Operator Certification Data Report

02/25/2019

Operator Certification

I hereby certify that I, or someone under my direct supervision, have inspected the drill site and access route proposed herein; that I am familiar with the conditions which currently exist; that I have full knowledge of state and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or the company I represent, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of false statements.

NAME: Sorina Flores Signed on: 09/05/2018

Title: Supv of Drilling Services

Street Address: 303 Veterans Airpark Ln #1000

City: Midland State: TX Zip: 79705

Phone: (432)818-1167

Email address: sorina.flores@apachecorp.com

Field Representative

Representative Name:

Street Address:

City: State: Zip:

Phone:

Email address:

APD ID: 10400033567 Submission Date: 09/07/2018

Operator Name: APACHE CORPORATION

Well Name: GHOST RIDER 22-15 FEDERAL COM Well Number: 201H

Well Type: OIL WELL Well Work Type: Drill

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - General

APD ID: 10400033567 Tie to previous NOS? Submission Date: 09/07/2018

BLM Office: CARLSBAD User: Sorina Flores Title: Supv of Drilling Services

Federal/Indian APD: FED Is the first lease penetrated for production Federal or Indian? FED

Lease number: NMLC0062269A Lease Acres: 600

Surface access agreement in place? Allotted? Reservation:

Agreement in place? NO Federal or Indian agreement:

Agreement number:

Agreement name:

Keep application confidential? YES

Permitting Agent? NO APD Operator: APACHE CORPORATION

Operator letter of designation:

Operator Info

Operator Organization Name: APACHE CORPORATION

Operator Address: 303 Veterans Airpark Lane #1000

Zip: 79705

Operator PO Box:

Operator City: Midland State: TX

Operator Phone: (432)818-1000

Operator Internet Address:

Section 2 - Well Information

Well in Master Development Plan? NO Mater Development Plan name:

Well in Master SUPO? NO Master SUPO name:

Well in Master Drilling Plan? NO Master Drilling Plan name:

Well Name: GHOST RIDER 22-15 FEDERAL COM Well Number: 201H Well API Number:

Field/Pool or Exploratory? Field and Pool Field Name: BONE SPRING Pool Name: WILDCAT;BONE SPRING, S

Is the proposed well in an area containing other mineral resources? USEABLE WATER

Operator Name: APACHE CORPORATION

Well Name: GHOST RIDER 22-15 FEDERAL COM Well Number: 201H

Describe other minerals:

Is the proposed well in a Helium production area? N Use Existing Well Pad? YES New surface disturbance? N

Type of Well Pad: MULTIPLE WELL

Multiple Well Pad Name: GHOST RIDER 22-15 Number: 1 EAST

Well Class: HORIZONTAL

Number of Legs: 1

Well Work Type: Drill

Well Type: OIL WELL

Describe Well Type:

Well sub-Type: EVALUATION

Describe sub-type: DEVELOPMENT WELL

Distance to town: 30 Miles Distance to nearest well: 30 FT Distance to lease line: 100 FT

Reservoir well spacing assigned acres Measurement: 240 Acres

Well plat: GhostRider22_15FedCOM201H_PlatREV_signed_20180907081145.pdf

Well work start Date: 03/01/2019 Duration: 17 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83 Vertical Datum: NAVD88

Survey number:

	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD
SHL Leg #1	400	FSL	676	FEL	24S	32E	22	Aliquot SESE	32.1969185	-103.6561629	LEA	NEW MEXICO	NEW MEXICO	F	NMLC0062269A	3590	0	0
KOP Leg #1	50	FSL	330	FEL	24S	32E	22	Aliquot SESE	32.1959599	-103.6550459	LEA	NEW MEXICO	NEW MEXICO	F	NMLC0062269A	-6468	10090	10058
PPP Leg #1	296	FSL	330	FEL	24S	32E	22	Aliquot SESE	32.1959599	-103.6550454	LEA	NEW MEXICO	NEW MEXICO	F	NMLC0062269A	-6886	10598	10476

Operator Name: APACHE CORPORATION

Well Name: GHOST RIDER 22-15 FEDERAL COM Well Number: 201H

	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD
EXIT Leg #1	2589	FSL	330	FEL	24S	32E	15	Aliquot NESE	32.2174542	-103.6550309	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 0039880	-6966	18182	10556
BHL Leg #1	2589	FSL	330	FEL	24S	32E	15	Aliquot NESE	32.2174542	-103.6550309	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 0039880	-6966	18182	10556

APD ID: 10400033567
Submission Date: 09/07/2018

Operator Name: APACHE CORPORATION

Well Name: GHOST RIDER 22-15 FEDERAL COM
Well Number: 201H

Well Type: OIL WELL
Well Work Type: Drill

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Show Final Text

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
1	QUATERNARY	3590	0	0		USEABLE WATER	No
2	RUSTLER	2514	1076	1076		POTASH	No
3	SALADO	1294	2296	2296		POTASH	No
4	CASTILE	204	3386	3386		NONE	No
5	LAMAR	-1276	4866	4866		NONE	No
6	DELAWARE	-1296	4886	4886		NATURAL GAS,OIL	No
7	AVALON SAND	-5146	8736	8767		OIL	No
8	BONE SPRING 1ST	-6066	9656	9688	OTHER : CARBONATE	NATURAL GAS,OIL	No
9	BONE SPRING 1ST	-6306	9896	9928	SANDSTONE	NATURAL GAS,OIL	No
10	BONE SPRING 2ND	-6466	10056	10088	OTHER : CARBONATE	NATURAL GAS,OIL	No
11	BONE SPRING 2ND	-6886	10476	10598	SANDSTONE	NATURAL GAS,OIL	No

Section 2 - Blowout Prevention

Pressure Rating (PSI): 5M
Rating Depth: 12200

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

Requesting Variance? YES

Variance request: Apache request a variance to use a flexible hose between BOP and Choke Manifold. Flex hose may vary pending availability. A quality control inspection and test certificate will be available for review.
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:

GhostRider22_15FedCom_BOP_CHOKE_3M_PLAN_20180828155440.pdf

GhostRider22_15FedCom_BOP_CHOKE_5M_Schem_Plan_Cont1_20190109141146.pdf

BOP Diagram Attachment:

GhostRider22_15FedCom_BOP_CHOKE_5M_Schem_Plan_Cont1_20180828155501.pdf

GhostRider22_15FedCom_BOP_CHOKE_5M_Schem_Plan_Cont2_20180828155654.pdf

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	SURFACE	17.5	13.375	NEW	API	N	0	1100	0	1100			1100	J-55	48	STC	2.78	1.48	BUOY	2.35	BUOY	4.02
2	INTERMEDIATE	12.25	9.625	NEW	API	N	0	4890	0	4890			4890	J-55	40	LTC	1.83	1.91	BUOY	1.8	BUOY	2.17
3	PRODUCTION	8.75	5.5	NEW	API	N	0	10816	0	10508			10816	P-110	17	BUTT	1.47	1.25	BUOY	2.19	BUOY	2.08
4	PRODUCTION	8.5	5.5	NEW	API	N	10816	18155	10508	10437			7339	P-110	17	BUTT	1.47	1.25	BUOY	2.19	BUOY	2.08

Casing Attachments

Casing ID: 1 **String Type:** SURFACE

Inspection Document:

Spec Document:

Tapered String Spec:

SaltFork3_4FedCom101H_ProdCsgTaperedSpecs_20180515134945.pdf

Casing Design Assumptions and Worksheet(s):

GhostRider22_15FedCom201H_SurfCsgDesignAssumpt_Plan_20180829085825.pdf

Operator Name: APACHE CORPORATION

Well Name: GHOST RIDER 22-15 FEDERAL COM Well Number: 201H

Casing Attachments

Casing ID: 2 **String Type:** INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

SaltFork3_4FedCom101H_ProdCsgTaperedSpecs_20180515134957.pdf

Casing Design Assumptions and Worksheet(s):

GhostRider22_15FedCom201H_IntermCsgDesignAssumpt_Plan_20180829085846.pdf

Casing ID: 3 **String Type:** PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

GhostRider22_15FedCom201H_ProdCsgDesignAssumpt_Plan_20180829090932.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

GhostRider22_15FedCom201H_ProdCsgDesignAssumpt_Plan_20180829090946.pdf

Section 4 - Cement

Operator Name: APACHE CORPORATION

Well Name: GHOST RIDER 22-15 FEDERAL COM Well Number: 201H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead		0	800	410	1.75	13.5	717.5	25	Cl C	4% Bentonite, 1% CaCl2
SURFACE	Tail		800	1100	226	1.33	14.8	300.58	25	Cl C	1% CaCl2
INTERMEDIATE	Lead		0	3912	739	2.05	12.5	1514.95	25	Cl C	5% Salt, 4% Bentonite, 0.1% Anti-settling, 0.4#/sk Defoamer
INTERMEDIATE	Tail		3912	4890	300	1.33	14.8	399	25	Cl C	0.3% Retarder
PRODUCTION	Lead		4690	10062	515	3.15	10.2	1622.25	20	TXl Lite	3M Beads, 0.5% HP fluid loss, 0.4% Anti-settling agent, 0.35% Retarder
PRODUCTION	Tail		10062	18155	1586	1.42	13.2	2252.12	20	TXl Lite	0.3% Fluid loss, 0.2% Retarder
PRODUCTION	Lead		4690	10062	515	315	10.2	1622.25	20	TXL Lite	3M beads, 0.5%HP fluid loss, 0.4% Anti-settling agent, 0.35% Retarder
PRODUCTION	Tail		10062	18155	1586	1.42	13.2	2252.12	20	TXl 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: BOP, Choke Manifold, Gas Buster, Blow Down Pit, Flare Line with Igniter, Pre-Mix Pit, Rotating Head

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

Circulating Medium Table

Operator Name: APACHE CORPORATION

Well Name: GHOST RIDER 22-15 FEDERAL COM Well Number: 201H

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	1100	SPUD MUD	8.3	9.5							
1100	4890	SALT SATURATED	9.8	10.5							
4890	10500	OTHER : CUT BRINE	8.8	10							Mud program will be same from TVD to end of lateral of 18,812' MD.
4890	10500	OIL-BASED MUD	8.8	10							Mud program will be same from TVD to end of lateral of 18,812' MD.

Section 6 - Test, Logging, Coring

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

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:

DS,GR,MUDLOG

Coring operation description for the well:

N/A

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 4941 Anticipated Surface Pressure: 2618.67

Anticipated Bottom Hole Temperature(F): 165

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

Describe:

Losses in Brushy Canyon and water flows from Bell/Cherry Canyon

Contingency Plans geoharzards description:

Lightweight cmt will be pumped for prod lead to increase chances of tie back into previous csg string. Contingency csg designs will be implemented if water flows become an issue in the Bell/Cherry Canyon.

Contingency Plans geohazards attachment:

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations plan:

GhostRider22_15FedCom201H_501H_202H_502H_H2SOpsContgPlan_20180829093549.pdf

Operator Name: APACHE CORPORATION

Well Name: GHOST RIDER 22-15 FEDERAL COM Well Number: 201H

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

GhostRider22_15FedCom201H_P1V2_36x48Dwg_20180829093910.pdf

GhostRider22_15FedCom201H_DirPlanProposal_20180829093909.pdf

Other proposed operations facets description:

Apache Corp respectfully request approval to utilize a spudder rig to pre-set surf csg. Please see attachment for procedure.

Other proposed operations facets attachment:

GhostRider22_15FedCom201H_CmtDetail_Cont1_20180829094145.pdf

GhostRider22_15FedCom201H_CmtDetail_Cont2_20180829094145.pdf

GhostRider22_15FedCom201H_CsgDesign_Cont1_20180829152054.pdf

GhostRider22_15FedCom201H_CsgDesign_Cont2_20180829152055.pdf

GhostRider22_15FedCom201H_Interm1CsgDesignAssumpt_Cont2_20180829152225.pdf

GhostRider22_15FedCom201H_Interm2CsgDesignAssumpt_Cont2_20180829152226.pdf

GhostRider22_15FedCom201H_IntermCsgDesignAssumpt_Contg1_20180829152226.pdf

GhostRider22_15FedCom201H_ProdCsgDesignAssumpt_Cont1_20180829152227.pdf

GhostRider22_15FedCom201H_ProdCsgDesignAssumpt_Cont2_20180829152227.pdf

GhostRider22_15FedCom201H_SurfCsgDesignAssumpt_Cont1_20180829152228.pdf

GhostRider22_15FedCom201H_SurfCsgDesignAssumpt_Cont2_20180829152228.pdf

TechDataSheetTMK_UP_FJ_7.625x26.4_P110_20180829152244.pdf

TechDataSheetTMK_UP_SF_5.5x17_P110_20180829152246.pdf

TechDataSheetTMK_UP_SF_7.625x26.4_P110_20180829152248.pdf

GhostRider22_15FedCom_201H_202H_203H_204H_OCD_GasCapturePlan_20180829152521.pdf

Other Variance attachment:

GhostRider22_15FedCom201H_SpudderRigProcedure_20180829094132.pdf

Flexline_20180829152310.pdf

APACHE BOP AND CHOKE MANIFOLD SCHEMATIC

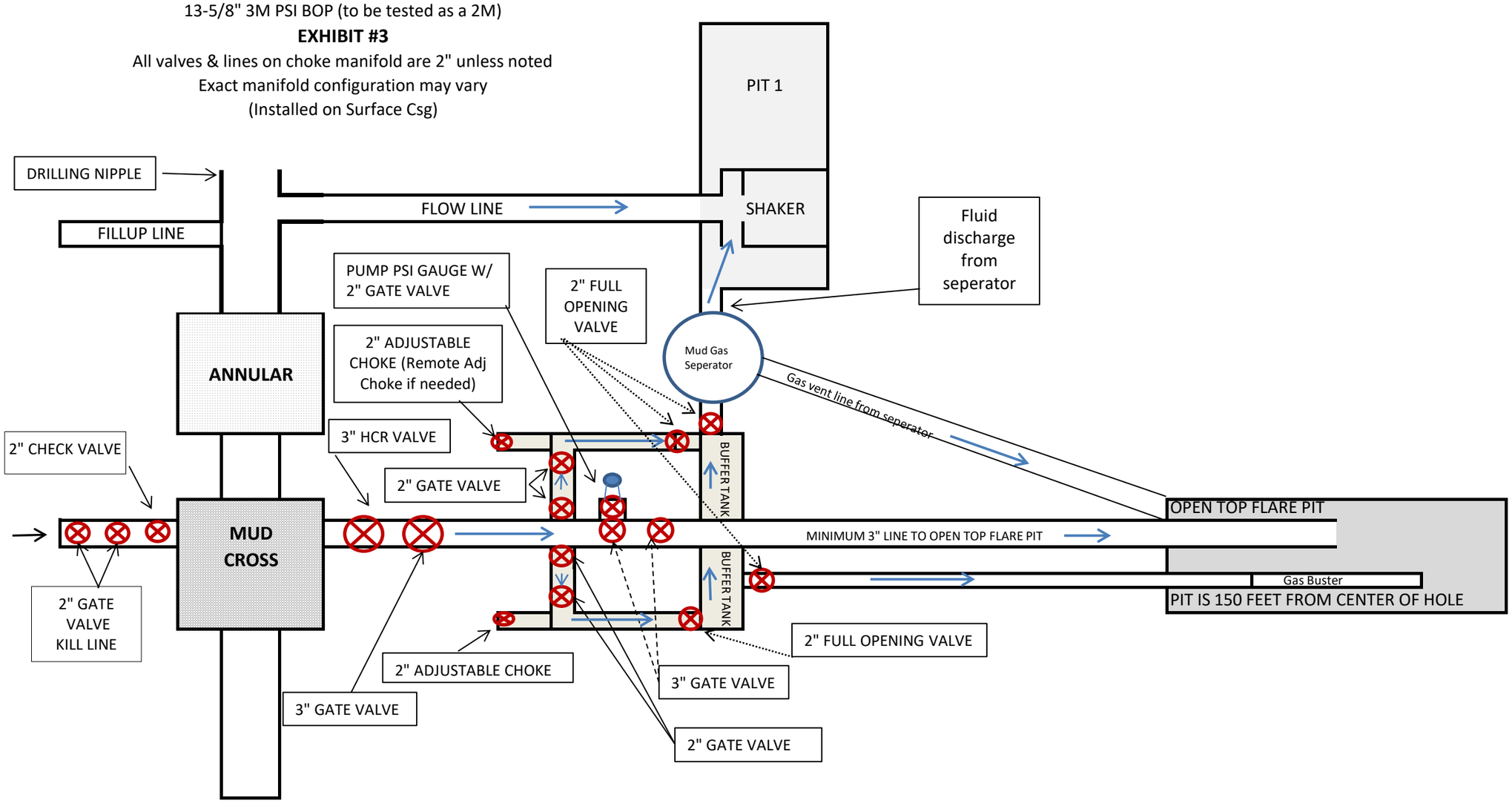
13-5/8" 3M PSI BOP (to be tested as a 2M)

EXHIBIT #3

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

Exact manifold configuration may vary

(Installed on Surface 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 (Plan)

12-1/4" hole: 13-5/8" 3M PSI BOP (to be tested as a 3M)

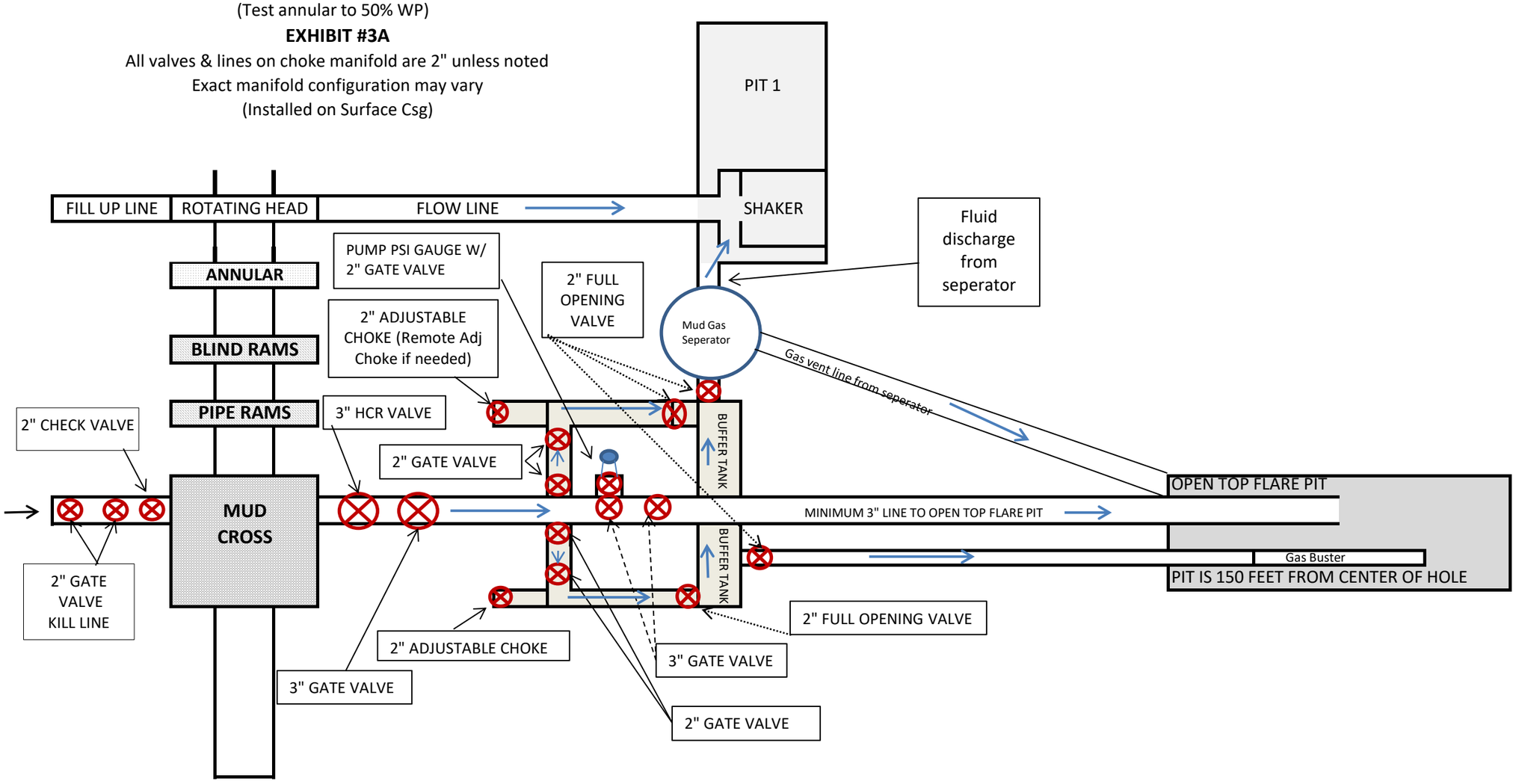
(Test annular to 50% WP)

EXHIBIT #3A

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

Exact manifold configuration may vary

(Installed on Surface 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 (Plan/Cont1)

8-3/4" hole: 13-5/8" 5M PSI BOP (to be tested as a 5M)

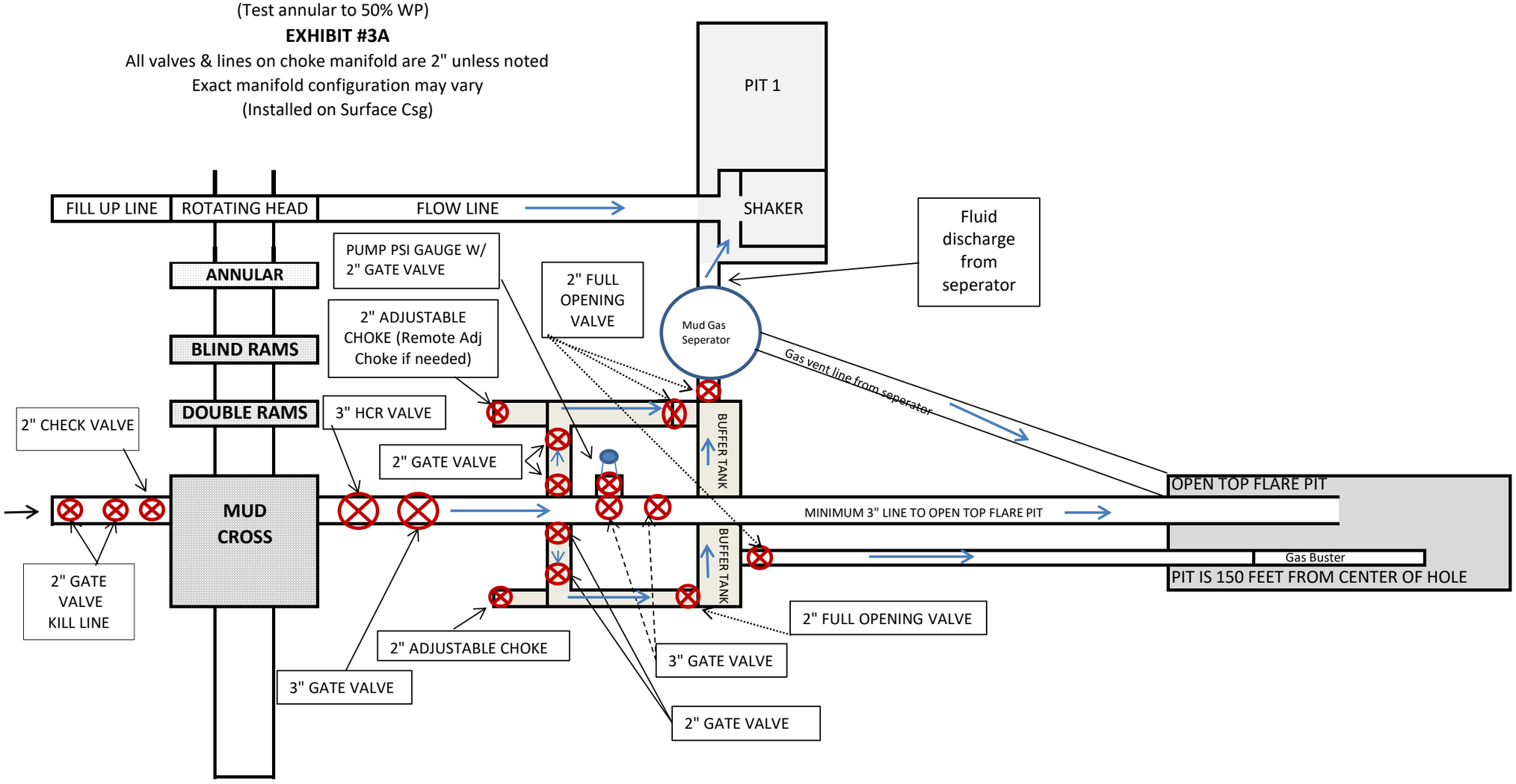
(Test annular to 50% WP)

EXHIBIT #3A

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

Exact manifold configuration may vary

(Installed on Surface 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" 3M PSI BOP (to be tested as a 2M)

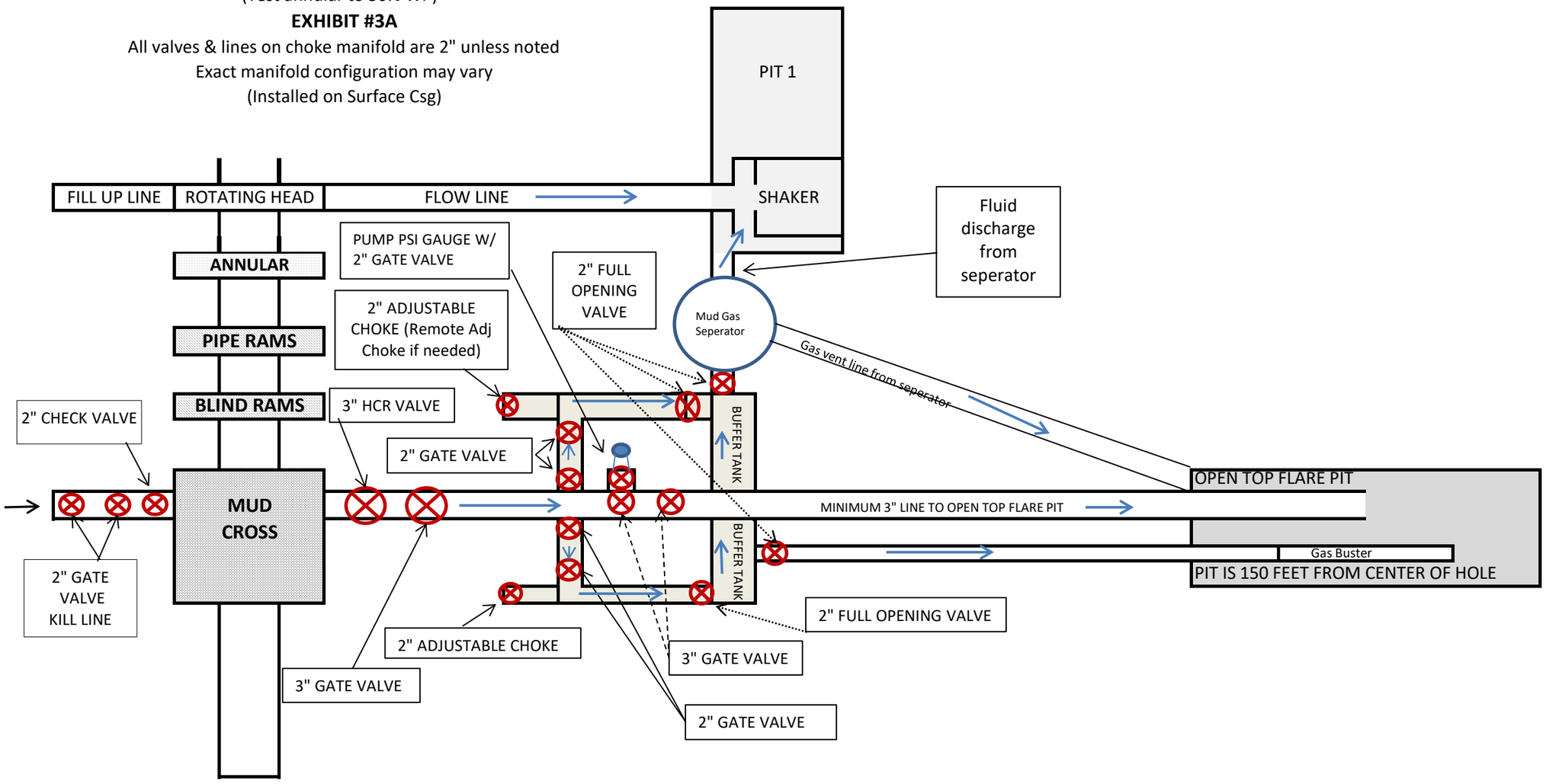
(Test annular to 50% WP)

EXHIBIT #3A

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

Exact manifold configuration may vary

(Installed on Surface 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 (Plan/Cont1)

8-3/4" hole: 13-5/8" 5M PSI BOP (to be tested as a 5M)

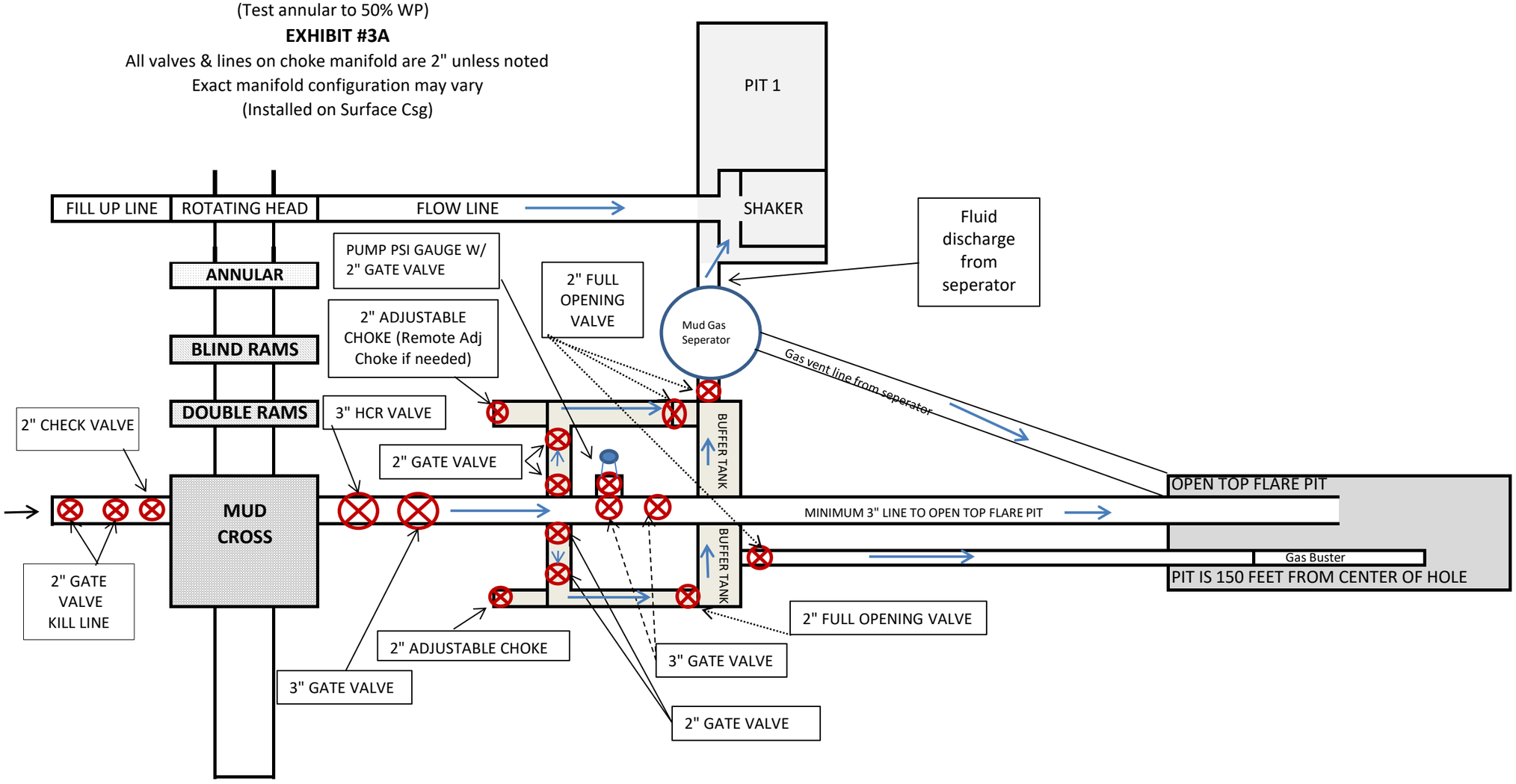
(Test annular to 50% WP)

EXHIBIT #3A

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

Exact manifold configuration may vary

(Installed on Surface 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 (Cont2)

6-3/4" hole: 13-5/8" 5M PSI BOP (to be tested as a 5M)

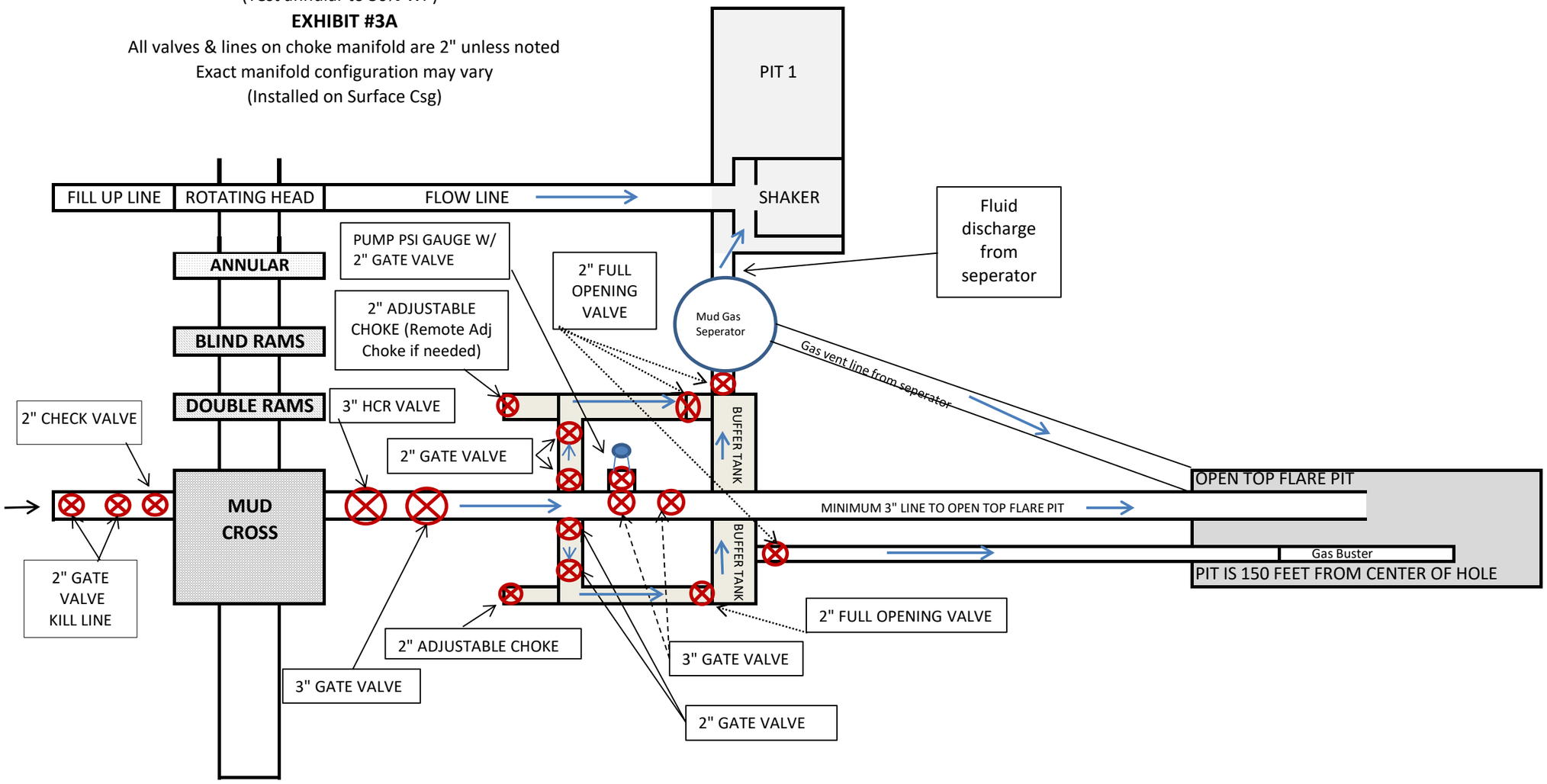
(Test annular to 50% WP)

EXHIBIT #3A

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

Exact manifold configuration may vary

(Installed on Surface Csg)



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

Ghost Rider 22-15 FedCom 201H - Cont 1

CEMENT: SURFACE

Stage Tool Depth: N/A

Single Stage

Lead:

Top MD of Segment:	0	Btm MD of Segment:	800
Cmt Type:	C	Cmt Additives:	4% Bentonite + 1% CaCl2
Quantity (sks):	410		
Yield (cu/ft/sk):	1.75	Volume (cu/ft):	717.5
Density (lbs/gal):	13.5	Percent OH Excess:	25%

Tail:

Top MD of Segment:	800	Btm MD of Segment:	1100
Cmt Type:	C	Cmt Additives:	1% CaCl2
Quantity (sks):	226		
Yield (cu/ft/sk):	1.33	Volume (cu/ft):	300.58
Density (lbs/gal):	14.8	Percent OH Excess:	25%

CEMENT: INTERMEDIATE

Single Stage

Lead:

Top MD of Segment:	0	Btm MD of Segment:	6500
Cmt Type:	TXI Lite	Cmt Additives:	10% Bentonite + 2% Silica Fume + 0.2% Suspension Agent + 0.6% Retarder
Quantity (sks):	933		
Yield (cu/ft/sk):	2.71	Volume (cu/ft):	2528.43
Density (lbs/gal):	11	Percent OH Excess:	25%

Tail:

Top MD of Segment:	6500	Btm MD of Segment:	7500
Cmt Type:	TXI Lite	Cmt Additives:	0.45% Dispersant + 0.35% Retarder
Quantity (sks):	331		
Yield (cu/ft/sk):	1.24	Volume (cu/ft):	410.44
Density (lbs/gal):	13.6	Percent OH Excess:	25%

2 Stage Cement Job

* DVT depth(s) will be adjusted based on hole conditions and cmt volumes will be adjusted proportionally. DVT will be set a minimum of 50 feet below previous csg and a minimum of 200 feet above current shoe. Lab report with 500psi comp strength time for cmt will be onsite for review.

*If lost circ 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:	4900	Btm MD of Segment:	6500
Cmt Type:	TXI Lite	Cmt Additives:	10% Bentonite + 2% Silica Fume + 0.2% Suspension Agent + 0.6% Retarder
Quantity (sks):	272		
Yield (cu/ft/sk):	2.71	Volume (cu/ft):	737.12
Density (lbs/gal):	11	Percent OH Excess:	25%

Tail:

Top MD of Segment:	6500	Btm MD of Segment:	7500
Cmt Type:	TXI Lite	Cmt Additives:	0.45% Dispersant + 0.35% Retarder
Quantity (sks):	331		
Yield (cu/ft/sk):	1.24	Volume (cu/ft):	410.44
Density (lbs/gal):	13.6	Percent OH Excess:	25%

Stage Tool / ECP Depth: ± 4900'

2nd Stage

Lead:

Top MD of Segment:	0	Btm MD of Segment:	4220
Cmt Type:	C	Cmt Additives:	5% Salt + 4% Bentonite + 0.1% Anti-Settling + Defoamer
Quantity (sks):	798		
Yield (cu/ft/sk):	2.05	Volume (cu/ft):	1635.9
Density (lbs/gal):	12.5	Percent OH Excess:	25%

Tail:

Top MD of Segment:	4220	Btm MD of Segment:	4900
Cmt Type:	C	Cmt Additives:	0.3% Retarder
Quantity (sks):	200		
Yield (cu/ft/sk):	1.33	Volume (cu/ft):	266
Density (lbs/gal):	14.8	Percent OH Excess:	25%

CEMENT: PRODUCTION 200' of tieback into intermediate string

Single Stage

Lead:

Top MD of Segment:	7300	Btm MD of Segment:	10062.88
Cmt Type:	TXI Lite	Cmt Additives:	3M Beads + 0.5% HP Fluid Loss + 0.4% Anti-Settling Agent + 0.35% Retarder
Quantity (sks):	264		
Yield (cu/ft/sk):	3.15	Volume (cu/ft):	831.6
Density (lbs/gal):	10.2	Percent OH Excess:	20%

Tail:

Top MD of Segment:	10062.88	Btm MD of Segment:	18155.52
Cmt Type:	TXI Lite	Cmt Additives:	0.3% Fluid Loss + 0.2% Retarder

Quantity (sks):	1586		
Yield (cu/ft/sk):	1.42	Volume (cu/ft):	2252.12
Density (lbs/gal):	13.2	Percent OH Excess:	20%

Ghost Rider 22-15 FedCom 201H - Cont 2

CEMENT: SURFACE

Stage Tool Depth: N/A

Single Stage

Lead:

Top MD of Segment:	0	Btm MD of Segment:	800
Cmt Type:	C	Cmt Additives:	4% Bentonite + 1% CaCl2
Quantity (sks):	410		
Yield (cu/ft/sk):	1.75	Volume (cu/ft):	717.5
Density (lbs/gal):	13.5	Percent OH Excess:	25%

Tail:

Top MD of Segment:	800	Btm MD of Segment:	1100
Cmt Type:	C	Cmt Additives:	1% CaCl2
Quantity (sks):	226		
Yield (cu/ft/sk):	1.33	Volume (cu/ft):	300.58
Density (lbs/gal):	14.8	Percent OH Excess:	25%

CEMENT: INTERMEDIATE 1

Single Stage

Lead:

Top MD of Segment:	0	Btm MD of Segment:	3912
Cmt Type:	C	Cmt Additives:	5% Salt + 4% Bentonite + 0.1% Anti-Settling + Defoamer
Quantity (sks):	739		
Yield (cu/ft/sk):	2.05	Volume (cu/ft):	1514.95
Density (lbs/gal):	12.5	Percent OH Excess:	25%

Tail:

Top MD of Segment:	3912	Btm MD of Segment:	4890
Cmt Type:	C	Cmt Additives:	0.3% Retarder
Quantity (sks):	300		
Yield (cu/ft/sk):	1.33	Volume (cu/ft):	399
Density (lbs/gal):	14.8	Percent OH Excess:	25%

2 Stage Cement Job

* DVT depth(s) will be adjusted based on hole conditions and cmt volumes will be adjusted proportionally. DVT will be set a minimum of 50 feet below previous csg and a minimum of 200 feet above current shoe. Lab report with 500psi comp strength time for cmt will be onsite for review.

*If lost circ 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:	2280	Btm MD of Segment:	3912
Cmt Type:	C	Cmt Additives:	5% Salt + 4% Bentonite + 0.1% Anti-Settling + Defoamer
Quantity (sks):	367		
Yield (cu/ft/sk):	2.05	Volume (cu/ft):	752.35
Density (lbs/gal):	12.5	Percent OH Excess:	25%

Tail:

Top MD of Segment:	3912	Btm MD of Segment:	4890
Cmt Type:	C	Cmt Additives:	0.3% Retarder
Quantity (sks):	300		
Yield (cu/ft/sk):	1.33	Volume (cu/ft):	399
Density (lbs/gal):	14.8	Percent OH Excess:	25%

Stage Tool / ECP Depth: ± 2280'

2nd Stage

Lead:

Top MD of Segment:	0	Btm MD of Segment:	1600
Cmt Type:	C	Cmt Additives:	5% Salt + 4% Bentonite + 0.1% Anti-Settling + Defoamer
Quantity (sks):	298		
Yield (cu/ft/sk):	2.05	Volume (cu/ft):	610.9
Density (lbs/gal):	12.5	Percent OH Excess:	25%

Tail:

Top MD of Segment:	1600	Btm MD of Segment:	2280
Cmt Type:	C	Cmt Additives:	0.3% Retarder
Quantity (sks):	200		
Yield (cu/ft/sk):	1.33	Volume (cu/ft):	266
Density (lbs/gal):	14.8	Percent OH Excess:	25%

Intermediate 2 cement will only tie back 200' into the intermediate 1 casing string.

CEMENT: INTERMEDIATE 2

Single Stage

Lead:

Top MD of Segment:	4690	Btm MD of Segment:	8940
Cmt Type:	TXI Lite	Cmt Additives:	3M Beads + 0.5% HP Fluid Loss + 0.4% Anti-Settling Agent + 0.35% Retarder
Quantity (sks):	168		
Yield (cu/ft/sk):	3.15	Volume (cu/ft):	529.2
Density (lbs/gal):	10.2	Percent OH Excess:	25%

Tail:

Top MD of Segment:	8940	Btm MD of Segment:	9940
Cmt Type:	H	Cmt Additives:	Retarder + Fluid Loss + Defoamer

Quantity (sks):	116		
Yield (cu/ft/sk):	1.18	Volume (cu/ft):	136.88
Density (lbs/gal):	15.6	Percent OH Excess:	25%

2 Stage Cement Job

* DVT depth(s) will be adjusted based on hole conditions and cmt volumes will be adjusted proportionally. DVT will be set a minimum of 50 feet below previous csg and a minimum of 200 feet above current shoe. Lab report with 500psi comp strength time for cmt will be onsite for review.

*If lost circ 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:	4940	Btm MD of Segment:	8940
Cmt Type:	TXI Lite	Cmt Additives:	3M Beads + 0.5% HP Fluid Loss + 0.4% Anti-Settling Agent + 0.35% Retarder
Quantity (sks):	194		
Yield (cu/ft/sk):	3.15	Volume (cu/ft):	611.1
Density (lbs/gal):	10.2	Percent OH Excess:	25%

Tail:

Top MD of Segment:	8940	Btm MD of Segment:	9940
Cmt Type:	H	Cmt Additives:	Retarder + Fluid Loss + Defoamer
Quantity (sks):	116		
Yield (cu/ft/sk):	1.18	Volume (cu/ft):	136.88
Density (lbs/gal):	15.6	Percent OH Excess:	25%

Stage Tool / ECP Depth: ± 4940'

2nd Stage

Lead:

Top MD of Segment:	4690	Btm MD of Segment:	4940

Cmt Type:	C	Cmt Additives:	0.3% Retarder
Quantity (sks):	24		
Yield (cu/ft/sk):	1.33	Volume (cu/ft):	31.92
Density (lbs/gal):	14.8	Percent OH Excess:	25%

CEMENT: PRODUCTION

Single Stage

Lead:

Top MD of Segment:	9740	Btm MD of Segment:	18155.52
Cmt Type:	TXI Lite	Cmt Additives:	0.3% Fluid Loss + 0.2% Retarder
Quantity (sks):	600		
Yield (cu/ft/sk):	1.42	Volume (cu/ft):	852
Density (lbs/gal):	13.2	Percent OH Excess:	20%

Ghost Rider 22-15 FedCom 201H - Cont 1

String:	**SURFACE**						
Hole Size:	17.5						
Top Setting Depth (MD):	0	Top Setting Depth (TVD):	0	Btm setting depth (MD):	1100	Btm setting depth (TVD):	1100
Size:	13-3/8"	Grade:	J-55	Weight (lbs/ft):	48	Joint (Butt,FJ, LTC,STC, SLH, N/A, Other):	STC
Condition (New/Used):	New			Standard (API/Non-API):	API		
Tapered String (Y/N)?:	N						
If yes, need spec attachment							
Safety Factors							
Collapse Design Safety Factor:	2.78			Burst Design Safety Factor:	1.48		
Body Tensile Design Safety Factor type?:	Dry/Buoyant				Buoyant		
Body Tensile Design Safety Factor:	4.02						
Joint Tensile Design Safety Factor type?:	Dry/Buoyant				Buoyant		
Joint Tensile Design Safety Factor:	2.35						

String:	**INTERMEDIATE**						
Hole Size:	12.25						
Top Setting Depth (MD):	0	Top Setting Depth (TVD):	0	Btm setting depth (MD):	960	Btm setting depth (TVD):	960
Size:	9-5/8"	Grade:	L-80	Weight (lbs/ft):	40	Joint (Butt,FJ, LTC,STC, SLH, N/A, Other):	BTC

Condition (New/Used): New Standard (API/Non-API): API

Tapered String (Y/N)?: N
If yes, need spec attachment

Safety Factors

Collapse Design Safety Factor: 5.87 Burst Design Safety Factor: 1.68

Body Tensile Design Safety Factor type?: Dry/Buoyant Buoyant
Body Tensile Design Safety Factor: 2.42

Joint Tensile Design Safety Factor type?: Dry/Buoyant Buoyant
Joint Tensile Design Safety Factor: 2.51

Top Setting Depth (MD):	960	Top Setting Depth (TVD):	960	Btm setting depth (MD):	7500	Btm setting depth (TVD):	7480
Size:	9-5/8"	Grade:	J-55	Weight (lbs/ft):	40	Joint (Butt,FJ, LTC,STC, SLH, N/A, Other):	BTC

Condition (New/Used): New Standard (API/Non-API): API

Tapered String (Y/N)?: N
If yes, need spec attachment

Safety Factors

Collapse Design Safety Factor: 1.19 Burst Design Safety Factor: 1.27

Body Tensile Design Safety Factor type?: Dry/Buoyant Buoyant
Body Tensile Design Safety Factor: 1.81

Joint Tensile Design Safety Factor type?: Dry/Buoyant Buoyant
Joint Tensile Design Safety Factor: 2.07

String: **PRODUCTION**

Hole Size:	8.75						
Top Setting Depth (MD):	0	Top Setting Depth (TVD):	0	Btm setting depth (MD):	10816.69	Btm setting depth (TVD):	10508.59
Size:	5-1/2"	Grade:	P-110	Weight (lbs/ft):	17	Joint (Butt,FJ, LTC,STC, SLH, N/A, Other):	BTC
Condition (New/Used):	New			Standard (API/Non-API):	API		
Hole Size:	8.5						
Top Setting Depth (MD):	10816.69	Top Setting Depth (TVD):	10508.59	Btm setting depth (MD):	18155.52	Btm setting depth (TVD):	10437
Size:	5-1/2"	Grade:	P-110	Weight (lbs/ft):	17	Joint (Butt,FJ, LTC,STC, SLH, N/A, Other):	BTC
Condition (New/Used):	New			Standard (API/Non-API):	API		

Safety Factors

Collapse Design Safety Factor:	1.47	Burst Design Safety Factor:	1.25
Body Tensile Design Safety Factor type?: Dry/Buoyant			Buoyant
Body Tensile Design Safety Factor:	2.05		
Joint Tensile Design Safety Factor type?: Dry/Buoyant			Buoyant
Joint Tensile Design Safety Factor:	2.13		

Tapered String (Y/N)?: N

If yes, need spec attachment

Ghost Rider 22-15 FedCom 201H - Cont 2

String: **SURFACE**

Hole Size:	17.5						
Top Setting Depth (MD):	0	Top Setting Depth (TVD):	0	Btm setting depth (MD):	1100	Btm setting depth (TVD):	1100
Size:	13-3/8"	Grade:	J-55	Weight (lbs/ft):	48	Joint (Butt,FJ, LTC,STC, SLH, N/A, Other):	STC

Condition (New/Used): New Standard (API/Non-API): API

Tapered String (Y/N)?: N
If yes, need spec attachment

Safety Factors

Collapse Design Safety Factor: 2.78 Burst Design Safety Factor: 1.48

Body Tensile Design Safety Factor type?: Dry/Buoyant Buoyant
Body Tensile Design Safety Factor: 4.02

Joint Tensile Design Safety Factor type?: Dry/Buoyant Buoyant
Joint Tensile Design Safety Factor: 2.35

String: **INTERMEDIATE 1**

Hole Size:	12.25						
Top Setting Depth (MD):	0	Top Setting Depth (TVD):	0	Btm setting depth (MD):	4890	Btm setting depth (TVD):	4890
Size:	9-5/8"	Grade:	J-55	Weight (lbs/ft):	40	Joint (Butt,FJ, LTC,STC, SLH, N/A, Other):	LTC

Condition (New/Used):	New	Standard (API/Non-API):	API

Tapered String (Y/N)?: N
If yes, need spec attachment

Safety Factors

Collapse Design Safety Factor:	1.83	Burst Design Safety Factor:	1.92

Body Tensile Design Safety Factor type?: Dry/Buoyant — Buoyant
Body Tensile Design Safety Factor: 2.17

Joint Tensile Design Safety Factor type?: Dry/Buoyant — Buoyant
Joint Tensile Design Safety Factor: 1.8

String: **INTERMEDIATE 2**

Hole Size: 8.75

Top Setting Depth (MD):	0	Top Setting Depth (TVD):	0	Btm setting depth (MD):	3240	Btm setting depth (TVD):	3240
Size:	7-5/8"	Grade:	P-110	Weight (lbs/ft):	26.4	Joint (Butt,FJ, LTC,STC, SLH, N/A, Other):	TMK UP SF

Condition (New/Used):	New	Standard (API/Non-API):	Non-API

Tapered String (Y/N)?: N
If yes, need spec attachment

Safety Factors

Collapse Design Safety Factor:	2.55	Burst Design Safety Factor:	2.79

Body Tensile Design Safety Factor type?: Dry/Buoyant — Buoyant
Body Tensile Design Safety Factor: 2.45

Joint Tensile Design Safety Factor type?: Dry/Buoyant — Buoyant

Joint Tensile Design Safety Factor:			2.17				
Top Setting Depth (MD):	3240	Top Setting Depth (TVD):	3240	Btm setting depth (MD):	9912	Btm setting depth (TVD):	9880.3
Size:	7-5/8"	Grade:	P-110	Weight (lbs/ft):	26.4	Joint (Butt,FJ, LTC,STC, SLH, N/A, Other):	TMK UP FJ
Condition (New/Used):	New			Standard (API/Non-API):	Non-API		
Tapered String (Y/N)?:	N						
If yes, need spec attachment							

Safety Factors

Collapse Design Safety Factor:	1.55	Burst Design Safety Factor:	2.9
Body Tensile Design Safety Factor type?: Dry/Buoyant		Buoyant	
Body Tensile Design Safety Factor:	3.11		
Joint Tensile Design Safety Factor type?: Dry/Buoyant		Buoyant	
Joint Tensile Design Safety Factor:	1.8		

String: **PRODUCTION**

Hole Size:	6.75						
Top Setting Depth (MD):	0	Top Setting Depth (TVD):	0	Btm setting depth (MD):	18155.52	Btm setting depth (TVD):	10437
Size:	5-1/2"	Grade:	P-110	Weight (lbs/ft):	17	Joint (Butt,FJ, LTC,STC, SLH, N/A, Other):	TMK UP SF
Condition (New/Used):	New			Standard (API/Non-API):	Non-API		

Safety Factors

Collapse Design Safety Factor: 1.47 Burst Design Safety Factor: 1.33

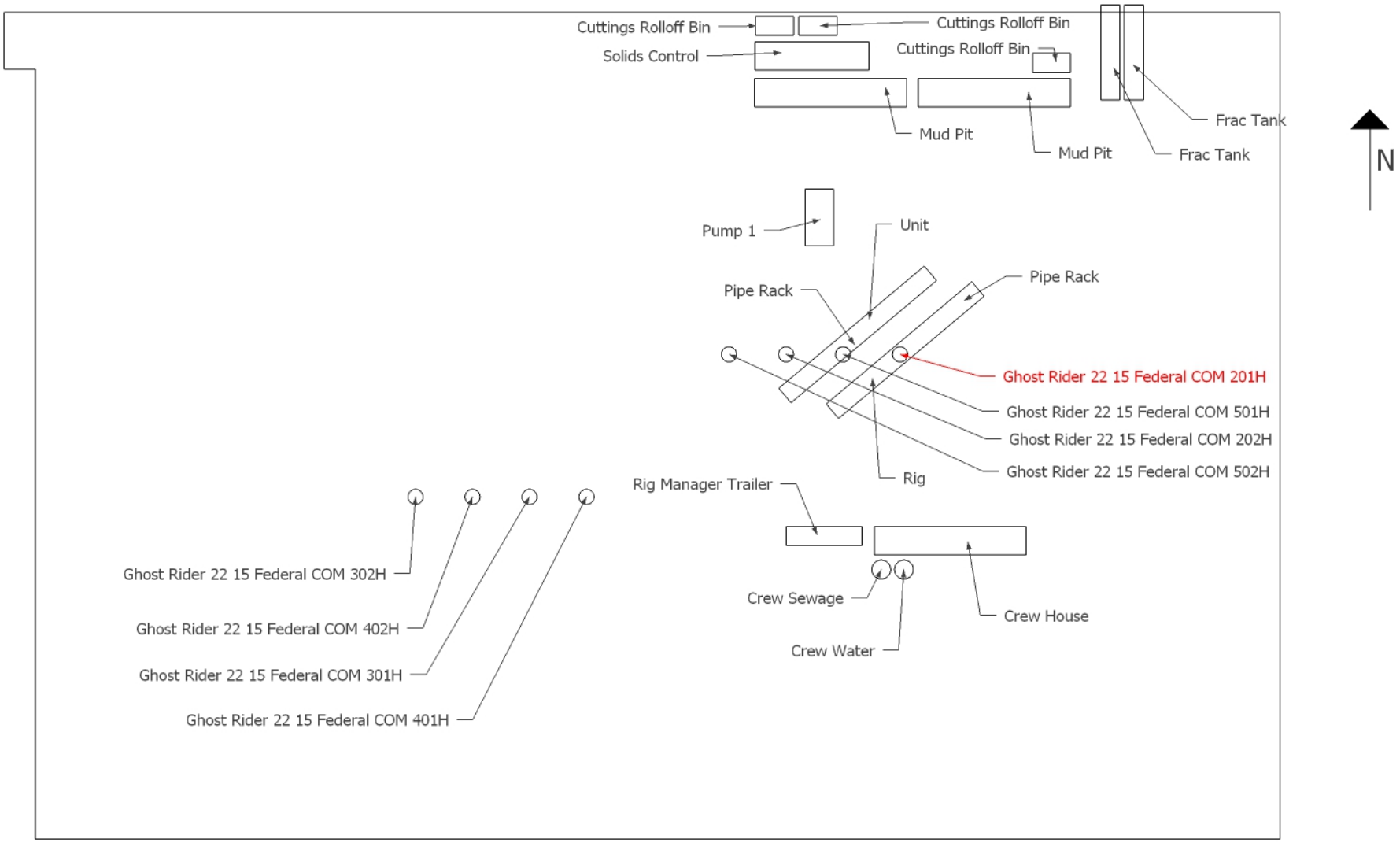
Body Tensile Design Safety Factor type?: Dry/Buoyant Buoyant
Body Tensile Design Safety Factor: 1.98

Joint Tensile Design Safety Factor type?: Dry/Buoyant Buoyant
Joint Tensile Design Safety Factor: 1.81

Tapered String (Y/N)?: N
If yes, need spec attachment

Apache Corp respectfully requests approval for the following changes and additions to the drilling plan:

1. Utilize a spudder rig to pre-set surface casing.
2. Description of Operations
    1. Spudder rig will move in their rig to drill the surface hole section and pre-set surface casing on the Ghost Rider 22-15 Federal COM 201H.
        a. After drilling the surface hole section, the rig will run casing and cement following all of the applicable rules and regulations (Onshore Oil and Gas Order No. 2).
        b. Rig will utilize fresh water based mud to drill 17-1/2" surface hole to TD. Solids control will be handled entirely on a closed loop basis.
2. The wellhead (page 3) will be installed and tested once the 13-3/8" surface casing is cut off and the WOC time has been reached.
3. A blind flange with the same pressure rating as the wellhead will be installed to seal the wellbore. Pressure will be monitored with a pressure gauge installed on the wellhead.
    a. A means for intervention will be maintained while the drilling rig is not over the well.
4. Spudder rig operations is expected to take 1-2 days on a single well pad.
5. The BLM will be contacted and notified 24 hours prior to commencing spudder rig operations.
6. Drilling operations will be performed with the drilling rig. At that time an approved BOP stack will be nippled up and tested on the wellhead before drilling operations commences on each well.
    a. The BLM will be contacted / notified 24 hours before the drilling rig moves back on to the pad with the pre-set surface casing.
7. Apache Corp will have supervision over the rig to ensure compliance with all BLM regulations and to oversee operations.
8. Once the rig is removed, Apache Corp will secure the wellhead area by placing a guard rail around the cellar area.


Cuttings Rolloff Bin
Cuttings Rolloff Bin
Solids Control
Cuttings Rolloff Bin
Mud Pit
Mud Pit
Frac Tank
Frac Tank
N
Pump 1
Unit
Pipe Rack
Pipe Rack
Ghost Rider 22 15 Federal COM 201H
Ghost Rider 22 15 Federal COM 501H
Ghost Rider 22 15 Federal COM 202H
Ghost Rider 22 15 Federal COM 502H
Rig
Rig Manager Trailer
Ghost Rider 22 15 Federal COM 302H
Ghost Rider 22 15 Federal COM 402H
Ghost Rider 22 15 Federal COM 301H
Ghost Rider 22 15 Federal COM 401H
Crew Sewage
Crew House
Crew Water