer

Formulation for 1 barrel of HI-Vis spacer:	Formulation for 200 barrels of HI-Vis spacer:
1-barrel of seawater	200-barrels of seawater
0.75 gpb of Flo-Vis L	150-gallons Flo-Vis L

Table 2: Spacer II - 350-bbls Solvent/Surfactant Spacer

Formulation for 1 barrel of solvent spacer:	Formulation for 350 barrels of solvent spacer:
0.800-barrels of drill water	280-barrels of drill water
0.200-barrels of ECF-1840	2940 gallons of ECF-1840

Note: Spacer II cannot be dumped overboard. Spacer II should be segregated in a separate pit or container for disposal.

2. Install ditch magnets and eventually load shaker screens with 175 mesh to remove solids from the fluids.
3. Trip in Hole (TIH) with Riser Clean-Out Assembly.

Riser Cleanout BHA
Bottom
Mule Shoe NC50 Box
16" SABS Jetting tool NC50 Box X Pin
Crossover 6 5/8" FH Box X NC50 Pin
Pup Joint 6 5/8" FH Box X Pin
1 Stand of 6 5/8" FH workstring
Pup Joint 6 5/8" FH Box X Pin
Crossover NC50 Box X 6 5/8" FH Pin
PUP Riser Brush NC50 Box X Pin
Crossover 6 5/8" FH Box X NC50 Pin
Pup Joint 6 5/8" FH Box X Pin
6 5/8 FH workstring to surface
Top

Note: For mud pump efficiency it is important to have accurate strokes and volumes to minimize interface. Assign specific pumps to specific lines and do not switch during the procedure.

4. Ensure that all valves are closed prior to beginning this operation. Open the boost valve and pump 20-bbls Spacer II followed by approximately 51-bbls of seawater down the boost line at 8 BPM and then close the boost line.
5. Open the lower choke valve and pump 20-bbls Spacer II followed by 78-bbls of seawater to the end of the lower choke line at 8 BPM. Isolate the lower choke. Momentarily open the upper choke line to flush. Ensure that all valves are closed
6. Open the lower kill valve and pump 20 bbls Spacer II followed by 78-bbls of seawater to the end of the lower kill line at 8 BPM. Isolate the lower kill line. Momentarily open the upper kill line to flush. Momentarily open the IGV to flush. Ensure that all valves are closed.
7. Pump the following spacers at approximately 16-BPM (do not stop pumping once spacers are begun):
 - 100-bbl Spacer I
 - 250-bbl Spacer II
 - 100-bbl Spacer I
8. When the cleaning spacer has entered the riser, slow the rig pump rate to 2 BPM. Open the boost, choke and kill lines and pump 20 bbls of seawater down the choke line, 20 bbls of seawater down the kill line and 20 bbls of seawater down the boost. This pushes the cleaning spacer from the lines into the cleaning spacer entering the riser. Close the boost, choke and kill lines. Increase pump rate down the workstring to 16 BPM. Once the final 100-bbl Spacer I is 50' above the choke and kill lines, open the boost line, upper choke and upper kill lines and pump seawater at 8 BPM through each while continuing to pump down the drill pipe. (Do not exceed a combined pumping speed higher than 40 BPM as this will affect the contact time of the chemicals
9. Displace the spacers to surface at the maximum rate (approximately 40-BPM); Reduce the pump rates as the spacers near the surface and divert spacer returns for proper disposal. Do not stop pumping until all spacers are recovered and seawater returns are visually clean.
10. Drop the 2 3/8-in ball to open the SABS jetting tool. Pump pressure can be applied to save time, no more than 3 bbl/min.

	DeepWater Horizon Rig Clean Up & Riser Clean-Out	bp 
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11. Apply approximately 900psi to shear open the SABS jetting tool
12. Once open, begin jetting the BOP stack at 10 bpm with 15 – 20 rpm.
Make 3 passes through the BOP stack.
13. Pick up above BOP and function rams.
14. Make one more pass with SABS jetting tool.
15. Drop the 2 1/5-in ball to close the SABS jetting tool. Pump pressure can be applied to save time, no more than 3 bbl/min.
16. Apply approximately 2,800 psi to close the SABS jetting tool.
17. Pump down the workstring and boost riser for at least one bottoms up or until seawater returns are visually clean.
18. POOH and lay down Riser Cleanout BHA.

DRAFT

i>>i

Date: 07/07/11

Time: 15:36:04

Production Number: BP-HZN-2179MDL00312869-1-8

eg Doc No : BP-HZN-2179MDL00312869

End Doc No : BP-HZN-2179MDL00312876

Bp
Nile Plug & Abandonment
Vioska Knoll 914 #1 ST4
OCSG 8785

Completion Proposal

Prepared For:
Mike Bednarz

Prepared By:
Chris Detiveaux, Sr.

Mi SWACO

Completion and Workover Fluid Job Data Form

Operator Bp Job tracking number _____
 Engineer or contact Mike Bednarz Phone/fax 281-366-7391

OPERATIONS INFORMATION

Company Reps. _____ and _____
 Rig name Horizon Phone/fax _____
 Load-out point Fourchon, LA Dock _____
 Dispatcher _____ Phone/fax _____

WELL INFORMATION

New drill Recompletion Workover Oil Gas Injector
 Field/Block Vioska Knoll 914 Lease, well name Well #1 ST3 OCSG 8785
 AFE number X7-004NX-E Other invoicing number _____

WELLBORE INFORMATION

PBTD 15,535' KOP _____ Water Depth 3524'
 Elevation ORKB/THF RKB/THF _____ RKB/MWL _____
 Perforated Interval _____ MD _____
 Maximum Deviation 72.13 @ 14,899' MD 13,278' TVD _____
 Mud wt. _____ Mud type _____ Brine wt. 11.4 ppg Brine type CaCl₂
 Brine TCT (°F) 22 Packer fluid wt. 11.4 ppg Type CaCl₂ Pkr fluid TCT (°F) 22

RESERVOIR INFORMATION

Temperature (°F) 220 @ 14,536' MD 13,159' TVD _____
 Pressure (psia) 1094 @ 14,536' MD 13,159' TVD _____
 Permeability _____ md Pore size _____ μ Porosity _____ % CO₂% _____ H₂S% _____

CASING, WORKSTRING AND TUBING DESIGN

Pipe	Size	Wt.	From	To (MD)	TVD	Metallurgy
Casing	9 5/8	53.5	3608'	15,535'		
Workstring	6 5/8	40	0	3598'		
Tubing	5 1/2	23	3598'	14,588'		
Tubing	4 1/2	13.5	14,588'	15,142'		

EQUIPMENT CAPACITY

Pump output _____ bpm @ _____ psig Plunger OD _____ in. Stroke _____ in.
 Deck space for filtration is Limited major concern no concern
 Deck space for MPTs is limited major concern No- concern

REQUIREMENTS

Displacement procedure Specify → Direct Indirect Staged Balanced
 Fluid loss control Specify → Solid-free Carbonate Salt
 Mechanical displacement aids Filtration Pricing
 MI Representative Chris Detiveaux, Sr. Date Submitted 12/09/09 Date Required _____



Procedure

Pre-Job Recommendations

1. Have all equipment, chemicals and fluids on location prior to starting job.
2. Review M-I SWACO's Safe Handling Completions video with all rig site personnel before handling any completion fluid or clean up spacers.
3. Rig-up all equipment and lines to be used.
4. Check all handling equipment that could introduce water into the brine system. Check valves for leaks and secure all water lines in the immediate proximity.
5. Ensure that all pits, solids-control equipment, and surface lines are clean. These activities should be monitored closely to assure all possible contaminants are removed. A cleaning procedure and checklist are attached.
6. Pump 100-bbl of water treated with one (1) 55-gal drums of Safe Surf O through all pumps, pits, manifolds, hoses, and lines that could be exposed to the completion fluid.

Procedure to Displace Riser to 11.4 ppg CaCl₂

1. Mix a 100 bbl Viscous Spacer.
 - a. 100 bbls seawater
 - b. 15 cans of Flo-Vis L (0.75 gpb Flo Vis L)
2. Ensure that all choke, kill, boost and bleed lines are closed.
3. Open Lower Choke and pump 36 bbls of 11.4 ppg CaCl₂. Close Lower Choke. Momentarily Open and Close the Upper Choke to allow brine to flush through.
4. Open Lower Kill and pump 36 bbls of 11.4 ppg CaCl₂. Close Lower Kill. Momentarily Open and Close the Upper Kill to allow brine to flush through.
5. Open the Boost Line and pump 70 bbls of 11.4 ppg CaCl₂ to fill Boost Line. Close the Boost Line.
6. Pump the 100 bbls of Viscous Spacer down the landing string, followed by 11.4 ppg CaCl₂.
7. After the Viscous Spacer has cleared the Boost Line, Continue to circulate down the landing string and begin to pump down the Boost, Choke and Kill lines until the Viscous

Spacer is recovered at surface. While circulating 11.4 ppg CaCl, begin filtration of completion fluid through DE filtration unit until fluid is filtered below 20 NTU out in clarity (and/or flat-lined) and solids are less than 0.1% by volume.

Displacement of 11.4 ppg CaBr₂ packer fluid to 11.4 ppg CaCl₂

Prior to displacing the 11.4 ppg CaBr₂ packer fluid, ensure that there is enough room in the pit room to capture the packer fluid. Divert the packer fluid to its own pit. Perform a Static Sheen Test on the fluid and obtain a sample of the 11.4 ppg CaBr₂ packer fluid to be sent in for an Oil & Grease Test. If the fluid passes the Oil & Grease Test and the Static Sheen Test, the fluid may be dumped overboard. If the fluid fails either test, then the fluid **MUST** be sent in for disposal.

Mix packer fluid.

Formulation for inhibited 11.4 ppg CaCl₂ packer fluid. Add:

- 1 (one) drum Safe-Cor per 100 bbl (corrosion inhibitor)
- 1 (one) pail Safe-Scav Ca per 100 bbl (oxygen scavenger)
- 1 (one) pail Myacide GA25 per 250 bbls (biocide)

Fluid Maintenance

For 11.4 ppg CaCl₂:

- Sack Calcium Chloride for weight maintenance (**Do not increase weight over 11.4 ppg with the CaCl₂, due to TCT concerns**)

Flush Jumper

Build a pumpable volume of filtered and treated seawater:

- Treat 95 bbls of seawater with 1 can of Safe-Scav CA. Wait 15 minutes then add 3 pails of Myacide GA 25 (1000 ppm concentration).
- Treat 600 bbls of seawater with 6 cans of Safe-Scav CA. Wait 15 minutes then add 6 pails Myacide GA25 (300 ppm concentration).

Cut and Remove 9 5/8" Casing, Circulate out SBM/Base Oil

Prior to perforating the 9 5/8" for removal, ensure that you have an area to capture xx bbls of SBM/Base Oil that may be behind casing. This fluid will be circulated out via the choke and kill lines to surface. The lines will be flushed by the seawater that will be displacing the SBM/Base Oil.



RIG CLEAN UP

PROCEDURE:

1. Use high pressures washers or steam cleaners to perform the clean up. This helps remove all mud film from the pit walls and off the crosswalks and grating on the pits.
2. Begin pumping water through all pumps, pits, lines, hoses and manifolds that may be exposed to completion fluid. Particular attention should be paid to the choke and kill manifolds, cement unit, gas buster or any other seldom used lines that may be contaminated with mud or mud solids.
3. Clean the shaker area thoroughly, especially the ditch lines from the sand traps to the pit room. Large amounts of water should be pumped through all centrifugal pumps at the shaker area including the desanders, desilters, centrifuge and degasser.
4. After the initial clean up has been completed 100 bbls of water treated with one (1) drum Safe Surf O should be pumped through all of the surface equipment. This includes the pumps and pump manifolds, chemical hopper, barite hopper and any other lines that may affect the completion fluid.
5. Clean and dry all pits, then bring the completion fluid onto location. The take on hose must be dry and not contaminated with mud.

RIG CLEAN UP CHECK LIST

A. AREAS TO CLEAN

1. Strongly suggest removing all of the drilling mud from the rig.
2. Clean the suction, return, settling, and reserve pits.
3. Clean the sand traps.
4. Clean the ditches and troughs.
5. Clean the trip tank.
6. Clean the shaker area including all solids equipment and lines.
7. Clean the mixing hoppers.
8. Clean the cement unit.
9. Any other pits or equipment that may come into contact with the completion fluid.

B. ITEMS TO FLUSH OUT

1. All mud pumps and suction lines.
2. All centrifugal pumps and lines.
3. Chemical and weight mixing lines.
4. Lines from the pit room to the trip tank.
5. Lines from the rig floor to the trip tank.
6. Choke, choke manifold and kill lines.
7. Standpipes.
8. Degassing and solids control equipment.
9. Lines to the cement unit and/or other pumping equipment.
10. Casing fill up line.
11. Lines to and from the filtration line.
12. Any other lines that the completion fluid may contact.



DERRICKMAN'S CHECKLIST

EQUIPMENT	CHECK (?)	EQUIPMENT	CHECK (?)
Pits - (All where Drilling		Rig Pumps	
Fluid will be stored)		Choke Lines	
Sand Traps		Upper Kill Line	
Degasser		Lower Kill Line	
Mud Cleaner		Reverse Circulating Line	
Mud Ditches		Overboard Lines	
Pumps		Pit Gun Lines (All)	
Header Box		Transfer Lines: -	
Shakers		To & From All Pits	
Gumbo		To & From Filter Unit	
Poor Boy		Diverter	
Trip Tank		Equalizing Lines	
Trip Tank Fill Line		Lines to Drill Floor	
Trip Tank Overflow Line		Hole Fill Pump	
Standpipe Manifold		Pop Off Lines	
Top Drive		Bleed Off Lines	
Chiksans		Kill Pump	
Choke Manifold		Solids Handling Equip	
Buffer Tank		Hose to Boat	
Choke & Kill Manifold		Relief Overboard (Cmt.)	
Mud Pump Charging Pumps		Mud Cleaner Pump	
General Service Pump			
H.P. Suction Manifold			



Health and Safety

Clear brine completion fluids contain concentrated salts that must be handled with care. Contact with the skin or eyes can cause slight to severe irritation, depending on salt concentration and exposure time. Prolonged exposure can lead to severe skin burns or permanent corneal injury.

Eye protection (goggles or face shield) is required. Eyewash bottles and fresh water wash-down stations in the work area should be readily available. If contact with the eyes occurs, irrigate the eyes with fresh water immediately and continuously for at least 15 minutes. Medical attention may be required depending on severity.

When working with saturated calcium chloride or bromide brine or with zinc brine, rig personnel should wear rubber gloves, safety slicker suits, hardhats and steel-toe rubber boots. Skin contact with salt-saturated completion brine will cause dehydration of the skin, which can be identified by redness and a drying sensation. Immediately flush skin with plenty of water to remove the salt solution. Medical attention may be required depending on severity. Remove all contaminated clothing and shoes. Wash clothes thoroughly before re-use.

Seek immediate medical help:

- If vapors or dust are inhaled and cause irritation.
- If any of the salt solutions are ingested in large amounts. Induce vomiting if the afflicted person is conscious.

M-I Completion Fluids representatives should conduct safety meetings with rig personnel to discuss brine-handling precautions before completion fluids are taken on. Proper training protects workers and minimizes hazards.

This suggested program is advisory only and may be rejected in the sole discretion of all parties receiving it. In addition all parties receiving this program recognize, agree, and acknowledge that M-I L.L.C. (M-I) has no care, custody or control of the well, the drilling equipment at neither the well, nor the premises about the well. Also, there are obviously many conditions within and associated with a well of which M-I can have no knowledge and over which it does not and cannot have control. Therefore, M-I shall not be liable for the failure of any equipment to perform in a particular way or the failure to obtain any particular results from carrying out this program by any party receiving it. Furthermore, the owner and operator of the well and the drilling contractor in consideration of the recommendations contained in this suggested program agree to indemnify and save M-I harmless from all claims and costs for loss, damage or injury to persons or property including, without limitations: subsurface damage, subsurface trespass or injury to the well or reservoir allegedly caused by M-I's operations or reliance by anyone upon this program unless such personal injuries or damage shall be caused by the willful misconduct or gross negligence of M-I.

Mi SWACO