

KANSAS CORPORATION COMMISSION OIL & GAS CONSERVATION DIVISION

Form ACO-4 Form must be typed March 2009

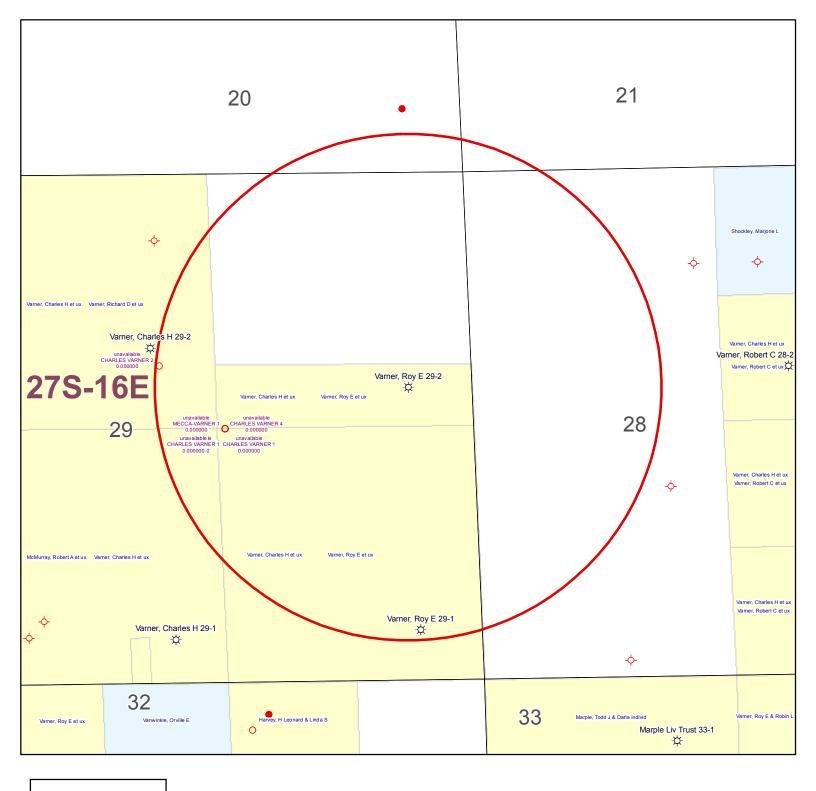
APPLICATION FOR COMMINGLING OF Commingling ID#_ PRODUCTION (K.A.R. 82-3-123) OR FLUIDS (K.A.R. 82-3-123a)

OPERAT	OR: License #	API No. 15		
Name:_		Spot Description: _		
Address	1:		_ Sec Twp	S. R East West
Address	2:		Feet from Nor	th / South Line of Section
City:	State: Zip:+	<u> </u>	Feet from Eas	st / West Line of Section
Contact	Person:	County:		
	()		Well	#:
1.	Name and upper and lower limit of each production interval to	be commingled:		
	Formation:	(Perfs):		
2.	Estimated amount of fluid production to be commingled from e			
	Formation:			BWPD:
	Formation:			BWPD:
	Formation:			BWPD:
	Formation:	BOPD:	MCFPD:	BWPD:
	Formation:	BOPD:	MCFPD:	BWPD:
☐ 3.	Plat map showing the location of the subject well, all other well the subject well, and for each well the names and addresses of	•	· ·	es within a 1/2 mile radius of
4.	Signed certificate showing service of the application and affida	avit of publication as required	d in K.A.R. 82-3-135a.	
For Con	nmingling of PRODUCTION ONLY, include the following:			
<u> </u>	Wireline log of subject well. Previously Filed with ACO-1:	Yes No		
6.	Complete Form ACO-1 (Well Completion form) for the subject	well.		
For Con	nmingling of FLUIDS ONLY, include the following:			
7.	Well construction diagram of subject well.			
8.	Any available water chemistry data demonstrating the compati	ibility of the fluids to be com	mingled.	
current ir mingling	/IT: I am the affiant and hereby certify that to the best of my nformation, knowledge and personal belief, this request for comis true and proper and I have no information or knowledge, which istent with the information supplied in this application.		ubmitted Electroni	ically
l —	C Office Use Only			in the application. Protests must be filed wihin 15 days of publication of

Date: _

Approved By:

15-Day Periods Ends: _



KGS STATUS

- ◆ DA/PA
- EOR
- **⇔** GAS
- △ INJ/SWD
- OIL
- **♦** OIL/GAS
- OTHER

Varner, Roy E 29-2 29-27S-16E 1" = 1,000'

KANSAS CORPORATION COMMISSION RIGINAL Form ACO-1 OIL & GAS CONSERVATION DIVISION RIGINAL Form Must Be Typed

WELL COMPLETION FORM WELL HISTORY - DESCRIPTION OF WELL & LEASE

Operator: License # _33344	API No. 15 - 205-26742 ~00 ~00
Name: Quest Cherokee, LLC	County: Wilson
Address: 211 W. 14th Street	s/2 _ se _ ne Sec. 29 Twp. 27 S. R. 16 V East West
City/State/Zip: Chanute, KS 66720	2310 feet from S (N)(circle one) Line of Section
Purchaser: Bluestem Pipeline, LLC	660 feet from (E) W (circle one) Line of Section
Operator Contact Person: Jennifer R. Ammann	Footages Calculated from Nearest Outside Section Corner:
Phone: (620) 431-9500	(circle one) NE SE NW SW
Contractor: Name: L S Well Service, LLC	Lease Name: Varner, Roy E. Well #: 29-2
License: 33374	Field Name: Cherokee Basin CBM
Wellsite Geologist: Ken Recoy	Producing Formation: Multiple
Designate Type of Completion:	Elevation: Ground: 970 Kelly Bushing: n/a
New Well Re-Entry Workover	Total Depth: 1313 Plug Back Total Depth: 1304.47
Oil SWD SIOW Temp. Abd.	Amount of Surface Pipe Set and Cemented at 22 Feet
✓ Gas ENHR SIGW	Multiple Stage Cementing Collar Used?
Dry Other (Core, WSW, Expl., Cathodic, etc)	If yes, show depth setFeet
If Workover/Re-entry: Old Well Info as follows:	If Alternate II completion, cement circulated from 1304.47
Operator:	feet depth to surface w/ 152
Well Name:	AH2-DG. (2/4/08)
Original Comp. Date: Original Total Depth:	Drilling Fluid Management Plan (Data must be collected from the Reserve Pit)
Deepening Re-perf Conv. to Enhr./SWD	,
Plug Back Plug Back Total Depth	Chloride content ppm Fluid volume bbls
Commingled Docket No.	Dewatering method used
Dual Completion Docket No	Location of fluid disposal if hauled offsite:
Other (SWD or Enhr.?) Docket No	Operator Name:
. , ,	Lease Name: License No.:
6/14/06 6/15/06 6/20/06 Spud Date or Date Reached TD Completion Date or	Quarter Sec TwpS. R East West
Recompletion Date Recompletion Date	County: Docket No.:
Kansas 67202, within 120 days of the spud date, recompletion, workove Information of side two of this form will be held confidential for a period of 1	the Kansas Corporation Commission, 130 S. Market - Room 2078, Wichita, er or conversion of a well. Rule 82-3-130, 82-3-106 and 82-3-107 apply. 2 months if requested in writing and submitted with the form (see rule 82-3-and geologist well report shall be attached with this form. ALL CEMENTING . Submit CP-111 form with all temporarily abandoned wells.
All requirements of the statutes, rules and regulations promulgated to regulations are complete and correct to the best of my knowledge.	te the oil and gas industry have been fully complied with and the statements
Signature: Signature: Coordinator Date: 10/11/06	KCC Office Use ONLY
Title.	Letter of Confidentiality Received
Subscribed and sworn to before me thisday ofOC	If Denied, Yes Date:
20_06.	Wireline Log ReceixenNSAS CORPORATION COMMISSION
Notary Public: Derra Klauman	Geologist Report Received
Q // ONO A TERR	
Notary Pub	iiç - Stale of Kansas Wichita Ko
My Appt. Expires	B-4-2010

Operator Name: Qu	est Cherokee, LL	С	Lease N	ame:_\	/arner, Roy	E	Well #: 29-2	
		✓ East	County: _					
tested, time tool ope temperature, fluid re-	n and closed, flowing covery, and flow rate	and base of formations p g and shut-in pressures, s if gas to surface test, final geological well site	whether shut along with fina	i-in pre	ssure reached	static level, hyd	rostatic pressure	es, bottom hole
Drill Stem Tests Take		_ Yes ✓ No		√ Lo	og Format	ion (Top), Depth	and Datum	Sample
Samples Sent to Ge	ological Survey	☐ Yes ☑ No		Name See	e attached		Тор	Datum
Cores Taken Electric Log Run (Submit Copy)		☐ Yes ☑ No ☑ Yes ☐ No	:					
List All E. Logs Run:								
Gamma Ray N Dual Induction Compensated		on Log						
		CASING Report all strings set-	RECORD	Ne		ction etc		
Purpose of String	Size Hole Drilled	Size Casing Set (In O.D.)	Weight Lbs./F	t	Setting Depth	Type of Cement	# Sacks Used	Type and Percent Additives
Surface	11	8-5/8"	20		22	"A"	5	
Production	6-3/4	4-1/2	10.5#		1304.42	"A"	160	
		ADDITIONA	L CEMENTING	A / SQL	JEEZE RECOR	D		<u> </u>
Purpose: Perforate Protect Casing Plug Back TD Plug Off Zone	Depth Top Bottom	Type of Cement	#Sacks U				Percent Additives	
Shots Per Foot		ION RECORD - Bridge Plu Footage of Each Interval Pe				acture, Shot, Ceme	ent Squeeze Recon	d Depth
Δ		967/929-932/913-91	-		`		er w/ 2% KCL, Blockle, 16000	<u> </u>
	1077 10777000							929-932/913-915
4	833-837/824-82	8			400gal 15%HCLw/ 59 b	bis 2%kci water, 600bbis wat	er w/ 2% KCL, Blockle, 13800	# 20/40 samd 833-837/824-828
	:							<u> </u>
TUBING RECORD 2-	Size 3/8"	Set At 1082.62	Packer At n/a		Liner Run	Yes 7	No	
Date of First, Resume 9/12/06	rd Production, SWD or I	Enhr. Producing Me		Flowing	g 📝 Pump	oing Gas	Lift Othe	er (Explain)
Estimated Production Per 24 Hours	oil n/a	Bbls. Gas 7.4mcf	Mcf	Wate 31.11		Bbls.	Gas-Oil Ratio	Gravity
Disposition of Gas		COMPLETION		J 1. 11	Production Inte	erval		
Vented ✓ Sold	Used on Lease	Open Hole		[Dually Comp.	Commingled		

Drill Log

Quest Cherokee, LLC

Roy Varner #29-2 S29, T27,R16 Wilson Co, KS API#205-26742-0000

0-3	DIRT	RECEIVED
3-45'	LIME	KANSAS CORPORATION COMMISSION
45-165	SHALE	
165-185	LIME	OCT 1 2 2006
185-228	SHALE	CONSERVATION DIVISION
228-270	LIME	WICHITA, KS
270-283	SHALE	, , , , , , , , , , , , , , , , , , ,
283-305	SAND	
305-306	COAL	
306-320		•
320-333	SANDY	SHALE
333-338	LIME	
338-360	SANDY	SHALE
360-440	LIME	
440-444	BLACK S	SHALE
444-453	LIME	
453-459	SANDY	SHALE
459-480	LIME	
480-495	SAND	
495-526		
526-616		SHALE
616-626	LIME	
626-646	SANDY	SHALE
646-661	LIME	
661-686	SANDY S	SHALE
686-696	SAND	
696-697	COAL	
697-743	SANDY S	SHALE
743-745	LIME	
745-746	COAL	
746-750	SHALE	
750-776	LIME PA	
776-779	BLACK S	
779-794	SANDY S	
794-819	LIME OS	WEGO
819-824 824-830	SHALE	
	LILME	
830-832 832-833	SHALE	
833-836	COAL SANDY S	SUALE
836-851	SAND	DIALE
851-857	SANDY S	SHALE
857-862	SAND OF	
862-909	SAND	JON OIL
909-910	COAL	
910-923	SANDY S	SHALE
923-926	LIME	אותבב
J20-J20	LIIVIL	

6-14-06 Drilled 11" hole and set 22' of 8 5/8" surface casing Set with 5 sacks Portland cement

6-15-06 Started drilling 6 3/4" hole

6-15-06 Finished drilling to T.D. 1313'

WATER @ 511'

511' SLIGHT BLOW
711' 3" ON 1/2" ORIFICE
761' 7" ON 1/2" ORIFICE
786 24" ON 1/2" ORIFICE
825' 80" ON 1/2" ORIFICE
836' 26" ON 1" ORIFICE
912' 26" ON 1" ORIFICE
937' 26" ON 1" ORIFICE
937' 33" ON 1" ORIFICE
1037' 33" ON 1" ORIFICE
1062' 27" ON 1" ORIFICE
1087' 15" ON 1" ORIFICE
1212' 15" ON 1" ORIFICE
1313' 17" ON 1" ORIFICE

L S Well Service, LLC #33374 543A 22000 Road Cherryvale, Kansas 67335 620-328-4433

Drill Log

Quest Cherokee, LLC

Roy Varner #29-2 S29, T27,R16 Wilson Co, KS API#205-26742-0000

COAL
SANDY SHALE
COAL
SANDY SHALE
SAND
SANDY SHALE
COAL
SANDY SHALE
COAL
SANDY SHALE
SAND
SHALE
COAL
SAND
SANDY SHALE
COAL
LIME MISSISSIPPI

T.D. 1313'



211 W. 14TH STREET, CHANUTE, KS 66720 620-431-9500 TICKET NUMBER 1477

FIELD TICKET REF #

FOREMAN Crais Coode

TREATMENT REPORT & FIELD TICKET CEMENT

DATE	WELL NAME & NUMBER					SEC	IION	TOWNSHIP	RANG	E COUNTY		
June 20 2006	Varmerie	204 F	29.2	2		29		27	16	wilson		
FOREMAN / OPERATOR	TIME	TIME		LESS UNCH	TRUCK #	TRAILE	ER .	TRUC HOUR	- 1	EMPLOYEE SIGNATURE		
Crain C	1:15	5115	- /	No	9031187			4		1000		
Tirid		4:30			903197			5.25 For		Julya		
Russel M		41:15			903206			3		7/		
Toe R		6:30	2		902139	98575	7	5.2	5	Are Blanc		
Leon II.		6.00			93/4/5		<u> </u>	4.75	5	A THE		
	. 4	1				1	0.4.011	10 0175 6 14	(FIOLIT			
JOB TYPE / bugton	<i>J</i>								EIGHT _	211/2 (10.C)		
CASING DEPTH 13					UBING							
SLURRY WEIGHT / (_		
DISPLACEMENT 20	ョラ DISPLA	ACEMENT F	'SI	N	MIX PSI		RATE	<u>9.0 6</u>	0r-			
REMARKS:	.5	,	,	•	, i i a	1	47 7		7 i	. <i>1</i>		
Ron 1 forto	of prom	ael Diai	<u> </u>	epi	10 50/10/2	11540	- 11/4/	<u>remen</u>	7 V1	<u> </u>		
3401 bouber	. / <u>< 0 x s/ 1</u>	31' ut /	<u> </u>	07101	nue and	<u> </u>	1 90 K	<u> </u>	emen	1		
not due in a	Sefere El	(heal	Dung	200	imped wip	ir plug	40	mottom	: <u></u>	<u>(</u>		
Modifice.					_ .							
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	1204			le Cas								
1	<u> </u>			rolling								
921313	<u> </u>	i		a trai								
951300		h / i	COSIN	is deci	10 /							
ACCOUNT CODE	QUANTITY or U	JNITS			DESCRIPTION OF SE	ERVICES OR F	RODUC	т		TOTAL AMOUNT		
703427	4	he.	Foreman	Pickup						_		
903255	325	h-	Cement F	Pump Truck	(
303204		V.	Bulk Trucl	k								
1104	152	Sε	Portland (N.							
1124	1		50/50 PO	Z-Blend-G	ement PoMe 3	٠ ''						
1126				lend-Geme	nt Us perpls.	9 4/2		<u></u>		-		
11,10	16	5.€	Gilsonite									
1107	/	516	Flo-Seal									
1118	ose"	516	Premium	Gel								
1215A	1001		KCL									
1111B	<u> </u>	I .			alemboride							
1123	7005		City Wate									
702/27	<u> </u>	5 kr	Transport		· · · · · · · · · · · · · · · · · · ·							
982/72 32/7/7	نه الله		80 Vac									
Ravin 4513		*1.7		1 ch > 0								

	A	В	С	D	Е	F	C	П	ı	ı	К
1	Produced Fluids #	O	1	2	3	4	G 5	Н	<u> </u>	J	1 N
	Parameters	Units	Input	Input	Input	Input	Input		Click he	ro	Click
3	Select the brines	Select fluid	7		7		7	Mixed brine:	to run S		
4	Sample ID	by checking					· ·	Cell H28 is	to run St		Click
	Date	the box(es),	3/19/2012	3/4/2012	3/14/2012	1/20/2012	1/20/2012	STP calc. pH.	>		
6	Operator	Row 3	PostRock	PostRock	PostRock	PostRock	PostRock	Cells H35-38			Click
	Well Name		Ward Feed	Ward Feed	Clinesmith	Clinesmith	Clinesmith	are used in	Goal Seek	SSP	
8	Location		#34-1	#4-1	#5-4	#1	#2	mixed brines			Click
_	Field		CBM	CBM	Bartles	Bartles	Bartles	calculations.			
10	Na ⁺	(mg/l)*	19,433.00	27,381.00	26,534.00	25689.00	24220.00	24654.20	Initial(BH)	Final(WH)	SI/SR
11	K ⁺ (if not known =0)	(mg/l)						0.00	Saturation Index	values	(Final-Initial)
12	Mg ²⁺	(mg/l)	1,096.00	872.00	1,200.00	953.00	858.00	995.91	Ca	lcite	
13	Ca ²⁺	(mg/l)	1,836.00	2,452.00	2,044.00	1920.00	1948.00	2040.23	-0.73	-0.60	0.13
	Sr ²⁺	(mg/l)						0.00	Ba	rite	
15	Ba ²⁺	(mg/l)						0.00			
	Fe ²⁺	(mg/l)	40.00	21.00	18.00	82.00	90.00	50.21	н	alite	
	Zn ²⁺		40.00	21.00	10.00	02.00	70.00	0.00	-1.77	-1.80	-0.03
		(mg/l)									-0.03
	Pb ²⁺	(mg/l)	2 (200 00	40.045.00	47.074.00	45.22.00	424 47 00	0.00		osum	0.00
	Cl'	(mg/l)	36,299.00	48,965.00	47,874.00	45632.00	43147.00	44388.44	-3.19	-3.18	0.00
-	SO ₄ ² ·	(mg/l)	1.00	1.00	8.00	1.00	1.00	2.40		nydrate	
21	F	(mg/l)						0.00	-3.96	-3.90	0.06
	Br [*]	(mg/l)						0.00	Anh	ydrite	
23	SiO2	(mg/l) SiO2						0.00	-3.47	-3.36	0.12
24	HCO3 Alkalinity**	(mg/l as HCO3)	190.00	234.00	259.00	268.00	254.00	241.03	Cele	estite	
25	CO3 Alkalinity	(mg/l as CO3)									
26	Carboxylic acids**	(mg/l)						0.00	Iron S	Sulfide	
27	Ammonia	(mg/L) NH3						0.00	-0.16	-0.22	-0.06
28	Borate	(mg/L) H3BO3						0.00	Zinc	Sulfide	
	TDS (Measured)	(mg/l)						72781			
	Calc. Density (STP)	(g/ml)	1.038	1.051	1.050	1.048	1.045	1.047	Calcium	ı fluoride	
	CO ₂ Gas Analysis	(%)	19.97	18.76	22.41	35.53	33.79	26.16	Curezun		
	H ₂ S Gas Analysis***	(%)	0.0289	0.0292	0.0296	0.0306	0.0151	0.0269	Iron Ca	arbonate	
_	Total H2Saq	(mgH2S/l)	1.00	1.00	1.00	1.00	0.50	0.90	-0.74	-0.51	0.23
-	pH, measured (STP)	pН	5.67	5.76	5.72	5.54	5.55	5.63	Inhibitor ne	eeded (mg/L)	
		0-CO2%+Alk,							Calcite	NTMP	
	Choose one option				_						
35	to calculate SI?	•	0	0	0	0	0		0.00	0.00	
	Gas/day(thousand cf/day)	(Mcf/D)		0		1	4	0	0.00	0.00	
	Oil/Day Water/Day	(B/D) (B/D)	100	100	100	100	100	500	Barite 0.00	0.00	
	J			100	100	100	100	200		о.00 оН	
	For mixed brines, enter val	. ,		ures in Cells (H	(40-H43)			(Enter H40-H43)	n		
40	For mixed brines, enter val Initial T	. ,		ures in Cells (H 71.0	(40-H43) 70.0	41.0	49.0	(Enter H40-H43) 60.0	5.69	5.60	
		lues for tempera	tures and press 66.0 66.0	`		41.0	49.0	60.0 89.0	5.69		
41	Initial T	lues for temperator (F)	tures and press 66.0	71.0	70.0			60.0 89.0	5.69	5.60	
41 42 43	Initial T Final T Initial P Final P	(F) (F) (psia) (psia)	tures and press 66.0 66.0	71.0 71.0	70.0 70.0	41.0	49.0	60.0 89.0	5.69 Viscosity (1.196 Heat Capaci	5.60 CentiPoise) 0.826 ity (cal/ml/ ⁰ C)	
41 42 43 44	Initial T Final T Initial P Final P Use TP on Calcite sheet?	(F) (F) (psia) (psia) 1-Yes;0-No	66.0 66.0 25.0	71.0 71.0 25.0	70.0 70.0 25.0	41.0 25.0	49.0 25.0	60.0 89.0 25.0 120.0	5.69 Viscosity (1.196 Heat Capaci 0.955	5.60 CentiPoise) 0.826 ty (cal/ml/°C) 0.959	
41 42 43 44 45	Initial T Final T Initial P Final P Use TP on Calcite sheet? API Oil Grav.	ues for temperat (F) (F) (psia) (psia) (psia) 1-Yes;0-No API grav.	66.0 66.0 25.0	71.0 71.0 25.0	70.0 70.0 25.0	41.0 25.0	49.0 25.0	60.0 89.0 25.0 120.0	5.69 Viscosity (1.196 Heat Capaci 0.955 Inhibitor no	5.60 CentiPoise) 0.826 ty (cal/ml/ ⁰ C) 0.959 eeded (mg/L)	
41 42 43 44 45 46	Initial T Final T Initial P Final P Use TP on Calcite sheet? API Oil Grav. Gas Sp.Grav.	ues for tempera (F) (F) (psia) (psia) 1-Yes;0-No API grav. Sp.Grav.	66.0 66.0 66.0 25.0 25.0	71.0 71.0 25.0	70.0 70.0 25.0	41.0 25.0	49.0 25.0	60.0 89.0 25.0 120.0	5.69 Viscosity (1.196 Heat Capaci 0.955 Inhibitor no	5.60 CentiPoise) 0.826 ty (cal/ml/°C) 0.959 eded (mg/L) HDTMP	
41 42 43 44 45 46 47	Initial T Final T Initial P Final P Use TP on Calcite sheet? API Oil Grav. Gas Sp.Grav. MeOH/Day	ues for tempera (F) (F) (psia) (psia) 1-Yes;0-No API grav. Sp.Grav. (B/D)	66.0 66.0 25.0	71.0 71.0 25.0	70.0 70.0 25.0	41.0 25.0	49.0 25.0	60.0 89.0 25.0 120.0	5.69 Viscosity (1.196 Heat Capaci 0.955 Inhibitor no Gypsum 0.00	5.60 CentiPoise) 0.826 ty (cal/ml/°C) 0.959 eded (mg/L) HDTMP 0.00	
41 42 43 44 45 46 47 48	Initial T Final T Initial P Final P Use TP on Calcite sheet? API Oil Grav. Gas Sp.Grav.	ues for tempera (F) (F) (psia) (psia) 1-Yes;0-No API grav. Sp.Grav.	tures and presss 66.0 66.0 25.0 25.0	71.0 71.0 25.0	70.0 70.0 25.0	41.0 25.0	49.0 25.0	60.0 89.0 25.0 120.0	5.69 Viscosity (1.196 Heat Capaci 0.955 Inhibitor no	5.60 CentiPoise) 0.826 ty (cal/ml/°C) 0.959 eded (mg/L) HDTMP	
41 42 43 44 45 46 47 48 49	Initial T Final T Initial P Final P Use TP on Calcite sheet? API Oil Grav. Gas Sp.Grav. MeOH/Day MEG/Day Conc. Multiplier	ues for tempera (F) (F) (psia) (psia) 1-Yes;0-No API grav. Sp.Grav. (B/D) (B/D)	tures and presss 66.0 66.0 25.0 25.0	71.0 71.0 25.0	70.0 70.0 25.0	41.0 25.0	49.0 25.0	60.0 89.0 25.0 120.0	5.69 Viscosity (1.196 Heat Capaci 0.955 Inhibitor no Gypsum 0.00 Anhydrite	5.60 CentiPoise) 0.826 ty (cal/ml/°C) 0.959 ceded (mg/L) HDTMP 0.00 HDTMP	
41 42 43 44 45 46 47 48 49 50	Initial T Final T Initial P Final P Use TP on Calcite sheet? API Oil Grav. Gas Sp.Grav. MeOH/Day MEG/Day Conc. Multiplier H* (Strong acid) *	ues for tempera (F) (F) (psia) (psia) 1-Yes;0-No API grav. Sp.Grav. (B/D) (B/D)	tures and presss 66.0 66.0 25.0 25.0	71.0 71.0 25.0	70.0 70.0 25.0	41.0 25.0	49.0 25.0	60.0 89.0 25.0 120.0	5.69 Viscosity (1.196 Heat Capaci 0.955 Inhibitor no Gypsum 0.00 Anhydrite	5.60 CentiPoise) 0.826 ty (cal/ml/°C) 0.959 ceded (mg/L) HDTMP 0.00 HDTMP	
41 42 43 44 45 46 47 48 49 50	Initial T Final T Initial P Final P Use TP on Calcite sheet? API Oil Grav. Gas Sp.Grav. MeOH/Day MEG/Day Conc. Multiplier	ues for tempera (F) (F) (psia) (psia) 1-Yes;0-No API grav. Sp.Grav. (B/D) (B/D) (N)	tures and presss 66.0 66.0 25.0 25.0	71.0 71.0 25.0	70.0 70.0 25.0	41.0 25.0	49.0 25.0	60.0 89.0 25.0 120.0	5.69 Viscosity (1.196 Heat Capaci 0.955 Inhibitor no Gypsum 0.00 Anhydrite	5.60 CentiPoise) 0.826 ty (cal/ml/°C) 0.959 ceded (mg/L) HDTMP 0.00 HDTMP	
41 42 43 44 45 46 47 48 49 50 51	Initial T Final T Initial P Final P Use TP on Calcite sheet? API Oil Grav. Gas Sp.Grav. MeOH/Day MEG/Day Conc. Multiplier H* (Strong acid) † OH (Strong base) †	ues for tempera (F) (F) (psia) (psia) 1-Yes;0-No API grav. Sp.Grav. (B/D) (B/D) (N)	tures and presss 66.0 66.0 25.0 25.0	71.0 71.0 25.0	70.0 70.0 25.0	41.0 25.0	49.0 25.0	60.0 89.0 25.0 120.0	5.69 Viscosity (1.196 Heat Capaci 0.955 Inhibitor no Gypsum 0.00 Anhydrite	5.60 CentiPoise) 0.826 ty (cal/ml/°C) 0.959 ceded (mg/L) HDTMP 0.00 HDTMP	
41 42 43 44 45 46 47 48 49 50 51 52 53 54	Initial T Final T Initial P Final P Use TP on Calcite sheet? API Oil Grav. Gas Sp.Grav. McOH/Day MEG/Day Conc. Multiplier H* (Strong acid) † OH* (Strong base) † Quality Control Checks at H ₂ S Gas Total H2Saq (STP)	ues for tempera (F) (F) (psia) (psia) 1-Yes;0-No API grav. Sp.Grav. (B/D) (N) (N) STP:	tures and presss 66.0 66.0 25.0 25.0	71.0 71.0 25.0	70.0 70.0 25.0	41.0 25.0	49.0 25.0	60.0 89.0 25.0 120.0	5.69 Viscosity (1.196 Heat Capaci 0.955 Inhibitor no Gypsum 0.00 Anhydrite	5.60 CentiPoise) 0.826 ty (cal/ml/°C) 0.959 ceded (mg/L) HDTMP 0.00 HDTMP	
41 42 43 44 45 46 47 48 49 50 51 52 53 54 55	Initial T Final T Initial P Final P Use TP on Calcite sheet? API Oil Grav. Gas Sp.Grav. MeOH/Day MEG/Day Conc. Multiplier H* (Strong acid) † OH' (Strong base) † Quality Control Checks at H ₂ S Gas Total H2Saq (STP) PH Calculated	ues for tempera (F) (F) (psia) (psia) 1-Yes;0-No API grav. Sp.Grav. (B/D) (N) (N) STP: (%) (mgH2S/I) (pH)	tures and presss 66.0 66.0 25.0 25.0	71.0 71.0 25.0	70.0 70.0 25.0	41.0 25.0	49.0 25.0	60.0 89.0 25.0 120.0	5.69 Viscosity (1.196 Heat Capaci 0.955 Inhibitor no Gypsum 0.00 Anhydrite	5.60 CentiPoise) 0.826 ty (cal/ml/°C) 0.959 ceded (mg/L) HDTMP 0.00 HDTMP	
41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56	Initial T Final T Initial P Final P Use TP on Calcite sheet? API Oil Grav. Gas Sp.Grav. MeOH/Day MEG/Day Conc. Multiplier H* (Strong acid) * OH* (Strong base) * Quality Control Checks at H ₂ S Gas Total H2Saq (STP) pH Calculated PCO2 Calculated	(F) (F) (psia) (psia) (1-Yes;0-No API grav. Sp.Grav. (B/D) (N) (N) STP: (%) (mgH2S/I) (PH) (%)	tures and presss 66.0 66.0 25.0 25.0	71.0 71.0 25.0	70.0 70.0 25.0	41.0 25.0	49.0 25.0	60.0 89.0 25.0 120.0	5.69 Viscosity (1.196 Heat Capaci 0.955 Inhibitor no Gypsum 0.00 Anhydrite	5.60 CentiPoise) 0.826 ty (cal/ml/°C) 0.959 ceded (mg/L) HDTMP 0.00 HDTMP	
41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57	Initial T Final T Initial P Final P Use TP on Calcite sheet? API Oil Grav. Gas Sp.Grav. MeOH/Day MEG/Day Conc. Multiplier H* (Strong acid) † OH (Strong base) † Quality Control Checks at H ₂ S Gas Total H2Saq (STP) pH Calculated PCO2 Calculated Alkalinity Caclulated	(F) (F) (psia) (1-Yes;0-No API grav. Sp.Grav. (B/D) (N) (N) STP: (%) (mgH2S/I) (pH) (%) (mg/I) as HCO3	tures and presss 66.0 66.0 25.0 25.0	71.0 71.0 25.0	70.0 70.0 25.0	41.0 25.0	49.0 25.0	60.0 89.0 25.0 120.0	5.69 Viscosity (1.196 Heat Capaci 0.955 Inhibitor no Gypsum 0.00 Anhydrite	5.60 CentiPoise) 0.826 ty (cal/ml/°C) 0.959 ceded (mg/L) HDTMP 0.00 HDTMP	
41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58	Initial T Final T Initial P Final P Use TP on Calcite sheet? API Oil Grav. Gas Sp.Grav. MeOH/Day MEG/Day Conc. Multiplier H* (Strong acid) * OH* (Strong base) * Quality Control Checks at H ₂ S Gas Total H2Saq (STP) pH Calculated PCO2 Calculated	(F) (F) (psia) (psia) (1-Yes;0-No API grav. Sp.Grav. (B/D) (N) (N) STP: (%) (mgH2S/I) (PH) (%)	tures and presss 66.0 66.0 25.0 25.0	71.0 71.0 25.0	70.0 70.0 25.0	41.0 25.0	49.0 25.0	60.0 89.0 25.0 120.0	5.69 Viscosity (1.196 Heat Capaci 0.955 Inhibitor no Gypsum 0.00 Anhydrite	5.60 CentiPoise) 0.826 ty (cal/ml/°C) 0.959 ceded (mg/L) HDTMP 0.00 HDTMP	
41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60	Initial T Final T Initial P Final P Use TP on Calcite sheet? API Oil Grav. Gas Sp.Grav. MeOH/Day MEG/Day Conc. Multiplier H* (Strong acid) * OH (Strong base) * Quality Control Checks at H ₂ S Gas Total H2Saq (STP) pH Calculated PCO2 Calculated Alkalinity Caclulated EXAnions= EXAnions= Calc TDS=	(F) (F) (psia) (psia) 1-Yes;0-No API grav. Sp.Grav. (B/D) (N) (N) STP: (%) (mgH2S/I) (pH) (%) (mg/I) as HCO3 (equiv./I)	tures and presss 66.0 66.0 25.0 25.0	71.0 71.0 25.0	70.0 70.0 25.0	41.0 25.0	49.0 25.0	60.0 89.0 25.0 120.0	5.69 Viscosity (1.196 Heat Capaci 0.955 Inhibitor no Gypsum 0.00 Anhydrite	5.60 CentiPoise) 0.826 ty (cal/ml/°C) 0.959 ceded (mg/L) HDTMP 0.00 HDTMP	
41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61	Initial T Final T Initial P Final P Use TP on Calcite sheet? API Oil Grav. Gas Sp.Grav. MeOH/Day MEG/Day Conc. Multiplier H* (Strong acid) * OH* (Strong base) * Quality Control Checks at H ₂ S Gas Total H2Saq (STP) pH Calculated PCO2 Calculated Alkalinity Caclulated 2Cations= 2Anions= Calc TDS= Inhibitor Selection	ues for tempera (F) (F) (psia) (psia) 1-Yes;0-No API grav. Sp.Grav. (B/D) (N) (N) STP: (%) (mgH2S/I) (pH) (%) (mg/I) as HCO3 (equiv./I) (equiv./I) (mg/I) Input	tures and pressures 66.0 66.0 25.0 25.0 0 0 0 Unit	71.0 71.0 25.0 25.0	70.0 70.0 25.0 25.0	41.0 25.0 25.0 Unit Converter	49.0 25.0 25.0	60.0 89.0 25.0 120.0 30.00 0.60 0	5.69 Viscosity (1.196 Heat Capaci 0.955 Inhibitor nc Gypsum 0.00 Anhydrite 0.00	5.60 CentiPoise) 0.826 ty (cal/ml/°C) 0.959 ceded (mg/L) HDTMP 0.00 HDTMP	
41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 60 61 62	Initial T Final T Initial P Final P Use TP on Calcite sheet? API Oil Grav. Gas Sp.Grav. MeOH/Day MEG/Day Conc. Multiplier H* (Strong acid) † OH (Strong base) † Quality Control Checks at H ₂ S Gas Total H2Saq (STP) pH Calculated PCO2 Calculated Alkalinity Caclulated \$\textit{Z}\text{calculated}\$ Alkalinity Caclulated \$\text{Z}\text{calculated}\$ Calc TDS= Inhibitor Selection Protection Time	(F) (F) (psia) (psia) (psia) 1-Yes;0-No API grav. Sp.Grav. (B/D) (N) (N) STP: (%) (mgH2S/I) (pH) (%) (mg/I) as HCO3 (equiv./I) (equiv./I) (mg/I)	tures and press 66.0 66.0 25.0 25.0	71.0 71.0 25.0 25.0	70.0 70.0 25.0 25.0 Inhibitor NTMP	41.0 25.0 25.0 Unit Converter	49.0 25.0 25.0 25.0	60.0 89.0 25.0 120.0 30.00 0.60 0	5.69 Viscosity (1.196 Heat Capaci 0.955 Inhibitor no Gypsum 0.00 Anhydrite 0.00	5.60 CentiPoise) 0.826 ty (cal/ml/°C) 0.959 ceded (mg/L) HDTMP 0.00 HDTMP	
41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63	Initial T Final T Initial P Final P Use TP on Calcite sheet? API Oil Grav. Gas Sp.Grav. MeOH/Day MEG/Day Conc. Multiplier H* (Strong acid) * OH (Strong base) * Quality Control Checks at H ₂ S Gas Total H2Saq (STP) pH Calculated PCO2 Calculated Alkalinity Caclulated 2Cations= 2Anions= Calc TDS= Inhibitor Selection Protection Time Have ScaleSoftPitzer	(F) (F) (psia) (psia) (psia) (1-Yes;0-No API grav. Sp.Grav. (B/D) (B/D) (N) (N) STP: (%) (mgH2S/I) (pH) (%) (mg/I) as HCO3 (equiv./I) (equiv./I) (equiv./I) (mg/I) Input 120	tures and pressures 66.0 66.0 25.0 25.0 0 0 0 Unit min	71.0 71.0 25.0 25.0 4 1 1 2	70.0 70.0 25.0 25.0 25.0 Inhibitor NTMP BHPMP	41.0 25.0 25.0 25.0 Unit Converter From Unit	49.0 25.0 25.0 25.0 (From metric Value 80	60.0 89.0 25.0 120.0 30.00 0.60 0	5.69 Viscosity (1.196 Heat Capaci 0.955 Inhibitor no Gypsum 0.00 Anhydrite 0.00	5.60 CentiPoise) 0.826 ty (cal/ml/°C) 0.959 ceded (mg/L) HDTMP 0.00 HDTMP	
41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64	Initial T Final T Initial P Final P Use TP on Calcite sheet? API Oil Grav. Gas Sp.Grav. McOH/Day MEG/Day Conc. Multiplier H* (Strong acid) † OH (Strong base) † Quality Control Checks at H ₂ S Gas Total H2Saq (STP) pH Calculated PCO2 Calculated Alkalinity Caclulated 2Cations= EAnions= Calc TDS= Inhibitor Selection Protection Time Have ScaleSoftPitzer pick inhibitor for you?	(F) (F) (psia) (psia) (1-Yes;0-No API grav. Sp.Grav. (B/D) (N) (N) STP: (%) (mgH2S/I) (pH) (%) (mg/I) as HCO3 (equiv./I) (equiv./I) (mg/I) Input 120	tures and pressures 66.0 66.0 25.0 25.0 0 0 0 0 Unit min	71.0 71.0 25.0 25.0 4 1 1 2 3	Inhibitor NTMP BHPMP PAA	41.0 25.0 25.0 25.0 Unit Converter From Unit °C m³	49.0 25.0 25.0 25.0 (From metric Value 80 100	60.0 89.0 25.0 120.0 30.00 0.60 0 0 To Unit	5.69 Viscosity (1.196 Heat Capaci 0.955 Inhibitor no Gypsum 0.00 Anhydrite 0.00 Value 176 3,531	5.60 CentiPoise) 0.826 ty (cal/ml/°C) 0.959 ceded (mg/L) HDTMP 0.00 HDTMP	
41 42 43 44 45 46 47 48 49 50 51 52 53 53 54 55 56 67 75 88 89 60 61 62 63 64 65	Initial T Final T Initial P Final P Use TP on Calcite sheet? API Oil Grav. Gas Sp.Grav. MeOH/Day MEG/Day Conc. Multiplier H† (Strong acid) † OH' (Strong base) † Quality Control Checks at H ₂ S Gas Total H2Saq (STP) pH Calculated PCO2 Calculated Alkalinity Caclulated 2Cations= EAnions= Calc TDS= Inhibitor Selection Protection Time Have ScaleSoftPitzer pick inhibitor for you? If No, inhibitor # is:	(F) (F) (psia) (psia) (psia) (1-Yes;0-No API grav. Sp.Grav. (B/D) (B/D) (N) (N) STP: (%) (mgH2S/I) (pH) (%) (mg/I) as HCO3 (equiv./I) (equiv./I) (equiv./I) (mg/I) Input 120	tures and pressures 66.0 66.0 25.0 25.0 0 0 0 Unit min	71.0 71.0 25.0 25.0 4 # 1 2 3	Inhibitor NTMP BHPMP PAA DTPMP	Unit Converter From Unit °C m³ m³	49.0 25.0 25.0 25.0 (From metric Value 80 100 100	60.0 89.0 25.0 120.0 30.00 0.60 0 0 To Unit "F ft"3 bbl(42 US gal)	5.69 Viscosity (1.196 Heat Capaci 0.955 Inhibitor no Gypsum 0.00 Anhydrite 0.00 Value 176 3,531 629	5.60 CentiPoise) 0.826 ty (cal/ml/°C) 0.959 ceded (mg/L) HDTMP 0.00 HDTMP	
41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 67 78 88 60 61 62 63 64 65 66	Initial T Final T Initial P Final P Use TP on Calcite sheet? API Oil Grav. Gas Sp.Grav. MeOH/Day MEG/Day Conc. Multiplier H* (Strong acid) * OH* (Strong acid) * OH* (Strong base) * Quality Control Checks at H ₂ S Gas Total H2Saq (STP) pH Calculated PCO2 Calculated Alkalinity Caclulated Alkalinity Caclulated ECations= EAnions= Calc TDS= Inhibitor Selection Protection Time Have ScaleSoftPitzer pick inhibitor for you? If No, inhibitor # is: If you select Mixed,	(F) (F) (psia) (psia) 1-Yes;0-No API grav. Sp.Grav. (B/D) (N) (N) (N) STP: (%) (mgH2S/I) (pH) (mg/I) as HCO3 (equiv./I) (mg/I) Input 120 1 4	tures and press 66.0 66.0 25.0 25.0 0 0 0 1-Yes;0-No #	71.0 71.0 25.0 25.0 4 1 2 3 4 5	Inhibitor NTMP BHPMP PAA DTPMP PPCA	Unit Converter From Unit °C m³ m³ MPa	49.0 25.0 25.0 25.0 (From metric Value 80 100 1,000	60.0 89.0 25.0 120.0 30.00 0.60 0 0 To Unit "F ft"3 bbl(42 US gal)	Value 176 3,531 629 145,074	5.60 CentiPoise) 0.826 ty (cal/ml/°C) 0.959 ceded (mg/L) HDTMP 0.00 HDTMP	
41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 67 60 61 62 63 64 65 66 66	Initial T Final T Initial P Final P Use TP on Calcite sheet? API Oil Grav. Gas Sp.Grav. MeOH/Day MEG/Day Conc. Multiplier H* (Strong acid) * OH' (Strong base) * Quality Control Checks at H ₂ S Gas Total H2Saq (STP) pH Calculated PCO2 Calculated Alkalinity Caclulated Alkalinity Caclulated EXATIONS= Calc TDS= Inhibitor Selection Protection Time Have ScaleSoftPitzer pick inhibitor for you? If No, inhibitor # is: If you select Mixed, 1st inhibitor # is:	(F) (F) (psia) (1-Yes;0-No API grav. Sp.Grav. (B/D) (N) (N) STP: (%) (mgH2S/I) (pH) (%) (mg/l) as HCO3 (equiv./I) (mg/l) Input 120 1 4	Unit min 1-Yes;0-No #	# # 1 2 3 4 4 5 6	Inhibitor NTMP BHPMP PAA DTPMP PPCA SPA	Unit Converter From Unit °C m³ m³ MPa Bar	49.0 25.0 25.0 25.0 	60.0 89.0 25.0 120.0 30.00 0.60 0 0 0 To Unit "F ft ³ bbl(42 US gal) psia	5.69 Viscosity (1.196 Heat Capaci 0.955 Inhibitor no Gypsum 0.00 Anhydrite 0.00 Value 176 3,531 629 145,074 7,194	5.60 CentiPoise) 0.826 ty (cal/ml/°C) 0.959 ceded (mg/L) HDTMP 0.00 HDTMP	
41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 67 63 64 65 66 67 68	Initial T Final T Initial P Final P Use TP on Calcite sheet? API Oil Grav. Gas Sp.Grav. MeOH/Day MEG/Day Conc. Multiplier H* (Strong acid) † OH (Strong base) † Quality Control Checks at H ₂ S Gas Total H2Saq (STP) pH Calculated PCO2 Calculated Alkalinity Caclulated SCations= EAnions= Calc TDS= Inhibitor Selection Protection Time Have ScaleSoftPitzer pick inhibitor for you? If No, inhibitor # is: If you select Mixed, 1st inhibitor is:	(F) (F) (psia) (psia) 1-Yes;0-No API grav. Sp.Grav. (B/D) (N) (N) STP: (%) (mgH2S/I) (pH) (%) (mg/I) as HCO3 (equiv./I) (equiv./I) (mg/I) Input 120 1 4 1 50	Unit min 1-Yes;0-No # # %	# # 1 2 3 4 4 5 6 6 7	Inhibitor NTMP BHPMP PAA DTPMP PPCA SPA HEDP	Unit Converter From Unit °C m³ m³ MPa Bar Torr	49.0 25.0 25.0 25.0 25.0 	60.0 89.0 25.0 120.0 30.00 0.60 0 0 0 To Unit "F ft ³ bbl(42 US gal) psia psia	5.69 Viscosity (1.196 Heat Capaci 0.955 Inhibitor no Gypsum 0.00 Anhydrite 0.00 Value 176 3,531 629 145,074 7,194 193	5.60 CentiPoise) 0.826 ty (cal/ml/°C) 0.959 ceded (mg/L) HDTMP 0.00 HDTMP	
41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 67 62 63 64 65 66 67 68 69	Initial T Final T Initial P Final P Use TP on Calcite sheet? API Oil Grav. Gas Sp.Grav. MeOH/Day MEG/Day Conc. Multiplier H* (Strong acid) † OH (Strong base) † Quality Control Checks at H ₂ S Gas Total H2Saq (STP) pH Calculated Alkalinity Caclulated PCO2 Calculated Alkalinity Caclulated EXAnions= Calc TDS= Inhibitor Selection Protection Time Have ScaleSoftPitzer pick inhibitor for you? If No, inhibitor for you? If you select Mixed, 1st inhibitor # is: % of 1st inhibitor is: % of 1st inhibitor is: 2nd inhibitor is:	(F) (F) (psia) (psia) (1-Yes;0-No API grav. Sp.Grav. (B/D) (N) (N) STP: (%) (mgH2S/I) (pH) (%) (mg/I) as HCO3 (equiv./I) (equiv./I) (mg/I) Input 120 1 4 1 50 2	Unit min 1-Yes;0-No # # % #	## 1 2 3 4 4 5 6 6 7 8	Inhibitor NTMP BHPMP PAA DTPMP PPCA SPA HEDP HDTMP	Unit Converter From Unit °C m³ MPa Bar Torr Gal	49.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25	60.0 89.0 25.0 120.0 30.00 0.60 0 0 10 10 10 10 10 10 10 10 10 10 10 1	5.69 Viscosity (1.196 Heat Capaci 0.955 Inhibitor ne Gypsum 0.00 Anhydrite 0.00 Value 176 3,531 629 145,074 7,194 193 238	5.60 CentiPoise) 0.826 ty (cal/ml/°C) 0.959 ceded (mg/L) HDTMP 0.00 HDTMP	
41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 67 62 63 64 65 66 67 68 69	Initial T Final T Initial P Final P Use TP on Calcite sheet? API Oil Grav. Gas Sp.Grav. MeOH/Day MEG/Day Conc. Multiplier H* (Strong acid) † OH (Strong base) † Quality Control Checks at H ₂ S Gas Total H2Saq (STP) pH Calculated PCO2 Calculated Alkalinity Caclulated SCations= EAnions= Calc TDS= Inhibitor Selection Protection Time Have ScaleSoftPitzer pick inhibitor for you? If No, inhibitor # is: If you select Mixed, 1st inhibitor is:	(F) (F) (psia) (psia) 1-Yes;0-No API grav. Sp.Grav. (B/D) (N) (N) STP: (%) (mgH2S/I) (pH) (%) (mg/I) as HCO3 (equiv./I) (equiv./I) (mg/I) Input 120 1 4 1 50	Unit min 1-Yes;0-No # # %	# # 1 2 3 4 4 5 6 6 7	Inhibitor NTMP BHPMP PAA DTPMP PPCA SPA HEDP	Unit Converter From Unit °C m³ m³ MPa Bar Torr	49.0 25.0 25.0 25.0 25.0 	60.0 89.0 25.0 120.0 30.00 0.60 0 0 0 To Unit "F ft ³ bbl(42 US gal) psia psia	5.69 Viscosity (1.196 Heat Capaci 0.955 Inhibitor no Gypsum 0.00 Anhydrite 0.00 Value 176 3,531 629 145,074 7,194 193	5.60 CentiPoise) 0.826 ty (cal/ml/°C) 0.959 ceded (mg/L) HDTMP 0.00 HDTMP	

Saturation Index Calculations

Champion Technologies, Inc. (Based on the Tomson-Oddo Model)

Brine 1: Ward Feed Yard 34-1 Brine 2: Ward Feed Yard 4-1 Brine 3: Clinesmith 5-4 Brine 4: Clinesmith 1 Brine 5: Clinesmith 2

			Ratio			
	20%	20%	20%	20%	20	
Component (mg/L)	Brine 1	Brine 2	Brine 3	Brine 4	Brine 5	Mixed Brine
Calcium	1836	2452	2044	1920	1948	1952
Magnesium	1096	872	1200	953	858	865
Barium	0	0	0	0	0	0
Strontium	0	0	0	0	0	0
Bicarbonate	190	234	259	268	254	253
Sulfate	1	1	8	1	1	1
Chloride	36299	48965	47874	45632	43147	43206
CO ₂ in Brine	246	220	264	422	405	401
Ionic Strength	1.12	1.48	1.46	1.38	1.31	1.31
Temperature (°F)	89	89	89	89	89	89
Pressure (psia)	50	50	120	120	120	119

Saturation Index

Calcite	-1.71	-1.41	-1.48	-1.68	-1.69	-1.69
Gypsum	-3.71	-3.64	-2.82	-3.73	-3.72	-3.69
Hemihydrate	-3.70	-3.65	-2.83	-3.74	-3.71	-3.69
Anhydrite	-3.89	-3.79	-2.97	-3.89	-3.88	-3.85
Barite	N/A	N/A	N/A	N/A	N/A	N/A
Celestite	N/A	N/A	N/A	N/A	N/A	N/A

PTB

Calcite	N/A	N/A	N/A	N/A	N/A	N/A
Gypsum	N/A	N/A	N/A	N/A	N/A	N/A
Hemihydrate	N/A	N/A	N/A	N/A	N/A	N/A
Anhydrite	N/A	N/A	N/A	N/A	N/A	N/A
Barite	N/A	N/A	N/A	N/A	N/A	N/A
Celestite	N/A	N/A	N/A	N/A	N/A	N/A



Wellbore Schematic

TOC - Surface

WELL: Varner, Roy E 29-2

SSI: 615360

API: 15-205-26742-00-00 **LOCATION:** SE NE Secc. 29-27S-16E

COUNTY: Wilson

	STATE: Kansas		
Casing	8.625" @ 22' 4.5'' 10.5# J-55, 4.05'' ID w/ 0.0159 bbl/ft capacity @ 1305'		
Perforations	Original Perfs: 7/5/2006 - Weir 1074-1077 (13) - Fleming 965-967 (9) - Croweburg 929-932 (13) - Bevier 913-915 (9) - Mulky 833-837 (17) - Summit 824-828 (17)		8.625" @ 22'
Completions	Spud Date: 6/14/2006 Completion date: 7/5/2006 Weir/Flem/Crowe/Bevier: - 16000# 20/40 - 400 gal 15% - 850 bbls - 14 bpm Mulky/Summit: - 13800# 20/40 - 400 gal 15% - 600 bbls - 14bpm	TD - 1313'	4.5" 10.5# @ 1305' 161 sks cement

VARNER, ROY E 29-2

I NAME & UPPE	R & LOWER LIMIT OF EACH PRODU	ICTION INTERVAL TO BE C	DIVIIVIING	LED			
FORMATION:	SUMMIT	(PERFS):	824 -	- 828			
FORMATION:	SQUIRREL	(PERFS):	866 -	872			
FORMATION:		(PERFS):	-	-			
FORMATION:		(PERFS):		- <u></u>			
FORMATION:		(PERFS):		-			
FORMATION:		(PERFS):		-			
FORMATION:		(PERFS):		- <u></u>			
FORMATION:		(PERFS):		- <u></u>			
FORMATION:		(PERFS):		-			
FORMATION:		(PERFS):		- <u></u>			
FORMATION:		(PERFS):					
FORMATION:		(PERFS):		-			
2 ESTIMATED AN	MOUNT OF FLUID PRODUCTION TO	BE COMMINGLED FROM	EACH INT	ERVAL			
FORMATION:	SUMMIT	BOPD:	0	MCFPD:	0.5	BWPD:	6.67
FORMATION:	SQUIRREL	BOPD:	3	MCFPD:	0	BWPD:	20
FORMATION:		BOPD:		MCFPD:		BWPD:	
FORMATION:		BOPD:		MCFPD:		BWPD:	
FORMATION:		BOPD:		MCFPD:		BWPD:	
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FORMATION:		BOPD:		MCFPD:		BWPD:	
						_	

AFFIDAVIT

STATE OF KANSAS

SS.

County of Sedgwick

Mark Fletchall, of lawful age, being first duly sworn, deposeth and saith: That he is Record Clerk of The Wichita Eagle, a daily newspaper published in the City of Wichita, County of Sedgwick, State of Kansas, and having a general paid circulation on a daily basis in said County, which said newspaper has been continuously and uninterruptedly published in said County for more than one year prior to the first publication of the notice hereinafter mentioned, and which said newspaper has been entered as second class mail matter at the United States Post Office in Wichita, Kansas, and which said newspaper is not a trade, religious or fraternal publication and that a notice of a true copy is hereto attached was published in the regular and entire Morning issue of said The Wichita Eagle for _1_ issues, that the first publication of said notice was

made as aforesaid on the 19th of

July A.D. 2012, with

subsequent publications being made on the following dates:

And affiant further says that he has personal knowledge of the statements above set forth and that they are true.

Subscribed and sworn to before me this

19th day of July, 2012

PENNY L. CASE 回台 Notary Public My Appt. Expires

Notary Public Sedgwick County, Kansas

Printer's Fee: \$132.40

LEGAL PUBLICATION

PUBLISHED IN THE WICHITA EAGLE
JULY 19, 2012 (3196748)
BEFORE THE STATE CORPORATION
COMMISSION OF THE STATE OF KANSAS
NOTICE OF FILING APPLICATION
RE: In the Matter of Postrock Midcontinent
Production, LLC Application for
Commingling of Production in the
Varner, Roy E 29-2 located in Wilson
County, Kansas.
To: All Oil 8 Gas Producers, Unleased Mineral
Interest Owners, Landowners, and all
persons whomever concerned.
You, and each of you, are hereby notified
that Postrock Midcontinent Production, LLC
has filled an application to commingle the Weir,
Fleming, Croweburg, Bevier, Mulky, Summit
and Squirret producing formations at the
Varner, Roy E 29-2, located in the S2 SE NE,
S29-T27S-R16E, Approximately 2238 FNL &
664 FEL, Wilson County, Kansas.
Any persons who object to or protest
this application shall be required to file their
objections or protest with the Conservation
Division of the State Corporation Commission
of the State of Kansas within fifteen (15)
days from the date of this publication. These
protests shall be filed pursuant to Commission
of the State of Kansas within fifteen (15)
days from the date of this publication. These
protests shall be filed pursuant to Commission
of the State of Kansas within fifteen (15)
days from the date of this publication. These
protests shall be filed pursuant to Commission
of the State of Kansas.
All persons interested or concerned shall
take notice of the foregoing and shall govern
themselves. accordingly. All person and/or
companies wishing to protest this application
are required to file a written protest, with the
Conservation Division of the Kansas Oil and
Gas Commission.

Gas Commission.

Gas Commission.

Upon the receipt of any protest, the Commission will convene a hearing and protestants will be expected to enter an appearance either through proper legal counsel or as individuals, appearing on their own behalf.

Postrock Midcontinent Production, LLC Postrock Midcontinent Production, LLC 210 Park Ayenue, Suite 2750 Oklahoma City, Oklahoma 73102 (405) 660-7704 A COPY OF THE AFFIDAVIT OF PUBLICATION MUST ACCOMPANY ALL APPLICATIONS

PROOF OF PUBLICATION

STATE OF KANSAS Wilson County - SS

JOSEPH S. and RITA M. RELPH, of lawful age, being duly sworn upon oath that they are the Owners and Publishers of the WILSON COUNTY CITIZEN:

THAT said newspaper has been published at least weekly fifty (50) times a year and has been so published for at least five years prior to the first publication of the attached notice:

THAT said newspaper is a general circulation on a daily, or weekly, or monthly, or yearly basis in;

WILSON COUNTY, KANSAS and is NOT a trade, religious or fraternal publication and has been PRINTED and PUBLISHED in Wilson County, Kansas.

THE ATTACHED was published on the following dates

in a regular issue of said newspaper:

in a regular issue of said new	spaper.
1st publication was made on the	19th day of July 2012
	July 20 12
2nd publication was made on the	//
	. 20
3rd publication was made on the	day of
	. 20
4th publication was made on the	day of

TOTAL PUBLI (Signed)

Subscribed and sworm to before me, this

6th publication was made on the

5th publication was made on the___

My commission expires

day of

day of

(Published in the Wilson County Citizen on Thursday, July 19, 2012.)

BEFORE THE STATE CORPORATION COMMISSION OF THE STATE OF KANSAS

NOTICE OF FILING APPLICATION

RE. In the Matter of Postrock Midcontinent Production, LLC Application for Comminging of Production in the Varner, Roy E 29-2 located in Wilson County, Kansas,

TO: All Oil & Gas Producers, Unleased Mineral Interest Owners, Landowners, and all persons whomever concerned,

You, and each of you, are hereby notified that Postrock Midcontinent Production, LLC has filed an application to commingle the Weir, Fleming. Croweburg, Bevier, Mulky, Summit and Squirrel producing formations at the Varner, Roy E 29-2, located in the S2 SE NE, S29-T27S-R16E, Approximately 2238 FNL & 664 FEL, Wilson County, Kansas.

Any persons who object to or protest this application shall be required to file their objections or protest with the Conservation Division of the State Corporation Commission of the State of Kansas within fifteen (15) days from the date of this publication. These protests shall be filed pursuant to Commission regulations and must state specific reasons why granting the application may cause waste, violate correlative rights or pollute the natural resources of the State of Kansas.

All persons interested or concerned shall take

notice of the foregoing and shall govern them-selves accordingly. All person and/or companies wishing to protest this application are required to file a written protest with the Conservation Divi-sion of the Kansas Oil and Gas Commission.

Upon the receipt of any protest, the Commission will convene a hearing and protestants will be expected to enter an appearance either through proper legal counsel or as individuals, appearing on their own behalf.

Postrock Midcontinent Production, LLC 210 Park Avenue, Suite 2750 Oklahoma City, Oklahoma 73102 (405) 660-7704 44 1 cpy.

Rita M. Relph NOTARY PUBLIC State of Kansas STATE OF KANSAS My Commission Expires

Affidavit of Notice Served			
Re: Application for: APPLICATION FOR COMMINGLING OF PRODUCTION OR FLUIDS ACO-4			
Well Name: VARNER, ROY E 29-2	Legal Location: S2SENE S29-T27S-R16E		
The undersigned hereby certificates that he / she is a duly authorized agent fo	. A #		
2012 , a true and correct copy of the application referenced above was delivered or mailed to the following parties:			
, a true and correct copy or the application releienced above was delivered or mailed to the following parties.			
Note: A copy of this affidavit must be served as a part of the application.			
Name	Address (Attach additional sheets if necessary)		
DART CHEROKEE BASIN, LLC	600 DART RD., PO BOX 177, MASON, MI 48854		
H & M PRODUCTION LLC	7230 W 162ND ST., STE A, STILWELL, KS 66085		
SPARTAN OPERATING CO., LLC	915 NORTH WASHINGTON AVE, LANSING, MI 48906		
I further attest that notice of the filing of this application was published in the WILSON COUNTY CITIZEN , the official county publication			
of county. A copy of the affidavit of this publication is attached.			
. e.l.i			
Signed this	12		
	Coff I Morris		
	plicant or Duly Authorized Agent fore me this 151 day of AUGUST 2012		
Subscribed and sworn to be	fore me this		
JENNIFER R. BEAL NO	Dungle of Beal		
MY COMMISSION EXPIRES	Commission Expires:		
1-30-3016 My	Commission Expires:		
	·		

VARNER, ROY E 29-2 - APPLICATION FOR COMMINGLING OF PRODUCTION OR FLUIDS

Offset Operators, Unleased Mineral Owners and Landowne Altach additional sheets if necessary) Name:	rs acreage Legal Description of Leasehold	<u> </u>
SEE ATTACHED	Edgal Document of Eddonors	•
	 -	
ereby certify that the statements made herein are true and correct	Constitution for the second se	
	Des L Mouris	and the same of th
	Applicant or Duly Authorized Algent	
Subscribed an	nd sworn before me this 14th day of AUGUST	,2012
	Sunger R Beal	
JENNIFER R. BEAL OFFICIAL MY COMMISSION EXPIRES		
T-20-20//	My Commission Expires: Quely 20, 20	16
La Carlo	0,0	

20,21,28,29-27S-16E

all unleased tracts

Dart Cherokee Basin, LLC 600 Dart Rd., P.O. Box 177 Mason, MI 48854

H & M Productions, LLC 7230 W. 162nd St., Ste. A Stilwell, KS 66085

Spartan Operating Co., LLC 915 North Washington Ave. Lansing, MI 48906 Conservation Division Finney State Office Building 130 S. Market, Rm. 2078 Wichita, KS 67202-3802



Phone: 316-337-6200 Fax: 316-337-6211 http://kcc.ks.gov/

Sam Brownback, Governor

Mark Sievers, Chairman Thomas E. Wright, Commissioner

August 29, 2012

Clark Edwards
PostRock Midcontinent Production LLC
Oklahoma Tower
210 Park Ave, Ste 2750
Oklahoma City, OK 73102

RE: Approved Commingling CO081214

Varner, Roy E. 29-2, Sec.29-T27S-R16E, Wilson County

API No. 15-205-26742-00-00

Dear Mr. Edwards:

Your Application for Commingling (ACO-4) for the above described well, received by the KCC on August 14, 2012, has been reviewed and approved by the Kansas Corporation Commission (KCC) per K.A.R. 82-3-123. Notice was examined and found to be proper per K.A.R. 82-3-135a. No protest had been filed within the 15-day protest period.

Based upon the depth of the Weir formation perforations, total oil production shall not exceed 100 BOPD and total gas production shall not exceed 50% of the absolute open flow (AOF).

File form ACO-1 upon re-completion of the well to commingle.

Commingling ID number CO081214 has been assigned to this approved application. Use this number for well completion reports (ACO-1) and other correspondence that may concern this approved commingling.

Sincerely,

Rick Hestermann Production Department