APD ID: 10400013453 **Submission Date:** 04/18/2017

Operator Name: APACHE CORPORATION

Well Name: BLACK & TAN 27 FEDERAL COM **Well Number:** 308H

Well Type: OIL WELL **Well Work Type:** Drill

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
17746	RUSTLER	3716	1636	1636		POTASH	No
18574	SALADO	1745	1971	1971		POTASH	No
17724	TANSILL	337	3379	3379		OIL	No
17694	YATES	180	3536	3536		NATURAL GAS,OIL	No
17740	CAPITAN REEF	-1043	4759	4759		USEABLE WATER	No
15315	DELAWARE	-1965	5681	5681		OIL	No
17688	BONE SPRING	-4860	8576	8576		OIL	Yes

Section 2 - Blowout Prevention

Pressure Rating (PSI): 5M **Rating Depth:** 12500

Equipment: Rotating Head, Mud Gas Separator, Blow Down Pit, Flare Line

Requesting Variance? NO

Variance request:

Testing Procedure: BOP/BOPE will be tested by independent service company to 250psi low and high pressure indicated above per Onshore Order 2 requirements. System may be upgraded to higher pressure but sill tested to WP listed . If system is upgraded, all components installed will be functional and tested. Pipe rams will be operationally checked each 24 hr period. Blind rams will be operationally checked on each TOOH. These checks will be noted on daily tour sheets. Other accessories to BOP equipment will include Kelly cock and floor safety valve (inside BOP), choke lines and choke manifold. (see attached schematic)

Choke Diagram Attachment:

BlkTan27Fed308H_BOP_Manif_SchemREV_07-19-2017.pdf

BOP Diagram Attachment:

BlkTan27Fed308H_BOP_Manif_SchemREV_07-19-2017.pdf

Operator Name: APACHE CORPORATION

Well Name: BLACK & TAN 27 FEDERAL COM **Well Number:** 308H

Section 3 - Casing

Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	Body SF
1	INTERMEDIATE	12.25	9.625	NEW	API	N	0	900	0	900	-7260	-8160	900	J-55	40	BUTT	5.37	1.7	BUOY	2.24	BUOY	1.96
2	SURFACE	17.5	13.375	NEW	API	N	0	1700	0	1700	-7260	-8960	1700	J-55	54.5	BUTT	2.15	1.82	BUOY	4.04	BUOY	3.79
3	INTERMEDIATE	12.25	9.625	NEW	API	N	900	5780	900	5780	-8160	-13040	4880	J-55	40	LTC	1.54	1.87	BUOY	1.8	BUOY	2.15
4	PRODUCTION	8.75	5.5	NEW	API	N	0	15726	0	10976	-7260	-23011	15726	P-110	17	BUTT	1.35	1.28	BUOY	2.13	BUOY	2.04

Casing Attachments

Casing ID: 1 **String Type:** INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

BlkTan27FedCom308H_IntermCsgAssum_04-18-2017.pdf

Operator Name: APACHE CORPORATION

Well Name: BLACK & TAN 27 FEDERAL COM **Well Number:** 308H

Casing Attachments

Casing ID: 2 **String Type:** SURFACE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

BlkTan27FedCom308H_SurfCsgAssum_04-18-2017.pdf

Casing ID: 3 **String Type:** INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

BlkTan27FedCom308H_IntermCsgAssum_04-18-2017.pdf

Casing ID: 4 **String Type:** PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

BlkTan27FedCom308H_ProdCsgAssum_04-18-2017.pdf

Section 4 - Cement

Operator Name: APACHE CORPORATION

Well Name: BLACK & TAN 27 FEDERAL COM **Well Number:** 308H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead		0	1285	650	1.73	13.5	1124	25	Cl C	4% Bentonite + 1% CaCl2
SURFACE	Tail		1285	1700	300	1.33	14.8	399	25	Cl C	1% CaCl2
INTERMEDIATE	Lead		0	5144	1043	1.88	12.9	1966.06	25	Cl C	5% NaCl + 6% Bentonite + 2 lb/sk Kolseal + 0.125 lb/sk CF + 0.4% Retarder
INTERMEDIATE	Tail		5144	5780	200	1.34	14.8	268	25	Cl C	0.2% Retarder
INTERMEDIATE	Lead		0	5144	1043	1.88	12.9	1966.06	25	Cl C	5% NaCl + 6% Bentonite + 2 lb/sk Kolseal + 0.125 lb/sk CF + 0.4% Retarder
INTERMEDIATE	Tail		5144	5780	200	1.34	14.8	268	25	Cl C	0.2% Retarder
PRODUCTION	Lead		0	10464	1262	2.32	11.9	2927.84	20	Cl H	10% Gel + 5% Salt
PRODUCTION	Tail		10464	15726	1115	1.44	12.8	1605.6	20	TXI Lite	0.3% Fluid Loss + 0.2% Retarder

Section 5 - Circulating Medium

Mud System Type: Closed

Will an air or gas system be Used? NO

Description of the equipment for the circulating system in accordance with Onshore Order #2:

Diagram of the equipment for the circulating system in accordance with Onshore Order #2:

Describe what will be on location to control well or mitigate other conditions: Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times

Describe the mud monitoring system utilized: PVT/Pason/Visual Monitoring

Circulating Medium Table

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
0	1700	SPUD MUD	8.3	9							
1700	5780	SALT SATURATED	9.8	10.5							
5780	11050	OTHER : CUT BRINE	8.6	9.5							

Section 6 - Test, Logging, Coring

List of production tests including testing procedures, equipment and safety measures:

Drill stem test will be based on geological sample shows. Onshore Order 2.111.D shall be followed. Will run GR/CNL from TD to surf (horizontal well - vertical portion of hole). Stated logs run will be in the completion report & submitted to BLM.

List of open and cased hole logs run in the well:

CBL,CNL/FDC,DS,GR,MWD,MUDLOG,TL

Coring operation description for the well:

None planned

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 5171 **Anticipated Surface Pressure:** 2756.28

Anticipated Bottom Hole Temperature(F): 150

Anticipated abnormal pressures, temperatures, or potential geologic hazards? YES

Describe:

Capital Reef poses lost circulation potential

Contingency Plans geoharzards description:

For Capitan Reef we will be switching over to a fresh water system if lost circ is encountered. A 2 stage cement job will be proposed to get cement to surface.

Contingency Plans geohazards attachment:

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations plan:

BlkTan27FedCom308H_H2SOpsContPlan_04-18-2017.pdf

Operator Name: APACHE CORPORATION

Well Name: BLACK & TAN 27 FEDERAL COM **Well Number:** 308H

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

BlkTan27FedCom308H_DirPlan_04-18-2017.pdf

BlkTan27FedCom308H_WallPlot_04-18-2017.pdf

Other proposed operations facets description:

**Cement contingency plan attached if loss circulation is encountered. System does not allow for contingency plans. Complete csg & cmt plan attached due to system irregularities.
**Cmt info is duplicated on Section 4 for Interm cmt. AFMSS requires same segments in cmt & csg.. AFMSS application is needing to correlate section 3 and section 4. Lucinda Lewis with AFMSS is aware of the issue. AFMSS team working on the issue. Casing & Cement detail attached.
**Apache requesting variance to use flexible hose between BOP & Manifold, see attachment for additional information.
*Anticipated Completion Date: 4/3/2018
*Anticipated First Production Date: 5/11/2018

Other proposed operations facets attachment:

BlkTan27FedCom308H_CsgDetail_04-18-2017.pdf

BlkTan27FedCom307H_308H_GasCapturePlan_07-18-2017.pdf

BlkTan27FedCom308H_CmtDetailREV2_07-20-2017.pdf

Other Variance attachment:

BlkTan27FedCom_Flexline_04-18-2017.pdf

APACHE BOP AND CHOKE MANIFOLD SCHEMATIC

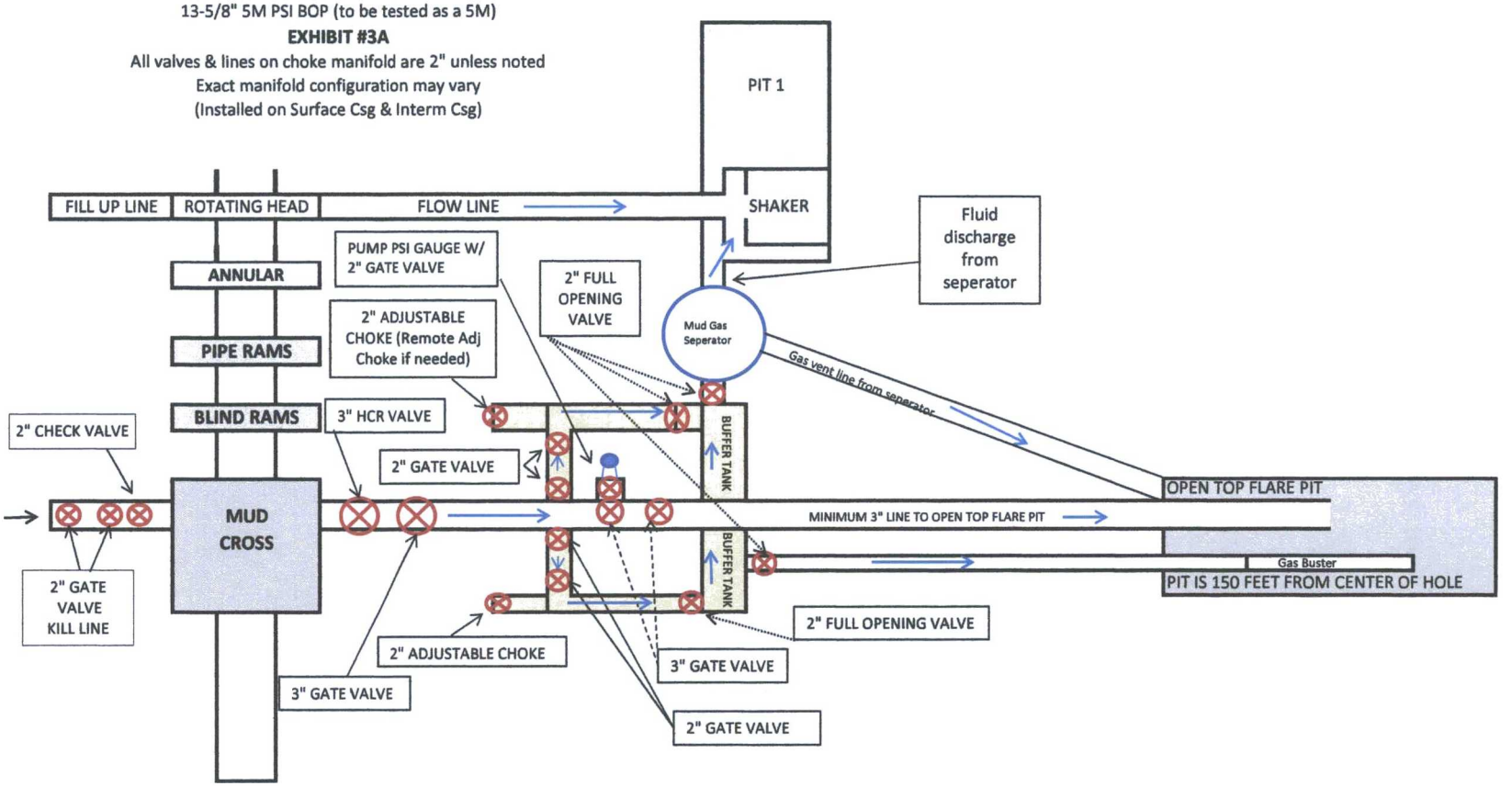
13-5/8" 5M PSI BOP (to be tested as a 5M)

EXHIBIT #3A

All valves & lines on choke manifold are 2" unless noted

Exact manifold configuration may vary

(Installed on Surface Csg & Interm Csg)



***** If H2S is encountered in quantities greater than 100ppm, Apache will shut in well & install a remote operated choke *****

APACHE BOP AND CHOKE MANIFOLD SCHEMATIC

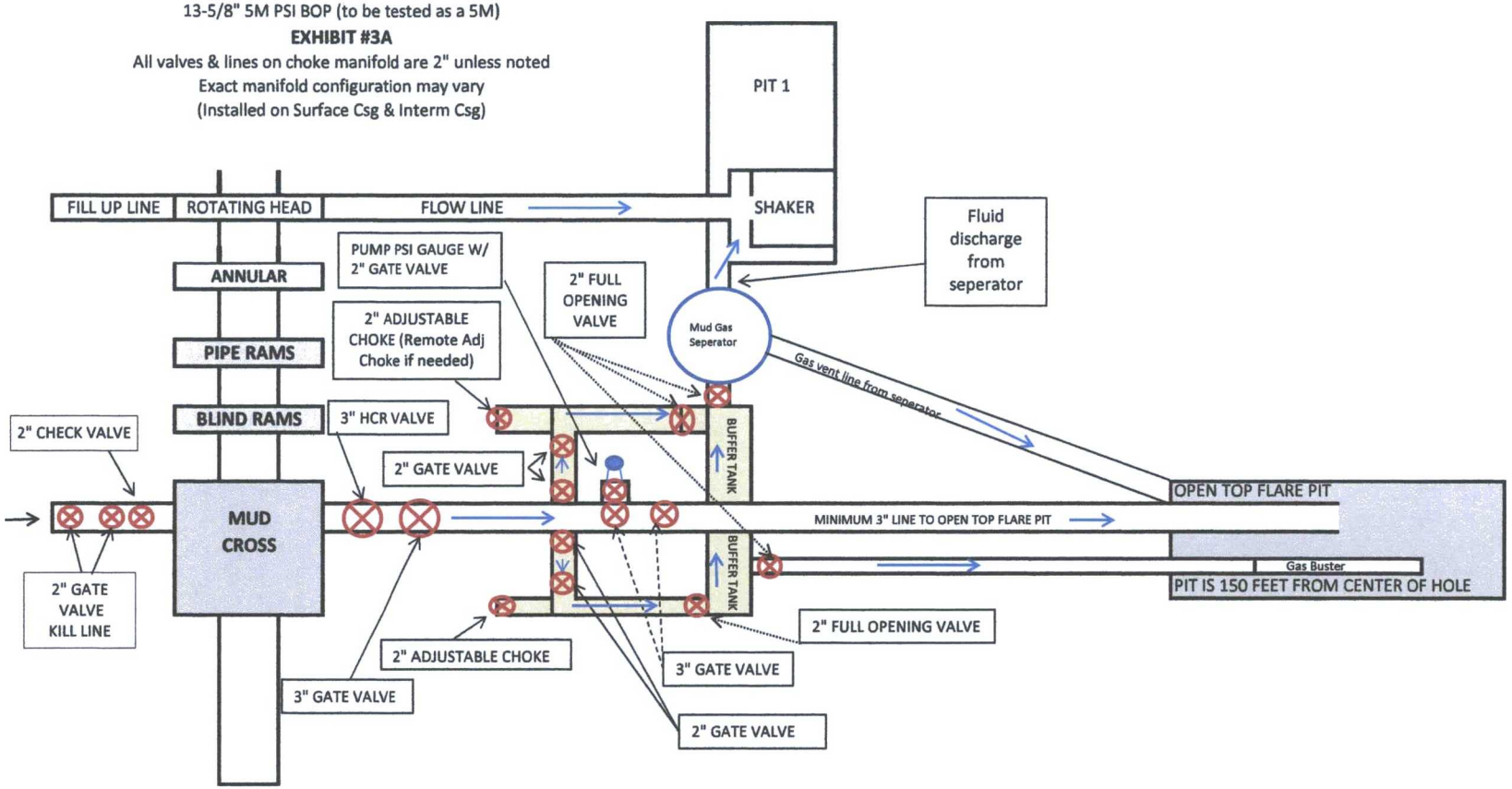
13-5/8" 5M PSI BOP (to be tested as a 5M)

EXHIBIT #3A

All valves & lines on choke manifold are 2" unless noted

Exact manifold configuration may vary

(Installed on Surface Csg & Interm Csg)



***** If H2S is encountered in quantities greater than 100ppm, Apache will shut in well & install a remote operated choke *****

Black and Tan 27 Federal COM 308H Intermediate Casing Design Assumptions

Pore Pressure

Vertical Depth (ft)	Pore Pressure/EMW		Permeable Zones
Depth (ft)	(psi)	(ppg)	Zones
20	0	0	No
1700	748	8.47	No
3900	1621	8	No
5800	2552	8.47	No
8586	3970	8.9	No
11352	5661	9.6	No

Fracture Pressure

Vertical Depth (ft)	Fracture Pressure/EMW	
Depth (ft)	(psi)	(ppg)
20	9	9
1700	1189	13.46
3900	2026	10
5800	4055	13.46
8586	6004	13.46
11352	8551	14.5

Temperature Gradient

Ambient Temperature is 80° F

Temperature gradient of 0.75°/100' TVD

Analysis Options

- Single External Pressure Profile
- Temperature Deration
- Buckling

Intermediate Casing Loads

Burst Loads

Internal Profile

Drilling Loads

- Gas Kick Profile
  - Influx at 15,726.8' MD
  - 30 Bbl Kick Volume
  - 0.5 ppg Kick Intensity
  - Maximum Mud Weight of 9.5 ppg
  - Kick gas gravity of 0.7 ppg
  - No margin of error on frac gradient
  - 5" DP
  - 650' of 6.5" Drill Collars
- Lost Returns with Water
  - No margin of error on frac gradient
  - Mud/Water Interface at 5780'
  - Mud weight with losses at 9.5 ppg
- Pressure Test
  - 1500 psi casing pressure test with 8.33 ppg fresh water
- Green Cement Pressure Test
  - 2300 psi put on casing when bumping the plug with 8.33 ppg displacement fresh water

External Profile

- Mud and Cement Mix-Water
  - TOC at surface
  - Mud weight is 10.2 ppg
  - Cement Mix-Water Density is 8.33 ppg

Collapse Loads

Internal Profile

Drilling Loads

- Partial Evacuation
  - 50% evacuation. Top of mud level at 2890'.
  - Mud Weight is 10.2 ppg
- Lost Returns with Mud Drop

    - Losses occurring at 5800' MD
    - Pore Pressure at 8.33 ppg
    - Current Mud Weight at 9.5 ppg
    - Mud level drops to 714.3'
- Cementing
    - Lead Slurry Density at 12.9 ppg
    - Tail Slurry Density at 14.8 ppg
    - Tail Slurry Length of 500'
    - TOC at surface
    - Mud Weight at shoe 10.2 ppg
    - Displacement fluid density at 8.33 ppg

External Profile

- Fluid Gradients w/ Pore Pressure
    - Fluid Gradient Above TOC is 10.2 ppg
    - Fluid Gradient Below TOC is 10.2 ppg

Axial Loads

- Average Running in hole speed at 2.0 ft/s
- Overpull of 100,000 lbf
- 2300 psi Green Cement Pressure Test
- Service Loads from Burst and Collapse

Black and Tan 27 Federal COM 308H Surface Casing Design Assumptions

Pore Pressure

Vertical Depth (ft)	Pore Pressure/EMW		Permeable Zones
Depth (ft)	(psi)	(ppg)	Zones
20	0	0	No
1700	748	8.47	No
3900	1621	8	No
5800	2552	8.47	No
8586	3970	8.9	No
11352	5661	9.6	No

Fracture Pressure

Vertical Depth (ft)	Fracture Pressure/EMW	
Depth (ft)	(psi)	(ppg)
20	9	9
1700	1189	13.46
3900	2026	10
5800	4055	13.46
8586	6004	13.46
11352	8551	14.5

Temperature Gradient

Ambient Temperature is 80° F

Temperature gradient of 0.75°/100' TVD

Analysis Options

- Single External Pressure Profile
- Temperature Deration
- Buckling

Surface Casing Loads

Burst Loads

Internal Profile

Drilling Loads

- Fracture @ Shoe w/ Gas Gradient Above
  - No margin of error on frac gradient
  - Using a 0.7 ppg gas gradient
- Lost Returns with Water
  - No margin of error on frac gradient
  - Mud/Water Interface at 1700'
  - Mud weight with losses at 10.2 ppg
- Pressure Test
  - 1500 psi casing pressure test with 8.33 ppg fresh water
- Green Cement Pressure Test
  - 1200 psi put on casing when bumping the plug with 8.33 ppg displacement fresh water

External Profile

- Mud and Cement Mix-Water
  - TOC at surface
  - Mud weight is 8.6 ppg
  - Cement Mix-Water Density is 8.33 ppg

Collapse Loads

Internal Profile

Drilling Loads

- Partial Evacuation
  - 50% evacuation. Top of mud level at 850'.
  - Mud Weight is 8.6 ppg
- Lost Returns with Mud Drop
  - Losses occurring at 4000'
  - Pore Pressure at 8.00 ppg
  - Current Mud Weight at 10.2 ppg
  - Mud level drops to 863'
- Cementing
  - Lead slurry of 13.5 ppg with TOC at surface

- Tail slurry slurry at 14.8 ppg with length of 500'
- Mud weight at shoe 8.6 ppg
- Displacement fluid density at 8.33 ppg

External Profile

- Fluid Gradients w/ Pore Pressure
  - Fluid Gradient Above TOC is 8.6 ppg
  - Fluid Gradient Below TOC is 8.6 ppg

Axial Loads

- Average Running in hole speed at 2.0 ft/s
- Overpull of 100,000 lbf
- 1200 psi Green Cement Pressure Test
- Service Loads from Burst and Collapse

Black and Tan 27 Federal COM 308H Production Casing Design Assumptions

Pore Pressure

Vertical Depth (ft)	Pore Pressure/EMW		Permeable Zones
Depth (ft)	(psi)	(ppg)	Zones
20	0	0	No
1700	748	8.47	No
3900	1621	8	No
5800	2552	8.47	No
8586	3970	8.9	No
11352	5661	9.6	No

Fracture Pressure

Vertical Depth (ft)	Fracture Pressure/EMW	
Depth (ft)	(psi)	(ppg)
20	9	9
1700	1189	13.46
3900	2026	10
5800	4055	13.46
8586	6004	13.46
11352	8551	14.5

Temperature Gradient

Ambient Temperature is 80° F

Temperature gradient of 0.75°/100' TVD

Analysis Options

- Single External Pressure Profile
- Temperature Deration
- Buckling

Production Casing Loads

Burst Loads

Internal Profile

Drilling Loads

- Pressure Test
  - 8000 psi with 8.33 ppg fresh water
- Green Cement Pressure Test
  - 3800 psi put on casing when bumping the plug with 8.33 ppg displacement

Production Loads

- Tubing Leak
  - Packer Fluid Density at 8.6 ppg
  - Packer Depth of 10414'
  - Perf Depth at 15726.8' MD
  - Gas/Oil Gradient 0.35 psi/ft
  - Reservoir pressure at 5132 psi
- Injection Down Casing
  - Injection pressure of 8000 psi
  - Injection density of 9.4 ppg

External Profile

- Fluid Gradients w/ Pore Pressure
  - 9.5 ppg mud weight above TOC
  - 8.33 ppg below TOC
  - Pore pressure applied in the openhole

Collapse Loads

Internal Profile

Drilling Loads

- Cementing
  - Mud weight at shoe is 9.5 ppg
  - TOC at surface
  - Lead Slurry Density is 11.9 ppg
  - Tail Slurry Density is 12.8 ppg
  - Tail Slurry Length at 5762.8'.
  - Displacement fluid density is 8.33 ppg

Production Loads

- Full Evacuation
- Above/Below Packer
    - Reservoir pressure at 4862 psi
    - Density Above Packer at 8.6 ppg
    - Density Below Packer at 6.0 ppg
    - Assuming a fluid drop above the packer

External Profile

- Fluid Gradients w/ Pore Pressure
    - Fluid Gradient Above TOC is 9.5 ppg
    - Fluid Gradient Below TOC is 9.5 ppg

Axial Loads

- Average Running in hole speed at 2.0 ft/s
- Overpull of 100,000 lbf
- 3800 psi Green Cement Pressure Test
- Service Loads from Burst and Collapse

Black and Tan 27 Federal COM 308H Intermediate Casing Design Assumptions

Pore Pressure

Vertical Depth (ft)	Pore Pressure/EMW		Permeable Zones
Depth (ft)	(psi)	(ppg)	Zones
20	0	0	No
1700	748	8.47	No
3900	1621	8	No
5800	2552	8.47	No
8586	3970	8.9	No
11352	5661	9.6	No

Fracture Pressure

Vertical Depth (ft)	Fracture Pressure/EMW	
Depth (ft)	(psi)	(ppg)
20	9	9
1700	1189	13.46
3900	2026	10
5800	4055	13.46
8586	6004	13.46
11352	8551	14.5

Temperature Gradient

Ambient Temperature is 80° F

Temperature gradient of 0.75°/100' TVD

Analysis Options

- Single External Pressure Profile
- Temperature Deration
- Buckling

Intermediate Casing Loads

Burst Loads

Internal Profile

Drilling Loads

- Gas Kick Profile
  - Influx at 15,726.8' MD
  - 30 Bbl Kick Volume
  - 0.5 ppg Kick Intensity
  - Maximum Mud Weight of 9.5 ppg
  - Kick gas gravity of 0.7 ppg
  - No margin of error on frac gradient
  - 5" DP
  - 650' of 6.5" Drill Collars
- Lost Returns with Water
  - No margin of error on frac gradient
  - Mud/Water Interface at 5780'
  - Mud weight with losses at 9.5 ppg
- Pressure Test
  - 1500 psi casing pressure test with 8.33 ppg fresh water
- Green Cement Pressure Test
  - 2300 psi put on casing when bumping the plug with 8.33 ppg displacement fresh water

External Profile

- Mud and Cement Mix-Water
  - TOC at surface
  - Mud weight is 10.2 ppg
  - Cement Mix-Water Density is 8.33 ppg

Collapse Loads

Internal Profile

Drilling Loads

- Partial Evacuation
  - 50% evacuation. Top of mud level at 2890'.
  - Mud Weight is 10.2 ppg
- Lost Returns with Mud Drop

    - Losses occurring at 5800' MD
    - Pore Pressure at 8.33 ppg
    - Current Mud Weight at 9.5 ppg
    - Mud level drops to 714.3'
- Cementing
    - Lead Slurry Density at 12.9 ppg
    - Tail Slurry Density at 14.8 ppg
    - Tail Slurry Length of 500'
    - TOC at surface
    - Mud Weight at shoe 10.2 ppg
    - Displacement fluid density at 8.33 ppg

External Profile

- Fluid Gradients w/ Pore Pressure
    - Fluid Gradient Above TOC is 10.2 ppg
    - Fluid Gradient Below TOC is 10.2 ppg

Axial Loads

- Average Running in hole speed at 2.0 ft/s
- Overpull of 100,000 lbf
- 2300 psi Green Cement Pressure Test
- Service Loads from Burst and Collapse

Black and Tan 27 Federal Com 308H

CEMENT: SURFACE

Stage Tool Depth: N/A

Lead:

Top MD of Segment:	0	Btm MD of Segment:	1285.47
Cmt Type:	C	Cmt Additives:	4% Bentonite + 1% CaCl2
Quantity (sks):	650		
Yield (cu/ft/sk):	1.73	Volume (cu/ft):	1124.5
Density (lbs/gal):	13.5	Percent OH Excess:	25%

Tail:

Top MD of Segment:	1285.47	Btm MD of Segment:	1700
Cmt Type:	C	Cmt Additives:	1% CaCl2
Quantity (sks):	300		
Yield (cu/ft/sk):	1.33	Volume (cu/ft):	399
Density (lbs/gal):	14.8	Percent OH Excess:	25%

CEMENT: INTERMEDIATE

Single Stage

Lead:

Top MD of Segment:	0	Btm MD of Segment:	5144.38
Cmt Type:	C	Cmt Additives:	5% NaCl + 6% Bentonite + 2 lb/sk Kolseal + 0.125 lb/sk Celloflake + 0.4% Retarder
Quantity (sks):	1043		
Yield (cu/ft/sk):	1.885	Volume (cu/ft):	1966.06
Density (lbs/gal):	12.9	Percent OH Excess:	25%

Tail:

Top MD of Segment:	5144.38	Btm MD of Segment:	5780
Cmt Type:	C	Cmt Additives:	0.2% Retarder
Quantity (sks):	200		
Yield (cu/ft/sk):	1.34	Volume (cu/ft):	268
Density (lbs/gal):	14.8	Percent OH Excess:	25%

2 Stage Cement Job

*** DV tool depth(s) will be adjusted based on hole conditions and cement volumes will be adjusted proportionally. DV tool will be set a minimum of 50 feet below previous casing and a minimum of 200 feet above current shoe. Lab reports with the 500 psi compressive strength time for the cement will be onsite for review.**

***If lost circulation is encountered, Apache may 2-stage Interm csg. A DVT may be used in the 9-5/8" csg & ECP may be placed below DVT.**

1st Stage

Lead:

Top MD of Segment:	3500	Btm MD of Segment:	5144.38
Cmt Type:	C	Cmt Additives:	5% NaCl + 6% Bentonite + 2 lb/sk Kolseal + 0.125 lb/sk Celloflake + 0.4% Retarder
Quantity (sks):	345		
Yield (cu/ft/sk):	1.885	Volume (cu/ft):	650.33
Density (lbs/gal):	12.9	Percent OH Excess:	25%

Tail:

Top MD of Segment:	5144.38	Btm MD of Segment:	5780
Cmt Type:	C	Cmt Additives:	0.3% Retarder
Quantity (sks):	200		
Yield (cu/ft/sk):	1.34	Volume (cu/ft):	268
Density (lbs/gal):	14.8	Percent OH Excess:	25%

Stage Tool / ECP Depth: ± 3500'

2nd Stage

Lead:

Top MD of Segment:	0	Btm MD of Segment:	2815.44
Cmt Type:	C	Cmt Additives:	5% NaCl + 6% Bentonite
Quantity (sks):	565		
Yield (cu/ft/sk):	1.868	Volume (cu/ft):	1055.42
Density (lbs/gal):	12.9	Percent OH Excess:	25%

Tail:

Top MD of Segment:	2815.44	Btm MD of Segment:	3500
Cmt Type:	C	Cmt Additives:	0.3% Retarder
Quantity (sks):	200		
Yield (cu/ft/sk):	1.34	Volume (cu/ft):	268
Density (lbs/gal):	14.8	Percent OH Excess:	25%

CEMENT: PRODUCTION

Single Stage

Lead:

Top MD of Segment:	0	Btm MD of Segment:	10464.02
Cmt Type:	H	Cmt Additives:	10% gel + 5% Salt
Quantity (sks):	1262		
Yield (cu/ft/sk):	2.32	Volume (cu/ft):	2927.84
Density (lbs/gal):	11.9	Percent OH Excess:	20%

Tail:

Top MD of Segment:	10464.02	Btm MD of Segment:	15726.8
Cmt Type:	TXI Lite	Cmt Additives:	0.3% Fluid Loss + 0.2% Retarder
Quantity (sks):	1115		
Yield (cu/ft/sk):	1.44	Volume (cu/ft):	1605.6
Density (lbs/gal):	12.8	Percent OH Excess:	20%

2 Stage Cement Job

*** DV tool depth(s) will be adjusted based on hole conditions and cement volumes will be adjusted proportionally. DV tool will be set a minimum of 50 feet below previous casing and a minimum of 200 feet above current shoe. Lab reports with the 500 psi compressive strength time for the cement will be onsite for review.**

***If lost circulation is encountered, Apache may 2-stage Interm csg. A DVT may be used in the 7" csg & ECP may be placed below DVT.**

1st Stage

Lead:

Top MD of Segment:	5830	Btm MD of Segment:	10464.02
Cmt Type:	H	Cmt Additives:	10% gel + 5% Salt
Quantity (sks):	606		
Yield (cu/ft/sk):	2.32	Volume (cu/ft):	1405.92
Density (lbs/gal):	11.9	Percent OH Excess:	20%

Tail:

Top MD of Segment:	10464.02	Btm MD of Segment:	15726.8
Cmt Type:	TXI Lite	Cmt Additives:	0.3% Fluid Loss + 0.2% Retarder
Quantity (sks):	1115		
Yield (cu/ft/sk):	1.44	Volume (cu/ft):	1605.6
Density (lbs/gal):	12.8	Percent OH Excess:	20%

Stage Tool / ECP Depth: ± 5830'

2nd Stage

Lead:

Top MD of Segment: 0

Btm MD of Segment: 4810.33

Cmt Type: H

Cmt Additives: 10% gel + 5% Salt

Quantity (sks): 540
Yield (cu/ft/sk): 2.32 Volume (cu/ft): 1252.8
Density (lbs/gal): 11.9 Percent OH Excess: 20%

Tail:

Top MD of Segment: 4810.33

Btm MD of Segment: 5830

Cmt Type: C

Cmt Additives: 0.3% Retarder

Quantity (sks): 200
Yield (cu/ft/sk): 1.34 Volume (cu/ft): 268
Density (lbs/gal): 14.8 Percent OH Excess: 20%

QUALITY CONTROL INSPECTION AND TEST CERTIFICATE				CERT. N°:	373	
PURCHASER:	ContiTech Oil & Marine Corp.			P.O. N°:	4500398355	
CONTITECH RUBBER order N°:	538079	HOSE TYPE:	3" ID	Choke and Kill Hose		
HOSE SERIAL N°:	67090	NOMINAL / ACTUAL LENGTH:		10,67 m / 10,73 m		
W.P. 68,9 MPa	10000 psi	T.P. 103,4 MPa	15000 psi	Duration:	60	min.

Pressure test with water at ambient temperature

See attachment. (1 page)

↑ 10 mm = 10 Min.

→ 10 mm = 25 MPa

COUPLINGS Type	Serial N°	Quality	Heat N°
3" coupling with	1252 8901	AISI 4130	A0709N A1126U
4 1/16" 10K API b.w. Flange end		AISI 4130	035285

NOT DESIGNED FOR WELL TESTING **API Spec 16 C**

Temperature rate:"B"

All metal parts are flawless

WE CERTIFY THAT THE ABOVE HOSE HAS BEEN MANUFACTURED IN ACCORDANCE WITH THE TERMS OF THE ORDER INSPECTED AND PRESSURE TESTED AS ABOVE WITH SATISFACTORY RESULT.

STATEMENT OF CONFORMITY: We hereby certify that the above items/equipment supplied by us are in conformity with the terms, conditions and specifications of the above Purchaser Order and that these items/equipment were fabricated inspected and tested in accordance with the referenced standards, codes and specifications and meet the relevant acceptance criteria and design requirements.

COUNTRY OF ORIGIN HUNGARY/EU

Date:	Inspector	Quality Control
05. March 2014.		ContiTech Rubber Industrial Kft. Quality Control Dept.

ATTACHMENT OF QUALITY CONTROL INSPECTION AND TEST CERTIFICATE *No: 371, 373, 374*

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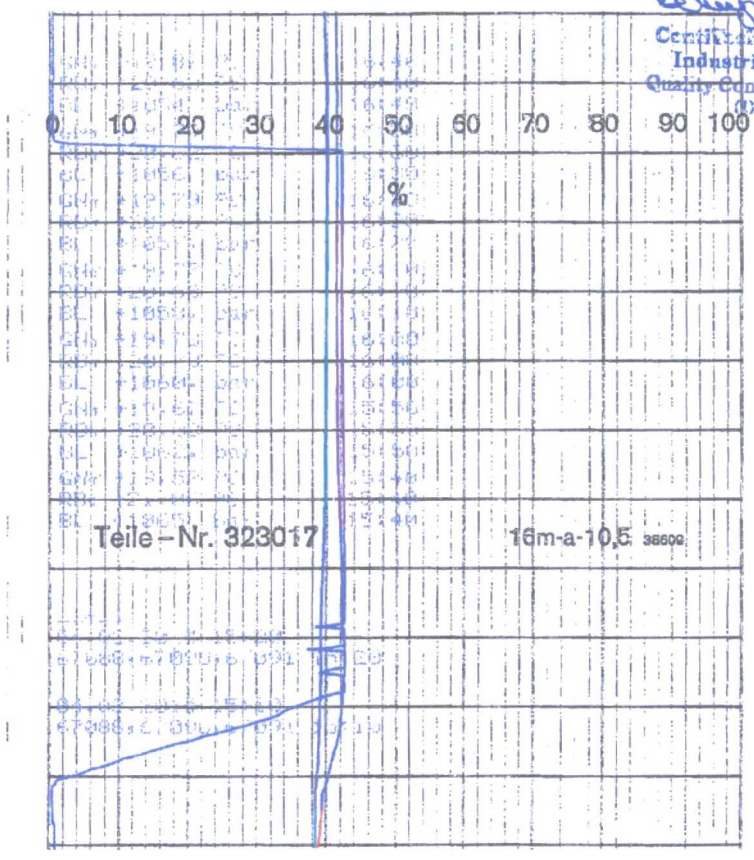
Certified Rubber Industrial Kft. Quality Control Dept.



Continental CONTITECH

Hose Data Sheet

CRI Order No.	538079
Customer	ContiTech Oil & Marine Corp.
Customer Order No	4500398355
Item No.	1
Hose Type	Flexible Hose
Standard	**API SPEC 16 C**
Inside dia in inches	3
Length	35 ft
Type of coupling one end	FLANGE 4.1/16" 10K API SPEC 6A TYPE 6BX FLANGE C/W BX155 R.GR.SOUR
Type of coupling other end	FLANGE 4.1/16" 10K API SPEC 6A TYPE 6BX FLANGE C/W BX155 R.GR.SOUR
H2S service NACE MR0175	Yes
Working Pressure	10 000 psi
Design Pressure	10 000 psi
Test Pressure	15 000 psi
Safety Factor	2,25
Marking	USUAL PHOENIX
Cover	NOT FIRE RESISTANT
Outside protection	St.steel outer wrap
Internal stripwound tube	No
Lining	OIL + GAS RESISTANT SOUR
Safety clamp	No
Lifting collar	No
Element C	No
Safety chain	No
Safety wire rope	No
Max.design temperature [°C]	100
Min.design temperature [°C]	-20
Min. Bend Radius operating [m]	0,90
Min. Bend Radius storage [m]	0,90
Electrical continuity	The Hose is electrically continuous
Type of packing	WOODEN CRATE ISPM-15