# **Well Release Checksheet**

Report Date	11/19/2018	Well File Number	11409
Well Operator	DENBURY ONSHORE, LLC	Location 22-131N-105W NENW, 1248' FNL	, 1654' FWL
Well Name	CEDAR HILLS 21-22	County	BOWMAN

## **Final Inspection Report**

Well Status	Dry Hole	Date Well Status	12/12/2015
Restoration Status	Approved For Release	Field OK For Release Date	7/16/2018
Land Use	PASTURE	Site Contractor	
Restoration Waiver	No		
Restoration Notes	Grown in nicely, and lease road was for a pr	eviously drilled well.	
		Inspector John Sandven	
		Initials <u>TDV/TJM</u>	

## **File Check**

	RBDMS		RBDMS	File	Review Notes
Completion Report			NA	N/A	
Plugging Report 🛩			1-2	Rec'd 12	-12-15/1985 (well file)
Drill Stem Tests			2	Rec'd No	date
Geological Report			Yes	Rur.'d 2015	(Well file re-entry)
Core Analysis V			Yes 12-9-15	Rec'd 4-	8-85
Logs Available 1		CND, D	DLL, DTS, DTSM, LL	Recd	
Other Required or Requested Information		3.	20-85 3-20-85		Initials AD
<b></b>	- ·	· · · · · · · · · · · ·		• • • • • • • • • •	·
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	<b>.</b>			· · · · · ·	
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# **Bond Information**

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NDIC Bond Number	D350 Bond Type Unit Blanket Bond	Bond Amount \$100,000.00
Surety Company	LIBERTY MUTUAL INS. CO.	Bond Status Active
Date Well Released	1-2-19	Initials <u> </u>

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600 EAS	GAS DIVISION T BOULEVARD DEP CK, ND 58505-0840 (09-2006)	T 405	193031-123.	101691011		Well	File No. 1140	09
PLEASE READ INSTRUCTION PLEASE SUBMIT THE ORIGIN		DUT FORM. 92 52	RECEIVI	ED N				
Notice of Intent	Approximate Start	10	DIVISION	rilling Prognosis		Spill Re	port	
			Nº CIAN	edrilling or Repai	ir	Shootin		
Report of Work Done	Date Work Comple		-	asing or Liner		Acidizin	9	
	January 6, 201	16		ug Well		Fracture	e Treatment	
Notice of Intent to Begin	a Workover Project that	t may Qualify	🗌 🗆 St	upplemental Hist	ory	Change	Production	Method
for a Tax Exemption Pure	Approximate Start			emporarily Abanc	ion	Z Reclam	ation	
Mall Name and Number								
Vell Name and Number Cedar Hills 21-22					-	24-HOUR PRO Before	T	RATE
ootages	Qtr-		Township	Range	Oil	Bbls	Oil	Bbls
2080 F N L 1	654 FW L NE	ENW 22	County	105 W	Water Gas		Water Gas	Bbls MCF
Cedar Hills		Red River B	Bowman		Loas	MGF	loas	IVICE
Trotter Construction		DETA	City Butte	ĸ	1.000	tate ID	Zip ( 586	Code 534
Trotter Construction Address 12651 2nd St. SW Denbury Onshore, LLC isted above. Work dor	included: mobi	reclamation wo	Butte ILS OF WOR ork for the su	bject was cable topsoil,	ompleted reclaim	ID d 01/06/2016 road and loo	by the contact	ontractor
Trotter Construction Address 12651 2nd St. SW Denbury Onshore, LLC listed above. Work dor topsoil was re-spread o	ne included: mobi on all reclaimed a	reclamation wo	Butte ILS OF WOR ork for the su	bject was cable topsoil,	ompleted reclaim	ID d 01/06/2016 road and loo	by the contact	ontractor
Trotter Construction Address 12651 2nd St. SW Denbury Onshore, LLC listed above. Work dor topsoil was re-spread of done per NDIC guidelin	ne included: mobi on all reclaimed a	reclamation wo	Butte ILS OF WOR ork for the su t, strip availa entire reclain	bject was cable topsoil,	ompleted reclaim	ID d 01/06/2016 road and loo	by the co cation. The control of the	ontractor he irk was
Trotter Construction Address 12651 2nd St. SW Denbury Onshore, LLC listed above. Work dor topsoil was re-spread of done per NDIC guidelin done per NDIC guidelin	ne included: mobi on all reclaimed a	reclamation wo ilize equipmen reas. Seeded	Butte ILS OF WOR ork for the su t, strip availa entire reclain entire reclain Telephon (972) 6	e Number 73-2893	ompleted reclaim I The rese	ID d 01/06/2016 road and loc red and recl	by the co cation. The control of the	ontractor he rk was
Trotter Construction Address 12651 2nd St. SW Denbury Onshore, LLC listed above. Work dor topsoil was re-spread of done per NDIC guidelin done per NDIC guidelin Sompany Denbury Onshore, LLC ddress 320 Legacy Drive	ne included: mobi on all reclaimed a	reclamation wo ilize equipment reas. Seeded	Butte ILS OF WOR ork for the su t, strip availa entire reclain reclain Telephon (972) 6	e Number 73-2893	ompleted reclaim I The rese	ID d 01/06/2016 road and loo red and recla	by the co cation. The aimed wo	ontractor he rk was
Trotter Construction Address 12651 2nd St. SW Denbury Onshore, LLC listed above. Work dor topsoil was re-spread of done per NDIC guidelin done per NDIC guidelin Sompany Denbury Onshore, LLC ddress 320 Legacy Drive	e included: mobi on all reclaimed a es.	reclamation wo ilize equipment reas. Seeded State TX	Butte ILS OF WOR ork for the su t, strip availa entire reclain entire reclain Telephon (972) 6	e Number 73-2893	ompleted reclaim The rese The rese Date By	ID d 01/06/2016 road and loc red and recta FOR STATI aceived 2 - 1 - 18	by the contraction. The second	ontractor he rk was r v oved
Name of Contractor(s) Trotter Construction Address 12651 2nd St. SW Denbury Onshore, LLC listed above. Work dor topsoil was re-spread of done per NDIC guidelin Company Denbury Onshore, LLC address 320 Legacy Drive City Plano Cignature Cig	Pe included: mobi on all reclaimed a es.	reclamation wo ilize equipment reas. Seeded	Butte ILS OF WOR ork for the su t, strip availa entire reclain reclain Telephon (972) 6	e Number 73-2893	ompleted reclaim The rese The rese Date By	ID d 01/06/2016 road and loo red and recla red and recla reclassion reclassio	by the contraction. The second	ontractor he rk was r v oved



#### **PLUGGING REPORT - FORM 7**

INDUSTRIAL COMMISSION OF NORTH DAKOTA OIL AND GAS DIVISION 600 EAST BOULEVARD DEPT 405 BISMARCK, ND 58505-0840 SFN 2467 (03-2004)

#### PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.

# DI EASE SUBMIT THE ORIGINAL AND ONE COPY

# Received

Well File No. 11409

FEB 1 8 2016

# ND Oil & Gas Division

		Telephone Number (972) 673-2893	Well Name and Number Cedar Hills 21-22	
Address 5320 Legacy Drive			Field Cedar Hills	
City Plano	State TX	Zip Code <b>75024</b>	Deepest Pool Penetrated South Red River B	

#### LOCATION

At Surface 1248 F N L	1654 F W L	Qtr-Qtr NENW	Section 22	Township 131 N	Range 105 W	County Bowman
Bottom Hole Location 1248 F N L	1654 F W L	Qtr-Qtr NENW	Section 22	Township 131 N	Range 105 W	County Bowman
Spud Date February 28, 1985		Elevation TD (Fee 2956 95	· ·	200	o. of DSTs ee Back) 2	Directional Survey Run?
Type of Electric and Other Log DLL, CDL, CND	s Run (See Instructions)		Was Well C List Interval		9328-	
Weight of Fluid Between Plugs	s (Lbs/Gal) <b>10 ppg</b>	Name of Matt T	•	tor Present Durir	ng Plugging	
Date Well Plugged	Drilling Contractor and Rig Number	Plugging Contract	• •			

December 12, 2015 | Trinidad 35 Schlumberger/Denbury supervised the plugging

#### CASING RECORD (Report all strings set in well)

Casing Size (Inches)	Measured Depth Set (Feet)	Amount Pulled	Hole Size (Inches)	Weight (Lbs/Ft)	Sacks Cement	Top of Cement
8 5/8	2018		9 7/8	24	860	surface

#### **ATTEMPTED COMPLETION DATA (If not previously reported)**

Perforations	Holes Per Foot	Swab/Prod. Potential (Oil/Water)	Acid, Frac, Sqz, Etc.	Amount and Kind of Material Used

#### **PLUGGING RECORD**

Type of Plug	Interval/Depth	Formation Isolated	Sacks of Cement/Class
Cement Plug	8788-9488	Red River A, B, C, & D	203 sacks class G
Cement Plug	8102-8402		50 sacks class G
Cement Plug	7087-7387		50 sacks class G
Cement Plug	6045-6345		50 sacks class G
Cement Plug	3700-4200		50 sacks class G
Cement Plug	1780-2080		50 sacks class G
Cement Plug	25-120		50 sacks class G

Page 2 SFN 2467 (03-2004)

#### DRILL STEM TEST DATA (IF NOT PREVIOUSLY REPORTED), ADDITIONAL INFORMATION, AND/OR LIST OF ATTACHMENTS

I hereby swear or affirm that the information provided	is true, complete and correct as determined from all	available records.	Date 02/17/2016
Signature - //	Printed Name	Title	
Aran Pape	Diana George	Regulatory Compliance	e Specialist
Above Signature Witnessed By			
Witness Signature	Witness Printed Name	Witness Title	
Pat alhan	Pat Calhoun	Field Clerk	

OIL AND GAS D 600 EAST BOUL BISMARCK, ND SFN 5749 (09-2006	EVARD DEPT 405 58505-0840			aceived 1 8 2016	Well	File No. 11409	
PLEASE READ INSTRUCTIONS BEFO PLEASE SUBMIT THE ORIGINAL AND			ND OII &	Gas Divis	lon		
Notice of Intent     App	proximate Start Date		<ul> <li>Drilling Prognosis</li> <li>Redrilling or Repai</li> </ul>				
■ Notice of Intent to Begin a Worke for a Tax Exemption Pursuant to			<ul> <li>Casing or Liner</li> <li>Plug Well</li> <li>Supplemental Histor</li> <li>Temporarily Abance</li> </ul>	C C ory C	Fracture Change Reclama	Production Me	hod
Well Name and Number				24-1	HOUR PRO	DUCTION RAT	E
Cedar Hills 21-22		17.0	In the second se	Bef		Afte	
Footages 1248 F N L 1654	FWL Qtr-Qtr Section		vnship Range 131 N 105 W	Oil Water	Bbls Bbls	Oil Water	Bbls Bbls
Field	Pool		County	Gas	MCF	Gas	MCF
Cedar Hills	South Red River B	·	Bowman				
Name of Contractor(s)							
Address			City	State	_	Zip Coc	e
	D		OF WORK				
work done.							
Denbury Onshore, LLC Address			Telephone Number (972) 673-2893	4.5		E USE ONLY	ed
Denbury Onshore, LLC Address 5320 Legacy Drive		State	Telephone Number (972) 673-2893 Zip Code	Date			ed
Company Denbury Onshore, LLC Address 5320 Legacy Drive City Plano Signature	Printed Name Diana Geor	ТХ	(972) 673-2893	Receiv			ed
Denbury Onshore, LLC Address 5320 Legacy Drive City Plano	Diana Geor	TX rge	(972) 673-2893	Date			ed

Denbury C	>							•	Activity									
•.		Surface	Legal Lo	cation	: 1248	3 FNL & 1		Cedar H	ills 21	-22								
Field Name Cedar Hills	South	API/UWI 33011004	290000	State ID 11409	#	A	ssoc.TB/T		Well Status PER - Pe			l Config	-	Latitud 46° S	9' 31.96			ude 47' 56.317" \
Ground Elevatio 2,931.60		(B Elev (ft) 6.40	KB-Grd (ft 24.80	· I		th (AII) (ftKB) I Hole - 9				Total Dep	th All (TV	D) (ftKB)			F	PBTD (A	JJ) (ftKB)	
Spud Date 2/28/1985	TD D	ate	Rig Relea					pletion End D	On Produc	tion Date	First Sale	es Date	First	Inj Date	First	t Date C	:02 Fio	Abandon Date 12/12/2015
Job Category Plug & Abar	ndon		Primary Job Abandon					ny Job Type nd Abandon		Job	Start Date	11/22/2	015		Job End		12/12/2	015
Job Purpose Offest P&A	weil. CH	SU 1-22	L				Operat			I					_ <b>I</b>			
Summary				····														
	in the second second	gNamo				Rig #				Rig Type				Rig				RR Date
Trinidad		T DUP IN TAXA			35		1	Drilling Rig						1/22/201			12/12/2	
ERD#01 200	22/2015		11/23/201					are to move										Eline al l
	23/2015		11/24/201		0 1	MIRU, rig squat sub	100% s. Squa	rigged dowr at subs & pr	n, 20% on epare to l	location	n, 0% ri errick. D	gged up	. Mov	e camps	, drill pi	pe & n		
3 11/2	24/2015	06:00	11/25/201	5 06:0	0 1	AIRU rig oad out. I	100% r Load ou	ut mud tanks	35% rigg s, mud pu	ed up. imps, g	00% of enerato	rs, fuel &	k wate	er tank, ti	rip tank,	, & boi	ler. Set	
					1	nouse's, s Secure lo	pacer l cation 8	os & spread nouse, push & wait on da	ier's hous lylight.	e, chan	ge hou:	se, mud	pump	s, & scr	house. I	Pin de	rrick on	to floor.
4 11/2	25/2015	06:00	11/26/201	5 06:0		ouster. W	ater & 1 @ 14:0 eadmar	fuel tanks, c	hoke ma rake pads	nifold, 8 on dra	k catwa works, s	lk. Relea static cal	ise tri bles o	ick crane n derrick	e @ 09: . String	00hrs. I up ble	. Releas ocks, pi	ut wraps on
5 11/2	26/2015	06:00	11/27/201	5 06:0	e	extender a	arm to a	d up. Rig u derrick. R/U nbridle bloc	flare line	s & solid	d contro	l equipm	nent.C	hange o	ut swive	el pacl	king, pr	
6 11/2	27/2015	06:00	11/28/201	5 06:0		brackets & Straighter pud insp	& safety & organized ection &	0 100% Rais v wire.Conno anize locatio & Safety Me ad cap, insta	ect kelly h on. Dress eting with	iose. Fu out rig f Crews	inction f loor. Ri . Inspec	test top o g Accept at rig with	trive a ted or	k mud pu Daywoi	umps. R rk @ 20	Rig up ):00hrs	Mathen s on 11-	a choke. 27-15. Pre
7 11/2	28/2015	06:00	11/29/201	5 06:0	v F ti	valves, Ho osi Iow 50 est 250 p element. I	CR, 4" i 100 psi Isi low { R/D tes	manual, & b high, pull ch 5000 psi hig ters & blow	lind rams leck valve h. Test m down mu	, Blind r on kill ud lines d lines.	ams fai line & te 4200 p N/D flo	iled. Cha est 250 p osi. Four wline, ro	nge o osi lov id torr tating	ut blind ( 5000 pa piece o head &	ram blo si high, of hydril i pollutior	cks. T re-insi rubbei n pan	est blin tall cheo r in bop on hydr	s. C/O hydril
8 11/2	29/2015 (	D6:00	11/30/201	5 06:0		nstall mo bipe. Tag black rubb b-10 WOB vashing v xement @ nspector	use hol @124( ber bac 3.f/ 124 vith 450 1850' Nicole	)', Break circ k over shak 4' to 1322',F ) gpm, 50 m dress off to	rp in front c, washing kers. Was Rig servic om, 0-12 \ 1900'. Cl bod test. I	of sub, g with 1 hed f/ 1 e, adjus NOB.f/ BU. Tes Displace	Pick up 2K WO 240' to t clamp 1322' to t 8 5/8" e hole w	p tools.W B, 60 RF 1244'.Co o om kell o 1900' F csg to 5 <i>v</i> ith 10.2	I/U bit PM, 30 ontinu y hos ound 00 ps opg sa	and TIH 00 GPM, e in hole e and tur cement i for 30m alt mud.	I picking Geting washir n goose stringer nin. Goo Drill cen	g up B LCM ng with e neck rs @ 1 od Tes ment 1	HA.TIH and gro 1 450 gr 2 Contir 793', 10 t. Conta 900' to	P/U 4" drill ound up om, 50 rpm, nue in hole 00% firm
9 11/:	30/2015 (	06:00	12/1/2015	06:00	1 N	MDC, Fi	iter Sul RPM=1	n rig floer. 5 & X-O. TIH 16. Circ 30 i	I to 1922	. Wash	& Rea	m 2018'	to 40	15' WOB	3 = 0-5K	(, RPN	l=70, G	
10 127	1/2015 0	3:00	12/2/2015	06:00	e F S a F 4 () L = 4	every 3 to prior to wi started dr. sphalt to POOH on IS61', hol Drice abo pottoms u = 0K, RP1 IS82' ther	6 stan per trip agging system elevate e packe ve 416 vp, Had M=90, C n again	Check flow up to 35K o n. No excess ors 3983' to ed off.Attern 0' lost all ho	Average , well stat ver.Circ s s cuttings surface c ipt to back le drag an pea grav MOTOR F	50 - 100 ice, pur lug arou back or asing.C k ream nd broke el size s RPM=11	) units t np slug und usin ver shal irc botto with pur circula shale cu 6. Bacl	Dackgrou , POOH. ng as a v kers.Rig oms up. mp, hole ation, Ho uttings ov kream ea	Ind ga Pulle Veight Servi FIH f/ pack le dra ver sh ach st	is. No Ce d 1 stand ed swee ce.Back 2018' to e off, rea g prior to aker.Wa and 1 to	ement p d and 4' p to hel ream fra 4160'.V m witho o above sh & Re 2 times	olug @ on th lp clea rom 46 Vash a out put 4160 eam 40 s. Atter	2 4120' 1 e secor in hole, 70' to 3 and rea mp 456 '= 25-40 072' to mpt to p	to 4200'.Circ ad stand adding 1983', m f/ 4160' to 1' to 4072'. JK. Circ 4597' WOB backoff @

#### Denbury ô

# **Daily Activity**

lar H	lills Sout	h 3301100	4290000	11409					Permitted	Well Config		46° 9' 31.96	84" N	1030	47' 56.317"
ind Ele	vation (ft)	Orig KB Elev (ft)	KB-Grd (f	t)  Tc	otal Depth (All) (ft					All (TVD) (ftKB)			PBTD (All		
31.60 Date		2,956.40 TD Date	24.80 Rig Relea		ICompletion St			nd D. I.On Prov	Juction Date   F	irst Sales Date	First Inj Da	te Fin	st Date CC	)2 Flo 14	Abandon Date
8/198															12/12/2015
H#51	्र स्टब्स् सि	tert Date:	En En	d Date						Summary				togat ing	
11	12/2/20	15 06:00	12/3/2015	5 06:00	P/U dri each st as hole	lling j and tries	ars, TIH to 1 to 2 times to packoff.	4090'. Wast . Having suc Hole packe	a & Ream 40 Iden increased off and pi	or safety.Rig 090' to 4747' ses in pea siz pe was stuck am F/ 4090'	WOB = 0K ze & some s with circula	, RPM=90, splintering ation. Set j	GPM= shale cu ars and	400,Ba ittings c pipe pu	ckream over shaker illed free.
12	12/3/20	15 06:00	12/4/2015	5 06:00	RPM=9 wt back Backre Service Evacua Called of hole and Re	0/10 c to 1 am e rig. ted i Triple Rea am f	0, GPM= 40 0.2 ppg.Rig each stand 1 Circulate ho rig floor and e A safety to med throug	00. Backrean service. W to 2 times. ole clean to a investigated come repla h the spots 612. Hole s	m each star ash & Ream Shakers are short trip. Ha d the alarm ace sensor. that would r tarted packi	to 9.9+.Wash ad 1 to 2 time a 4857' to 560 e some what 2S alarm sou and determin TOOH F/ 56 not pull troug ng off @ 441	s. Shakers D9' WOB = cleaner, Ra nded show ed that the 09' T/ 4000 h @ 30K ov	are some v 0/5K, RPM aised mud ing 20-100 re was a ba v'. Had seve ver. TIH to	what cle =90/100 wt back ppm or ad sense eral tigh 4417. T	aner, R ), GPM to 10.2 I the sci or on rig spots agged L	Raised mud = 400. Ppg. reen. g floor. on trip out up. Wash
13	12/4/20	15 06:00	12/5/2015	5 06:00	Tanks. weight mud. V	Cut d up sa Vash	Irilline.Wait ame to 10.3	on & P/U jai ppg. TIH F/ F/ 4345' T/ 4	s, HWT DP 1881' T/ 43	it, Bit sub, Hi Flnish clean 145'. Displace acking off or h	mud tanks hole with	, Fill tanks 10.3 OBM a	with OB and circ	M, Treaulate an	at and nd conditior
14	12/5/20	15 06:00	12/6/2015	5 06:00	Shaker and Re small s drag. E clean. tight sp Had mo Ream I	s loo am F ize c Back TOO ots ( ore d F/ 44	k a lot clear 7/4485' T/4 uttings com ream each s H F/ 5010' 1 @ 4374, 473 rag than the	ner. Circ pric 724'. No pa ing back. Se tand 1 to 2 7 4251. Hac 30, & 4780. 9 short trip. S . No packing	r to Wiper t cking off or ervice rig. W times. Shak I some drag Circulate ho Service rig. I	off or hole d rip. POOH to hole drag. B vash and Rea vers have sma not over 304 le clean. TOO Make up Roo drag. Backr	4345' no p ackream ea m F/ 4724' all size cutti (. TIH F/ 42 DH F/ 5010 k bit and TI	roblems, T ach stand 1 T/ 5010'. N ings comin (51' T/ 5010 ' T/ surface H T/ 4400'	IH tagge I to 2 tin Io packi g back. 0. Had to and bro Taggeo	ed @ 44 nes. Sh ng off c Circulat o ream eak off l up. Wa	485'. Wash akers have or hole te hole through PDC bit. ash and
15	12/6/20	15 06:00	12/7/2018	5 06:00	connec Drill ce Backre	tions ment am e	circulate 1 plug F/ 582	5 minutes. S 25' T/ 5905' 1 1 to 2 times.'	hakers have for 80'. WO	rl packing off. e small size o B=15 ROP=4 ections circul	uttings con Ofph. Wash	ning back. In and Rean	Tagged n F/ 582	cemen 5' T/ 67	it @ 5825'. 718'.
16	12/7/20	15 06:00	12/8/2015	5 06:00	minute LCM pi Cernen While p inside.l ppg. Se stand 1 Well st 30bbls	s. Sh il, req bump POO ervice to 2 arted while	akers have gained full ro g @ 7308' to ing 100#/bh H attemptin e rig. Circ cu times.even I flowing and e circulating	small size c eturns.Lost : o 7392'. ol LCM pill, H g to pull thn utting mud w y 3 connecti d gaining mu . Service rig	uttings com 29 bbls. Wh 1 ole packed 1 packoff, ( 1 back to 9. ons circulate ud. Gained 3 . Wash and	each stand 1 ing back. los ile reaming @ off with 75 b Sot returns ba 8 ppg. Wash a 15 minutes. 30bbls. Circul Ream F/ 614 . Shakers ha	t partial ret 7491' lost bls of pill or ack @ 5341 and Ream Shakers h late and rais 49' T/ 6434'	urns @ 74 complete utside of dr l'. Circ cutti F/ 5341' T ave small s se mud we . Backrear	02', Pun returns. ing mud / 6149'. size cutt ight to 1 m each	25 bbls wt bac Backre ings co 0.2. Ga stand 1	) bbls of k to 9.8 eam each ming back. ained
17	12/8/20	15 06:00	12/9/201	5 06:00	minute leaking to 4930 POOH 4565'-4 thru sp stand 1	s. Sh , hel )', Ho to ca 1562' ots w 1 to 2	akers have d for just a t ble started g asing shoe. & 3510'.Ch vith no resis t times.even	small size of bit then start iving mud b Check flow ange swivel tance. Conti y 3 connecti	uttings com ed back lea ack, well flo (well static). packing. P nue in hole ons circulate	each stand 1 ing back. Rig king.Check fi wing @ 3-4 b POOH to sur ump thru and to 6914'. Wa e 15 minutes. sion canyon.	service, at ow (well sta bls hr.Mix a face casing test same. sh and Rea . Shakers h	tempt to st atic), Pump and pump , Well takin TIH, Tag am F/ 6915 ave small s	op swiv slug ar 12.0 ppg ng prope spot @ 4 ' T/ 8043 size cutt	el packi ad POO J. kill pil er fill, Ha 4773', 5 3'. Bacl ings co	ing from H f/ 6915' I to finish ad spot @ i936', Wash kream each ming back.

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enbu	ryô							y Activity							_	
		Surfac	o l oral l o	cation:	1248 FNL 8	2 16	Cedar	Hills 21	22							
ld Name	, lills Sout	API/UWI		State ID# 11409	124011121		c.TB/TestSite	Well Status PER - P		Well C	onfig		Latitude 46° 9' 31	064" N	Longi	tude ° 47' 56.317'
ound Ele	vation (ft)	Orig KB Elev (ft)	KB-Grd (ft)	) Tot	al Depth (Ali) (ft			JEEK-F		th All (TVD)	(ftKB)		40 9 31	PBTD (A		47 50.517
931.60 ud Date		2,956.40 TD Date	24.80 Rig Release		iginal Hole - Completion St		Completion End C	On Produc	tion Date	First Sales	Date	First Inj C	Date	First Date C	02 Flo	Abandon Date
28/198	35							<u> </u>								12/12/2015
			End			_				Sun					•	
18	12/9/20	15 06:00	12/10/201	5 06:00	minutes canyon TOOH 100 bbl	s. Sh . Fuli T/ 44 s of	Ream F/ 8043' lakers have sm I returns and no 482' checking fl 11.5 kill mud. T rro tool @ bit. S	all size cut losses. So ow every 2 OOH F/ 44	ings cor ervice rig 000'. Ho 82' T/ s	ning back g. Circula le not tak urface an	k. Pumj ite hole king pro id lay de	p at a re clean. I per fill. own hea	duced rai Drop Gyro Build 100 avy weigh	e 350 GP @ 9488'. bbls of 11	M thro Pump 1.5 kill	ough Mission In slug and Mud. Spot
19	12/10/2	015 06:00	12/11/201	5 06:00	Wash 4 5173' w Wash f to 5000 OBM. F stands	791' ash 934 psi. Rig di to pt	DC, Clean floor. to 4800', Tag (@ 5173', 5828 19' to 9488'. L/C Pump 40 bbl M own cement ec ull out of cemer ille wait on cem	5072' atten ' wash, TIH ) 1 joint DP /lud push @ juipment. C at @ 30 fpn	1pt to wa to 6580 to 947 13.0 p ement i 1. Place	ash hole p )'.Circ bol 5'. Circ bo 5'. Circ bo 5'. Circ bo pg, 42 bb n place @ nerf ball	packed ttoms u ottoms o l ceme 2 1830. in pipe	off, wor p and p up. Helo nt @ 15 . Bottom and circ	k pipe an ump slug I PJSM w 5.8 ppg, an o of plug S culate hole	d clean up due to U f ith Schlun nd Displac 488 Top ( clean, La	hole, tubing berge e 88.4 3788. ay dow	TIH tag @ TIH to 9349 er. Test lines bbls of 10.3 TOOH 12
20	12/11/2	015 06:00	12/12/201	5 06:00	pressur proceed Schlum BBLS M 0850. F Held P. @ 15.8 in place PJSM v 15.8 pp in place Held P. @ 15.8 Cemen Lay doo	e ind d with berg Aud I POOI JSM PPg with S g, 5. PPg JSM PPg t in p wn 3	tagging plug.T crease. Notified h plug verificati jer. Test lines to Push and Displ H L/D Drill pipe with Schlumbe , 5.8 BBLS Mud Schlumberger. 8 BBLS Mud P 1400. POOH to with Schlumbe , 5.8 BBLS Mud place @ 1630. 6 stands on dri and tag cemen	Matthew 1 on without o 4500 psi, ace 81.8 b to 7387.D rger. Test I d Push and 6345'.Dro Test lines t ush and Di 4200'. Drc rger. Test I d Push and COOH T/2 I pipe. Pull	ibor as him.L/D Pump 2 bis of 10 rop wipe ines to 4 Displac b wiper 1 o 4500 p splace 5 p wiper nes to 4 Displac 967'. Se wear bu	to be on I drill pipe (4 bbl Mu) (3 OBM. Fr ball and (500 psi. (500 psi. (500 psi. (500 psi. (500 psi.) (500 psi.) ball and (500 psi.) (500 psi.) (500 psi.) (500 psi.) (500 psi.)	location to 8402 d push Rig dow d pump 2 s of 10.3 pump ar o 24 bbl of 10.3 pump a Pump 2 bls of 10 Place r	a @ 06:( 2'.Circ, i @ 13.0 wn cema around 24 bbl M 3 OBM. round to 0BM. F round to 24 bbl M 0.3 OBM nerf ball	00 hrs CS Mix Space ppg, 18 t ent equipm to clear of lud push ( Rig down o clear dril ush @ 13 Rig down ( o clear dril ush @ 13 Alg down ( o clear dril ud push ( A. Rig dow in drill pip	T. He call r, Held P. bl cemen ment. Cen Irill pipe.C @ 13.0 pp cement ed I pipe.Circ 0 ppg, 18 cement ed I pipe. Cir @ 13.0 pp wn cement e and circ	ed and JSM w t @ 15 nent in irc, Mix g, 18 l equipme c, Mix S bbl ce juipme c, Mix sg, 30 l t equip culate l	I said to ith 5.8 ppg, 5.8 place @ x Spacer, bbl cement itent. Cement Spacer, Held ement @ ent. Cement Spacer, bbl cement bbl cement hole clean.
21	12/12/2	015 06:00	12/12/201	5 19:00	push @ Rig dov 122'.Cit 13.0 pp	) 13. vn ce rc, M ig, 8.	080'. Circ, Mix 0 ppg, 18.2 bbl ement equipme lix Spacer, Helo .8 bbl cement ( blace @ 1130. l	cement @ nt. Cemen I PJSM wit 2 13.0 ppg	15.8 pp in place Schlur Verify c	g, 5.7 BB e @ 0900 nberger. ement at	BLS Mu ).L/D DI Test lin shale s	d Push P, Pull F es to 48 shaker (	and Displ Rotating h 500 psi. P	ace 13.4 t ead, Run ump 24 bl	bls of back i bl Mud	10.3 OBM. n hole to push @

Denbury Ô		Surface I	egal L	ocation	0 1248 FNL		Ce		nent Plu IIIIs 21	•	ueez	es	Bridge	Plugs, R	etainers, Ce	ment	Plugs, etc.
Field Name Cedar Hills Sou	AP	301100429	1.1.1.1	State ID# 11409	1240114		oc.TB/TestS	ite	Well Status PER - Pe		Well	Config		Latitude 46° 9' 31		Longitur 103°	<sup>de</sup> 47' 56.317" W
Ground Elevation (ft) 2,931.60	Orig KB 2,956.		KB-Grd (1 24.80		tal Depth (All) ( riginal Hole		00.0			Total Depth	All (TVI	D) (ftKB)			PBTD (All) (	ftKB)	
Spud Date	TD Date		CHARLES AND DEVICE	ase Date	Completion :		Completic	on End D	. On Produc	tion Date F	irst Sale	es Date	First Inj Da	ate	First Date CO2		Abandon Date
2/28/1985						_					-	_		_	-		12/12/2015
Other In Hole	Des			1	Data I	0.4	Data	Ton		Dim (4)	(D)	1 0	D (in)		Co		
	Des	_		Run	Date	Pui	Date	Jop	(ftKB)	Btm (ft)			D (in)			411	
Cement (filtere Cement Plug, F	and the state of the state of the																
Description Cement Plug		Type Plug			String				Cementing	Start Date 2/10/201	5	Ceme	enting End Da 12/10		Wellbore		е
Comment																	
Cement Stages		aler a			Sec. Sec.		and The	1.							Sector Con	-	
Stg # Description 1 Cement F		Fop Depth (ftK 8,7		(TVD) (ftKB)		,488 E	ltm (TVD) (f	tkb) MD	Tagged (ft 8,672.0	Tag Metho Work String	od Tag	Date	Depth P	lug Drille	Drill Out Date	C	Drill Out Dia (in)
Cement Fluids	( = )		PUL	-	Cartan.		-			1	1	-		120		-	
Fluid		Est Top (ft	1 4 4 W 1 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4		Btm (ftKB)	0 040	Class	1	Amou	nt (sacks)	0	Yield (ft <sup>3</sup> /	/sack)	Den	s (lb/gal) 13.00	Vo	l Pumped (bbl) 40.0
Mud push Tail			8,788		8,08 9,48	1. A. 18	indard	-		20			1.16		15.80	-	40.0
Displacement	-		0,700	-		24	indard	_		20	0		1.10		10.30	-	12.0
Stg # Description		Top Depth (ftK	(B) Top (		Btm (ftKB)	E		ftKB) MD	Tagged (ft	Tag Metho	d Tag	Date	Depth P	lug Drille	Drill Out Date		Drill Out Dia (in)
2 Cement F Cement Fluids	Jug	8,1	02		8	,402		-	-		1		-	-		_	
Fluid	1	Est Top (ff	tKB)	Est	Btm (ftKB)	-	Class	5	Amou	nt (sacks)	1.5	Yield (ft3/	/sack)	Den	s (ib/gal)	Vo	l Pumped (bbl)
Mud															13.00		24.0
cement				-					-			_	1.16		15.80	1.1	18.0
mud push									-		_			-	10.30	-	5.8
mud Stg # Description		Top Depth (ftk	(B) Top	(TVD) (ftKB)	Btm (ftKB)	TE	3tm (TVD) (	ftKB) MD	Tagged (ft	Tag Metho	d Tag	Date	Depth P	lug Drille	10.30 Drill Out Date		81.0 Drill Out Dia (in)
3 Cement F		7,0				,387									Contraction and and		
Cement Fluids Fluid	1	Est Top (f		Eet	Btm (ftKB)	-	Class		Amou	nt (sacks)		Yield (ft)	(sack)	Den	s (lb/gal)	Vo	I Pumped (bbl)
Mud		Estropti	ND)	CSU	bun (urb)	-	Ciasa		Anou	in (sachs)	-	tield (it)	(Sauny	Dun	13.00		24.0
cement	-												1.16		15.80		18.0
mud push															10.30		5.8
mud						15									10.30	- 12	70.0
Stg # Description 4 Cement F	Plug	Fop Depth (ftK 6,0	(B) Top (	TVD) (ftKB)	Btm (ftKB) 6	,345	3tm (TVD) (1	AKB) MD	Tagged (ft	Tag Metho	od Tag	Date	Depth P	lug Drille	Drill Out Date		Drill Out Dia (in)
<b>Cement Fluids</b>		in man											111-1				
Fluid		Est Top (f	tKB)	Est	Btm (ftKB)	200	Class	5	Amou	nt (sacks)		Yield (ft <sup>3</sup> )	/sack)	Den	s (lb/gal) 13.00	Vo	Pumped (bbl) 24.0
cement	-					-			-		-	_	1.16	-	15.80		18.0
mud push	-					-			-		-				10.30		5.8
mud						-			1						10.30	1.77	59.5
Stg # Description 5 Cement F	Plug	Top Depth (ftk 3,7		(TVD) (ftКB) 3,699.9	Btm (ftKB)	,200		ftKB) MD 99.9	Tagged (ft 3,793.0	Tag Metho Work String	od Tag	Date	Depth F	Plug Drille	Drill Out Date		Drill Out Dia (in)
Cement Fluids Fluid		Est Top (f	HKD)	1 50	Btm (ftKB)		Class		Amer	int (sacks)	-1-	Yield (ft <sup>3</sup>	(sack)	Den	s (lb/gal)	Ve	bl Pumped (bbl)
Mud		Est top (i	(ND)	CSU			Class	,	Amou	an (sacks)	-	tield (it)	/sach)	Don	13.00		24.0
cement				1							- ( +		1.16		15.80		18.0
mud push											31				10.30		5.8
mud				1.000	6. 200							_			10.30	- 12	33.8
Stg # Description 6 Cement		Top Depth (fth 1.7	KB) Top 780	(TVD) (ftKB) 1,780.0		,080	3tm (TVD) ( 2.0	(ftKB) MD 80.0	Tagged (ft	Tag Metho	od Tag	) Date	Depth F	Plug Drille	Drill Out Date	1	Drill Out Dia (in)
Cement Fluids	-								-	1							
Fluid		Est Top (f	tKB)	Est	Btm (ftKB)		Class	5	Amou	int (sacks)	3	Yield (ft <sup>a</sup>	/sack)	Den	s (lb/gal) 13.00	Vo	bl Pumped (bbl) 24.0
Mud cement	-			-		-			-		-		1.16		15.80	-	18.2
mud push				-								_			10.30		5.7
mud				-				-				-			10.30		13.4
Stg # Description		Top Depth (fth	KB) Top 4.8	(TVD) (ftKB)	) Btm (ftKB)	120		(ftKB) MD	Tagged (ft	. Tag Metho	od Tag	g Date	Depth F	Plug Drille	Drill Out Date	1	Drill Out Dia (in)
7 Cement I	lug	2	4.0			120		20.0	-	1	-		_		1	-	

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# Other in Hole & Cement Plugs & Squeezes Cedar Hills 21-22

Bridge Plugs, Retainers, Cement Plugs, etc.

		Surface	Legal Lo		1248 FN									
Field Na	ame	API/UWI		State ID#		Assoc	TB/TestSite	Well Status		Well Config		atitude		Longitude
Ceda	r Hills Sou	th 330110042	90000	11409				PER - Pe	ermitted		4	6° 9' 31.9	364" N	103° 47' 56.317" W
Ground	Elevation (ft)	Orig KB Elev (ft)	KB-Grd (f	t) To	tal Depth (Al	) (ftKB)		•	Total Depth	All (TVD) (ftKB)			PBTD (All)	(ftKB)
2,931		2,956.40	24.80	i lo	riginal Ho	le - 9,50	0.0							
Spud D 2/28/	ate	TD Date	Rig Relea	ise Date	Completion	Start	Completion End D	. On Produc	tion Date I	First Sales Date	First Inj Da	F	irst Date CO	2 Flo Abandon Date 12/12/2015
Cem	ent Fluids													
12.7	Fluid	Est Top	ftKB)	Est	Btm (ftKB)	tere state	Class	Amou	nt (sacks)	Yield (ft	/sack)	Dens (	b/gal)	Vol Pumped (bbl)
Mud													13.00	24.0
ceme	nt										1.16		13.00	8.8
Cem	ent (filtere	diforaType=Squ	eeze)		وتعاريبه والمعاد						an Syna ar i			1
Descrip			String			Date		Wellbore		Job		Comme	nt	
Comme	ent									·· <b></b>				
Cem	ent Stages	;												
Stg #	Description			Top	(ftKB)	tm (ftKB)	Pump Start Date	Pump	End Date	Q Pump Ini	Q Pump Fi	P Pump Fi	n P Held (p	si) P Rel Date
Cem	ent Fluids			l										
	Fluid	Fluid Des	at a <del>c</del> ha	Est Top (ftk	(B)	Est Btm (ft	KB) Amoun	t (sacks)	Vol Pum	ped (bbl)	Yield (ft³/sack)	D	ns (lb/gai)	Com
•														
					L									
l														

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#### Casing Summary Schematic Cedar Hills 21-22

r Hills South (ft) Orig KB Elev (ft) .60 2,956.40	33011004290000 KB-Grd (ft) Total Depth (All)	11409 PER - Per					
.60 12.956.40	KB-Grd (ft) Total Depth (All)	(ftKB)		tal Depth All (TVD	)) (ftKB)		PBTD (All) (ftKB)
	24.80 Original Hole		- Casting O	talaan Quada a	- 0.0408KD		
Origin	al Hole, 2/15/2016	and the second	Run Date	Set Depth (ft.	Set Depth (TV OD (i	n) Drift Min (in)	) Centralizers Scrate
	Vertical schematic (act	ual)	2/28/1985 Prop Run?	2,018 Centralizer/Scratc	2,018.0 8 5/	8	
			Jts	Item Des	OD (in) ID (in)	Wt (lb/ft) Grade	Top (ftKB) Btm (f
ייינגענע איז אינאערעטענאינענענענעראיינע	w)			ising Joints	8 5/8		25.0 2,0
Sz:9 7/ OD:8 5/8; Dep (MD):25-2,01	th 📲	12/10/2015; Cement Plug; 24.8-120 2/28/1985; Surface Casing Cement; 25- 2,018; 770 sxs Lite & 200 sxs Class G 12/10/2015; Cement Plug; 1,780-2,080	~				
Sz	8	12/10/2015; Cement Plug; 3,700-4,200 12/10/2015; Cement Plug; 6,045-6,345					
		12/10/2015; Cement Plug; 7,087-7,387					
		12/10/2015; Cement Plug; 8,102-8,402					
		12/10/2015; Cement Plug; 8,788-9,488					



(361) 767\_0602 (800) 606\_GVRO Fav (361) 767\_0612

A PRIME PROVIDENCE CONTRACTOR STATE



# SURVEY COVER LETTER

State of North Dakota

Company Name:	Denbury Reportions	
Company Address	5320 NOARDUNE	
	Plano, TX.	
	75024	

Well Name:	Cedar Hills 1-22	
County and State:	Bowman Co., ND	
Tch #:	1315180249	
Nenthe:	0 to 2010 m	
Duies:	11/29/15 Thru 11/30/15	

These surveys are true to the best of our knowledge.

Neisha Havelka Regulaton Daniel Gobin Service Technician **VES Survey International** 252 24th St. East Dickinson, North Dakota 58601 701-483-0674

				Company: Denbur Lease/Well: Ceo				Æ	
Denbu				Rig Name: Ti					
Dendu	rv 🛩		S	tate/County: North	Dakota/Bowman		VE	S) SURV	ΈY
				VS-Azi: 0.000	0 Degrees			CO/INTER	MATIONAL
			Lati		ngitude: -103.79898			and the second se	
				Azimuths referen					
			<u></u>					p <sup>2</sup>	
				No Grid Converg	Jence Applied				
				Depth Referenc	e : RKB=24'				
				LOG MS GYRO SUR Filename: msgyro_ru Minimum Curva Report Date/Time: 1	ture Method				
				VES Survey Int Dickinson, Nor (Office), 701-/ Surveyor: Dan Cedar Hills 1-22 / Af	rth Dakota 483-0674 niel Gobin				
Measured	Incl	Drift				Vertical	Closure	Closure	Deeler
Depth	Angle	Direction	TVD	+N/-S	+E/-W	Section	Distance	Direction	Dogleg Severity
FT	Deg	Deg	FT	FT	FT	FT	FT	Deg	Deg/100
	0.000	0.000	0.000	0.000	0.000	0.000	2.000		
0.000					0.000		0.000	0.000	****
0.000 30.000	0.112	208.869	30.000	-0.026		0 026	0.020	200 000	
	0.112 0.289	208.869 153.467	30.000 98.070	-0.026 -0.237	-0.014	-0.026	0.029	208.869	0.373
30.000			98.070	-0.237	-0.014 0.030	-0.237	0.239	172.719	0.357
30.000 98.070	0.289	153.467			-0.014 0.030 0.143	-0.237 -0.539	0.239 0.557	172.719 165.092	0.357 0.198
30.000 98.070 189.400 280.730	0.289 0.121	153.467 173.838	98.070 189.399	-0.237 -0.539	-0.014 0.030	-0.237	0.239	172.719	0.357
30.000 98.070 189.400 280.730 372.060	0.289 0.121 0.158 0.094	153.467 173.838	98.070 189.399	-0.237 -0.539	-0.014 0.030 0.143 0.183	-0.237 -0.539 -0.757	0.239 0.557 0.779	172.719 165.092 166.390	0.357 0.198 0.046
30.000 98.070 189.400 280.730 372.060 463.390	0.289 0.121 0.158 0.094 0.101	153.467 173.838 166.465	98.070 189.399 280.729	-0.237 -0.539 -0.757	-0.014 0.030 0.143	-0.237 -0.539 -0.757 -0.816	0.239 0.557 0.779 0.834	172.719 165.092 166.390 168.058	0.357 0.198 0.046 0.273
30.000 98.070 189.400 280.730 372.060 463.390 554.720	0.289 0.121 0.158 0.094	153.467 173.838 166.465 327.717	98.070 189.399 280.729 372.059	-0.237 -0.539 -0.757 -0.816	-0.014 0.030 0.143 0.183 0.173 0.151	-0.237 -0.539 -0.757 -0.816 -0.831	0.239 0.557 0.779 0.834 0.844	172.719 165.092 166.390 168.058 169.720	0.357 0.198 0.046 0.273 0.211
30.000 98.070 189.400 280.730 372.060 463.390 554.720 646.050	0.289 0.121 0.158 0.094 0.101	153.467 173.838 166.465 327.717 166.863	98.070 189.399 280.729 372.059 463.389	-0.237 -0.539 -0.757 -0.816 -0.831 -1.085	-0.014 0.030 0.143 0.183 0.173 0.151 0.176	-0.237 -0.539 -0.757 -0.816 -0.831 -1.085	0.239 0.557 0.779 0.834 0.844 1.100	172.719 165.092 166.390 168.058 169.720 170.763	0.357 0.198 0.046 0.273 0.211 0.135
30.000 98.070 189.400 280.730 372.060 463.390 554.720	0.289 0.121 0.158 0.094 0.101 0.221	153.467 173.838 166.465 327.717 166.863 177.569	98.070 189.399 280.729 372.059 463.389 554.718	-0.237 -0.539 -0.757 -0.816 -0.831	-0.014 0.030 0.143 0.183 0.173 0.151	-0.237 -0.539 -0.757 -0.816 -0.831	0.239 0.557 0.779 0.834 0.844	172.719 165.092 166.390 168.058 169.720	0.357 0.198 0.046 0.273 0.211
30.000 98.070 189.400 280.730 372.060 463.390 554.720 646.050	0.289 0.121 0.158 0.094 0.101 0.221 0.167 0.220	153.467 173.838 166.465 327.717 166.863 177.569 30.505 188.640	98.070 189.399 280.729 372.059 463.389 554.718 646.048 737.378	-0.237 -0.539 -0.757 -0.816 -0.831 -1.085 -1.146 -1.205	-0.014 0.030 0.143 0.183 0.173 0.173 0.151 0.176 0.252 0.293	-0.237 -0.539 -0.757 -0.816 -0.831 -1.085 -1.146 -1.205	0.239 0.557 0.779 0.834 0.844 1.100 1.174 1.240	172.719 165.092 166.390 168.058 169.720 170.763 167.619 166.338	0.357 0.198 0.046 0.273 0.211 0.135 0.408 0.417
30.000 98.070 189.400 280.730 372.060 463.390 554.720 646.050 737.380	0.289 0.121 0.158 0.094 0.101 0.221 0.167 0.220 0.171	153.467 173.838 166.465 327.717 166.863 177.569 30.505 188.640 77.245	98.070 189.399 280.729 372.059 463.389 554.718 646.048 737.378 828.707	-0.237 -0.539 -0.757 -0.816 -0.831 -1.085 -1.146 -1.205 -1.349	-0.014 0.030 0.143 0.183 0.173 0.151 0.176 0.252 0.293 0.400	-0.237 -0.539 -0.757 -0.816 -0.831 -1.085 -1.146 -1.205 -1.349	0.239 0.557 0.779 0.834 0.844 1.100 1.174 1.240 1.407	172.719 165.092 166.390 168.058 169.720 170.763 167.619 166.338 163.487	0.357 0.198 0.046 0.273 0.211 0.135 0.408 0.417 0.356
30.000 98.070 189.400 280.730 372.060 463.390 554.720 646.050 737.380 828.710	0.289 0.121 0.158 0.094 0.101 0.221 0.167 0.220 0.171 0.122	153.467 173.838 166.465 327.717 166.863 177.569 30.505 188.640 77.245 140.104	98.070 189.399 280.729 372.059 463.389 554.718 646.048 737.378 828.707 920.037	-0.237 -0.539 -0.757 -0.816 -0.831 -1.085 -1.146 -1.205 -1.349 -1.393	-0.014 0.030 0.143 0.183 0.173 0.151 0.176 0.252 0.293 0.400 0.595	-0.237 -0.539 -0.757 -0.816 -0.831 -1.085 -1.146 -1.205 -1.349 -1.393	0.239 0.557 0.779 0.834 1.100 1.174 1.240 1.407 1.515	172.719 165.092 166.390 168.058 169.720 170.763 167.619 166.338 163.487 156.857	0.357 0.198 0.046 0.273 0.211 0.135 0.408 0.417 0.356 0.174
30.000 98.070 189.400 280.730 372.060 463.390 554.720 646.050 737.380 828.710 920.040 1011.370	0.289 0.121 0.158 0.094 0.101 0.221 0.167 0.220 0.171 0.122 0.317	153.467 173.838 166.465 327.717 166.863 177.569 30.505 188.640 77.245 140.104 187.719	98.070 189.399 280.729 372.059 463.389 554.718 646.048 737.378 828.707 920.037 1011.367	-0.237 -0.539 -0.757 -0.816 -0.831 -1.085 -1.146 -1.205 -1.349 -1.393 -1.718	-0.014 0.030 0.143 0.183 0.173 0.151 0.176 0.252 0.293 0.400 0.595 0.624	-0.237 -0.539 -0.757 -0.816 -0.831 -1.085 -1.146 -1.205 -1.349 -1.393 -1.718	0.239 0.557 0.779 0.834 1.100 1.174 1.240 1.407 1.515 1.828	172.719 165.092 166.390 168.058 169.720 170.763 167.619 166.338 163.487 156.857 160.047	0.357 0.198 0.046 0.273 0.211 0.135 0.408 0.417 0.356
30.000 98.070 189.400 280.730 372.060 463.390 554.720 646.050 737.380 828.710 920.040 1011.370 1102.700	0.289 0.121 0.158 0.094 0.101 0.221 0.167 0.220 0.171 0.122 0.317 0.510	153.467 173.838 166.465 327.717 166.863 177.569 30.505 188.640 77.245 140.104 187.719 196.907	98.070 189.399 280.729 372.059 463.389 554.718 646.048 737.378 828.707 920.037 1011.367 1102.694	-0.237 -0.539 -0.757 -0.816 -0.831 -1.085 -1.146 -1.205 -1.349 -1.393 -1.718 -2.357	-0.014 0.030 0.143 0.183 0.173 0.151 0.176 0.252 0.293 0.400 0.595 0.624 0.472	-0.237 -0.539 -0.757 -0.816 -0.831 -1.085 -1.146 -1.205 -1.349 -1.393 -1.718 -2.357	0.239 0.557 0.779 0.834 1.100 1.174 1.240 1.407 1.515 1.828 2.404	172.719 165.092 166.390 168.058 169.720 170.763 167.619 166.338 163.487 156.857 160.047 168.689	0.357 0.198 0.046 0.273 0.211 0.135 0.408 0.417 0.356 0.174
30.000 98.070 189.400 280.730 372.060 463.390 554.720 646.050 737.380 828.710 920.040 1011.370	0.289 0.121 0.158 0.094 0.101 0.221 0.167 0.220 0.171 0.122 0.317	153.467 173.838 166.465 327.717 166.863 177.569 30.505 188.640 77.245 140.104 187.719	98.070 189.399 280.729 372.059 463.389 554.718 646.048 737.378 828.707 920.037 1011.367	-0.237 -0.539 -0.757 -0.816 -0.831 -1.085 -1.146 -1.205 -1.349 -1.393 -1.718	-0.014 0.030 0.143 0.183 0.173 0.151 0.176 0.252 0.293 0.400 0.595 0.624	-0.237 -0.539 -0.757 -0.816 -0.831 -1.085 -1.146 -1.205 -1.349 -1.393 -1.718	0.239 0.557 0.779 0.834 1.100 1.174 1.240 1.407 1.515 1.828	172.719 165.092 166.390 168.058 169.720 170.763 167.619 166.338 163.487 156.857 160.047	0.357 0.198 0.046 0.273 0.211 0.135 0.408 0.417 0.356 0.174 0.276
30.000 98.070 189.400 280.730 372.060 463.390 554.720 646.050 737.380 828.710 920.040 1011.370 1102.700	0.289 0.121 0.158 0.094 0.101 0.221 0.167 0.220 0.171 0.122 0.317 0.510	153.467 173.838 166.465 327.717 166.863 177.569 30.505 188.640 77.245 140.104 187.719 196.907	98.070 189.399 280.729 372.059 463.389 554.718 646.048 737.378 828.707 920.037 1011.367 1102.694	-0.237 -0.539 -0.757 -0.816 -0.831 -1.085 -1.146 -1.205 -1.349 -1.393 -1.718 -2.357	-0.014 0.030 0.143 0.183 0.173 0.151 0.176 0.252 0.293 0.400 0.595 0.624 0.472	-0.237 -0.539 -0.757 -0.816 -0.831 -1.085 -1.146 -1.205 -1.349 -1.393 -1.718 -2.357	0.239 0.557 0.779 0.834 1.100 1.174 1.240 1.407 1.515 1.828 2.404	172.719 165.092 166.390 168.058 169.720 170.763 167.619 166.338 163.487 156.857 160.047 168.689	0.357 0.198 0.046 0.273 0.211 0.135 0.408 0.417 0.356 0.174 0.276 0.223

Page 1 of 2 V.E.S. Survey Date: 11/29/2015

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1468.020	0.354	223.316	1467.997	-5.161	-1.342	-5.161	5.333	194.576	0.201
1559.350	0.605	174.638	1559.324	-5.847	-1.490	-5.847	6.034	194.302	0.500
1650.680	0.638	220.006	1650.649	-6.716	-1.772	-6.716	6.946	194.782	0.526
1742.010	0.645	149.576	1741.975	-7.548	-1.839	-7.548	7.769	193.691	0.810
1833.340	0.294	145.063	1833.302	-8.183	-1.445	-8.183	8.310	190.012	0.386
1924.670	0.157	141.828	1924.631	-8.473	-1.233	-8.473	8.563	188.281	0.150
2016.000	0.217	222.203	2015.961	-8.700	-1.272	-8.700	8.792	188.319	0.269



I. certify that I am employed by VES Survey International. That I did on the day(s)Daniel Gobin of 11/29/15 through 11/29/15 conduct or supervise the taking of a Rate Gyro survey from a depth of 0.00 feet to a depth of 2,016.00 \_\_\_\_\_feet; that the data is true, correct, complete and within the limitations of the tool as set forth by Vaughn Energy Services, that I am authorized and qualified to make this report; that this survey was conducted at the request of Denbury for the Cedar Hills Well # 1-22 API# 33-011-00429 in Bowman County / Parish North Dakota ; and that I have reviewed this report and

find that it conforms to the principles and procedures as set forth by Vaughn Energy Services

Daniel Gobin Service Technician Vaughn Energy Services



19510 Oil Center Blvd Houston, TX 77073 Bus 281.443.1414 Fax 281.443.1676

Tuesday, January 26, 2016 State of North Dakota

Subject: Surveys

Re: Denbury Onshore, LLC Cedar Hills 21-22 Bowman, ND A.P.I. No: 33-011-00429

Enclosed, please find the original and one copy of the survey performed on the above-referenced well by Ryan Directional Services, Inc.. Other information required by your office is as follows:

Surveyor Name	Surveyor Title	Borehole Number	Start Depth	End Depth	Start Date	End Date	Type of	TD Straight Line Projection
Nick Cevasco	MWD Operator	O.H.	2016'	4704'	11/30/15	12/06/15	MWD	4767'

If any other information is required please contact the undersigned at the letterhead address or phone number.

Annette Meardle Technical Support Technician



Ryan Directional Services, Inc. 19510 Oil Center Blvd. Houston, Texas 77073 Bus: 281.443.1414 Fax: 281.443.1676

Sunday, December 06, 2015

State of North Dakota County of Bowman

Subject: Survey Certification Letter

Survey Company:	Ryan Directional Services, Inc.	
Job Number:	9420	Surface: Lat 46.158874 Long -103.798397
Survey Job Type:	Ryan MWD	A.P.I. No: <b>33-011-00429</b>
Customer:	Denbury Onshore LLC	Location: Bowman, ND
Well Name:	Cedar Hills 21-22	RKB Height: 25ft
Rig Name:	Trinidad 35	Distance to Bit: 63'

									TD Straight	
			Borehole	Start	End	Start	End	Туре	Line	
								-		
_	Surveyor Name	Surveyor Title	Number	Depth	Depth	Date	Date	of	Projection	

The data and calculations for this survey have been checked by me and conform to the calibration standards and operational procedures set forth by Ryan Directional Services, Inc. I am authorized and qualified to review the data, calculations and these reports; the reports represents true and correct Directional Surveys of this well based on the original data, the minimum curvature method, corrected to True North and obtained at the well site.

Nick Covasco

Nick Cevasco MWD Supervisor Ryan Directional Services, Inc.

Report #: Date:	1 6-Dec-15			N DIREC	TIONAL	SERVIC	ES, INC	:	Ryan Job # Kit #	9420	-
-	0-Dec-13		A NABO	HS COMPANY							-
					SURVEY RE	PORT					
	Customer:	Denbury O	nshore LLC				I	MWD Operator:	Michael	Orbach	_
	Well Name & No.:	Cedar H	ills 21-22					RKB:	2	25	_
	County, State:	Bowm	an, ND					API Number:	33-011	-00429	_
F	Rig Contractor & No.:	Trinic	dad 35				Vertical Se	ection Direction:	0.	00	_
Surfac	ce Location: Y or Lat:	46.15	8874N								
	X or Long	103.79	8397W								
	NAD27 or NAD83:		D83								
5	Survey Corrected To:	True	North								
				Minimu	m Curvature		n				
				wimmu	un curvature		11				
Sur #	Meas. Depth	Inc.	Azm.	Course Len.	TVD	Ver.Sect.	+N / -S	+E/-W	DLS	Cls Dir	CIs Azm
Tie in to Gy	yro Surveys		-	-		-	-				-
Tie In	2016	0.22	222.20	2016.00	2015.96	-8.70	-8.70	-1.27	0.27	8.79	188.31
1	2049	0.09	208.48	33.00	2048.96	-8.77	-8.77	-1.32	0.41	8.87	188.59
2	2144	0.13	143.09	95.00	2143.96	-8.92	-8.92	-1.30	0.13	9.02	188.26
3	2238	0.09	318.43	94.00	2237.96	-8.95	-8.95	-1.28	0.23	9.04	188.14
4	2332	0.09	310.78	94.00	2331.96	-8.85	-8.85	-1.39	0.01	8.96	188.90
5	2426	0.13	291.45	94.00	2425.96	-8.76	-8.76	-1.54	0.06	8.90	189.97
6	2520	0.35	255.94	94.00	2519.96	-8.79	-8.79	-1.92	0.27	9.00	192.31
7	2615	0.26	258.49	95.00	2614.96	-8.91	-8.91	-2.41	0.10	9.23	195.15
8	2710	0.31	233.26	95.00	2709.96	-9.10	-9.10	-2.83	0.14	9.53	197.26
9	2806	0.22	276.59	96.00	2805.96	-9.24	-9.24	-3.22	0.22	9.78	199.22
10	2901	0.35	241.53	95.00	2900.95	-9.35	-9.35	-3.66	0.22	10.04	201.35
11	2995	0.26	230.98	94.00	2994.95	-9.62	-9.62	-4.07	0.11	10.45	202.94
12	3090	0.35	231.95	95.00	3089.95	-9.94	-9.94	-4.47	0.09	10.90	204.21
13	3186	0.44	256.29	96.00	3185.95	-10.21	-10.21	-5.06	0.20	11.39	206.36
14	3281	0.40	244.43	95.00	3280.95	-10.44	-10.44	-5.71	0.10	11.90	208.69
15 16	3375 3470	0.57	264.11 247.41	94.00	3374.94	-10.63	-10.63	-6.47	0.25	12.44	211.35
16 17	3470 3565	0.53	247.41 268.33	95.00 95.00	3469.94 3564.94	-10.84 -11.02	-10.84 -11.02	-7.35 -8.15	0.17	13.10 13.71	214.13 216.48
17	3565 3660	0.48	253.48	95.00	3659.93	-11.02 -11.14	-11.02 -11.14	-8.15 -8.90	0.13	14.26	216.48
18	3755	0.44	253.46	95.00	3754.93	-11.14	-11.14	-8.90	0.13	14.26	218.62
20	3850	0.79	251.28	95.00	3849.92	-11.66	-11.66	-10.88	0.20	15.94	220.09
20	3945	0.75	249.34	95.00	3944.91	-12.09	-12.09	-12.08	0.05	17.09	223.02
21	<b>4040</b>	1.10	249.34 254.00	95.00 95.00	4039.90	-12.09 -12.56	-12.09 -12.56	-13.54	0.03	18.47	<b>22</b> 4.90 <b>227.15</b>
23	4135	1.19	264.73	95.00	4134.88	-12.90	-12.90	-15.40	0.24	20.09	230.04
24	4230	1.13	264.29	95.00	4229.86	-13.09	-13.09	-17.43	0.08	21.80	233.08
25	4325	1.41	253.39	95.00	4324.83	-13.53	-13.53	-19.59	0.31	23.81	235.37
26	4420	1.19	252.95	95.00	4419.81	-14.16	-14.16	-21.66	0.23	25.87	236.83
27	4514	1.49	256.99	94.00	4513.78	-14.72	-14.72	-23.78	0.33	27.97	238.25
28	4609	1.23	242.40	95.00	4608.76	-15.47	-15.47	-25.89	0.45	30.16	239.14
29	4704	1.01	243.37	95.00	4703.74	-16.32	-16.32	-27.54	0.23	32.01	239.36
PTB	4767	1.01	243.37	63.00	4766.73	-16.81	-16.81	-28.53	0.00	33.12	239.49
											1



# **Denbury Onshore, LLC**

# Cedar Hills 21-22

1,248' FNL & 1,654' FWL Section 22, T131N, R105W Cedar Hills Field / Red River Formation Bowman County, North Dakota

#### Prepared for:

Allen Kimble Denbury Onshore, LLC 5320 Legacy Drive Plano, Texas 75204

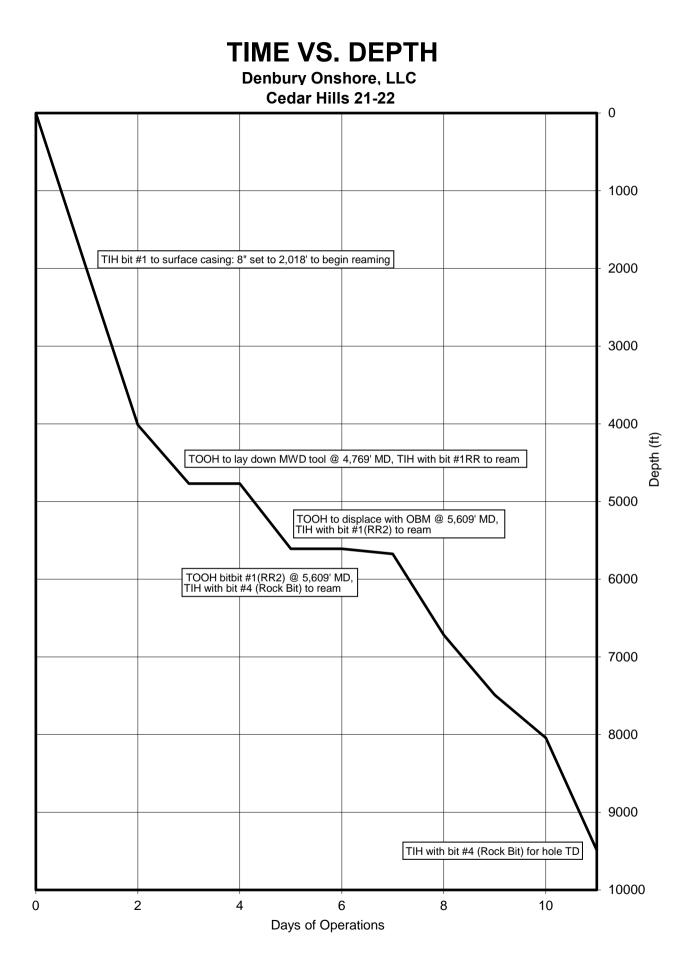
#### Prepared by:

Cole Jack, Kyle Eno PO Box 80507; Billings, MT 59108 (406) 259-4124 geology@sunburstconsulting.com www.sunburstconsulting.com

# WELL DATA SUMMARY

OPERATOR:	Denbury Onshore, LLC
ADDRESS:	5320 Legacy Drive Plano, Texas 75204
WELL NAME:	Cedar Hills 21-22
<u>API #:</u>	33-011-00429
WELL FILE #:	11409
SURFACE LOCATION:	1,248' FNL & 1,654' FWL Section 22, T131N, R105W
FIELD/ OBJECTIVE:	Cedar Hills Field / Red River Formation
COUNTY, STATE	Bowman County, North Dakota
BASIN:	Williston
WELL TYPE:	Red River Vertical Clean-out
ELEVATION:	GL: 2931.6' KB: 2,956.4'
Re-Entry DATE:	November 29th, 2015
CONTRACTOR:	Trinidad 35
PUMPS:	EMSCO FB-1300 (stroke length - 12")
TOOLPUSHERS:	Michael Hutchinson, Darren Senum
FIELD SUPERVISORS:	Tod Wisum, William Crane, Will Crane, Bill Long
CHEMICAL COMPANY:	Newpark Drilling Fluids
MUD ENGINEER:	Leroy Lange, Jerry Umbdenstock
MUD TYPE:	Salt water to 5,609' Diesel invert to 9,489'

MUD LOSSES:	Salt Water: 232.3 bbls; Oil Based Much: 781.4 bbls
PROSPECT GEOLOGIST:	Allen Kimble
WELLSITE GEOLOGISTS:	Cole Jack, Kyle Eno
GEOSTEERING SYSTEM:	Sunburst Digital Wellsite Geological System
ROCK SAMPLING:	Based on Company Man discretion
SAMPLE EXAMINATION:	Binocular microscope & fluoroscope
SAMPLE CUTS:	Trichloroethylene
GAS DETECTION:	MSI (Mudlogging Systems, Inc.) TGC - total gas with chromatograph Serial Number(s): ML-055
ELECTRIC LOGS:	N/A
DRILL STEM TESTS:	N/A
DIRECTIONAL DRILLERS:	Ryan Directional NA
<u>MWD:</u>	Ryan Directional Micheal Orbach
CASING:	Surface: 8" 36# J-24 set to 2,018'
SAFETY/ H <sub>2</sub> S MONITORING:	H2S personal meters



# MORNING REPORT SUMMARY

		Depth			WOB		WOB							
Day	Date 2015	(0500 Hrs)	24 Hr Footage	Bit #	(Klbs) RT	RPM (RT)	(Klbs) MM	RPM (MM)	PP	SPM 1	SPM 2	GPM	24 Hr Activity Summary	Formation
0	11/29	1'		-	-	-	-	-	-	-	-	-	HPJSM, finish N/U Bop's. PJSM, Test bop's: Test hydril to 250 psi low 3500 psi high, test pipe rams, kill line valves,HCR, 4" manual, & blind rams, Blind rams failed. Change out blind ram blocks. Test blind rams 250 psi low 5000 psi high, pull check valve on kill line & test 250 psi low 5000 psi high, re-install check valve & test 250 psi low 5000 psi high. Test mud lines 4200 psi. Found torn piece of hydril rubber in bops. C/O hydril element. R/D testers & blow down mud lines. N/D flowline, rotating head & pollution pan on hydril & c/o hydril element & seals on cap. R/U testers & Test hydril 250 psi low & 3500 psi high. 5min low, 10 min high.	-
1	11/30	2,018'	2017	1	17	50	-		984	67	67	386	Finish test Hydril to 3500 psi high.Install wear bushing.Nipple up rotaring head bowl, flex line to flow line, Install mouse holes.Install tarp in front of sub, Pick up tools.M/U bit and TIH picking up BHA.TIH P/U 4" drill pipe. Tag @ 1240', Break circ, washing with 12K WOB, 60 RPM, 300 GPM, Geting LCM and ground up black rubber back over shakers. Washed f/ 1240' to 1244'.Continue in hole washing with 450 gpm, 50 rpm, 0-10 WOB.f/ 1244' to 1322',Rig service, adjust clamp om kelly hose and turn goose neck. Continue in hole washing with 450 gpm, 0-12 WOB.f/ 1322' to 1900' Found cement stringers @ 1793', 100% firm cement @ 1850' dress off to 1900'. CBU.Test 8 5/8" csg to 500 psi for 30min. Good Test. Contacted NDIC inspector Nicole & verified good test. Displace hole with 10.2ppg salt mud. Drill cement 1900' to 2018' WOB - 10-12, RPM-60, GPM- 385. CBU. Slip & Cut Drilline.Service Rig. Drop VES Gyro. TOH.	Pierre
2	12/1	4,015'	1997	1	5	75	-	-	1860	67	67	400	Lay dn bha. Clean rig floor. P/U 0° bend, 7/8, 6.7 XHR mud motor, MWD, Test MWD, (good test) M/U Bit, NMDC, Filter Sub & X-O. TIH to 1922'. Wash & Ream 2018' to 4015' WOB = 0-5K, RPM=70, GPM= 400, MOTOR RPM=116. Circ 30 minutes every 3 to 6 stands reamed. Average 850 - 1250 units background gas. Service Rig.	Mowry
3	12/2	4.769'	754	2(1RR)	5	75	_		1860	67	67	400	Wash & Ream 4015' to 4769' WOB = 0-5K, RPM=70, GPM= 400, MOTOR RPM=116. Circ 30 minutes every 3 to 6 stands reamed. Average 50 - 100 units background gas. No Cement plug @ 4120' to 4200'.Circ prior to wiper trip.Check flow, well statice, pump slug, POOH. Pulled 1 stand and 4' on the second stand started dragging up to35K over.Circ slug around using as a weighted sweep to help clean hole, adding asphalt to system. No excess cuttings back over shakers.Rig Service.Back ream from 4670' to 3983', POOH on elevators 3983' to surface casing.Circ bottoms up.TIH f/ 2018' to 4160'.Wash and ream f/ 4160' to 4561', hole packed off.Attempt to back reamwith pump, hole packe off, ream without pump 4561' to 4072'. Once above 4160' lost all hole drag and broke circulation, Hole drag prior to above 4160' = 25-40K. Circ bottoms up, Had increase in pea gravel size shale cuttings over shaker.Wash & Ream 4072' to 4597' WOB = 0K, RPM=90, GPM= 400, MOTOR RPM=116. Backream eachstand 1 to 2 times. Attempt to packoff @ 4582' then again @ 4597'. Had increase in pea size & some splintering shale cuttings over shaker. POOH to L/D directional assembly.	Inyan Kara

# MORNING REPORT SUMMARY

		Depth			WOB		WOB							
Day	Date 2015	(0500 Hrs)	24 Hr Footage	Bit #	(Klbs) RT	RPM (RT)	(Klbs) MM	RPM (MM)	PP	SPM 1	SPM 2	GPM	24 Hr Activity Summary	Formation
4	12/3	4,769'	0	2(1RR)	5	75	-	-	1564	75	75		POOH & L/D directional assembly.Clean floor for safety.Rig Service.M/U Bit, Bit Sub, TIH with drill collars, P/Udrilling jars, TIH to 4090'. Wash & Ream 4090' to 4747' WOB = 0K, RPM=90, GPM= 400,Backream each stand 1 to2 times. Having sudden increases in pea size & some splintering shale cuttings over shaker as hole tries to packoff. Hole packed off and pipe was stuck with circulation. Set jars and pipe pulled free. TOOH T/ 4090 with very little drag. Wash & Ream F/ 4090' T/ 4659.	Inyan Kara
5	12/4	5,609'	840	2(1RR)	5	75	-	-	1564	75	75		Circ @ 4700' lowering mud weight from 10.2+ to 9.9+.Wash & Ream 4700' to 4857' WOB = 0/5K, RPM=90/100,GPM= 400. Backream each stand 1 to 2 times. Shakers are some what cleaner, Raised mud wt back to 10.2ppg. Rig service. Wash & Ream 4857' to 5609' WOB = 0/5K, RPM=90/100, GPM= 400. Backream each stand 1 to 2times. Shakers are some what cleaner, Raised mud wt back to 10.2 ppg. Service rig. Circulate hole clean to shorttrip. H2S alarm sounded showing 20-100 ppm on the screen. Evacuated rig floor and investigated the alarm and determined that there was a bad sensor on rig floor. Called Triple A safety to come replace sensor. TOOH F/ 5609'T/ 4000'. Had several tight spots on trip out of hole. Reamed through the spots that would not pull trough @ 30Kover. TIH to 4417. Tagged up. Wash and Ream F/ 4417' T/ 4612. Hole started packing off @ 4417 and unloading a lot of shale @ shakers. Decide to TOOH to displace with OBM.	Spearfish
6	12/5	5,609'	0	3(1RR)	0-5	100	_	-	2137	75	75		POOH to change BHA, Swap to OBM.TIH w/ Bit, Bit sub, HWT DP, Dump and clean tanks.Clean Mud Tanks.Cutdrilline.Wait on & P/U jars, HWT DP.Finish clean mud tanks, Fill tanks with OBM, Treat and weight up same to 10.3 ppg. TIH F/ 1881' T/ 4345'. Displace hole with 10.3 OBM and circulate and condition mud. Wash and Ream F/ 4345' T/ 4820'. Np packing off or hole drag. Backream each stand 1 to 2 times. Shakers look a lot cleaner.	Spearfish
7	12/6	5,674'	65	4	0-5	100	-		2178	75	75		Wash and Ream F/ 4820' T/ 5674'. Np packing off or hole drag. Backream each stand 1 to 2 times. Shakers look alot cleaner. Circ prior to Wiper trip. POOH to 4345' no problems, TIH tagged @ 4485'. Wash and Ream F/ 4485' T/4724'. No packing off or hole drag. Backream each stand 1 to 2 times. Shakers have small size cuttings coming back. Service rig. Wash and Ream F/ 4724' T/ 5010'. No packing off or hole drag. Backream each stand 1 to 2 times. Shakers have small size cuttings coming back. Circulate hole clean. TOOH F/ 5010' T/ 4251. Had some dragnot over 30K. TIH F/ 4251' T/ 5010. Had to ream through tight spots @ 4374, 4730, & 4780. Circulate hole clean. TOOH F/ 5010' T/ surface and break off PDC bit. Had more drag than the short trip. Service rig. Wash and Ream F/ 4400' T/ 4500'. No packing off or hole drag. Backream each stand 1 to 2 times.	Spearfish

# MORNING REPORT SUMMARY

		Depth			WOB		WOB							
Day	Date 2015	(0500 Hrs)	24 Hr Footage	Bit #	(Klbs) RT	RPM (RT)	(Klbs) MM	RPM (MM)	PP	SPM 1	SPM 2	GPM	24 Hr Activity Summary	Formation
8	12/7	6,718'	1044	4	0-5	100	-	-	2534	75	75		Wash and Ream F/ 4500' T/ 5825'. Periodicallyl packing off. Backream each stand 1 to 2 times.Very 3 connections circulate 15 minutes. Shakers have small size cuttings coming back. Tagged cement @ 5825'. Drill cement plug F/5825' T/ 5905' for 80'. WOB=15 ROP=40fph. Wash and Ream F/ 5825' T/ 6718'. Backream each stand 1 to 2 times.Very 3 connections circulate 15 minutes. Shakers have small size cuttings coming back. Service rig.	Amsden
9	12/8	7,491'	773	4	0-5	100			2441	70	70		Wash and Ream F/ 6718' T/ 7491'. Backream each stand 1 to 2 times.every 3 connections circulate 15 minutes.Shakers have small size cuttings coming back. lost partial returns @ 7402', Pumped 50 bbls of LCM pill, regained full returns.Lost 29 bbls. While reaming @ 7491' lost complete returns. Cement Plug @ 7308' to 7392'. While pumping 100#/bbl LCM pill, Hole packed off with 75 bbls of pill outside of drill pipe, 25 bbls inside.POOH attempting to pull thru packoff, Got returns back @ 5341'. Circ cutting mud wt back to 9.8 ppg. Service rig. Circ cutting mud wt back to 9.8 ppg. Wash and Ream F/ 5341' T/ 6149'. Backream each stand 1 to 2 times.every 3 connections circulate 15 minutes. Shakers have small size cuttings coming back. Well started flowing and gainingmud. Gained 30bbls. Circulate and raise mud weight to 10.2. Gained 30bbls while circulating. Service rig. Wash and Ream F/ 6149' T/ 6434'. Backream each stand 1 to 2 times.every 3 connections circulate 15 minutes. Shakers have small size cuttings coming back. Well started flowing and gainingmud. Gained 30bbls. Circulate and raise mud weight to 10.2. Gained 30bbls while circulating. Service rig. Wash and Ream F/ 6149' T/ 6434'. Backream each stand 1 to 2 times.every 3 connections circulate 15 minutes. Shakers have small size cuttings coming back.	Mission Canyon
10	12/9	8,043'	552	4	0-5	100		-	2623	75	75		Wash and Ream F/ 6434' T/ 6915'. Backream each stand 1 to 2 times.every 3 connections circulate 15 minutes.Shakers have small size cuttings coming back. Rig service, attempt to stop swivel packing from leaking, held for just a bit then started back leaking.Check flow (well static), Pump slug and POOH f/ 6915' to 4930', Hole started givingmud back, well flowing @ 3-4 bbls hr.Mix and pump 12.0 ppg. kill pill to finish POOH to casing shoe. Check flow(well static).POOH to surface casing, Well taking proper fill, Had spot @ 4565'-4562' & 3510'.Change swivel packing. Pump thru and test same. TiH, Tag spot @ 4773', 5936', Wash thru spots with no resistance. Continue inhole to 6914'. Wash and Ream F/ 6915' T/ 8043'. Backream each stand 1 to 2 times.every 3 connections circulate15 minutes. Shakers have small size cuttings coming back. Pump at a reduced rate 350 GPM through Mission canyon. Full returns and no losses. Service rig.	Lodgepole
11	12/10	9,489'	1446	4	0-5	100	-	-	-	-	-		Wash and Ream F/ 8043' T/ 9488'. Backream each stand 1 to 2 times.every 3 connections circulate 15 minutes. Shakers have small size cuttings coming back. Pump at a reduced rate 350 GPM through Mission canyon. Full returns and no losses. Service rig. Circulate hole clean. Drop Gyro @ 9488'. Pump slug and TOOH T/ 4482' checking flow every 2000'. Hole not taking proper fill. Build 100 bbls of 11.5 kill mud. Spot 100 bbls of 11.5 kill mud. TOOH F/ 4482' T/ surface and lay down heavy weight on the way out of hole. Remove Gyro tool @ bit. Service rig. TIH with drill collars and lay down same.	Red River D

# DAILY MUD SUMMARY

Date 2015	Mud Depth	Mud WT (ppg)	VIS (sec/ qt)	PV (cP)	YP (lbs/ 100 ft <sup>2</sup> )	Gels (lbs/ 100 ft <sup>2</sup> )	600/ 300	NAP/ H <sub>2</sub> 0 (ratio)	NAP/ H <sub>2</sub> 0 (% by vol)	Cake (API/ HTHP)	Cor. Solids (%)	HPHT Filtrate	РОМ	рН	Excess Lime (lb/bbl)	Cl <sup>-</sup> (mg/L)	LGS/ HGS (%)	CaCl (ppm)	Electrical Stability	Gain/ Loss (bbls)
11/29	1,900'	9.9	29	2	1	1/1/1	4/3	-	-/98	-	-	-	-	10.5	-	168k	-/-	-	-	0/15.6
11/30	2,809'	10.1	55	12	13	10/18/21	'6/5	-	-95.6	-	1.6	-	-	9.5	-	180k	-/-	-	-	0/24.3
12/01	4,769'	10.2	62	12	18	13/17/22	42/30	-	-/93.8	-	3.2	-	-	8.5	-	169k	-	-	-	0/26.6
12/02	4,769'	10.1	61	11	19	11/18/23	41/30	-	-/81.5	-	3.9	-	-	8.5	-	158k	-	-	-	0/104.2
12/03	5,228'	10.2	62	18	18	13/19/25	54/36	-	-/77	-	5.1	-	-	8.5	-	170k	-	-	-	0/61.6
								Chang	e mud from S	alt Water	r Mud to [	Diesel invert	t							
12/04	4,612'	10.2	58	16	14	8/11/15	46/30	-	-/79	1/-	4.6	7	-	8.5	-	175k	4.4/3.1	-	-	0/0
12/05	4,891'	10.45	47	15	8	5/6/7	38/23	72/28	63/25	-/2	11	14	1.8	-	2.33	50k	3/8	242k	367	0/361.3
12/06	5,835'	10.5	47	17	7	4/5/6	35/21	75/25	65/22	-/2	11.2	10	2.2	-	2.84	45k	2.4/8.8	242k	451	0/32.5
12/07	6,912'	9.95	47	13	4	4/5/5	38/23	67/33	59/29	-/2	10.2	13	2.3	-	2.98	46k	2.3/7.9	198k	238	0/150.3
12/08	7,066'	10.35	49	15	8	4/5/5	38/23	67/33	59/29	-/2	10.2	13	2.3	-	2.98	46k	2.3/7.9	198k	238	0/5

# **BOTTOM HOLE ASSEMBLY RECORD**

					Moto		Reason For								
Bit #	Size (in.)	Туре	Make	Model	Depth In	Depth Out	Footage	Hours	Σ hrs	Vert. Dev.	Make	Model	Bend	Rev/Gal	Removal
1	7 7/8	PDC	Varel	DT1GJMR	2,018'	4,769'	2,751'	18.1	18.1	Vertical	Hunting	-	.00°	0.24	Hole Sloughing Off
2(1RR)	7 7/8	PDC	Varel	DT1GJMR	4,769'	5,609'	840'	22.1	40.2	Vertical	Hunting	-	.00°	0.24	Change to Invert
3(1RR)	7 7/8	PDC	Varel	DT1GJMR	5,609'	5,674'	65'	15.4	55.6	Vertical	Hunting	-	.0°	0.24	Tight Hole
4	7 7/8	Rock Bit	Varel	-	5,674'	9,489'	3,815'	55	110.6	Vertical	Ryan	-	.0°	0.24	TD Hole



6am Depth: 2,018' F Estimated TVD: 2,018' Estimated VS: 0' Previous depth: 1' 24 hr. footage: 2,017' Weather: 30°/11°F; Light Snow, Winds 5-10 MPH Operator: Denbury Onshore LLC. Well Name: Cedar Hills 21-22 Field Cedar Hills Location: 1248' FNL & 1,654' FWL Sec. 22, T131N, R105W Cedar Hills / Red River

Planned TD (MD): 9,500' Ft. to plan TD: 7,482'

> Objective: Red River D Present zone: Red River D

Date: November 30, 2015 Report #: 2

Rig: Trinidad 35 GL elevation: -KB elevation: 2,955'

Current Activity: Picking up BHA to ream vertical

Drilling Parameters:	WOB (klbs) RT:	RPM (RT):	WOB(klbs) MM:	RPM (MM):	PP (psi):	SPM 1:	SPM 2:	GPM:
	18	50	-	93	983	67	67	386
BHA:	Bit #:	Diameter (in):	Make:	Model:	Serial #:	Depth in:	Footage:	Hours:
	1	8 3/4	Varel	DT1GJMR	14441919	2,018'	0'	-
	Motor (make):	Motor (model):	Motor (bend):	Motor (rev/gal):	Gamma to	bit (ft):	Surv	vey to bit (ft):
	Hunting	-	.0°	0.24	-			60'
Mud Data:	Wt (ppg):	Vis (sec/qt):	Depth of Data:	Mud Type:	24-hr mud los	sses (bbls):	Cumulative	e mud losses (bbls):
	9.9	29	1,900'	Saltwater/ Brine	15.0	-		15.6
		Pressure (psi):	Casing Back	Pressure (psi)	Gas buste			min/strokes):
	10	)39		-	off		7min	915 strokes
Gas:	Gas Show (	units/depth):	Gas Show (	units/depth):	Gas Show (ur	nits/depth):	Gas Sho	ow (units/depth):
	10,177u	1,650'	5,015u	1,689'	-	-	-	-
		d gas (max):	Backgroun	d gas (min):	Background	gas (avg):	Connecti	on gas (max/min):
		)0u	-	5u	55เ		-	-
		gas:	Down-Time Ga	s (units/depth):	Flar		G	as Buster
	5	6u	-	-	Non	e		Off
Sample Description:								
	Sample	quality:	Oil s	stain:	Poros	sity:		Cut:
		-		-	-			-
Present Activity	Picking up BHA to	ream vertical						
Summary:	· · · · · · · · · · · · · · · · · · ·							
-								
Comments:								
		p on location 11/28						
Contact:	Cole Jack		320-290-9671	5am-5pm				
	Kyle Eno		231-445-0555	5pm-5am				
	Geology rig phone	):	-					



6am Depth: 4,769' Estimated TVD: 4,768' Estimated VS: -12' Previous depth: 4,007' 24 hr. footage: 762' Weather: 30°/11°F; Light Snow, Winds 5-10 MPH Operator: Denbury Onshore LLC. Well Name: Cedar Hills 21-22 Field Cedar Hills Location: 1248' FNL & 1,654' FWL Sec. 22, T131N, R105W Cedar Hills / Red River

Planned TD (MD): 9,500' Ft. to plan TD: 4,731'

> Objective: Red River D Present zone: Red River D

Date: December 1, 2015 Report #: 3

Rig: Trinidad 35 GL elevation: -KB elevation: 2,955'

Current Activity: TOOH to lay down MWD tool

	P		-					
Drilling Parameters:	WOB (klbs) RT:	RPM (RT):	WOB(klbs) MM:	RPM (MM):	PP (psi):	SPM 1:	SPM 2:	GPM:
	5	75	-	-	1700	67	70	400
BHA:	Bit #:	Diameter (in):	Make:	Model:	Serial #:	Depth in:	Footage:	Hours:
	1	8 3/4	Varel	DT1GJMR	14441919	2,018'	2,751'	-
	Motor (make):	Motor (model):	Motor (bend):	Motor (rev/gal):	Gamma to	bit (ft):	Surv	ey to bit (ft):
	Hunting	-	.0°	0.24	-			60'
Mud Data:	Wt (ppg):	Vis (sec/qt):	Depth of Data:	Mud Type:	24-hr mud los	sses (bbls):	Cumulative	mud losses (bbls):
	10.2	62	4,769'	Saltwater/ Brine	26.	6		66.5
	Hydrostatic F	Pressure (psi):	Casing Back	Pressure (psi)	Gas buste	er status	Lag (	min/strokes):
	25	529		-	on	1	15min	2,094 strokes
Gas:	Gas Show (	units/depth):	Gas Show (	units/depth):	Gas Show (u	nits/depth):	Gas Sho	w (units/depth):
	444u	4.200'	431u	4.100'	329u	4,270u	-	-
	Backgroun	d gas (max):	Backgroun	d gas (min):	Background	,	Connectio	on gas (max/min):
		20u	50u		250	• • •	-	-
	Trip	gas:	Down-Time Gas (units/depth):		Flare:		Gas Buster	
		-	-	-	None		On	
Sample Description:		LE: black- dark gray s cement, moderate	, ,		ı; SANDSTONE: lig	jht gray, fine grai	ined, firm-hard, a	ingular, moderately
	Sample	quality:	Oils	stain:	Poros	sitv:		Cut:
		bod		-	-			-
Present Activity Summary:	TOOH to lay down	n MWD tool						
Comments:	Sunburst rigged u	p on location 11/28	/2015					
Contact:	Cole Jack	•	320-290-9671	5am-5pm				
	Kyle Eno		231-445-0555	5pm-5am				
	Geology rig phone	9:	-					



6am Depth: 4,769' Estimated TVD: 4,768' Estimated VS: -12' Previous depth: 4,007' 24 hr. footage: 762' Weather: 30°/11°F; Light Snow, Winds 5-10 MPH Operator: Denbury Onshore LLC. Well Name: Cedar Hills 21-22 Field Cedar Hills Location: 1248' FNL & 1,654' FWL Sec. 22, T131N, R105W Cedar Hills / Red River

Planned TD (MD): 9,500' Ft. to plan TD: 4,731'

> **Objective:** Red River D **Present zone:** Red River D

Date: December 2, 2015 Report #: 4

Rig: Trinidad 35 GL elevation: -KB elevation: 2,955'

Current Activity: TOOH to lay down MWD tool

						0.0014		0.014
Drilling Parameters:			WOB(klbs) MM:	RPM (MM):	PP (psi):	SPM 1:	SPM 2:	GPM:
	5	75	-	-	1700	67	70	400
BHA:	Bit #:	Diameter (in):	Make:	Model:	Serial #:	Depth in:	Footage:	Hours:
	1	8 3/4	Varel	DT1GJMR	14441919	2,018'	2,751'	-
	Motor (make):	Motor (model):	Motor (bend):	Motor (rev/gal):	Gamma to	o bit (ft):	Surv	ey to bit (ft):
	Hunting	-	.0°	0.24	-			60'
Mud Data:	Wt (ppg):	Vis (sec/qt):	Depth of Data:	Mud Type:	24-hr mud los	24-hr mud losses (bbls):		mud losses (bbls):
	10.2	62	4,769'	Saltwater/ Brine	26.	6		66.5
	Hydrostatic I	Pressure (psi):	Casing Back	Pressure (psi)	Gas buste	er status	Lag (	min/strokes):
	25	529		-	on		15min	2,094 strokes
Gas:	Gas Show (	units/depth):	Gas Show (	units/depth):	Gas Show (u	nits/depth):	Gas Sho	w (units/depth):
	444u	4.200'	431u	4.100'	329u	4.270u	-	-
	Backgroun	d gas (max):	Backgroun	d gas (min):	Background	gas (avg):	Connectio	on gas (max/min):
		20u		Ou j	250		-	-
	Trip	gas:	Down-Time Gas (units/depth):		Flare:		Gas Buster	
		-	-	-	Nor	ne	On	
Sample Description:	4280 - 4300 SHAI	F: black- dark grav	/ firm-hard_sub-blo	ocky earthy-smooth		nht aray fine arai	ined firm-hard a	ngular moderately
		s cement, moderate			,	,		
	Sample	quality:	Oils	stain:	Poros	sity:		Cut:
	go	bod		-	-			-
Present Activity	TOOH to lay down	n MWD tool						
Summary:								
· · · · •								
Comments:								
	Sunburst rigged u	p on location 11/28	/2015					
Contact:	Cole Jack		320-290-9671	5am-5pm				
	Kyle Eno		231-445-0555	5pm-5am				
	Geology rig phone	e:	-					



6am Depth: 4,685' I Estimated TVD: 4,684' Estimated VS: -11' Previous depth: 4,769' 24 hr. footage: -84' Weather: 42°/26°F; Sunny, Winds 5-10 MPH Operator: Denbury Onshore LLC. Well Name: Cedar Hills 21-22 Field Cedar Hills Location: 1248' FNL & 1,654' FWL Sec. 22, T131N, R105W Cedar Hills / Red River

Planned TD (MD): 9,500' Ft. to plan TD: 4,815'

> Objective: Red River D Present zone: Red River D

Date: December 3, 2015 Report #: 5

Rig: Trinidad 35 GL elevation: -KB elevation: 2,955'

Jrilling Parameters:	WOB (klbs) RT:	RPM (RT):	WOB(klbs) MM:	RPM (MM):	PP (psi):	SPM 1:	SPM 2:	GPM:
	5	100	-	-	1600	75	75	400
BHA:	Bit #:	Diameter (in):	Make:	Model:	Serial #:	Depth in:	Footage:	Hours:
	1	8 3/4	Varel	DT1GJMR	14441919	2,018'	2,667'	-
	Motor (make):	Motor (model):	Motor (bend):	Motor (rev/gal):	Gamma to	bit (ft):	Surv	ey to bit (ft):
	Hunting	-	.0°	0.24	-			60'
Mud Data:	Wt (ppg):	Vis (sec/qt):	Depth of Data:	Mud Type:	24-hr mud los	4-hr mud losses (bbls):		mud losses (bbls):
	10.2	62	4,341'	Saltwater/ Brine	26.	6		66.5
	Hydrostatic F	Pressure (psi):	Casing Back	Pressure (psi)	Gas buste	er status	Lag (	min/strokes):
	24	184		-	or	1	14min	1,969 strokes
Gas	Gas Show (	units/depth):	Gas Show (	units/depth):	Gas Show (u	nits/depth):	Gas Sho	w (units/depth):
	470u	4,200'	265u	4,425'	-	-	-	-
	Backgroun	d gas (max):	Backgroun	d gas (min):	Background	gas (avg):	Connectio	on gas (max/min):
	20	)0u	10	)Ou	150	u t c,	-	-
	Trip	gas:	Down-Time Gas (units/depth):		Flare:		Gas Buster	
	4-	70			None		On	
ample Description:		70u _E: black- dark grav	- /. firm-hard. sub-blo	- ocky. earthy-smooth	-			-
ample Description:	4280 - 4300 SHAI				-			-
ample Description:	4280 - 4300 SHAI sorted, calcareous	E: black- dark gray	ly cemented; comn		-	jht gray, fine grai		-
Sample Description:	4280 - 4300 SHAI sorted, calcareous	E: black- dark gray	ly cemented; comn	non cement	; SANDSTONE: liç	jht gray, fine grai		ngular, moderately
	4280 - 4300 SHAI sorted, calcareous Sample	E: black- dark gray s cement, moderate <b>quality:</b> pod	ly cemented; comn	non cement	; SANDSTONE: liç	jht gray, fine grai		ngular, moderately
Present Activity	4280 - 4300 SHAI sorted, calcareous Sample gr Washing & Ream	E: black- dark gray s cement, moderate quality: bod ing to Bottom	iy cemented; comm Oil s	non cement	; SANDSTONE: lig Poros -	iht gray, fine grai		ngular, moderately
Present Activity Summary: Comments:	4280 - 4300 SHAI sorted, calcareous Sample gr Washing & Ream	E: black- dark gray s cement, moderate quality: bod ing to Bottom	iy cemented; comm Oil s	non cement	; SANDSTONE: lig Poros -	iht gray, fine grai		ngular, moderately
Present Activity Summary: Comments:	4280 - 4300 SHAI sorted, calcareous Sample gr Washing & Ream	E: black- dark gray s cement, moderate quality: bod ing to Bottom	Oil s	non cement	; SANDSTONE: lig Poros -	iht gray, fine grai		ngular, moderately



Operator: Denbury Onshore LLC. Well Name: Cedar Hills 21-22 Field Cedar Hills Location: 1248' FNL & 1,654' FWL Sec. 22, T131N, R105W Cedar Hills / Red River

Planned TD (MD): 9,500' Ft. to plan TD: 3,891'

> **Objective:** Red River D **Present zone:** Red River D

Date: December 4, 2015 Report #: 6

Rig: Trinidad 35 GL elevation: 2,932' KB elevation: 2,956'

Current Activity: Circulating bottoms up to TOOH; Swap over to Invert

rilling Parameters:	WOB (klbs) RT	RPM (RT):	WOB(klbs) MM:	RPM (MM):	PP (psi):	SPM 1:	SPM 2:	GPM:	
	5	80	-	-	1750	75	75	529	
BHA:	Bit #:	Diameter (in):	Make:	Model:	Serial #:	Depth in:	Footage:	Hours:	
210.0	1	8 3/4	Varel	DT1GJMR	14441919	2,018'	3,591'	-	
	Motor (make):	Motor (model):	Motor (bend):	Motor (rev/gal):	Gamma to	,	,	ey to bit (ft):	
	Hunting	-	.0°	0.24	-			60'	
Mud Data:	Wt (ppg):	Vis (sec/qt):	Depth of Data:	Mud Type:	24-hr mud los	sses (bbls):	Cumulative	mud losses (bbls):	
	10.2	62	5,228'	Saltwater/ Brine	19			85	
	Hydrostatic F	Pressure (psi):	Casing Back	Pressure (psi)	Gas buste	er status	Lag (	min/strokes):	
	29	975		-	or		14min	1,969 strokes	
Gas:	Gas Show (	units/depth):	Gas Show (	units/depth):	Gas Show (u	nits/depth):	Gas Sho	w (units/depth):	
	120u	5,196'	123u	5,379'	133u	5,594u	-	-	
	Backgroun	d gas (max):	Backgroun	d gas (min):	Background	gas (avg):	Connectio	on gas (max/min):	
	10	20u	9	Ou	105	u			
	12	-00			Flare:			Gas Buster	
		gas:	Down-Time Ga	s (units/depth):	Flar	e:	G	as Buster	
	<b>Trip</b> 4280 - 4300 SHAL	gas: - .E: black- dark gray	- /, firm-hard, sub-blo	- ocky, earthy-smooth	Nor	ie	_	On	
	<b>Trip</b> 4280 - 4300 SHAL	gas: -	- /, firm-hard, sub-blo	- ocky, earthy-smooth	Nor	ie	_	On	
	Trip 4280 - 4300 SHAL sorted, calcareous	gas: - .E: black- dark gray	- /, firm-hard, sub-bk ly cemented; comr	- ocky, earthy-smooth	Nor	ie ht gray, fine grai	_	On	
ample Description:	Trip 4280 - 4300 SHAL sorted, calcareous Sample	gas: - - E: black- dark gray s cement, moderate	- /, firm-hard, sub-bk ly cemented; comr	- cky, earthy-smooth	<u>Nor</u> ; SANDSTONE: انړ	ie ht gray, fine grai	_	On ngular, moderately	
	Trip 4280 - 4300 SHAL sorted, calcareous Sample	gas: - E: black- dark gray s cement, moderate quality:	- /, firm-hard, sub-bld ly cemented; comr Oil s	- cky, earthy-smooth	<u>Nor</u> ; SANDSTONE: انړ	ie ht gray, fine grai	_	On ngular, moderately	
Present Activity Summary: Comments:	Trip 4280 - 4300 SHAL sorted, calcareous Sample gc Circulating bottom	gas: - E: black- dark gray cement, moderate quality: bood s up to TOOH; Swa	- /, firm-hard, sub-blo ly cemented; comr Oil s ap over to Invert	- cky, earthy-smooth	Nor ; SANDSTONE: lig Poros	ie ht gray, fine grai	_	On ngular, moderately	
Present Activity Summary: Comments:	Trip 4280 - 4300 SHAL sorted, calcareous Sample gc Circulating bottom	gas: - E: black- dark gray cement, moderate quality: bood s up to TOOH; Swa	- /, firm-hard, sub-blo ly cemented; comr Oil s ap over to Invert	- bocky, earthy-smooth non cement	Nor ; SANDSTONE: lig Poros	ie ht gray, fine grai	_	On ngular, moderately	
Present Activity Summary: Comments: Contact:	Trip 4280 - 4300 SHAL sorted, calcareous Sample gc Circulating bottom Made it to 5,609' I	gas: - E: black- dark grays cement, moderate quality: pod s up to TOOH; Swa MD, wiper trip back	- /, firm-hard, sub-blo ly cemented; comr Oil s ap over to Invert to 4,000', wash & 1		Nor ; SANDSTONE: lig Poros	ie ht gray, fine grai	_	On ngular, moderately	



6am Depth: 4,807' PI Estimated TVD: 4,806' Estimated VS: -11' Previous depth: 5,609' 24 hr. footage: -802' Weather: 45°/26°F; Sunny, Winds 15-23 MPH Operator: Denbury Onshore LLC. Well Name: Cedar Hills 21-22 Field Cedar Hills Location: 1248' FNL & 1,654' FWL Sec. 22, T131N, R105W Cedar Hills / Red River

Planned TD (MD): 9,500' Ft. to plan TD: 4,693'

> Objective: Red River D Present zone: Red River D

Date: December 5, 2015 Report #: 7

Rig: Trinidad 35 GL elevation: 2,932' KB elevation: 2,956'

Drilling Parameters:	WOB (klbs) RT:	RPM (RT):	WOB(klbs) MM:	RPM (MM):	PP (psi):	SPM 1:	SPM 2:	GPM:
	5	100	-	-	2100	75	75	529
BHA:	Bit #:	Diameter (in):	Make:	Model:	Serial #:	Depth in:	Footage:	Hours:
	1RR#2	8 3/4	Varel	DT1GJMR	14441919	2,018'	2,789'	-
	Motor (make):	Motor (model):	Motor (bend):	Motor (rev/gal):	Gamma te	bit (ft):	Surv	ey to bit (ft):
	Hunting	-	.0°	0.24	-			60'
Mud Data:	Wt (ppg):	Vis (sec/qt):	Depth of Data:	Mud Type:	24-hr mud lo	sses (bbls):	Cumulative	mud losses (bbls):
	10.2	58	4,612'	Invert	19	)		85
	Hydrostatic F	Pressure (psi):	Casing Back	Pressure (psi)	Gas buste	er status	Lag (	min/strokes):
	25	549		-	or	า	14min	1,969 strokes
Gas:	Gas Show (	units/depth):	Gas Show (	units/depth):	Gas Show (u	nits/depth):	Gas Sho	w (units/depth):
		. ,					-	-
	Backgroun	d gas (max):	Backgroun	d gas (min):	Background	gas (avg):	Connectio	on gas (max/min):
	3	5u	2	:Ou	- 25	u	-	-
	Trip	gas:	Down-Time Gas (units/depth):		Flare:		Gas Buster	
	15	56u			None		No	
Sample Description:		LE: black- dark gray	, ,		; SANDSTONE: II	gnt gray, fine gra	ined, tirm-nard, a	ingular, moderately
	Sample	quality:	Oils	stain:	Poros	sitv:		Cut:
		bod		-	-	- • <b>-</b>		-
Present Activity Summary:	Wash & Ream to	Bottom						
Comments:	Switched to invert	mud from salt wate	er, TIH and wash &	ream to bottom, wo	ork tight spots			
Contact:	Cole Jack		320-290-9671	5am-5pm	• •			
	Kyle Eno		231-445-0555	5pm-5am				



6am Depth: 4,550' Pla Estimated TVD: 4,549' Estimated VS: -11' Previous depth: 5,674' 24 hr. footage: -1,124' Weather: 48°/26°F; Sunny, Winds 15-23 MPH

Operator: Denbury Onshore LLC. Well Name: Cedar Hills 21-22 Field Cedar Hills Location: 1248' FNL & 1,654' FWL Sec. 22, T131N, R105W Cedar Hills / Red River

Planned TD (MD): 9,500' Ft. to plan TD: 4,950'

> Objective: Red River D Present zone: Red River D

Date: December 6, 2015 Report #: 8

Rig: Trinidad 35 GL elevation: 2,932' KB elevation: 2,956'

Drilling Parameters:	WOB (klbs) RT:	RPM (RT):	WOB(klbs) MM:	RPM (MM):	PP (psi):	SPM 1:	SPM 2:	GPM:
	5	100	-	-	2100	75	75	529
BHA:	Bit #:	Diameter (in):	Make:	Model:	Serial #:	Depth in:	Footage:	Hours:
	4	8 3/4	-	-	-	5,674'	-1,124'	-
	Motor (make):	Motor (model):	Motor (bend):	Motor (rev/gal):	Gamma to	bit (ft):	Surv	rey to bit (ft):
	Hunting	-	.0°	0.24	-			•
Mud Data:	Wt (ppg):	Vis (sec/qt):	Depth of Data:	Mud Type:	24-hr mud lo	sses (bbls):	Cumulative	mud losses (bbls):
	10.45	47	4,891'	Invert	361	.3		593.6
	Hydrostatic F	Pressure (psi):	Casing Back	Pressure (psi)	Gas buste	er status	Lag (	min/strokes):
	24	472		-	or	1	13min	2,000 strokes
Gas:	Gas Show (	units/depth):	Gas Show (	units/depth):	Gas Show (u	nits/depth):	Gas Sho	w (units/depth):
	94u	4.416		, , , ,	···· (·		-	-
	Backgroun	d gas (max):	Backgroun	d gas (min):	Background	gas (avg):	Connectio	on gas (max/min):
		5u 5u		0u j	25		-	-
	Trip	gas:	Down-Time Gas (units/depth):		Flare:		Gas Buster	
	5	8u			None		No	
Sample Description:		s cement, moderate	· · · · ·			gni gray, nne grai	neu, iim-naiu, a	ingular, moderately
	Sample	quality:	Oils	stain:	Poros	sitv:		Cut:
		bod		-	-			-
Present Activity Summary:	Wash & Ream to	Bottom						
Comments:	Reached 5,010' M	1D, tripped out for a	tri-cone bit, TIH, w	vash & ream to botto	om			
Contact:	Cole Jack		320-290-9671	5am-5pm				
	Kyle Eno		231-445-0555	5pm-5am				
	Geology rig phone	e:	-					



6am Depth: 6,785' Pla Estimated TVD: 6,784' Estimated VS: -12' Previous depth: 5,674' 24 hr. footage: 1,111' Weather: 50°/35°F; Sunny, Winds 15-23 MPH

Operator: Denbury Onshore LLC. Well Name: Cedar Hills 21-22 Field Cedar Hills Location: 1248' FNL & 1,654' FWL Sec. 22, T131N, R105W Cedar Hills / Red River

Planned TD (MD): 9,500' Ft. to plan TD: 2,715'

> Objective: Red River D Present zone: Red River D

Date: December 7, 2015 Report #: 9

Rig: Trinidad 35 GL elevation: 2,932' KB elevation: 2,956'

								•
Drilling Parameters:	WOB (klbs) RT:	RPM (RT):	WOB(klbs) MM:	RPM (MM):	PP (psi):	SPM 1:	SPM 2:	GPM:
	5	100	-	-	2500	75	75	529
BHA:	Bit #:	Diameter (in):	Make:	Model:	Serial #:	Depth in:	Footage:	Hours:
	4	8 3/4	-	-	-	5,674'	1,111'	-
	Motor (make):	Motor (model):	Motor (bend):	Motor (rev/gal):	Gamma to	bit (ft):	Surv	rey to bit (ft):
	Hunting	-	.0°	0.24	-			-
Mud Data:	Wt (ppg):	Vis (sec/qt):	Depth of Data:	Mud Type:	24-hr mud los	24-hr mud losses (bbls):		mud losses (bbls):
	10.5	47	5,835'	Invert	32.	5		626.1
	Hydrostatic F	Pressure (psi):	Casing Back	Pressure (psi)	Gas buste	er status	Lag (	min/strokes):
	37	704		-	on		20min	2,964 strokes
Gas:	Gas Show (	units/depth):	Gas Show (	units/depth):	Gas Show (u	nits/depth):	Gas Sho	w (units/depth):
	65u	6,170'		,	···· (·		-	-
	Backgroun	d gas (max):	Backgroun	d gas (min):	Background	gas (avg):	Connectio	on gas (max/min):
	5	5u	5	Ou	52	u i u	-	-
	Trip	gas:	Down-Time Gas (units/depth):		Flar	e:	Gas Buster	
		-			None		No	
Sample Description:		stalline, anhydritic i		ky, laminateu in par	, eariny lexiule, ca	arbonaceous, Lin	NESTONE. gray-	black, arginaceous in
	Sample	quality:	Oil s	stain:	Poros	sity:		Cut:
		bod		-	-	-		-
Present Activity Summary:	Wash & Ream to	Bottom						
Comments:	Drilled through plu	ıg at 5,825' MD, ma	nximum cement see	en was ~40%				
	Cole Jack	• • • •	320-290-9671	5am-5pm				
	Kyle Eno		231-445-0555	5pm-5am				
	Geology rig phone	):	-					



6am Depth: 7,492' Pla Estimated TVD: 7,491' Estimated VS: -12' Previous depth: 5,674' 24 hr. footage: 1,818' Weather: 53°/32°F; Sunny, Winds 15-23 MPH

Operator: Denbury Onshore LLC. Well Name: Cedar Hills 21-22 Field Cedar Hills Location: 1248' FNL & 1,654' FWL Sec. 22, T131N, R105W Cedar Hills / Red River

Planned TD (MD): 9,500' Ft. to plan TD: 2,008'

> Objective: Red River D Present zone: Red River D

Date: December 8, 2015 Report #: 10

Rig: Trinidad 35 GL elevation: 2,932' KB elevation: 2,956'

Drilling Parameters:	WOB (klbs) RT:	RPM (RT):	WOB(klbs) MM:	RPM (MM):	PP (psi):	SPM 1:	SPM 2:	GPM:
	5	100	-	-	2500	75	75	529
BHA	Bit #:	Diameter (in):	Make:	Model:	Serial #:	Depth in:	Footage:	Hours:
	4	8 3/4	-	-	-	5,674'	1,818'	-
	Motor (make):	Motor (model):	Motor (bend):	Motor (rev/gal):	Gamma te	bit (ft):	Surv	ey to bit (ft):
	Hunting	-	.0°	0.24	-			-
Mud Data:	Wt (ppg):	Vis (sec/qt):	Depth of Data:	Mud Type:	24-hr mud lo	sses (bbls):	Cumulative	mud losses (bbls):
	9.95	47	7,491'	Invert	15	0		776
	Hydrostatic I	Pressure (psi):	Casing Back	Pressure (psi)	Gas bust	er status	Lag (	min/strokes):
	3	876		-	or	า	20min	2,964 strokes
Gas	Gas Show	(units/depth):	Gas Show (	units/depth):	Gas Show (u	nits/depth):	Gas Sho	w (units/depth):
	87u	7,098'	122u	7,290'	122u	7,344u	-	-
	Backgroun	d gas (max):	Backgroun	d gas (min):	Background	gas (avg):	Connectio	on gas (max/min):
		0u	7	Ou	80	u	-	-
	Trip	gas:	Down-Time Gas (units/depth):		Flare:		Gas Buster	
	1	50u			None		No	
	Sample	quality:	Oil s	stain:	Poros	sity:		Cut:
		bod		-	-			-
Present Activity Summary	Wash & Ream to	Bottom						
Comments		ug at ~7,300', max o	ement 30%					
		ug at ~7,300', max o	ement 30% 320-290-9671	5am-5pm				
	Drilled through plu	ug at ~7,300', max o		5am-5pm 5pm-5am				

# **GEOLOGIC MORNING REPORT**



6am Depth: 8,045' Pla Estimated TVD: 8,044' Estimated VS: -15' Previous depth: 7,492' 24 hr. footage: 553' Weather: 61°/35°F; Sunny, Winds 13-23 MPH

Operator: Denbury Onshore LLC. Well Name: Cedar Hills 21-22 Field Cedar Hills Location: 1248' FNL & 1,654' FWL Sec. 22, T131N, R105W Cedar Hills / Red River

Planned TD (MD): 9,500' Ft. to plan TD: 1,455'

> Objective: Red River D Present zone: Red River D

Date: December 9, 2015 Report #: 11

Rig: Trinidad 35 GL elevation: 2,932' KB elevation: 2,956'

Current Activity: Wash & Ream to Bottom

Drilling Parameters:	WOB (klbs) RT:	RPM (RT):	WOB(klbs) MM:	RPM (MM):	PP (psi):	SPM 1:	SPM 2:	GPM:
	5	100	-	-	2500	66	66	465
BHA:	Bit #:	Diameter (in):	Make:	Model:	Serial #:	Depth in:	Footage:	Hours:
	4	8 3/4	-	-	-	5,674'	2,371'	-
	Motor (make):	Motor (model):	Motor (bend):	Motor (rev/gal):	Gamma to	bit (ft):	Surv	ey to bit (ft):
	Hunting	-	.0°	0.24	-			-
Mud Data:	Wt (ppg):	Vis (sec/qt):	Depth of Data:	Mud Type:	24-hr mud los	sses (bbls):	Cumulative	mud losses (bbls):
	10.35	49	7,066'	Invert	5			781
	Hydrostatic F	Pressure (psi):	Casing Back	Pressure (psi)	Gas buste	er status	Lag (	min/strokes):
	43	329		-	or	1	19min	2,523 strokes
Gas:	Gas Show (	units/depth):	Gas Show (	units/depth):	Gas Show (u	nits/depth):	Gas Sho	w (units/depth):
	66u	7.668'	65u	7.855'	-	-	-	-
	Backgroun	d gas (max):	Backgroun	d gas (min):	Background	gas (avg);	Connectio	on gas (max/min):
	60u Trip gas:		50u		55u		-	-
			Down-Time Gas (units/depth):		Flare:		Gas Buster	
		-			None		No	
	Sample	quality:	Oil stain:		Porosity:		Cut:	
	go	bod		-	-		-	
Present Activity Summary:	Wash & Ream to	Bottom						
Comments:								
Contact:	Cole Jack		320-290-9671	5am-5pm				
	Kyle Eno		231-445-0555	5pm-5am				
	Geology rig phone	):	-					

INDUSTRIAL CO OIL AND GAS DI	MMISSION OF NORTH VISION EVARD DEPT 405 58505-0840	Ι ΟΑΚΟΤΑ	WELLS - FORM 4	We	ell File No. 11409
	D ONE COPY.	<ivi.< th=""><th></th><th></th><th></th></ivi.<>			
✓ Notice of Intent App	roximate Start Date		Drilling Prognosis		Report
	Mark Completed		Redrilling or Repair	ir Shoot	
Report of Work Done Date	e Work Completed		Casing or Liner		ure Treatment
		-116	Plug Well		
Notice of Intent to Begin a Worke for a Tax Exemption Pursuant to			Supplemental Hist		ge Production Method
Арр	roximate Start Date		Temporarily Abane	—	mation
			Other Filter	r Media Container Wa	alver
Well Name and Number				24-HOUR PF	
Cedar Hills 21-22				Before	After
Footages <b>1248</b> F <b>N</b> L <b>1654</b> F			nship Range 131 N 105 W	Oil Bb Water Bb	
<b>1248 F N L 1654</b> F Field			County		CF Gas MCF
Cedar Hills	South Red Riv	er B	Bowman		
Name of Contractor(s) Address			OF WORK	State	Zip Code
Denbury does not plan to util	lize any disposable	e filter medi	a at this well site to o	drill, complete, or p	produce this well.
Company Denbury Onshore, LLC Address 5320 Legacy Drive			Telephone Number 972-673-2677	FOR ST	ATE USE ONLY
City		State	Zip Code	Date 11/2/2015	
Plano Signature	> Printed N	TX ame J. Yates	75024	11/3/2015 Ву Todd L. H	
	Date	er 21, 2015		Title	
Email Address					
Regulatory Compliance Mana Email Address tommy.yates@denbury.com	ager  Octobe	er 21, 2015		DMR Peri	mit Manager



# **Oil and Gas Division**

Lynn D. Helms - Director Bruce E. Hicks - Assistant Director

**Department of Mineral Resources** 

Lynn D. Helms - Director

North Dakota Industrial Commission

www.oilgas.nd.gov

November 5, 2015

Tommy J. Yates Regulatory Compliance Manager DENBURY ONSHORE, LLC 5320 Legacy Dr Plano, TX 75024

> RE: VERTICAL WELL CEDAR HILLS 21-22 NENW Section 22-131N-105W Bowman County, North Dakota Well File # 11409

Dear Tommy :

Pursuant to Commission Order No. 8814 & 9276, approval to drill the above captioned well is hereby given.

### **PERMIT STIPULATIONS:**

- Effective June 1, 2014, a covered leak-proof container (with placard) for filter sock disposal must be maintained on the well site beginning when the well is spud, and must remain on-site during clean-out, completion, and flow-back whenever filtration operations are conducted.
- A dike surrounding the entire location may be required at the discretion of the NDIC field inspector.
- Denbury must record any plugs encountered when re-entering the well and submit the information on a Form 4 (Sundry Notice).
- Denbury must obtain NDIC Field inspector approval 24hrs prior to any plugging operations.
- DENBURY ONSHORE must contact NDIC Field Inspector Matthew Tibor at (701) 590-2140 prior to location construction.

## Drilling pit

NDAC 43-02-03-19.4 states that "a pit may be utilized to bury drill cuttings and solids generated during well drilling and completion operations, providing the pit can be constructed, used and reclaimed in a manner that will prevent pollution of the land surface and freshwaters. Reserve and circulation of mud system through earthen pits are prohibited. All pits shall be inspected by an authorized representative of the director prior to lining and use. Drill cuttings and solids must be stabilized in a manner approved by the director prior to placement in a cuttings pit."

### Permit Fee & Notification

Payment was received in the amount of \$100 via credit card. It is requested that notification be given immediately upon the spudding of the well. This information should be relayed to the Oil & Gas Division, Bismarck, via telephone (701) 328-8020. The following information must be included: Well name, legal location, permit number, drilling contractor and rig number, company representative, date and time of spudding. Office hours are 8:00 a.m. to 12:00 p.m. and 1:00 p.m. to 5:00 p.m. Central Time. Please leave a message if after hours or on the weekend.

Tommy J. Yates November 5, 2015 Page 2

### **Confidential status**

Your request for confidential status of all information furnished to the Director, or his representatives, is hereby granted. Such information, except production runs, shall remain confidential for six months and expires on <u>May 5, 2016.</u>

Confidential status notwithstanding, the Director and his representatives shall have access to all well records wherever located. Your company personnel, or any person performing work for your company shall permit the Director and his representatives to come upon any lease, property, well, or drilling rig operated or controlled by them, complying with all safety rules, and to inspect the records and operation of such wells and to have access at all times to any and all records of wells. The Commission's field personnel periodically inspect producing and drilling wells. Any information regarding such wells shall be made available to them at any time upon request. The information so obtained by the field personnel shall be maintained in strict confidence and shall be available only to the Commission and its staff.

### Conductors, Rat holes, and Mouse holes

To protect near surface groundwater any conductor, rat, or mouse hole drilled must be constructed with a string of casing and cemented to ground level. Any such string must be secured at the surface when not in use. In addition, all rat and mouse holes must be plugged with cement and cut off at least 4' below final grade within a reasonable timeframe after the rig completes drilling operations on the pad.

### Surface casing cement

Tail cement utilized on surface casing must have a minimum compressive strength of 500 psi within 12 hours, and tail cement utilized on production casing must have a minimum compressive strength of 500 psi before drilling the plug or initiating tests.

### Logs

NDAC Section 43-02-03-31 requires the running of (1) a suite of open hole logs from which formation tops and porosity zones can be determined, (2) a Gamma Ray Log run from total depth to ground level elevation of the well bore, and (3) a log from which the presence and quality of cement can be determined (Standard CBL or ultrasonic cement evaluation log) in every well in which production or intermediate casing has been set, this log must be run prior to completing the well. All logs run must be submitted free of charge, as one digital TIFF (tagged image file format) copy and one digital LAS (log ASCII) formatted copy. Digital logs may be submitted on a standard CD, DVD, or attached to an email sent to <u>digitallogs@nd.gov</u> Thank you for your cooperation.

Sincerely,

Todd L. Holweger Mineral Resources Permit Manager





INDUSTRIAL COMMISSION OF NORTH DAKOTA OIL AND GAS DIVISION 600 EAST BOULEVARD DEPT 405 BISMARCK, ND 58505-0840 SFN 4615 (03-2006)

#### PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM. PLEASE SUBMIT THE ORIGINAL AND ONE COPY

Type of Work	Type of Well			Approximat	e Date Work Will	Short C	Confidential Status
New Location	Oil & Gas			11 .			Yes
				1	1 / 10 / 201		
Operator	0					Telephone	
DENBURY ONSHORE, LL						(972) 67	-
Address			Cit	<i>,</i>		State	Zip Code
5320 Legacy Dr				ano		TX	75024
Name of Surface Owner or Tenant							
Leo & Debra McDonnell							
Address			Cit	,		State	Zip Code
13 Bull Drive {PO Box 111	2}		C	olumbus		MT	59019
			to the owner of a				ted within five hundred
WELL INFORMATION	permanently	occupied dwe	elling within 1,32	0 feet.	feet of	f an occupied	dwelling.
Well Name				ell Number			
CEDAR HILLS			2	1-22			
At Surface		Qtr-Qtr	Section	Township	Range	County	
1248 F N ∟ 1	1654 <b>⊢ W</b> ∟	NENW	22	131 N	105 W	Bowman	
If Directional, Top of Pay		Qtr-Qtr	Section	Township	Range	County	
F L	F L			N	W		
Proposed Bottom Hole Location		Qtr-Qtr	Section	Township	Range	County	
F L	F L			N	W		
Latitude of Well Head	Longitude of Well Head	I NA	D Reference	Description of	(Subje	ect to NDIC Ap	proval)
46° 09' 31.96"	-103° 47'	55.96 " N	AD83	SPACING I	JNIT: Cedar	<b>Hills Sout</b>	h-RR"B" Unit
	res in Spacing/Drilling L	Init Spacii	ng/Drilling Unit S	Setback Requirem	ent	Industrial Com	nmission Order
2930 Feet Above S.L.	55040		0 0		660 Feet	88	814/9276
Objective Horizons		•				Pierre Shale 1	Гор
Red River - B				1			355
Existing Size	Weight D	Depth	Cement Volume	• NOTE: Surfac	e hole must be	drilled with fr	esh water
Surface Casing 8 - 5/8	<b>8 " 24</b> Lb./Ft.	2018 Feet	860 Sacks	and surface c	asing must be o	emented bac	k to surface.
Proposed Size	Weight(s)	Longstrin	g Total Depth		Cement Volume	e Cement To	p Top Dakota Sand
Longstring Casing -	" Lb.	-	Feet MD	Feet TVD	Sacks	F	eet <b>4016</b> Feet
Base Last Charles Salt (If Applicable	e) Estimated Total Dep	oth (feet)		Drilling Mud Type	(Vertical Hole - F	Below Surface	
<b>7382</b> Feet	9500 Feet M	· · ·	00 Feet TVD	INVERT	,		5/
Proposed Logs							
	Hole: NA						

### Comments

Will re-enter PA'd Cedar Hills 1-22 {W11409} well bore. Will drill out existing cement plugs to 9500' & re-plug well per NDIC requirements. Re-plug objective is to isolate entire Red River A, B, C, & D intervals in order to prevent conformance issues.

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.					
ePermit	Printed Name Tommy J. Yates	Title Regulatory Comp	liance Manager		

FOR	STATE USE ONLY	FOR STATE USE ONLY				
Permit and File Number         API Number           11409         33 - 011 - 00429		Date Approved 11 / 5 / 2015				
Field CEDAR HILLS		<sup>By</sup> Todd L. Holweger				
Pool Permit Type SOUTH RED RIVER B DEVELOPMENT		Title Mineral Resources Permit Manager				

REQUIRED ATTACHMENTS: Certified surveyors plat, estimated geological tops, proposed mud/cementing plans, \$100 fee.

# WELL LOCATION PLAT

DENBURY ONSHORE, LLC

5320 LEGACY DRIVE PLANO, TX 75024

CEDAR HILLS 21-22

1248 feet from the north line and 1654 feet from the west line (surface location Section 22)

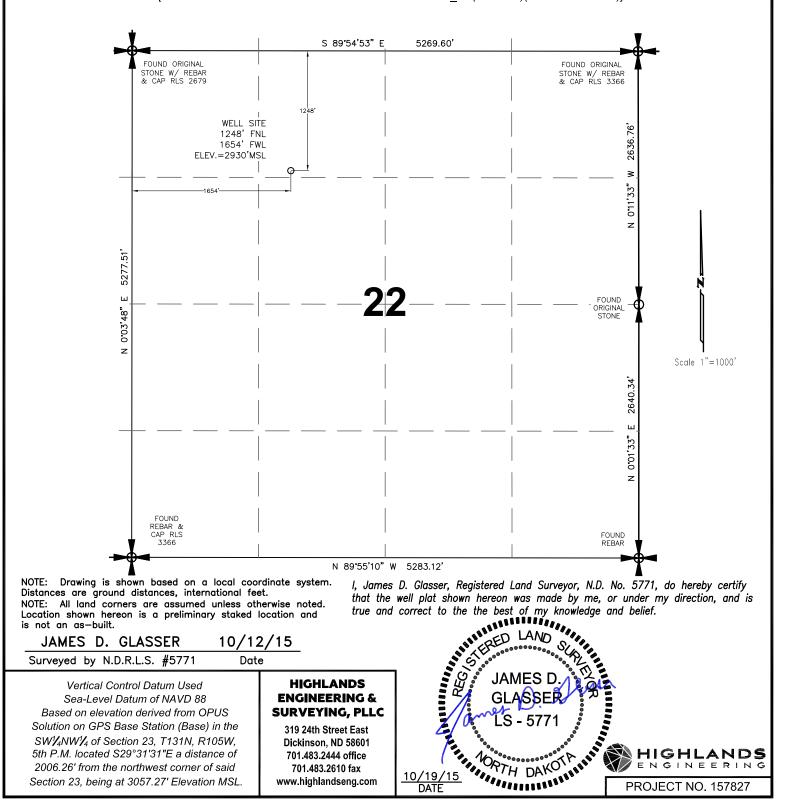
Section 22, T131N, R105W - 5th Principal Meridian

Bowman County, North Dakota

Surface Owner at well site - Leo & Debra Mcdonnell

SURFACE HOLE:

Latitude 46°09'31.96" (46.158879°) North - Longitude 103°47'55.96" (103.798977°) West - [NAD-83] Latitude 46°09'31.95" (46.158874°) North - Longitude 103°47'54.23" (103.798397°) West - [NAD-27] North Dakota State Plane NAD-83 Northing : 197,055.279 - Easting : 1,132,756.470 North Dakota State Plane NAD-27 Northing : 197,047.885 - Easting : 1,164,352.686 [derived from N.G.S. O.P.U.S. Solution REF FRAME: NAD 83 (CORS96)(EPOCH:2002.000)]





# **Oil and Gas Division**

Lynn D. Helms - Director Bruce E. Hicks - Assistant Director

**Department of Mineral Resources** 

Lynn D. Helms - Director

North Dakota Industrial Commission

www.oilgas.nd.gov

April 9, 2014

## RE: Filter Socks and Other Filter Media Leakproof Container Required Oil and Gas Wells

Dear Operator,

North Dakota Administrative Code Section 43-02-03-19.2 states in part that all waste material associated with exploration or production of oil and gas must be properly disposed of in an authorized facility in accord with all applicable local, state, and federal laws and regulations.

Filtration systems are commonly used during oil and gas operations in North Dakota. The Commission is very concerned about the proper disposal of used filters (including filter socks) used by the oil and gas industry.

Effective June 1, 2014, a container must be maintained on each well drilled in North Dakota beginning when the well is spud and must remain on-site during clean-out, completion, and flow-back whenever filtration operations are conducted. The on-site container must be used to store filters until they can be properly disposed of in an authorized facility. Such containers must be:

- leakproof to prevent any fluids from escaping the container
- covered to prevent precipitation from entering the container
- placard to indicate only filters are to be placed in the container

If the operator will not utilize a filtration system, a waiver to the container requirement will be considered, but only upon the operator submitting a Sundry Notice (Form 4) justifying their request.

As previously stated in our March 13, 2014 letter, North Dakota Administrative Code Section 33-20-02.1-01 states in part that every person who transports solid waste (which includes oil and gas exploration and production wastes) is required to have a valid permit issued by the North Dakota Department of Health, Division of Waste Management. Please contact the Division of Waste Management at (701) 328-5166 with any questions on the solid waste program. Note oil and gas exploration and production wastes include produced water, drilling mud, invert mud, tank bottom sediment, pipe scale, filters, and fly ash.

Thank you for your cooperation.

Sincerely,

Bruce E. Hicks

Assistant Director

# Denbury 🙆

# **Re-entry Geologic Prognosis**

# Cedar Hills 21-22

Origination date: 20 Oct 2015 Revised: 10/27/15 Tyates

Originator: Allen Kimble Geologist: Allen Kimble email: allen.kimble@denbury.com Office: 972-673-2722

FIELD: Cedar Hills

COUNTY: Bowman

STATE: North Dakota

ELEVATIONS: GL 2930' PAD: 2931' FLOOR HEIGHT : 24.5' KB: (GRD + DF) : 2955'

SURFACE LOC: NAD 27, lat 46.158874, Long -103.798397, 1248' FNL & 1654' FWL, NENW Sec. 22-T131N-R105W PRIMARY OBJECTIVES: Re-enter, drill out old plugs and cement off all of the Red River Formation. Re-PA well.

#### PROPOSED / PERMIT TD: 9500'

KNOWN DRILLING HAZARDS: Salt water disposal in Cretaceous Sands, Salts, nitrogen and salt water disposal in the Permian Section, Lost Circulation in the Mission Canyon.

RECOMMENDED LOGGING PROGRAM: VERTICAL: n/a

RECOMMENDED LOGGING PROGRAM: HORIZONTAL: n/a

RECOMMENDED CORING AND TESTING PROGRAM: n/a

MUDLOGGER: The Sunburst consulting wellsite geologists ... as required to moniter gas.

### **GEOLOGIC TOPS PROGNOSIS**

SUBJECT WELL: Cedar Hills 21-22

	KB:	2955		NDIC Names	
FORMATION	TVD	SUBSEA	Formation Highlights		
Pierre	355	2600		K-P	
Niobrara	3027	-14		K-Nb	
Greenhorn	3478	-523		K-Gh	
Mowry	4016	-1061		K-M	
Newcastle	4203	-1248		K-N	
Muddy Sand	4230	-1275	SWD	K-Ms	
Skull Creek Shale	4310	-1355		K-Sc	
Inyan Kara FlowHazard	4458	-1503	SWD	K-lk	
Swift	4833	-1878		J-S	
Rierdon	5289	-2334		J-R	
Piper Lime	5385	-2430		J-PI	
Spearfish	5612	-2657		T-S	
Pine salt	5770	-2815	<u>Salt</u>	Pm	
Base of Pine Salt	6077	-3122	<u>Salt</u>	Pm	
Minnekahta	6231	-3276	<u>Nitrogen</u>	Pm-Mk	
Opeche	6280	-3325	Nitrogen	Pm-Op	
Minnelusa Flow Hazard	6341	-3386	SWD, Nitrogen	Pm-Eba	
Amsden	6518	-3563	SWD, Nitrogen	Pn-A	
Kibbey	6942	-3987		M-KI	
Madison	7056	-4101		M-Md	
Ratcliffe	7282	-4327		M-Chrl	
Base of Last Salt	7382	-4427		M-MDLS	
Mission Canyon	7438	-4483	Lost Cir	M-Mc	
Lodgepole	7874	-4919		M-MdLp	
Miss Fossil Bank	8233	-5278	WSW	M-Fb	
Devonian	8387	-5432		D-Dv	
Silurian Interlake	8658	-5703		S-IL	
Ordovician Gunton	9034	-6079		O-G	
Stoughton	9082	-6127		O-St	
Red River	9152	-6197		O-RR	
Red River "A"	9165	-6210		O-RR-a	
Top of Unitized Formation	9179	-6224			
Red River "B" Porosity	9199	-6244		O-RR-b	
Red River "C" Porosity	9271	-6316		O-RR-c	
Red River "D" Porosity	9331	-6376		O-RR-d	
Drilled TD	9500	-6545			

This will be a re-entry of Total's Cedar Hills No. 1-22, API No 3301100429, NDIC No. 11409 Existing Cement Plugs at: 1968-2018, 4120-4200, 6270-6350, 7290-7370, 8327-8407, 9060-9140



RE: Denbury Request to Re-Enter, Re-Drill, and Re-Plug the Cedar Hills 21-22 (FKA Total Petroleum Cedar Hills 1-22)

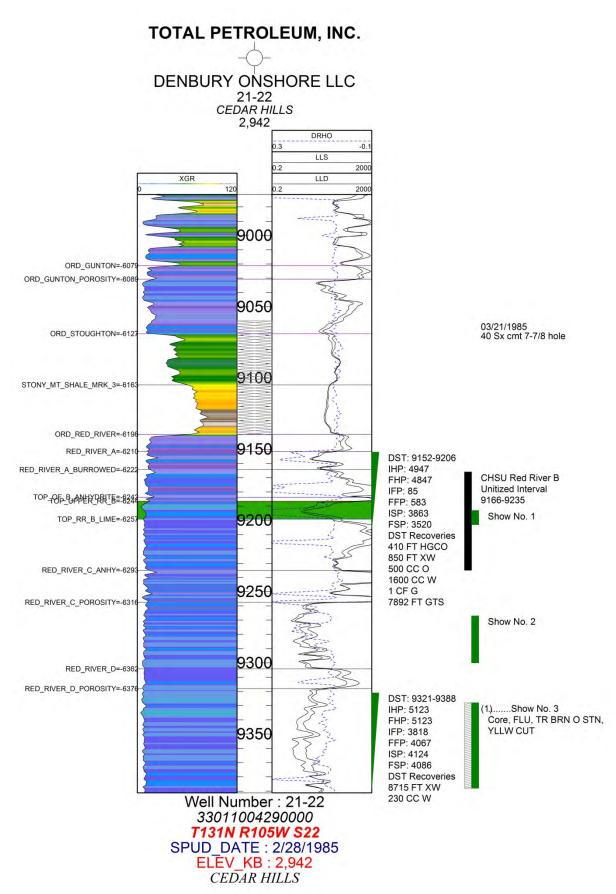
To assure present day water flood conformance and efficient injection of future CO2, Denbury would like to set an open-hole cement plug across the entire Red River formation as drilled by Total in their Cedar Hills 1-22 (33-011-00429). Hopefully, this will eliminate potential cross flow from the Red River "B" into other zones of permeability not dedicated to the Cedar Hills South Unit.

Of particular concern is the Total drill stem test of the Red River "D" (9321-9388) which recovered 8715' of salt water and recorded high flowing pressures (FF 3818-4067). If this interval is capable of giving up this much water at these high flowing pressures, then it is conceivable that the interval could thief water, oil or CO2 from the Red River "B" just as easily. From the open-hole logs, we also see an additional 55' (gross) of Red River "A" and "C" that could contribute to out of zone cross flow. Please note the Total Petroleum open-hole log in figure 1.

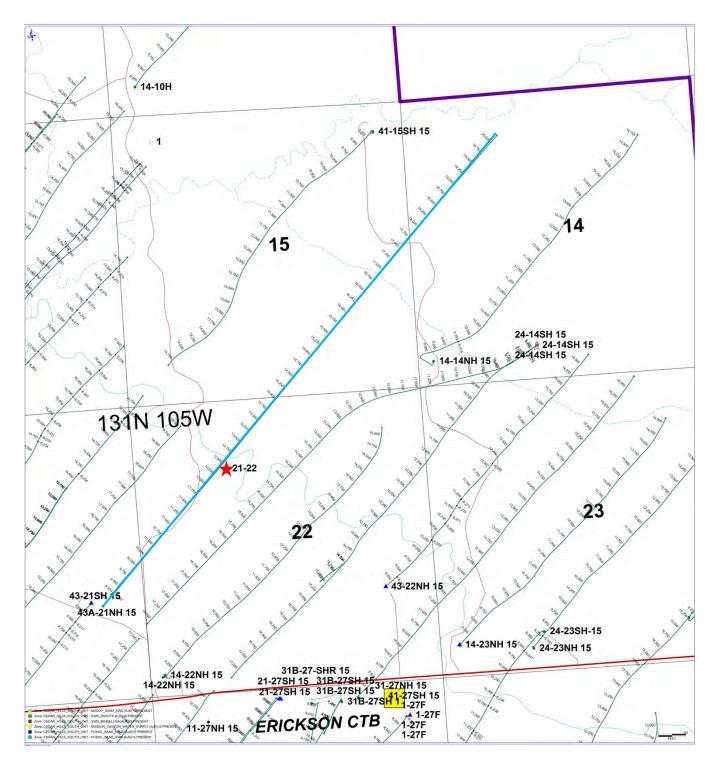
In summary, the Total Cedar Hill 1-22 surface location is approximately 110' southeast of the proposed Denbury CHSU 43A-21NH 15. (see figure 2. map) There are potential long term conformance – cross flow issues in addition to a collision risk between the proposed lateral and the old Total Petroleum vertical Red River test. Denbury would like to address these issues before they become a problem. From our experience, we have found that it is much easier to re-plug an abandoned well before secondary-tertiary operations re-pressure the reservoir.

Allen J. Kimble Senior Geologist Denbury Resources

4 November 2015



<u>Figure 1</u>: Open-hole log with DSTs, Cores, Formation Tops, Cement plug, Unitized Interval, and Oil shows annotated.



*Figure 2*: Map Cedar Hills South Unit, Bowman Co., N.D. Note location of the Total 21-22 relative to the proposed 43A -21NH 15 (future Red River "B" injection well).

# **Tommy Yates**

From:	Tommy Yates
Sent:	Wednesday, October 21, 2015 9:37 AM
То:	Dressler, Ty R. (tdressler@nd.gov); kkading@nd.gov
Cc:	Todd Holweger (tholweger@nd.gov)
Subject:	Denbury's Proposed Cedar Hills 21-22 Well, NE-NW Sec. 22-T131N-R105W, Bowman
	County, ND
Attachments:	CEDAR HILLS 21-22 WELL PACKAGE 10-20-15.pdf

Ty & Kevin,

Pending NDIC permit approval, Denbury is planning to re-enter and re-drill a previously plugged and abandoned well bore in the NE-NW of section 22, T131N-R105W, in Bowman County. The re-drilled well will be known as the Denbury Cedar Hills 21-22. Per the inactive PLOTS map on the ND Game and Fish website, it appears that this Land is currently subscribed to PLOTS.

A copy of the Land survey package is included for reference. The initial proposed surface disturbance will be 3.7 acres. Once the drilling rig is removed and the well is completed, the site will be partially reclaimed to 1.91 acres of surface disturbance.

Please let me know if you require additional information regarding this project proposal. Thanks!

# Tommy Yates

Regulatory Compliance Manager - Northern Region Denbury Onshore, LLC Denbury Resources, Inc. Direct: 972.673.2677 Mobile: 214.724.0076 Fax: 972.673.2299 tommy.yates@denbury.com



# **Re-Entry Plan**

Cedar Hills 21-22

# Procedure:

# Notify the NDIC field inspector Matt Tibor at 701-590-2140 prior to beginning drilling or plugging operations.

Denbury plans to re-enter the existing plugged and abandoned Cedar Hills 1-22 well bore (circa 1985), drill out the cement plugs to the original 9500' TD, and re-plug to abandon the well.

Drilling fluid will consist of 9.5 - 10 ppg oil-water inverted emulsion (75/25 to 80/20) mud system with 45-60 viscosity units and less than 20 fluid loss units. Solids will be limited to less than 5%.

A closed loop pitless drilling system will be employed. All drill cuttings will be hauled to a properly licensed disposal facility (Oaks Landfill located in the NW sec.35-T18N-R52E, Dawson County, MT).

All cement plugs will consist of a class G base slurry containing additives appropriate for permanently plugging the well bore for abandonment. Cement volumes were calculated using an 8.0" hole size with no washout and a cement yield of 1.0 cuft/sk.

Weighted mud or spacer will be placed between the cement plugs and a balanced mud method will be utilized to place each plug. See the proposed well bore diagram for plugging details.

During the re-plugging operations, plans are to plug the entire Red River A, B, C, and D intervals to prevent conformance issues during ongoing secondary EOR water flood development, that's now underway. The isolation will also prevent future conformance issues if tertiary EOR using CO2 is utilized.

All work will be conducted using the drilling rig, Trinidad 35.

# Hydraulic Fracturing Statement:

No hydraulic fracture stimulation treatments are planned for the subject well.

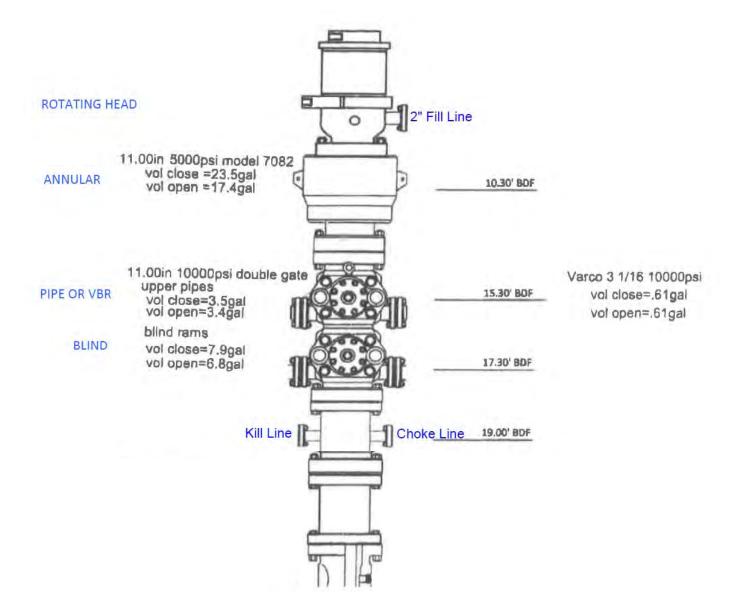
# Gas Capture Plan Statement:

No flaring of produced gas is planned to occur on the well site.

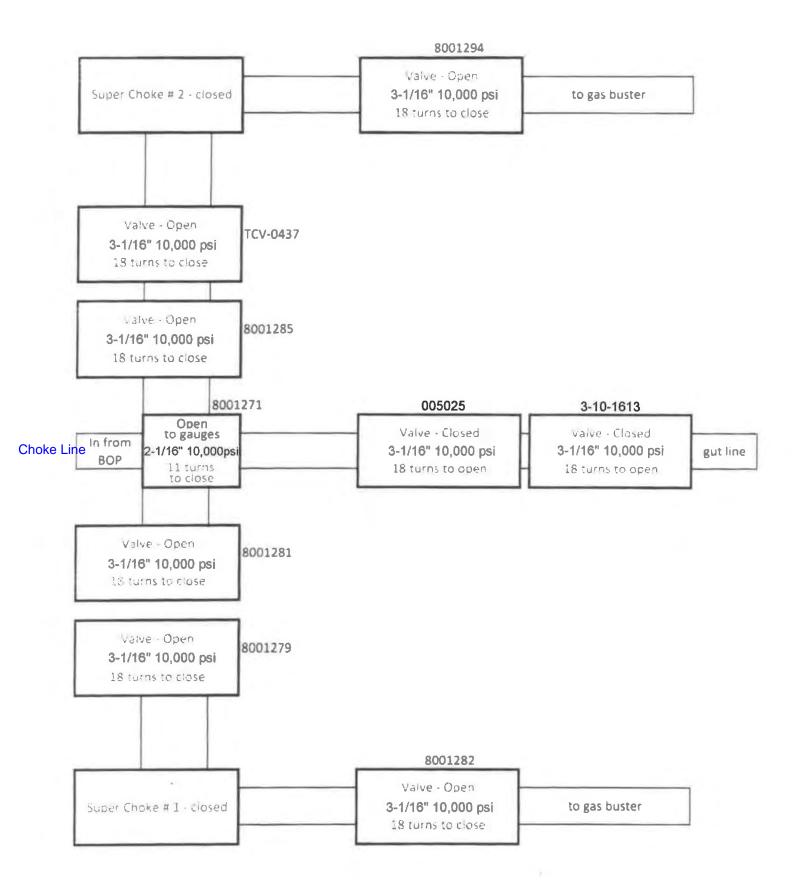
# Denbury Onshore, LLC Cedar Hills 21-22 Re-entry, Re-drill, & Re-plug to Abandon of Cedar Hills 1-22 (W11409) Proposed Wellbore Schematic

		Plug #7	50 sx G cement	Revised 11-5-15 Tyates
Pierre	355'	0' - 150'		
	2018' Existing 8-5/8" Su		50 sx G cement	
Niobrara	3027'	1943' - 2093'		
Greenhorn	3478'			
Mowry	4016'	Plug #5		
Newcastle	4203'	4050' - 4200'	50 sx G cement	
Muddy Sand	4230'	4030 - 4200		
Skull Creek Shale	4310'	i		
Inyan Kara FlowHazard	4310			
Swift	4833'	i		
Rierdon	5289'			
	5385'	ii		
Piper Lime	5612'			
Spearfish Pine salt	5770'	ii		
Base of Pine Salt				
	6077'	Div		
Minnekahta	6231' 6280'	Plug #4 6200' - 6350'	50 sx G cement	OBM
Opeche	6341'	6200 - 6350		
Minnelusa Flow Hazard	6518'	: :		9.5 - 10.0 ppg
Amsden		1 1		
Kibbey	6942'	: :		
Madison	7056'	Di		
Ratcliffe	7282'	Plug #3	50 sx G cement	
Base of Last Salt	7382'	7220' - 7370'		
Mission Canyon	7438'	: :		
Lodgepole	7874'	I I		
Fossil Bank	8233'	· · · · · · · · · · · · · · · · · · ·		
Devonian	8387'	Plug #2	50 sx G cement	
Silurian Interlake	8658'	8257' - 8407'		
Ordovician Gunton	9034'			
Stoughton	9082'	-		
Red River	9152'			
Red River "A"	9165'		140 sx G cement + 35% Silica i	t BHS1 is > 220°F
Top of Unitized Formation	9179'	Plug #1		
Red River "B" Porosity	9199'	9052' - 9500'	Assuming 8.0"	
Red River "C" Porosity	9271'		Hole Size from	
Red River "D" Porosity	9331'		2018' - 9500'	
Drilled TD	9500'			

# TRINIDAD RIG 35 BOP CONFIGURATION



# TRINIDAD RIG 35 CHOKE MANIFOLD ALIGNMENT





October 21, 2015

North Dakota Industrial Commission Department of Mineral Resources Oil and Gas Division 1016 East Calgary Ave. Bismarck, ND 58503-5512

Re: Legal Street Address Request Cedar Hills 21-22

Dear Mr. Holweger:

Pursuant to NDAC 43-02-03-16, this letter is to serve as confirmation that Denbury Onshore, LLC has requested a legal street address for our Cedar Hills 21-22 observation well to be drilled from a single well pad site. The well pad will be located in (NENW) of Section 22-T131N-R105W, Bowman County, ND.

The request was sent via email to the Bowman County Emergency Services Coordinator, Karla Germann, on 10/21/2015. Ms. Germann confirmed receipt of our request on 10/21/2015.

Sincerely,

142

Tommy J. Yates Regulatory Compliance Manager (972) 673-2677

Denbury Resources Inc. 5320 Legacy Drive • Plano, Texas 75024 • Tel: 972.673.2000 • denbury.com

Subsidiaries Denbury Onshore, LLC • Denbury Green Pipeline-Texas, LLC • Denbury Gulf Coast Pipelines, LLC • Greencore Pipeline Company LLC

# **Tommy Yates**

From:	Karla Germann <kgermann@bowmancountynd.gov></kgermann@bowmancountynd.gov>
Sent:	Thursday, October 22, 2015 10:43 AM
То:	Tommy Yates
Subject:	RE: Legal Street Address Request - Observation Well in Bowman County (Denbury Cedar Hill 21-22)

We have received your request. We do not address well sites in Bowman and Slope counties. Thanks. Karla

Karla Germann Emergency Services - Bowman/Slope Counties

From: Tommy Yates [mailto:Tommy.Yates@denbury.com]
Sent: Wednesday, October 21, 2015 8:46 AM
To: Karla Germann
Subject: Legal Street Address Request - Observation Well in Bowman County (Denbury Cedar Hill 21-22)

Hi Karla,

Per NDIC rules, Denbury is requesting that a legal street address be provided for the following proposed oil well surface location in Bowman County.

Proposed Well Site:

### Cedar Hills 21-22 (NENW Sec. 22-T131N-R105W).

The legal plat for the proposed oil well location is attached, along with maps showing access from the nearest county roads.

Would you please acknowledge that you have received this email and my request for this legal street address? My understanding is that you will not actually be giving out addresses until the 911 Emergency Services committee has time to meet and discuss it more depth.

Thank you for your time. Tommy

## Tommy Yates

Regulatory Compliance Manager - Northern Region Denbury Onshore, LLC Denbury Resources, Inc. Direct: 972.673.2677 Mobile: 214.724.0076 Fax: 972.673.2299 tommy.yates@denbury.com



# HORIZONTAL SECTION PLAT

DENBURY ONSHORE, LLC

5320 LEGACY DRIVE PLANO, TX 75024

CEDAR HILLS 21-22

1248 feet from the north line and 1654 feet from the west line (surface location Section 22)

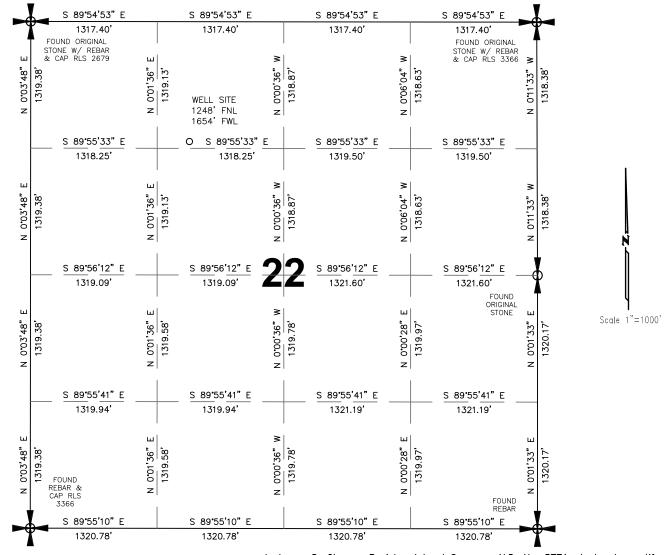
Section 22, T131N, R105W - 5th Principal Meridian

Bowman County, North Dakota

Surface Owner at well site - Leo & Debra Mcdonnell

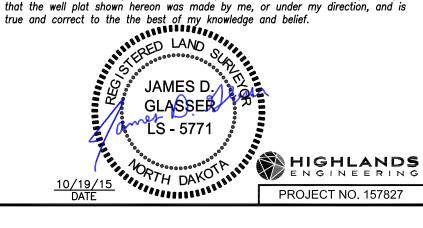
SURFACE HOLE:

Latitude 46°09'31.96" (46.158879°) North - Longitude 103°47'55.96" (103.798977°) West - [NAD-83] Latitude 46°09'31.95" (46.158874°) North - Longitude 103°47'54.23" (103.798397°) West - [NAD-27] North Dakota State Plane NAD-83 Northing : 197,055.279 - Easting : 1,132,756.470 North Dakota State Plane NAD-27 Northing : 197,047.885 - Easting : 1,164,352.686 [derived from N.G.S. O.P.U.S. Solution REF FRAME: NAD 83 (CORS96)(EPOCH:2002.000)]



All corners shown on this plat were found in the field during Denbury Onshore, LLC Cedar Hills 21-22 oil well survey on September 30, 2015. Distances to all others are calculated.

I, James D. Glasser, Registered Land Surveyor, N.D. No. 5771, do hereby certify that the well plat shown hereon was made by me, or under my direction, and is



HIGHLANDS **ENGINEERING &** SURVEYING, PLLC

319 24th Street East Dickinson, ND 58601 701.483.2444 office 701.483.2610 fax www.highlandseng.com

NOTE: Drawing is shown based on a local coordinate system. Distances are ground distances, international feet.

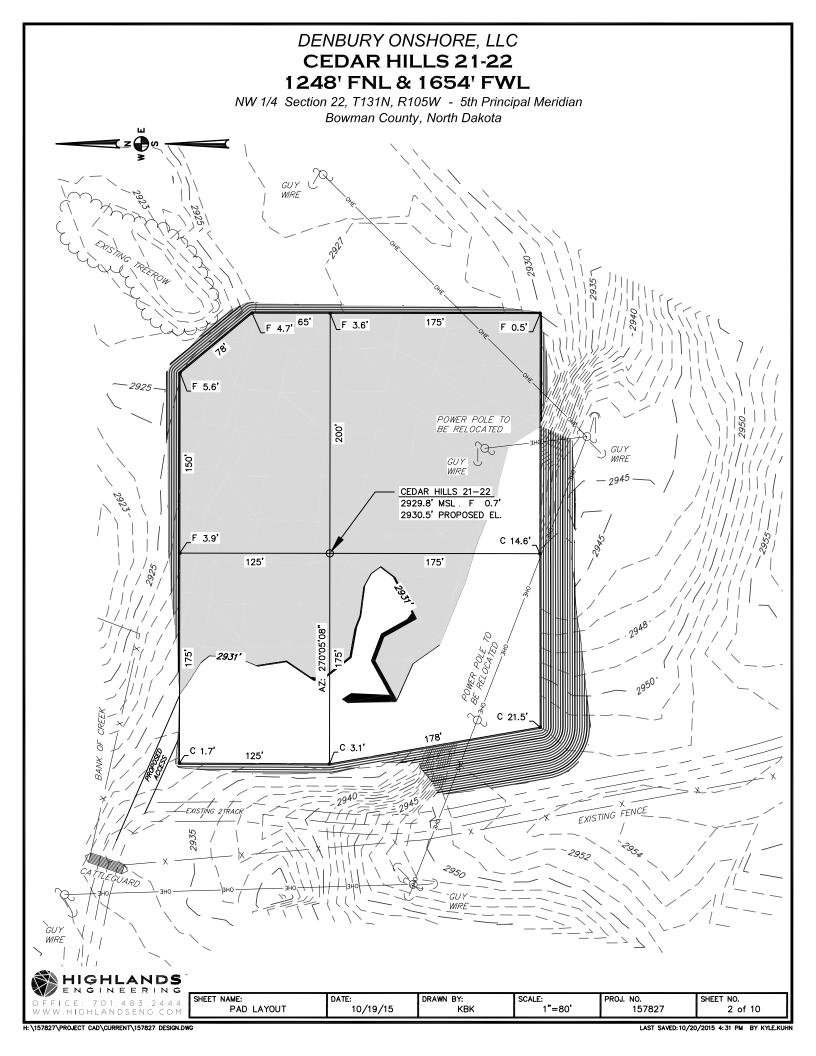
# DENBURY ONSHORE, LLC **CEDAR HILLS 21-22** 1248' FNL & 1654' FWL

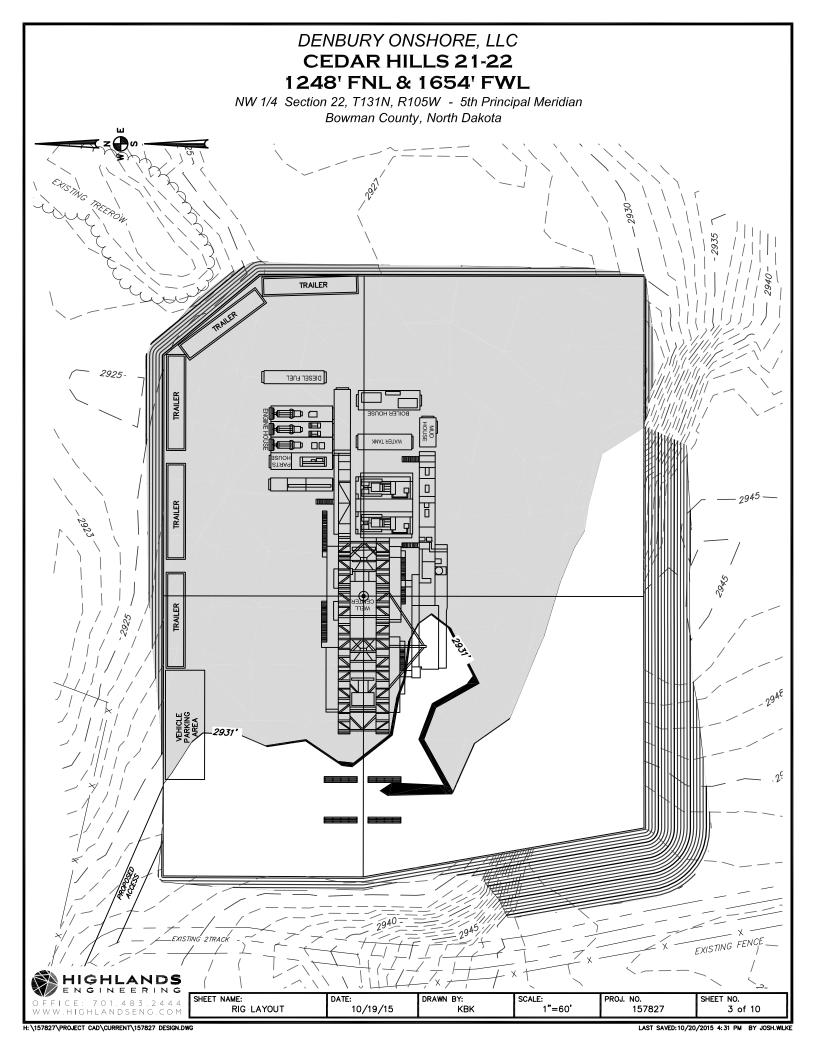
NW 1/4 Section 22, T131N, R105W - 5th Principal Meridian Bowman County, North Dakota

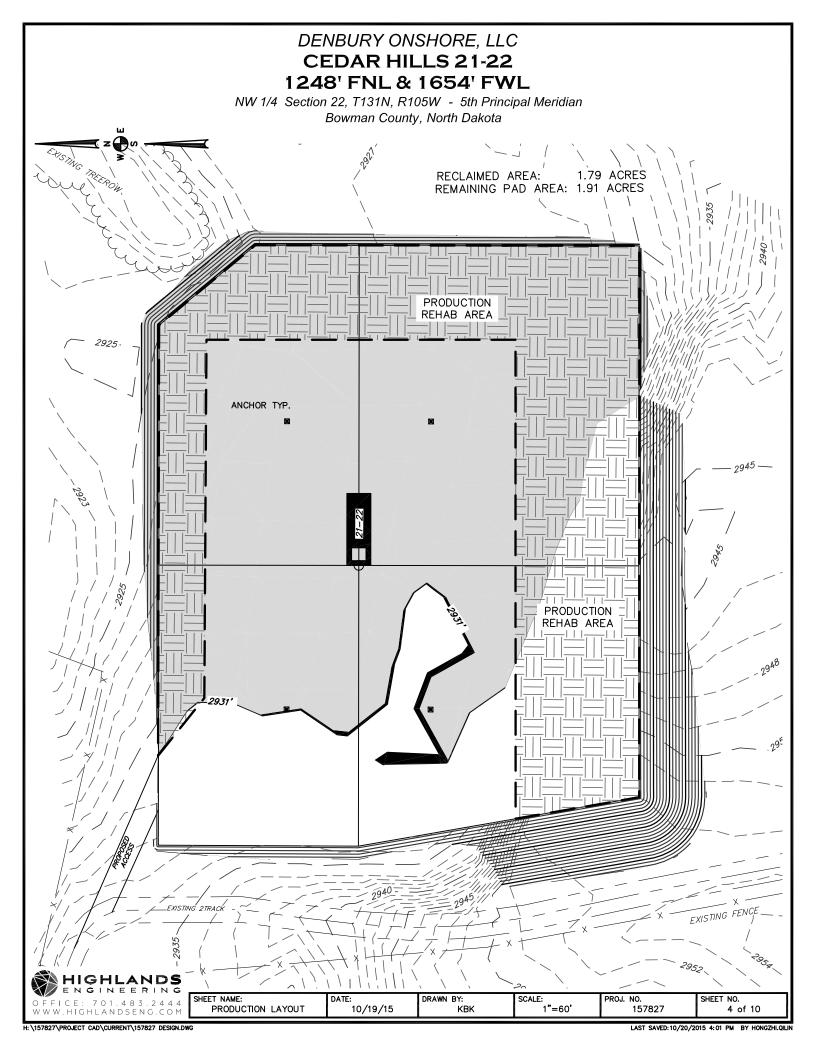
EXISTING SITE ELEVATION PROPOSED PAD ELEVATION	2,929.8' MSL 2,930.5' MSL
EXCAVATION (INCLUDES 6" TOPSOIL STRIPF	0 CY
EMBANKMENT	13,062 CY 7,828 CY
PLUS SHRINKAGE (30%)	2,348 CY 10,176 CY
STOCKPILE PIT STOCKPILE TOP SOIL (6")	0 CY 2,422 CY
ROAD EMBANKMENT OR STOCKPILE FROM PAD	464 CY
DISTURBED AREA FROM PAD AND STOCKPILE	3.70 ACRES
DISTURBED AREA AFTER RECLAMATION	1.91 ACRES
	NOTE: REQUIRED EMBANKMENT IS CALCULATED AFTER 6" TOPSOIL IS STRIPPED FROM THE LOCATION.
NOTE: ALL CUT END SLOPES ARE 2:1 AND FILL END SLOPES ARE 2:1	



OFFICE: 701.483.2444	SHEET NAME:	DATE:	DRAWN BY:	SCALE:	proj. no.	SHEET NO.
WWW.HIGHLANDSENG.COM	QUANTITIES	10/19/15	KBK	N/A	157827	1 of 10
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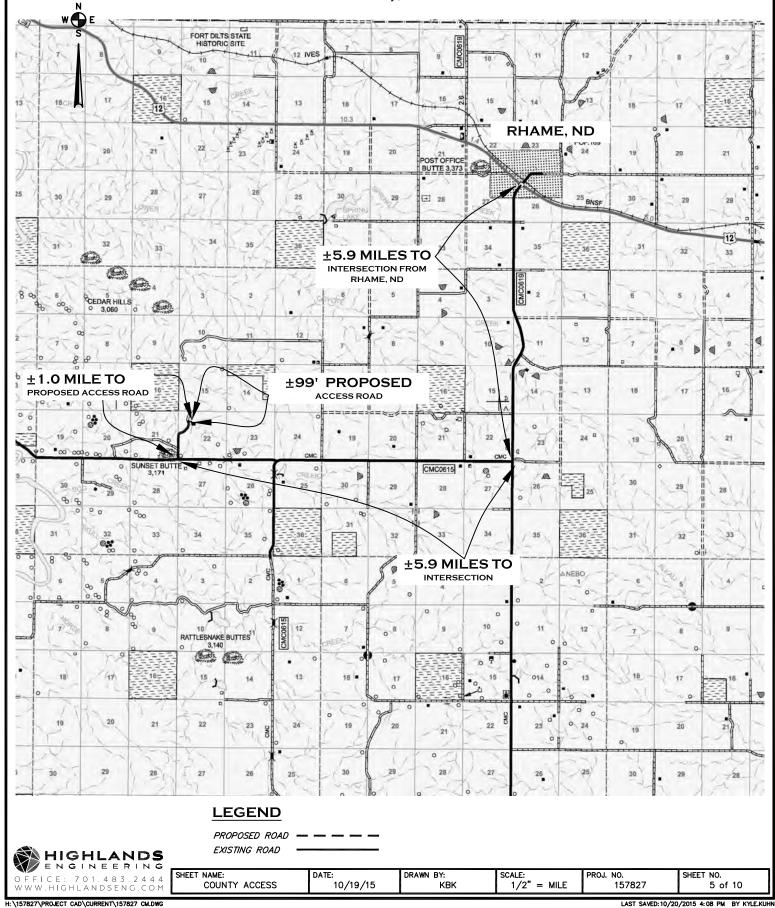


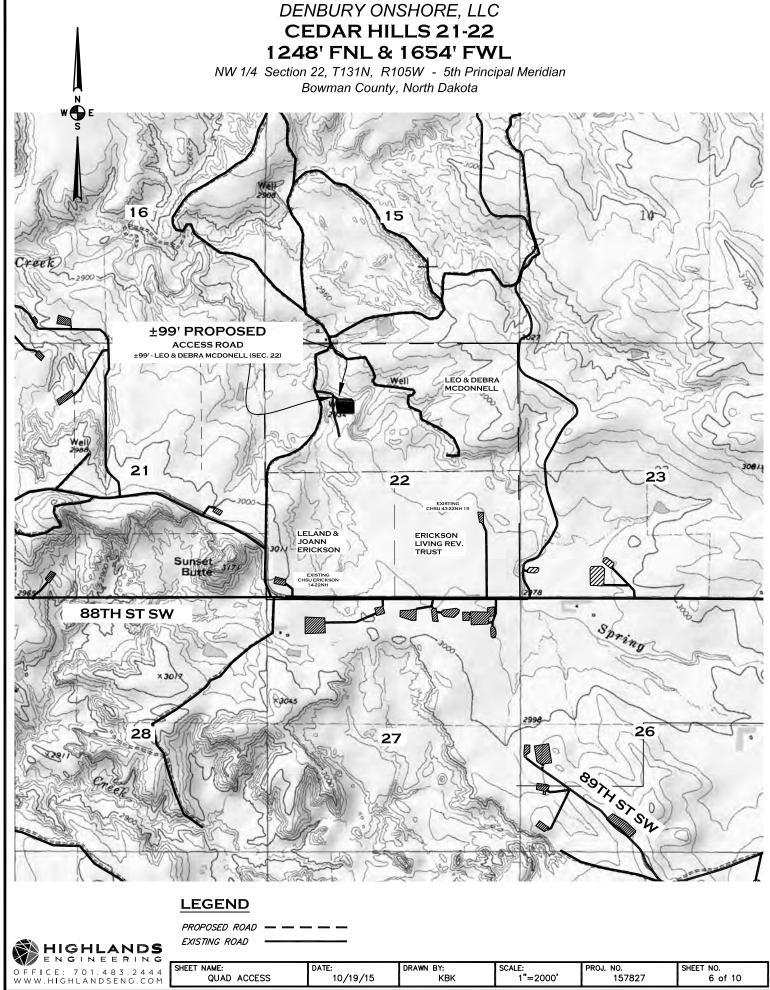




# DENBURY ONSHORE, LLC **CEDAR HILLS 21-22** 1248' FNL & 1654' FWL

NW 1/4 Section 22, T131N, R105W - 5th Principal Meridian Bowman County, North Dakota

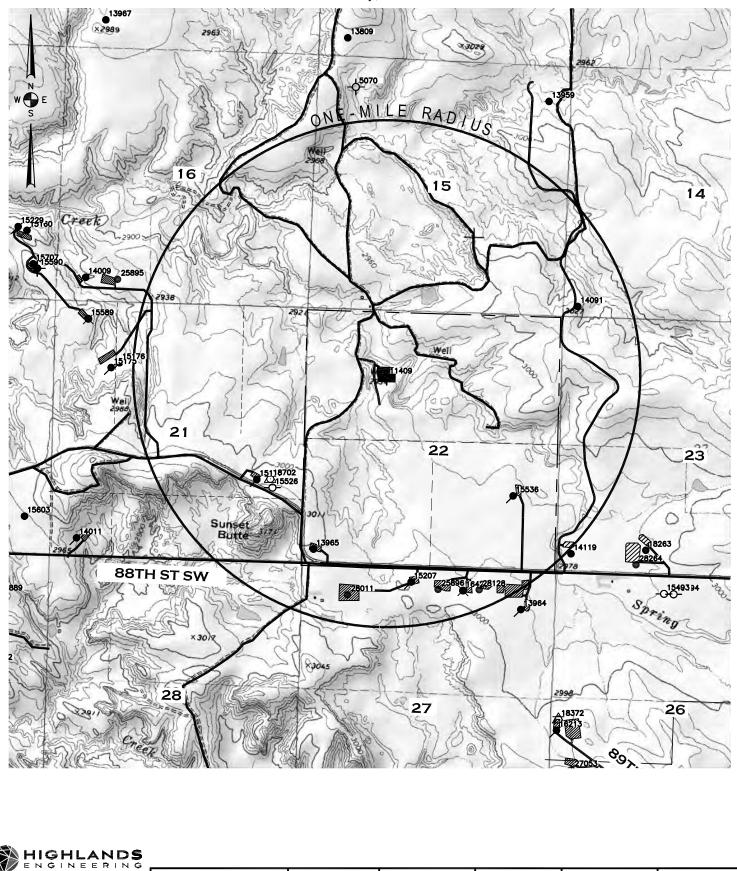




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DENBURY ONSHORE, LLC CEDAR HILLS 21-22 1248' FNL & 1654' FWL

NW 1/4 Section 22, TT131NN, R R105WW - 5th Principal Meridian Bowman County, North Dakota



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7 of 10

SCALE: 1"=2000' PROJ. NO.

157827

# DENBURY ONSHORE, LLC CEDAR HILLS 21-22 1248' FNL & 1654' FWL

NW 1/4 Section 22, TT131NN, R R105WW - 5th Principal Meridian Bowman County, North Dakota

# WELLS WITHIN ONE-MILE RADIUS

File	Operator	Well Name	Section	Township	Range	Feet NS	FNSL	Feet EW	FEWL	Status
25896	DENBURY ONSHORE, LLC	CHSU 31B-27SHR 15	27	131	105	325	N	2400	Е	Α
11409	TOTAL PETROLEUM, INC.	CEDAR HILLS 1-22	22	131	105	1250	N	1650	W	DRY
15177	DENBURY ONSHORE, LLC	CHSU 43-21SH 15	21	131	105	1780	S	980	E	A
15536	DENBURY ONSHORE, LLC	CHSU 43-22NH 15	22	131	105	1695	S	925	Е	A
28128	DENBURY ONSHORE, LLC	CHSU 31-27NH 15	27	131	105	290	N	1545	Е	А
13965	DENBURY ONSHORE, LLC	CHSU ERICKSON 14-22NH 15	22	131	105	385	S	245	W	Α
14119	DENBURY ONSHORE, LLC	CHSU CAPTAIN 14-23NH 15	23	131	105	550	S	330	W	Α
15207	DENBURY ONSHORE, LLC	CHSU 21-27SH 15	27	131	105	200	N	2300	W	Α
14091	DENBURY ONSHORE, LLC	CHSU SPRING CREEK 14-14NH 15	14	131	105	400	S	250	W	Α
16423	DENBURY ONSHORE, LLC	CHSU 31B-27SH 15	27	131	105	325	N	1880	E	TA
18702	BURLINGTON RESOURCES OIL & GAS COMPANY LP	CHSU 43-21NH 15	21	131	105	1805	S	700	E	PNC
15526	BURLINGTON RESOURCES OIL & GAS COMPANY LP	CHSU 43-21NH 15	21	131	105	1625	S	650	Е	PNC



CE: 701.483.2444	SHEET NAME:	DATE:	DRAWN BY:	SCALE:	PROJ. NO.	SHEET NO.
HIGHLANDSENG.COM	WELL NAMES	10/19/15	KBK	N/A	157827	8 of 10

Legend

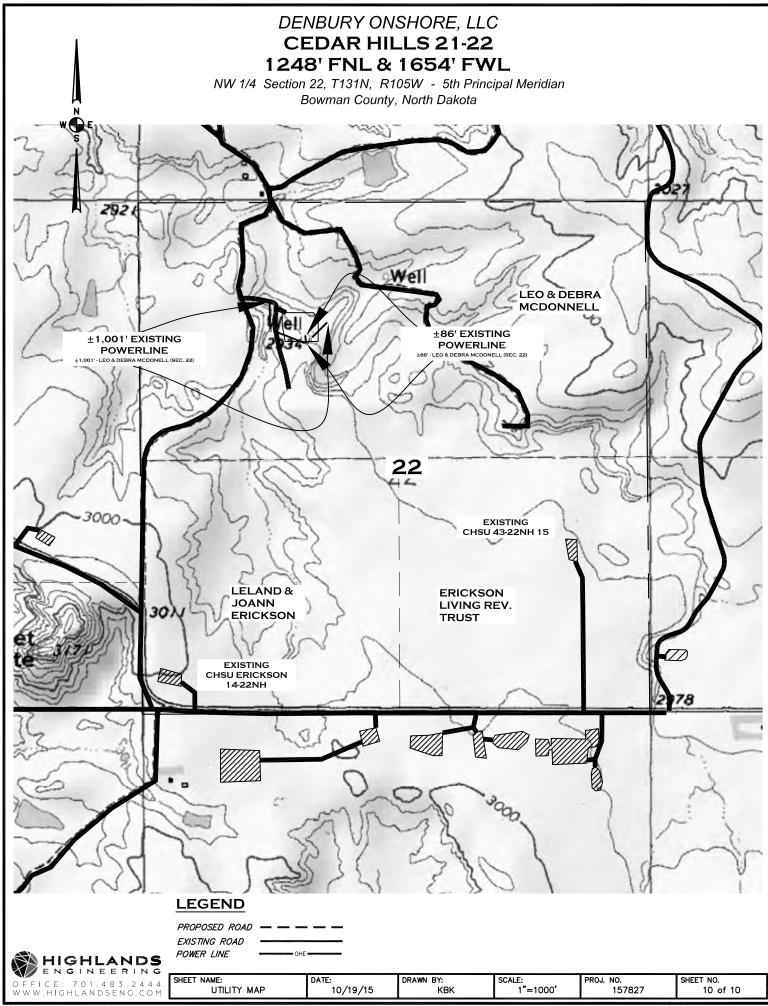
well	s	0	DRL, AI	0	LOC, GASD
STAT	TUS, WELL_TYPE	0	DRL, GASC	0	LOC, OG
*	A, AGD	0	DRL, GASD	o	LOC, SWD
ð	A, AI	0	DRL, OG	o	LOC, WI
-\$2	A, CBM	0	DRL, SWD	٠	PA, DF
×	A, DF	0	DRL, WI	+	PA, GASC
*	A, DFP	\$	DRY, GASC	+	PA, GASD
*	A, GASC	\$	DRY, GASD	٠	PA, GS
*	A, GASD	\$	DRY, OG	+	PA, OG
*	A, GASN	¢	DRY, ST	+	PA, SWD
٠	A, OG	*	EXP, GASD	+	PA, WI
۵	A, SWD	•	EXP, OG	+	PA, WS
*	A, WI	☆	EXP, SWD	-0-	PNC, GASD
¥	A, WS	¥	EXP, WS	-0-	PNC, OG
ð	A,AI	ø	IA, AI	-0-	PNC, SWD
×	AB, AI	茶	IA, CBM	×	TA, AI
×	AB, DF	×	IA, DF	×	TA, GASC
*	AB, DFP	*	IA, DFP	×	TA, GASD
*	AB, GASC	*	IA, GASC	×	TA, OG
*	AB, GASD	*	IA, GASD	×	TA, SWD
10	AB, GI	•	IA, OG	×	TA, WI
	AB, OG	۵	IA, SWD	×	TA, WS
۵	AB, SWD	*	IA, WI	×	TAO, GI
1	AB, WI	*	IA, WS	×	TAO, OG
*	AB, WS	10	IA,AI	×	TAO, WI
	Confidential, Confidential	0	LOC, GASC		

A = Active; AB = Abandened, DRL = Drilling, Dry = Dry, EXP = Expired, JA = Tractive; LOC = Location, PA = Preducer Abandened, PNC = Permit New Cancelled TA = Temporarily Abandened, TAO = Temporarily Abandened Observation.

AGD = Acid Gas Disposal, AI = Air Injection, DF = Dump Flood, DFP = Dump Flood Producing, GASN = Nitrogen Gas Well, GASC = Gas Condensate, GASD = Gas Dry, GI = Gas Injection, GS = Gas Storage, OG = Oil or Gas Well, SWD = Salt Water Disposal, WI = Water Injection, WS = Water Supply, ST = Strat Test



OFFICE: 701.483.2444	SHEET NAME:	DATE:	DRAWN BY:	SCALE:	PROJ. NO.	SHEET NO.
WWW.HIGHLANDSENG.COM	GIS SYMBOLS	10/19/15	KBK	N/A	157827	9 of 10
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NORTH DAKOTA INDUSTRIAL COMMISSION

IL AND GAS DIVISION

WESLEY D. NORTON Chief Enforcement Officer

F. E. WILBORN Deputy Enforcement Officer

CLARENCE G. CARLSON Geologíst CHARLES KOCH Engineering Dept.

Field Supervisor

KEN KALLESTAD Reclamation Sup.

April 28, 1987

Total Petroleum Inc. One Allen Center Suite 2950 Houston, TX 77002

Dear Sirs:

This letter is to notify you that the well sites(s) listed below have been approved by our field personnel in regard to surface restoration.

Also, our files indicate that all reports and logs have been properly filed, and the well(s) listed are hereby removed from your bond.

However, if in the future, slumping of the pit and or trenches, erosion, casing leaks, etc. should occur, you will be required to correct the problem.

Sincerely,

aur.

Donna Bauer Permit/Bond Secretary

DB/tp

20. (C)

#11409 - Cedar Hills #1-22, NE NW Sec. 22-131N-105W, Bowman County.

900 EAST BOULEVARD, BISMARCK, NORTH DAKOTA 58505 701-224-2969

The Total Petroleum 1-22 Cedar Hills prospect was drilled 1250' Fill and on 1650' FWL in Section 22, T 131 N-R 105 W, Bowman County, North Dakota. //Sign The well was spudded 2/28/85 and finished running electric logs 3/20/85. Total depth was 9500' in the Red River Formation. 8 5/5" surface casing was set at a depth of 2013' KB and cemented with 770 sax lite and 200 sax class G with 2% calcuim and 1/4# Flo seal.

The well was drilled by Noble Drilling rig #75, under the supervision of Randy Martin, tool pusher; L. F. Scott, drilling engineer; and Tcm Graff, geologist. Continental Lab did the mud logging with Gordon McPherson as technician.

### SUMMARY AND CONCLUSIONS

I arrived on location Monday, March 11, 1985, at a depth of 8200'. The well was drilling in the Mississippian Lodgepole formation. No significant sample or mud log shows were present in up hole formations from the Lower Mississippian to the top of the Red River formation. Oil Shows existed in four zones within the Red River formation. The Red River "A" zone had a good sample and mud log show (Show Report #1) and was drill stem tested with significant oil recovery (DST #1). The zone also made salt water and the ratio of water to oil would indicate noncommerical production. The Red River "B" zone had good shows of oil in the samples but very little gas increase while drilling (Show Report #2). The zone was not drill stem tested and electric logs calculate salt water. The Red River "C" zone was cored (see Core Description). It was also drill stem tested with salt water almost flowing to the surface (DST #2). Logs and core analysis confirm the negative drill stem test. The Red River "D" zone had poor dolomite porosity development with a minor sample show. No gas increase was logged and electric logs show it to be tight. In conclusion the Red River "A" zone offers the only possibility for hydrocarbon production and all indications are that this would be non-commerical, consequently the well was plugged and abandoned.

### FORMATION TOPS

Formation	Sample	Electric Log	Subsea
Duperow	8406	8407	(-5465)
Interlake	8645	8647	(-5705)
Stoney Mountain	9077	9070	(-6128)
Red River	9147	9140	(-6198)
Red River "A"	9193	9188	(-6246)
Red River "B"	9262	9256	(-6314)
Red River "C"	9323	9318	(-6376)
Red River "D"	9410	9408	(-6466)
Total Depth	9500	9500'	(-6558)
KB 2942			、/

(b) SHOW REPORTS Show #1 Red River "A" 9193-9203 drlg rate before 8 min/ft, during 1 min/ft, after 7 min/ft. Total gas before 5 units, during 88 units, after 50 units during .3750%, after .1860% C<sub>1</sub> before, .01%, after .1060%  $C_2^-$  before, .002%, during .21%, after .0952%  $C_3$  before, .002%, during .1570%, during .01% after .0080%  $1C_4$  before, --, during .034%, after .023%  $NC_A$  before, --, Show #2 Red River "B" 9267-9300 drlg. rate before 9 min/ft, during 1-2 min/ft, after 6 min/ft Total gas before, 6 units, during 17 units, after 8 units C1 before, .092%, during .0445%, after .0145% after .0065%  $C_2$  before, .04%, during .032%, C<sub>5</sub> before, .043%, during .0312%, after .0057% . after -during .0010%, 1C4 before, --, NC4 before, .0112%, during .0170%, after .017% DST REPORTS DST No. 1 9152'-9206' Lynes Red River "A" IΗ 4947 85-158 5 min IF 60 ISI 3865 2F 183-360 180 3520 180FSI 415-523 1803F FΗ 4847 218°F BHT 1F open at 1/2", 2" 1 min through 5 min 2F open at 1/2", 8" at 10 min. 1 lbs at 20 min, 2 lbs at 40 min. 2 1/2 lbs at 50 min, 2 bls at 60 min, 2 1/2 1bs at 70 min, 3 1bs at 110-180 min GTS 55 min into FSI 3F open at 1", 4" at 15 min, 1 lbs at 30 min, 1/2 lbs at 60 min, 10" at 80 min, 8" at 120 min, 5" at 150 min, 6" at 160 min, 7" at 170-180 min Recovery Pipe 410' HGCO API 41° at 62° .26 at 60° = 28,000 ppm CL 850' SW Sampler .15 cu ft gas at 120 psi 500 cc oil API 41 at 60° 1600 cc water .15 at 62° = 65,000 ppm CL Pit mud = .06 at 53° = 195,000 ppm CL 2

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	No. 2 9321'-9388' River "C"	Lynes
ΙH	5123	
IF	680-1003	5 min
ISI	4124	60
2F	1022-3795	180
FSI	4086	180

3F3818-4067FS5123BHT225°F

IF open with SB, 3" at 1 min, 9" at 3 min, 18" at 5 min
2F open at 1/2", 15" at 5 min, 22" at 10 min, 21" at 20 min, 7" at 60 min,
3" at 90 min, 1 1/2" at 120 min, SB at 180 min

5F open at 1/2", 1/8" at 20 min, SB 30-50 min, weak SB 60-120 min, dead 130-180 min

### Recovery

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Pipe 310' amon 8 inhib cut mud 8715' water .35 at 65° = 20,000 ppm CL<sup>-</sup> Sampler 2300 cc water .29 at 65° = 25,000 ppm CL<sup>-</sup> pit mud = .05 at 68° = 190,000 ppm CL<sup>-</sup>

180

### BIT RECORD

Bit No.	MAKE	Size	Туре	Serial	Depthout	Feet	Hours	Com Hours	Dev.
1	HTC	12 1/4	OSC-3AJ	VW480	2018	1956	20	20	1°
2	HTÇ	7 7/8	J1	HE202	4567	2549	31	51	1 1/4°
3	SEC	7 7/8	S-86-F	411342	6583	2016	70	121	1/2°
4	SEC	7 7/8	M84F	185930	8235	1652	84 1/2	205 1/2	3/4°
5	STC	7 7/8	F57	EP5861	9206	971	76 1/2	282	l°
6	HTC	7 7/8	J44	DR990	9328	122	11	293	<u> -                                   </u>
7	CHRIS 🔷	7 7/8	SC-276	0111030	9388	60	6 1/2	299 1/2	<b>_</b> · · ·
RR≠6	HTC	7 7/8	J44	DR990	9500	112	8 1/2	308	l°

MUD DATA

DATE	DEPTH	WT	VIS	PV	ΥP	GEL STRENGTH	PH	WL	CHLOR.	SALT
3/11	8114	10.3	31	4	2	1/2	7.4	10	195K	322K
3/12	8376	10.4	32	5	4	2/4	7	12	192K	316K
3/13	8664	10.3	32	4	2	1/3	7.2	24	192K	317K
5/14	9011	10.3	37	Э	7	5/5	7.1	20	191X	315K
3/15	9195	10.3	35	8	6	2/5	7.0	10	195K	322K
5/16	9206	10.3	36	Э	5	2/5	7.1	10	195K	322K
3/17	9303	10.3	39	12	8	5/7	7.2	8	191K	315K
3/18	9338	10.4	38	11	9	4/10	7.0	10.2	191K	315K
3/19	9463	10.5	36	9	7	3/8	7.0	11.4	200K	300K
3/20	Loggin	g								

### CORE DESCRIPTION

Core #1 9328-9388

**建温泉和建筑设计的建建设理由超速度通道建设建度温泉的全体的,这个时间,**这个时间的超超分时,可以不可以在一下了一下了,最大大的外越越越越越越不可能的。他们们们们的一下,

- 9328-31 Dolomite medium to dark brown, very finely crystalline, microsucrosic, limy in part, vugular, dark brown oil stain, uneven yellow gold fluorescence, bleeding dark brown to black oil, fair intercrystalline porosity.
- 9331-33 Dolomitic limestone dark brown, microcrystalline, firm, hard, dense, tight, slightly argillaceous, no stain, odor, fluorescence or cut, calcareous inclusions.
- 9535-40 Dolomite medium to dark brown, very finely crystalline, microsucrosic, vugular, burrowed, calcareous inclusions, spotty dark brown oil stain, uneven dull yellow gold fluorescence, fast streaming yellow-blue cut, black dead oil in spots, fair oil show, possible water.
- 9340-47 Dolomite, medium to light brown, very finely crystalline, microsucrosic, fair intercrystalline porosity, calcareous inclusions, uneven brown oil stain and black asphaltic oil in places, no fluorescence, still cuts due to dead oil, probable water.
- 9347-50 Dolomite, medium to dark brown, microcrystalline firm, hard, tight, and anhydrite light brown, cryptocrystalline, dense, tight, no vugs, minor black dead oil stain, shale partings, still cuts due to dead oil.
- 9350-54 Dolomite medium to dark brown, microcrystalline to very finely crystalline, dense, tight, trace poor intercrystalline porosity, calcareous inclusions, scattered dark brown to black oil stain, core bleeding black oil unevenly, probable water.
- 9354-56 Dolomite, medium to light brown, microcrystalline to very finely crystalline, firm, dense, tight, no stain, odor, fluorescence or cut, trace dark brown to black dead oil, mottled with calcareous inclusions
- 9356-62 Dolomite medium brown, microcrystalline, occasionally very finely crystalline, firm, dense, tight, slightly argillaceous, limy calcareous inclusions, no stain, odor, fluorescence or cut, grades to dolomitic limestone.
- 9362-68 Dolomite and dolomitic limestone, medium brown, microcrystallime, firm, hard to soft and earthy, vugular, burrowed, mottled with limestone inclusions, no stain, odor, fluorescence or cut, probable water.

9368-75 Bolomite, medium to dark brown, microcyrstalline to very finely crystalline, uniformly even textured, no vugs or burrows, earthy, very slightly argillaceous, no stain, odor, fluorescence or cut, tight, probable water.

C<sup>rei</sup>s

- 9375-79 Dolomite, medium brown, very finely crystalline, firm, poor intercrystalline porosity, microsucrosic, mottled with calcareous inclusions, uneven brown oil stain, uneven dull gold fluorescence, minor black dead oil, very slow streaming yellow-blue cut, poor oil show, probable water.
- 9379-82 Dolomitic limestone, dark brown, microcrystalline, firm, dense, tight, minor shale partings, fossiliferous, calcareous inclusions, no stain, odor, fluorescence or cut.
- 9382-85 Dolomite, medium brown, microcrystalline, occasionally very finely crystalline and microsucrosic, calcareous inclusions, poor intercrystalline porosity, very uneven dull gold fluorescence, uneven dark brown oil stain, fast streaming yellowblue cut, fair to poor oil show, possible water.
- 9385-87 Limestone, dark brown, microcrystalline, argillaceous, carbonaceous, tight, spotty yellow fluorescence, fast streaming yellow-blue cut, poor oil show.
- 9378-88 Dolomite, medium brown, very finely crystalline, microsucrosic, limy calcareous inclusions, very weak and spotty dull gold fluorescence, trace brown oil stain, very slow streaming yellow-blue cut, tight to poor intercrystalline porosity, probable water.

### FORMATION SUMMARY

### Lodgepole

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Samples in the interval 8330-8406 consisted of limestone, white-bufflight brown, very fine to fine crystalline and occasionally microcyrstalline. Fair intercrystalline porosity was present but there were no hydrocarbon shows in the samples and no gas increases. The samples displayed only dull mineral fluorescence. The lower portion of the interval had minor interbeds of medium to dark gray slightly calcareous shale.

### Duperow 8406-8645

The Duperow consists of dolomite and slightly dolomitic limestone with interbeds of shale. The dolomite is tan-cream-buff-pink-gray brown. It's hard and fine, cryptocrystalline to very finely crystalline, slightly to moderately argillaceous. Only very poor intercrystalline porosity was present. Samples displayed abundant yellow mineral fluorescence. The dolomitic limestone is white-gray brown, cryptocrystalline to microcrystalline, chalky and very slightly argillaceous. Only poor and scattered intercrystalline porosity was present. No hydrocarbon shows were logged. Interbeds in the Upper Duperow consist of dark gray to gray brown calcareous to non-calcareous shale. The lower units above the Interlake are multicolored gray, green, orange and purple shales with minor interbedded anhydrite.

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### Interlake 8645-9077

The Interlake consists of dolomite and thin interbeds of shale and anhydrite. The dolomite is white to light brown to mottled pink and lavender. It ranges from cryptocrystalline to very finely crystalline and is slightly to moderately argillaceous in part. Certain zones display fair to good intercrystalline porosity. Bright yellow mineral fluorescence was present but there was no indication of hydrocarbons except for a 2 unit increase in background gas. Shale interbeds were gray to gray green to orange to purple, soft, blocky, silty and slightly calcareous. Minor white microcrystalline to very finely crystalline anhydrite was also present.

### Stoney Mountain 9077-9147

The Stoney Mountain is a sequence of very argillaceous limestone, dolomite, and calcareous shale. The limestone is white to light gray brown to dark gray. It's mottled and very argillaceous and grades to very calcareous shale and soft earthy dolomite. The interval contains numerous fossil shell fragments and worm burrows. No rocks of reservoric quality exist.

### Red River 9147-9500

The only significant shows of oil and gas in the 1-22 Cedar Hills well were found in the Red River formation. It consists of an interbedded sequence of limestone, dolomite and anhydrite with distinct zones of dolomite porosity. For convenience, the Red River porosity is separated and will be discussed in order from top to bottom.

### Red River "A" 9147-9237

The Red River "A" consists of a sequence of limestone, dolomite, and anhydrite. The limestone is light to medium brown, cryptocrystalline to microcrystalline, firm, dense, and tight. Porosity develops where dolomite is present. The dolomite is dark brown, very finely crystalline and microsucrosic. It has fair to good intercrystalline porosity, dark brown oil stain, yellow gold fluorescence and bright yellow-green fast streaming cut. A good drilling break and gas increase was logged in the interval 9193-9203. Drilling penetration averaged 1 min/ft and an eighty-three unit gas increase was logged with C<sub>1</sub>-NC<sub>4</sub> being present (Show Report  $\neq$ 1). In addition, the interval 9152-9206 was drill stem tested and recovered 410' of heavily gas cut oil and 850' of salt water. The sample chamber contained .15 cubic feet of gas, 500 cc of oil and 1600 cc of salt water (DST  $\neq$ 1). In conclusion, samples, tests, gas analysis, and electric logs indicate oil and salt water production from the "A" zone.

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#### Red River "B" 9273-9323

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The upper portion of the "B" zones consists of anhydrite and tight limestone. Porosity developes in dolomite in the interval 9262-9303. Drilling penetration averaged 2 min/ft. Samples were described as dolomite dark brown, very finely crystalline, microsucrosic, slightly argillaceous with fair intercrystalline porosity. The dolomite had dark brown oil stain, uneven dull gold fluorscence and fast streaming yellowblue cut. It was described as a fair oil show but only 17 units of total gas was logged with  $C_INC_4$  being present (Show Report #2). The zone was not drill stem tested. Electric logs calculate high salt water saturation.

#### Red River "C" 9323-9410

The Red River "C" zone, because of it's thickness, is usually the best zone of production in the Bowman County area. In the 1-22 Cedar Hills well a zone of porosity was developed between 9523'-9388'. A sixty foot core was cut and analyzed (9528'-9388'). Good porosity was developed with some oil show, but low permeability and oil saturation indicate salt water (see Core Description). In addition, the interval 9321'-9388' was drill stem tested and recovered 8715 feet of salt water with no hydrocarbon show. The sample chamber contained 2300 cc of salt water. Electric logs confirm salt water production from the Red River "C" zone.

#### Red River "D" 9410-9500

Very little "D" zone porosity was developed in this well. A slight increase in drilling penetration was logged but no gas increase was present. The samples in this interval were interbedded dolomite and limestone, light to medium brown very finely crystalline to microcrystalline. Only poor intercrystalline porcsity was developed in dolomite. There was dull gold fluorescence and very few pieces would yield a slow streaming yellow-blue cut. Low porosity and resistivity on electric logs indicates high water saturations. CORE ANALYSIS REPORT FOR TOTAL PETROLEUM CORP. NO. 1-22 CEDAR HILLS WILDCAT BOWMAN COUNTY, NORTH DAROTA APR 1885 R LUCIVED N. D. OIL & CAS DIVISION

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NO+ 1-22 WILDCAT	ETRULEUM CORP. 2 CEDAR HILLS 28UNTY, NORTH		DATE FORMATI DRLG, F LOCATIO	ON : LUID:	SALT 6	VER "C" El ND C	DIL	R105W		Ai El	ILE NO NALYSTS LEVATION ILLISTON	E R∍E E 294	2 KB
						YLE'S L					a ka	/ 110/10	
SAMPLE NUMBER	рертн	PERM. TO MAXIMUM	AIR (MD) 90 DEG	POR. He	FLUID QIL	SATS. WTR	GRAIN DEN				DESCRIP	LIDN	<b>.</b>
	9328.0-9380.0	I.	CORE NO.	1 RE	D RIVE	R "C" F	- M -						
			3-18-85	CUT 6	60' RE	C+ 60'							
1	9328.0-29.0	0.97	*	8,4	25.5	23.7	2.79		DOL	VZEN	XLN-5UC	ГТАЛ	SCAT
2	9329.0-30.0	0.67	0.17	10,9	38.8	12.9	2.80		001.	VZEN	XLN-SUC	LINY	SCAI
3	9330.0-31.0	2.00	0,25	8,3	10+0	42.9	2.78	VF			XEN-BUC		
4	9331.0-32.0	0,30	0.25	5,8		13.9	2.79				XLN-SUC		
5	9332.0-33.0	0.19	*	5.3	0.0	22,6	2,80				XUN-SUC		
6	9333.0-34.0	0+38	0.21	10.2	6.9	55.0	2.83				XLN-SUC		
7	9334+0-35+0	4.70	0.21	14.5	11.0	56.8	2.85	VF			XLN-SUC XLN-SUC		
8 9	9335+0-36+0 9336+0-37+0	5.30 17.	*	10.8 10.4	19.0 16.9	47+1 33+7	2,82 2,81				XUN-SUC		
10	9337.0-38.0	6,70		11.1	16.7	35.7	2,81				XLN~SUC		
11	9338.0-39.0	1.30		12.3	9.1	61.0	2.83				XEN-SUC		
12	9339.0-40.0	1.40		13.9	3.5		2.02				XLN-SUC		
13	9340.0-41.0	2,20		14,4	1.5	77,1	2.83		<b>DOL</b>	VZEN	XLN-5UC	SCAT	VUGS
1.4	9341.0-42.0	11.	7,40	12.6	5,1	68.3	2.81				XLN-SUC		
15	9342+0-43+0	. 7.70	0.17	15.1	1 + 7	70.7	2.82				XI_N-SUC		
1.6	9343.0-44.0	0.65	0.60	17.0	3.1	68.2	2.83				XLN-SUC		
17	9344.0-45.0	23.	0.12	18.8	3 • 1	72+2	2+83				XLN-SUC		
18	9345+0-46+0	26.	*	24.7	1.0	78,5	2.81				XLN-SUC		
19	9346.0-47.0	30.	*	13.7	0.8	69,9	2,81				XLN-SUC		
20	9347+0-48+0	3.50	0.73	14.4	0.8	82.9	2,85				XLN-5UC		
21 22	9348+0-49+0 9349+0-50+0	1.80 42.	1,50	15.1 15.9	0.9 0:6	80,7 81,1	2.85 2.82				XI.N-SUC XI.N-SUC		
23	9349+0=30+0	18.	*	13.6	6.4	65,7	2+81				XLN-SUC		

These analyses, opinions or interpretations are based on observations and materials supplied by the client to whom, and for whose exclusive and confidential use, this report is made. The interpretations or opinions and the state of t a second data and make on warrants of

				DAL	LAS, TE	X A 9				
TRIME IL	TROLEUM CORF.		DATE	:	3-18-8	5			FILE NO : 3805-3	\$62
NB. 1-22	CEDAR HILLS		FORMATI	0N :	RED RI	VER "C"	•		ANALYSTS : R.E.B.	
			FULL	DIAME	TER DO	YLE'S I	.AW ANAL	YSIS	i i	
SAMPLE NUMBER	DEPTH	PERM. TO MAXIMUM	AIR (MB) 90 DEG	POR. He	FLUID DIL	SATS. WTR	GRAIN DEN		DESCRIPTION	
						*** *** *** *** ***			ه سب سب بين حيد بين منه بين	
24	9351.0-52.0	5.20	1.30	17,1	1.6	66.5	2.83		DOL V/FN X1N-SUC CAL ING	•
25	9352.0-53.0	2.10	1.50			55.8	2.85		DOL V/FN XLN-SUC CAL IN	
26	9353.0-54.0	2.80		11.0	1.0	60.8	2.83		DOL V/FN XLN-SUC CAL IN	
27	9354.0-55.0	7,80		11,7		75.3	2.82		DOL V/FN XLN-SUC CAL IN	
28	9355.0-56.0	33.		17.1	1.9	59.7	2.83		DOL V/FN XLN-SUC LINY C	٩Ľ.
29	9356.0-57.0	14.		18+4	3.9	68.6	2.85		DOL V/FN XLN-SUC	
30	9357.0~58.0	6,50		14.9	4.3	70.4	2.82		BOL V/FN XLN-SUC LINY C	<b>ί</b>
31	9358.0-59.0	2,90	*	11.4	0.9	78.9	2.79		DOL VZEN XLN-SUC LIMY C	ΥĽ
32	9359.0-60.0	6.70		18.3	1.0	76.6	2.80		DOL V/FN XLN-SUC LIMY C	¥Ł.,
33	9360.0-61.0	4.90	*	10+6	0.7	71.2	2.81		DOL V/FN XLN-SUC CAL IN	2
34	9361.0-62.0	7,90	*	8+2	1.4	81.7	2.82		DOL V/FN XLN-SUC	
35	9362.0-63.0	16.	8.60	17.2	0.6	78,5	2.83		DOL V/FN X1.N-SUC	
36	9363.0-64.0	3,40	*	10.2	0.9	78+4	2.82		DOL V/FN XLN-SUC SCAT V	
37	9364.0-65.0	17.		14.3	0.7	78.6	2,82		DOL VIEN XEN-SUC CAL IN	2
38	9365+0-66+0	1.70		8.9	1.5	85+6	2.83		DOL VZEN XLN CAL INC	
39	9366.0-67.0	8+30			8+4	57.9	2+85		DOL VIEN XUN-SUC SCAT V	
40	9367.0-68.0	5,40	2.00	14.9	1.8	81.5	2.86		DOL V/FN XLN-SUC SCAT V	.)())
41	9368.0-69.0	6.10			1.4	77.7	2+87		DOL V/FN XLN-SUC	
42	9369.0-70.0	5.10		12.7	1.0	76.3	2.87		DOL V/FN XLN-SUC	~
43	9370.0-71.0	6,30		13.9			2.85		DOL VZEN XLN-SUC CAL IN	1- <i>7</i>
	9371.0-72.0	0.56				61,7		=	BOL V/FN XLN-SUC	
45	9372+0-73+0	0.30	*	9.7	1.8	72.8	2.83	VF	DOL VZEN XLN-SUC	~
46	9373.0-74.0	0.76	0,63	11.8	1.7	71.6	2.86	VF	DOL V/FN XLN-SUC CAL IN	i.r
47	9374.0-75.0	2.20	*	12.4	1.4	64.3	2.83	VF	DOL VZEN XLN-SUC	r
48	9375.0-76.0	3.50	*	15+6	0+8	63+5	2.83	٧F	DOL V/FN XLN-SUC CAL IN	
49	9376.0-77.0	2.00	0.95	9.3	8.5	54.7	2.86		DOL V/FN XLN-SUC CAL IN DOL V/FN XLN-SUC CAL IN	
50	9377,0-78,0	4.20	*	8.1	6.2	58.7 45 A	2.83		DOL V/FN XLN-SUC CAL IN	
51 52	9378.0-79.0	5.80 3.90	0.34	14.3 11.5	4.2 649	65.4 58.2	2+83 2+82		DOL VIEN XEN-SUC CHE IN DOL VIEN XEN-SUC CAE IN	
	9379.0-80.0	3.70	*	E I 4 J	C) 4 7	. FO & 20	2 K D 2			4*

These analyses, opinions or interpretations are based on observations and materials supplied by the client to whom, and for whose exclusive and confidential use, this report is made. The interpretations or opinions where a but the first stand and the officers and complements are more the responsibility and make no wattanky of

	na na serie de la construcción de la construcción de la const		CORE	cum Re	DRATO servoir	Engine		0 01 03 pA323 (J 10 10 10 7)
	ETROLEUM CORP. 2 CEDAR HILLS		DATE FORMATI	1	3-18-85 RED RIV	5		FILE ND ; 3805-3628 . ANALYSTS ; R.E.B.
			FULL	DIAME	TER 90)	(LE'S L	AW ANALYS	IS
SAMPLE NUMBER	DEPTH	FERM. T8 AI MAXIMUM 9		FOR. He	FLUID OIL	SATS. WTR	GRAIN DEN	DESCRIPTION
54	9381.0-82.0	2.80	*	17.1	3.5		2+83	DOL V/FN XLN~SUC CAL INC
56 56	9382+0-83+0 9383+0~84+0	1.60 4.20	0,85 0,06	10.3 B.6	5.0 1.1	73.4 55.7	2+86 2+86	DOL V/FN XLN-SUC CAL INC DOL V/FN XLN-SUC CAL INC
57	9384,0-85,0	2.80	*	6+4	2.7	58.6	2,84	DOL V/FN XLN-SUC CAL INC
58	9385.0-86.0	0+02	*	1.7	80.6	7+7	2.71	LM VZEN XLN-SUC DOL VZCARB CAL
59	9386.0-87.0	0.02	*	6.6	62.9	7,0	2,76	LM VZEN XEN-SUC DOL VZCARB CAL
60	9387.0-88.0	10. **	*	7.8	11,9	59.5	2.82	DOL V/FN XLN~SUC LIMY CAL INC

**\*** SAMPLE NOT SUITABLE FOR FULL DIAMETER ANALYSIS

**\*\* INDICATES FRACTURED FERM SAMPLE** 

VF INDICATES VERTICAL FRACTURE

1			oleum K	ORAFORIES, IT Reservoir Engineeri LLAS, TEXAB		n stap prosentana i bi bi ina		··· •
	TOTAL PETROLEUM CORP. DO NO, 1-22 CEDAR HILLS FI			1 3-18-85		FILE NO.		,28
	NOT 1-22 CEDAR HILLS	UKMA	TUN	: RED RIVER "C"		ANAL 1STS	‡ R+E∘B+	
•	*** [0]	DRE 9	GUMMARY	AVERAGES FOR 1	Z0NE ***			•
	DE	ртн з	INTERVA	L: 9328.0 TO	9388+0			
	FEET OF CORE ANALYZED \$	6(	.0	FEET OF CORE IN	CLUDED IN AV	ERAGESI 60.0		
	SAMPLES FALL	и ои	итнін	THE FOLLOWING RA	NGES WERE AV	ERAGED		
	PERMEABILITY MAXIMUM RA	NGE (	(MD.)	: 0.01 T	0 43, (	UNCORRECTED FO	R SLIPPAGE)	I
	HELIUM POROSITY RANGE C	<u>%</u> )		: 1.6 T				
	OIL SATURATION RANGE (%			1 0.0 T				
	WATER SATURATION RANGE	(%)		: 0.0 T	0 100.0			
	SHALE SAMPLES EXCLUDED	FROM	AVERAG	ES.				
	AVERAGES	FOR	DEPTH	INTERVAL: 9328	.0 10 9388.	0		
	AVERAGE PERMEABILITY (MILLIDARCIES	)		FRODUCTI	VE CAPACITY	(MILLIDARCY-FE	FT)	
	ARITHMETIC PERMEABILITY	:	6.9	ARITH	METIC CAPAC)		: 415.	
	GEOMETRIC PERMEABILITY	;	2.9		TRIC CAPACIT		: 175.	
•	HARMONIC PERMEABILITY	1	0.00	HAKMU	NIC CAPACITY		1 20.	
	GEONETRIC MAXIMUM % 90 DEG PERM	. :	0.32	GE.OME.	TRIC MAXIMUN	1 8 90 DEG CAPA	CITY: 19.	,
	AVERAGE FORDSITY (FERCENT)	:	12.3		TOTAL WATER ENT OF PORE		: 65.4	1
	AVERAGE RESIDUAL OIL SATURATION (PERCENT OF PORE SPACE)	t	6.0					

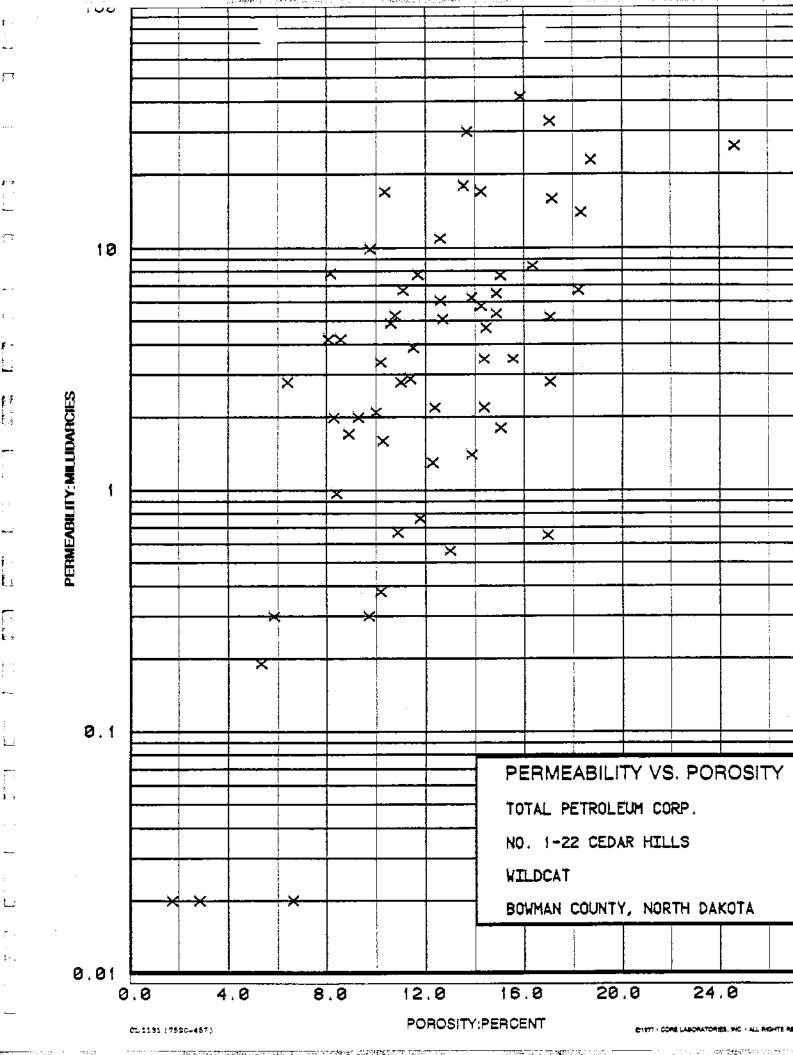
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- č <sup>r</sup> i			CORE LABOR Petroleum Rese PALL	natunica,	INC.		CPR01. 1157	1
			PERMEABIL	ITY VS POROS	ITY			
		/: TOTAL PET :- WILDCAT	TROLEUM CORP.	WELI Covi		NO. 1-22 CED Bownan Count		акота
		AIR PER Porosi	RMEABILITY : MD - H TY : PERCEN		( UNCORREC (	TED FOR SLIPP HELIUM	AGE ) )	
	DEPTH INTERVAL	RANGE & Symbol	PERMEABILITY MINIMUM MAXIMUM	POROSITY M1N. MAX.	POROSITY Average	PERMEABI ARITHNETIC	LITY AVERA HARMONIC	
				1.6 25.0	12.3	6.7	0,33	2.

These analyses, opinions or interpretations are based on observations and materials supplied by the client to whom, and for whose exclusive and confidential use, this report is made. The interpretations or opinions . . . . . . . . the test of the second se



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DALLAS, TEXAS

#### STATISTICAL DATA FOR FOROSITY AND FERMEABILITY HISTOGRAM

COMPANY: TOTAL PETROLEUM CORP. FIELD : WILDCAT

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WELL : ND. 1-22 CEDAR HILLS COUNTY, STATE: BOWNAN COUNTY, NORTH DAKOTA

""PAGE \* 1

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AIR PERMEABILITY # MD. ( HORIZONTAL ) RANGE USED 0.010 TO 43. POROSITY : PERCENT ( HELIUM ) RANGE USED 1.6 TO 46.0

#### (PERMEABILITY UNCORRECTED FOR SLIPPAGE)

DEFTH LIMITS: 9328.0 - 9388.0INTERVAL LENGTH : 60.0FEET ANALYZED IN ZONE: 60.0LITHOLOGY EXCLUDED : NONE

#### DATA SUMMARY

FOROSITY	PERMEABI	LITY AVERA	AGES
AVERAGE	ARITHMETIC	HARMONIC	GEOMETRIC
<u>+</u>			
12.3	6.9	0.33	2.9

These analyses, opinions or interpretations are based on observations and materials supplied by the client to whom, and for whose exclusive and confidential use, this report is made. The interpretations or opinions expression is particular to present the best information in the presentable but Care Laboratoriae. Inc. and its officers and employees summers a remombility and make up wattanty of

DALLAS, TEXAS

### STATISTICAL DATA FOR POROSITY AND PERMEABILITY HISTOGRAM

COMPANY: TOTAL PETROLEUM CORP. FIELD : WILDCAT

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WELL : NO, 1-22 CEDAR HILLS COUNTY, STATE: DOWNAN COUNTY, NORTH DAKOTA i i ser a site

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#### GROUPING BY FOROSITY RANGES

POROSITY RANGE	FEET IN RANGE	AVERAGE POROSITY	AVERAĐE (đeom.)	FERK, (ARITH)	FREQUENCY (PERCENT)	CUMULATIVE Frequency (%)
0.0 - 2.0 $2.0 - 4.0$ $4.0 - 6.0$ $6.0 - 8.0$ $8.0 - 10.0$ $10.0 - 12.0$ $12.0 - 14.0$ $14.0 - 16.0$ $16.0 - 18.0$	$     \begin{array}{r}       1.0 \\       1.0 \\       2.0 \\       2.0 \\       7.0 \\       14.0 \\       10.0 \\       11.0 \\       6.0 \\     \end{array} $	1.7 2.8 5.5 6.5 8.8 10.8 13.1 14.9 17.0	0,020 0,020 0,239 0,237 2,4 2,8 4,4 5,8 5,9	0,020 0,245 1,4 3,7 4,3 8,2 9,1 11, 15,	1.7 1.7 3.3 3.3 15.0 23.3 16.7 18.3 10.0 5.0	1.7 3.3 6.7 10.0 25.0 48.3 65.0 83.3 93.3 98.3
18.0 - 20.0 24.0 - 26.0	3.0 1.0	18+5 24+7	13, 26,	26.	1.7	100.0

TOTAL NUMBER OF FEET = 60.0

These analyses, opinions or interpretations are based on observations and materials supplied by the client to whom, and for whose exclusive and confidential use, this report is made. The interpretations or opinions

DALLAS, FEXAS

#### STATISTICAL DATA FOR POROSITY AND PERMEABILITY HISTODRAM

COMPANY: TOTAL PETROLEUM CORF. FIELD : WILDCAT

777 Y C

WELL : NO. 1-22 CEBAR HILLS COUNTY, STATE: BOWNAN COUNTY, NORTH DAKOTA

PAGE 3

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#### GROUPING BY PERMEABILITY RANGES

PERMEABILITY RANGE	FEET IN RANGE	AVERAGE (GEOM+)	PERM. (ARITH)	AVERAGE POROSITY	FREQUENCY (PERCENT)	CUMULATIVE FREQUENCY (%)
					,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
0.020 - 0.039	3.0	0.020	0.020	3.7	5.0	5.0
0.156 - 0.312	3.0	0,259	0.263	6+9	5+0	10.0
0.312 - 0.625	2.0	0+461	0.470	11.6	3.3	13.3
0.625 - 1.250	4.0	0,753	0,762	12.0	6.7	20.0
1,250 - 2,500	10.0	1.8	1.8	11+5	16.7	36.7
2.500 - 5.000	12.0	3.6	3.6	11+6	20.0	56.7
5 10.	14.0	6.4	6.5	13+7	23.3	80.0
10.~ 20.	7.0	14+	15.	13.8	11.7	91+7
20 40.	4.0	20.	28.	18.6	6.7	98+3
40,- 80,	1.0	42.	42+	15.9	1.7	100.0

TOTAL NUMBER OF FEET = 60.0

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DALLAS, TEXAS

#### STATISTICAL DATA FOR FOROSITY AND PERMEABILITY HISTOGRAM

COMPANY: TOTAL PETROLEUM CORP. FIELD : WILDCAT

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WELL : NO. 1-22 CEDAR HILLS COUNTY, STATE: BOWMAN COUNTY, NORTH DAKOTA

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POROSITY-FEET OF STORAGE CAPACITY LOST FOR SELECTED POROSITY CUT OFF

POROSITY CUT OFF	FEET Lost	CAPACITY Lost (%)	FEET REMAINING	CAPACITY REMAINING (%)	ARITH MEAN	MEDIAN
tert and tak bet that the state and	**** *** afte aft ant and east					
0.0	0.0	0.0	60.0	100.0	12.3	12.2
2.0	1.0	0.2	59,0	99+8	12+4	12.3
4.0	2.0	0.6	58.0	99.4	12.6	12.4
6.0	4.0	2.1	56.0	97.9	12.9	12.6
8.0	6.0	3.9	54.0	96.1	13.1	12+8
10.0	15.0	14.7	45.0	85.3	14.0	13.7
12.0	27+0	35.3	31.0	64.7	15.4	15.0
14.0	39.0	53.1	21.0	46,9	16.5	
16.0	50.0	75+3	10.0	24+7	18.2	
18.0	56.0	87.1	4 • 0	10.9	20.0	
20.0	59.0	96+6	1.0	3+4	24.7	25.0
22.0	59.0	96.6	1.0	3.4	24+7	
24.0	59.0	96.6	1.0	3.4	24.7	
26.0	60.0	100.0	0.0	0.0		

TOTAL STORAGE CAPACITY IN FOROSITY-FEET ==

736.0

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## Petroleum Reservoir Engineering

CORE LABORATORIES, INC.

DALLAS, TEXAS

### STATISTICAL DATA FOR FOROSITY AND PERMEABILITY HISTOGRAM

COMPANY: TOTAL FETROLEUM CORP. FIELD : WILDCAT

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An example of the

WELL : NO, 1-22 CEDAR HILLS COUNTY, STATE: BOWMAN COUNTY, NORTH DAKOTA

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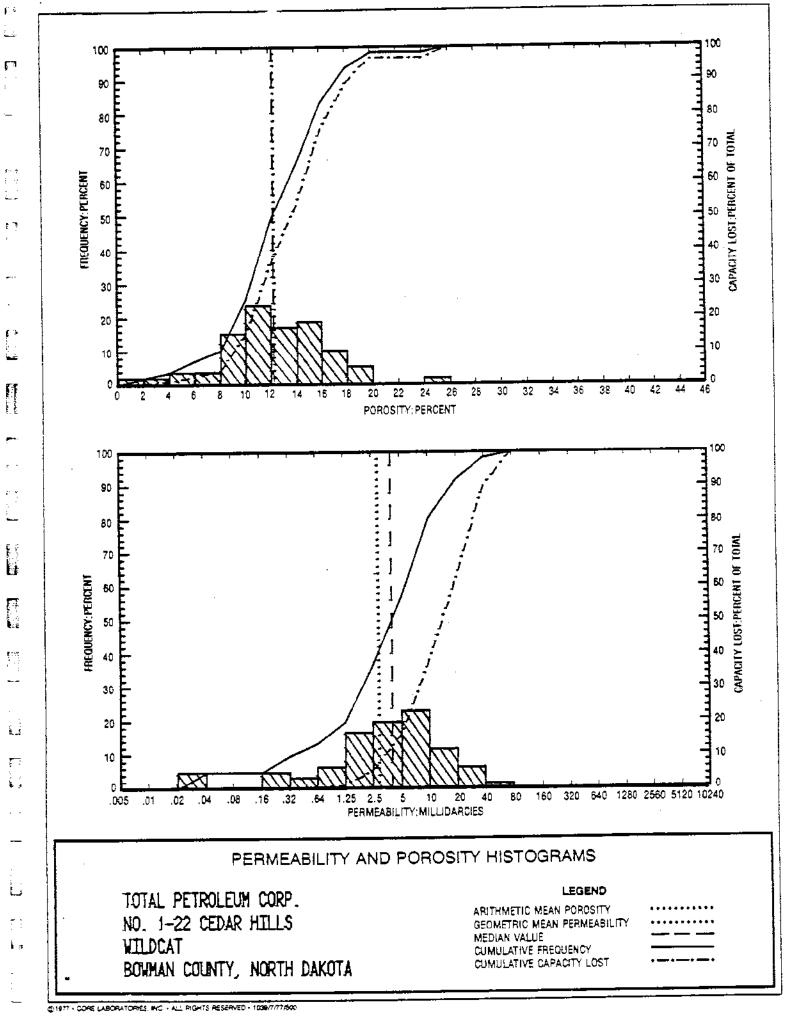
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### MILLIDARCY-FEET OF FLOW CAPACITY LOST FOR SELECTED PERMEABILITY OUT OFF

PERMEABILITY CUT OFF	FEET LOST	CAPACITY L8st (%)	FEET REMAINING	CAPACITY Remaining (%)	GEDM Mean	MEDIAN
		***** *** *** *** *** ***		المريد بين محمد معيد الله المعالية المعالية المحمد المريد المحمد المريد المعال		
0.005	0.0	0.0	60+0	100.0	2.92	3,97
0.010	0.0	0.0	60.0	100.0	3.27	3.97
0.020	0.0	0.0	60.0	100+0	2.92	3.97
0.039	3.0	0.0	57.0	100+0	3.80	4+33
0.078	3.0	0.0	57.0	100.0	3.80	4.33
0.156	3.0	0.0	57.0	100.0	3,80	4.33
0.312	6.0	0+2	54.0	99.8	4.41	4.72
0.625	8.0	0.4	52.0	99.6	4+81	5.00
1,250	12.0	1.2	48.0	98.8	5,62	5,52
2,500	22.0	5.6	38.0	94.4	7+58	7.07
5.	34.0	16.1	26+0	83.9	10.74	
10.	48.0	38.0	12.0	62.0	17,57	
20.	55.0	62.9	5.0	37.1	30.14	
40.	59.0	87.7	1.0	10.1	42.00	
80.	60.0	100+0	0.0	0.0		

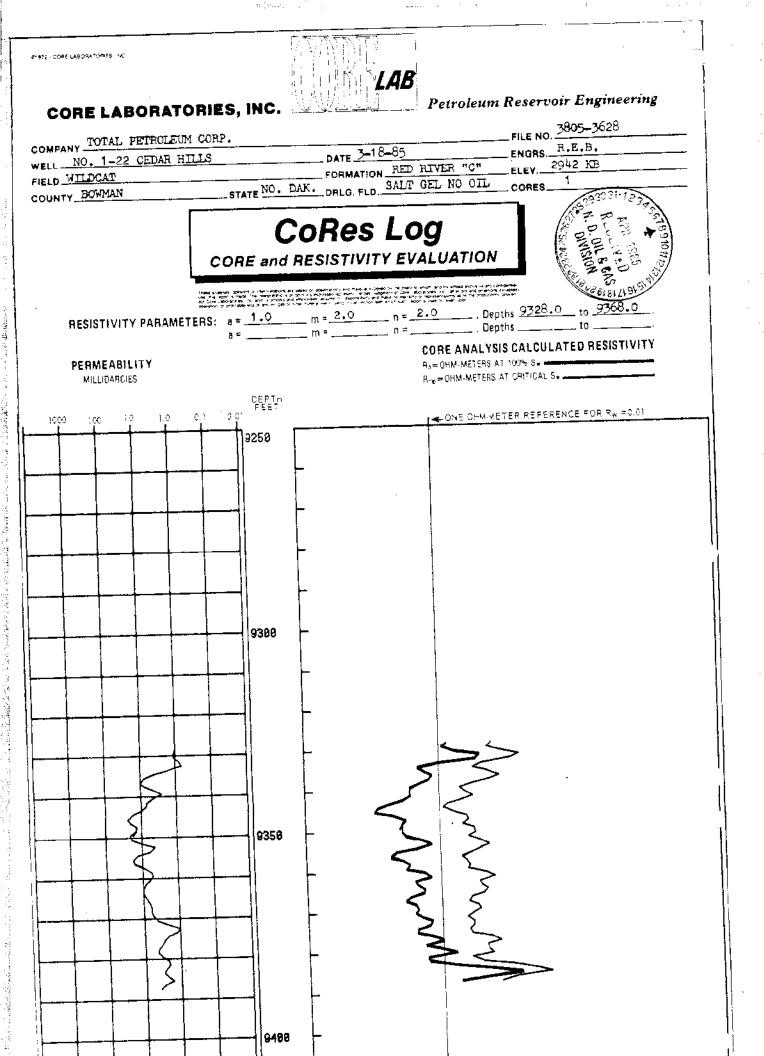
TOTAL FLOW CAPACITY IN MILLIDARCY-FEET(ARITHMETIC) = 414.74

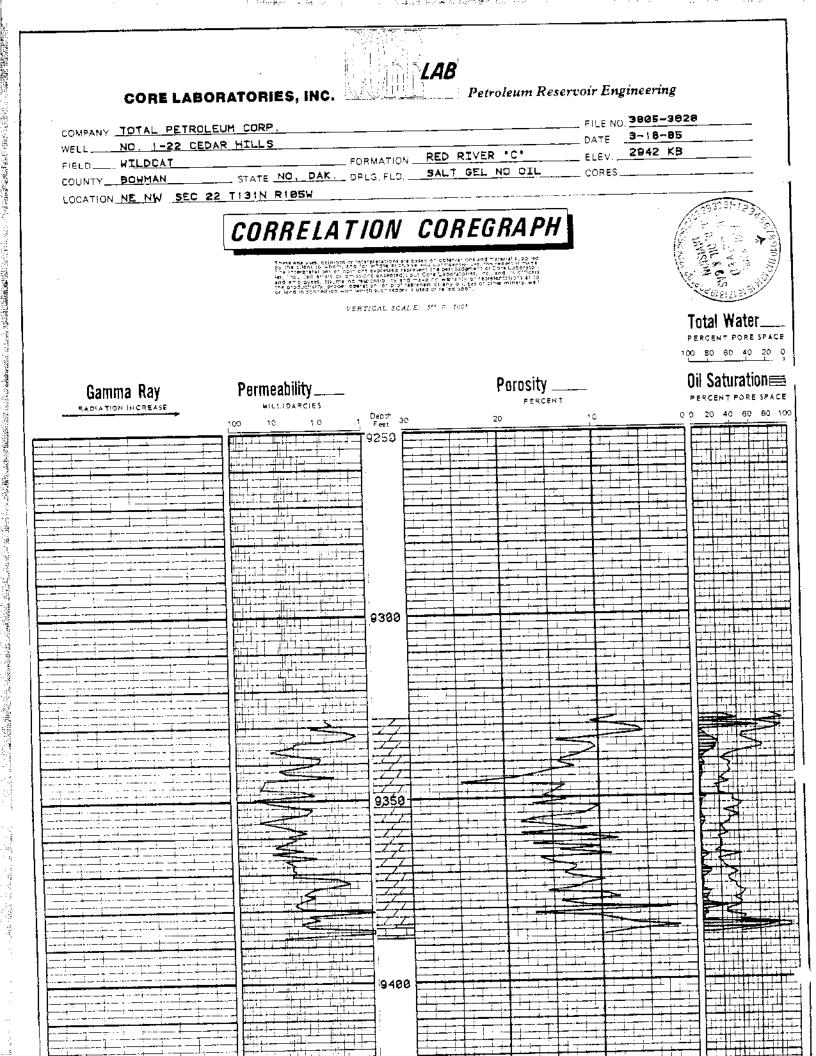
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	FORM 7		Well File No. 11409
_		rth Dakota State Industrial Commission Oil and Gas Division	75 3) 16th
(	900 EAS	T BOULEVARD - BISMARCK, NORTH DAKOTA - SUSS V	GAS 20 ( HOLE
	NAME OF OPERATOR:	un, Inc ADDRESS:	31 300, Denver, CO 80201
	WELLNAME AND NO.: <u>Cedar Hills</u>	L-22_FIELD: <u>Wildcat</u> COU	JNTY:Bowman •
	LOCATION OF WELL: Qtr., <u>NELNW</u>	Sec.,22Twp., _131N	Rge., 105W
	Well is	feet from (N) (X) section line and $1650$	feet and from 🌾) (🐉 / section li
	TOTAL DEPTH: 95001	ELEV.: 2942.1 (DRX BR	<u></u> КВ)
	DATE PLUGGED: March 21,	, 19 85 ELECTRIC OR OTHER LOGS RUN	BLL, CDL, CNL, UAL
	NO, OF DSTS RUN: <u>2</u> (see back)		
	IF WELL WAS CORED, INTERVALS CORED:	9328-93881	
	IF WELL WAS FILLED WITH MUD LADEN FLU NAME OF FIELD INSPECTOR PRESENT DURI	<b>_</b>	

### WELL RECORD

	C	ASI <u>NG</u>		PL	UGS	1	CEMENT
SIZE	DEPTH SET	WEIGHT NO./FT.	AMOUNT PULLED	TYPE	DEPTH	NO. Sacks	INTERVAL
<u>3-5/81</u>	<u>2018' KB</u>	2/ #	None	Class G	9140	40	Red River
			<b></b>		8407	40	Duperow
				P	7370	40	Mission Canyon
				11	6350	40	Minnelusa
				11	4200	40	Newcastie
			· · · · · · · · · · · · · · · · · · ·	11	2018	50	BASE SURF_CSG
	·······						
		·					
		_					

<u>REMARKS:</u>

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WO top plug pending rancher's request.

Will report final plug via Sundry Notice.

	GEOLOGIC MARKERS		· · · · · · · · · · · · · · · · · · ·
Name	Measured Depth	True Vertical Depth	
<u>Greenhorn</u>	35001		
Dakota	45281	_	
Spearfish	5593	_	
Pine Salt	57601		
Minnelusa Kibbey Line	6350		
Charles			
Mission Canyon	7370		
Lodgepole	78581		
Devonian	8410		
Interlake	86431		
Red River			

## (COMPLETE FORM ON REVERSE SIDE)

#### DRILL STEM TEST DATA

#### \*\*\*SEE ATTACHED\*\*\*

I hereby swear or affirm that the information herein provided is true, complete and correct as determined from all available records,

Alamet Jala Signature	- <u>3/29/</u> Date	les-
<u>Sr. Petroleum Engineer</u> Title	-	~.
State of <u>Colorado</u>	_)	(
County of	)55 _)	
On this Gth day of	March	, 19 <u>\$5</u> , before me personaily appeared
David Patri	to me known as the person descr	ibed in and who executed the foregoing instrument
and acknowledged that (s)he executed the same		AL D
Notary	Notary Public	no Munaker
Seal	State of	Lado county of Denner
	My Commission ex	

#### INSTRUCTIONS

TAN TANK TANK

1. Within thirty (30) days after the plugging of any well, the owner or operator thereof must file the original and three copies of this report with the North Dakota Industrial Commission, Oil and Gas Division.

2. The owner or operator shall file with the Oil and Gas Division three copies of the following: all logs run, drill stem test reports and charts, formation water analysis and noninterpretive lithologic logs or sample descriptions if complied.

ONE DENVER PL 999 18TH STREE DENVER COLOR		TELEPHONE 303	291-2000	<u>MAILING ADDRESS</u> P. O. BOX 500 DENVER. COLORADO BO20
CEDAR HILLS				
Sec 22-T13: Bowman Cout			093031-123	
Well File -		/		
			APR TONS TO	
DST #1 -	Red River "A"	9152-9206'		
	<b></b>	(	DIVISION GAS	
ĪĒ	 5 Min	<u>Pressures</u> 85-158		
ISI	60 Min	3863		
2nd Flow	180 Min	183-360		
FSI	180 Mín	3520		
FF	180 Mín	41 <b>5-</b> 523		
IH		4947		
ΥH.		4847		
Sampler: 3	500 cc 0il, 16	00 cc Wtr.,#15 cu ft_Ga	s. Recoverv: 41	0' (5.8 BBLS) HGCO
- 1	Pressure 120 p	si, Rw = .049 © 68 <sup>0</sup>		01 (4.7 BBLS) SW
(	Gravity 24° AP	si, Rw = .049 © 68 <sup>0</sup> I, Temp = 218°F	126	01 (10.5 BBLS) Total
		·		
)ST #2 -	Red River "C"	9321-9388'		
	<i></i>	2		
IF	<u>Time</u> - 5 Min	<u>Pressures</u> 680-1003		
ir ISI	60 Min	4124		
2nd Flow	180 Min	1082 3705		

2nd Flow 180 Min 1082-3795 FSI 180 Min 4086 180 Min ΞF 3818-4067 IHP 5123 FHP 5123

Sampler: 2300cc Wtr

1991年11月1日,建筑建筑地址建立资源的1000多度,建筑建筑地址是一部为1000多层度,建筑性量量度的100000000,1000多层发展,建筑全部设计和1000多位,1000多位,1000多位

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4 1.211

Becovery: 310' (4.4 BBLS) Amonia cut mud 8715' (117.1 BBLS) SW 9025' (121.5 BBLS) Total

W C	FORM 4		900 EA	ST BOULEVAR	I and Gas Di D · BISMARCK	strial Commission vision NORTH DAKOTA	DIVISION GAS	Well File N	∛o. <u>1+∠og</u>
	<ol> <li>Notice of .nd</li> <li>Notice of Ind</li> <li>Notice of Ind</li> <li>Notice of Ind</li> <li>Notice of Ind</li> <li>Seport of Water</li> <li>Report of Shares</li> </ol>	tention to Chan tention to Pull ( tention to Aban ater Shut-Off	or Redrill ge Plans Casing idon Well			7. Report of C	asing edrilling or Rep ary History al Test nosis	air	
and and finite sector and from	WELL NO.	<u>:_22</u>	is located	12500	t, from	(N) (SX line and _	1650	ft. from th	ne (XEX (W) lia
ning men an		<u>Wildca</u>	<u>r                                    </u>	evel.		<u>105%</u>   Pool, The elev			
		(State names of	, and expected indicate muc	depth of objec	ETAILS OF We trive sand; show enting points,	ORK) w sizes, weight, and and all other detai	d lengths of pro	posed casing,	
A. B.	<u>Dispositi</u> <u>Di</u> spositi	on of Salt on of Mué:							
а 2 2 2						orth Dakota.			
, } ⊃.	<u>Approxima</u>	te Date of	Restoratio	on: April	- May, 19	985.			
Е. Е.		ponsible fo		: Total P	etroleum,	Inc.			
<ul> <li>с</li> <li>г</li> <li>г</li></ul>	incicale :	<u>if Cropian</u>	<u>1:</u>			·.			
	Ī	Cotal Petro P.C. Box 50 Denver, CC	)0, Ste 310		Appro		)o not write in t	his space	19 <u>.85</u>
		nul // .ei/J, Petr			By	K <u>ennietti</u> Dielomä	5 Kal	listal	
	Title <u>Sr.</u>	Petroleur.	Engineer		یے Title nstructions Ov		tion Le	<u>apervi</u>	ar_

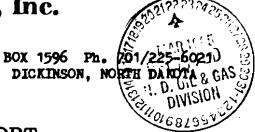
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BOX 3659 Ph. 307/237-9327 CASPER, WYONING



## WATER ANALYSIS REPORT

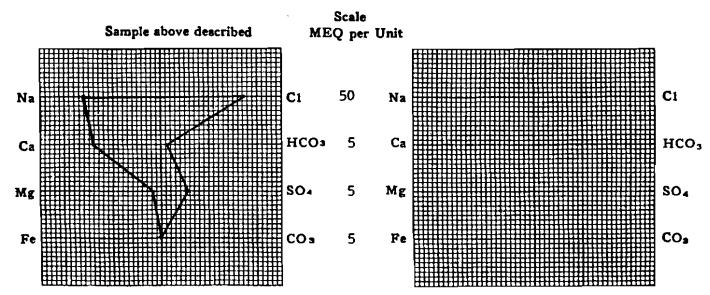
OPERATOR	Total Petroleum	DATE 3/21/85	LAB NO. 2549-7
WELL NO	Cedar Hills #1-22		<u>22–131N–105W</u>
FIELD		FORMATION Red	River "C"
COUNTY	Bowman	INTERVAL 932	-9388
STATE	N.D	SAMPLE FROM DST	1 #2 (Sample Chamber)

## REMARKS & CONCLUSIONS: Orange brown cloudy water, Light orange brown cloudy filtrate.

<u>Nitrate, mq/l --- negative</u> Chromate, mg/l -- trace

<u>Cations</u> Sodium - (Calc) Potassium Lithium Magnesium Iron Total Catio		<u>meq/1</u> 811,15  72.01 8.06  891.22	Anions         mg/1           Sulfate         1,370           Chloride         30,380           Carbonate         0           Bicarbonate         366           Hydroxide         -           Hydrogen sulfide         -	<u>meq/1</u> 28.50 856.72 
Total dissolved solids, mg/i NaCl equivalent, mg/l - Observed pH	-	52,304 51,378 6.82	Specific resistance @ 68°F.: Observed 0.149 Calculated 0.150	ohm-meters ohm-meters

#### WATER ANALYSIS PATTERN



(Na value in above graphs includes Na, K, and Li) NOTE: Mg/1=Milligrams per liter Meq/1= Milligram equivalents per liter Bodium chloride equivalent=by Dunlap & Heathorne calculation from components



BOX 3659 Ph. 307/237-9327 CASPER, WYOMING BOX 1596 Ph. 701/225-6021

## WATER ANALYSIS REPORT

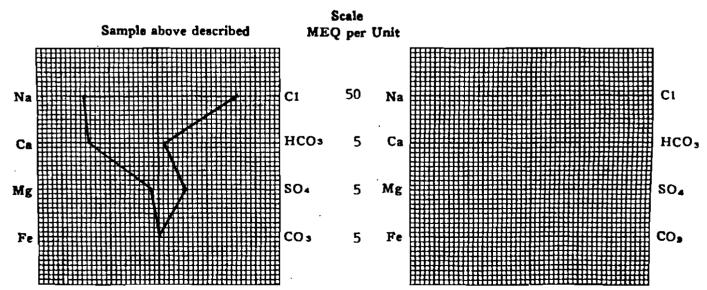
OPERATOR	Total Petroleum	DATE 3/21/8	35 LAB NO2549-6
WELL NO.	Cedar Hills #1-22	LOCATION	Sec. 22-131N-105W
FIELD		FORMATION	Red River "C"
COUNTY	Bowman	INTERVAL	9321-9388
STATE	N.D	SAMPLE FROM_	DST #2 (Sample #6)

## REMARKS & CONCLUSIONS: Orange brown cloudy water, Light orange brown cloudy filtrate.

<u>Nitrate, mg/1 — negative</u> Chromate, mg/1 — negative

Lithium	<u>mg/1</u> 17.694  1.443  98 	<u>meq/1</u> 769.69  72.01 8.06  849.76	Anions         mg/1           Sulfate         1,370           Chloride         28,910           Carbonate         0           Bicarbonate         366           Hydroxide         -           Hydrogen sulfide         -	<u></u>
Total dissolved solids, mg/l NaCl equivalent, mg/l - Observed pH		<u>49,881</u> <u>48,955</u> <u>6.79</u>	Specific resistance @ 68°F.: Observed 0.159 Calculated 0.154	

#### WATER ANALYSIS PATTERN



(Na value in above graphs includes Na, K, and Li) NOTE: Mg/1=Milligrams per liter Meq/1= Milligram equivalents per liter Sodium chloride equivalent=by Dunlap & Hawthorne calculation from components



BOX 3659 Ph. 307/237-9327 CASPER, WYOMING BOX 1596 Ph. 701/225-6021 JIVED DICKINSON, NORTH DAKOTA TO OIL & GAS DIVISION

## WATER ANALYSIS REPORT

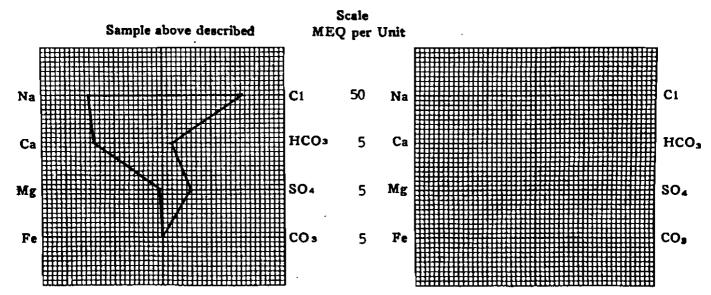
OPERATOR	Total Petroleum	DATE 3/21	/85	_ LAB N	ro. 2549-5
WELL NO.	Cedar Hills #1-22	LOCATION	Sec. 22-13		
FIELD		FORMATION_	Red River	"C"	
COUNTY	Bowman	INTERVAL	9321-9388		
STATE	N.D.	SAMPLE FROM	nDST #2	(Sample	#5)

## REMARKS & CONCLUSIONS: Light brown cloudy water, Light brown cloudy filtrate.

<u>Nitrate, mg/l --- negative</u> Chromate, mg/l -- negative

	38 762.92	Anions         mg/1           Sulfate         1,400           Chloride         28,420           Carbonate         0           Bicarbonate         512           Hydroxide         -	<u>1</u> 29.12 801.44  8.40
Total dissolved solids, mg/1	<u>838.96</u> <u>49,362</u> <u>48,265</u>	Hydrogen aulfide Total Anions · Specific reaistance @ 68°F.: Observed <u>0.159</u> Calculated 0.156	ohm-meters

#### WATER ANALYSIS PATTERN



(Na value in above graphs includes Na. K. and Li) NOTE: Ng/1=Milligrams per liter Meq/1= Milligram equivalents per liter Bodium chloride equivalent=by Dunisp & Hawthorne calculation from composenu



BOX 3659 Ph. 307/237-9327 CASPER, WYONING BOX 1596 Ph. 701/225-6021 DICKINSON, NORTH DAROTA

## WATER ANALYSIS REPORT

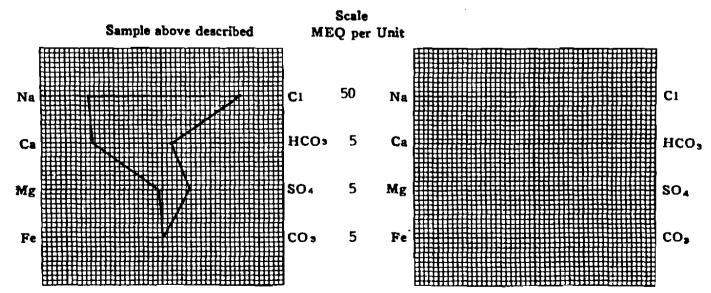
OPERATOR	Total Petroleum	DATE LAB M	NO. 2549-4
WELL NO	Cedar Hills #1-22	LOCATION Sec. 22-131N-105W	<b>__</b> _
FIELD		FORMATION Red River "C"	<u> </u>
COUNTY	Bowman	INTERVAL 9321-9388	
STATE	N.D	SAMPLE FROM DST #2 (Sample #4	4)

## REMARKS & CONCLUSIONS. Light brown cloudy water, Light brown cloudy filtrate.

Nitrate, mg/1 --- negative Chromate, mg/1 --- negative

	•	<u>meq/1</u> 762.30 72.01 4.03 838.34	Anions Sulfate	N . 20	<u></u>
Total dissolved solids, m NaCl equivalent, mg/l Observed pH	• • • • • • •		Specific resistance @ 68°F.: Observed Calculated	0.162 0.156	ohm-meters

#### WATER ANALYSIS PATTERN



(Na value in above graphs includes Na, K, and Li) NOTE: Mg/1=Milligrams per liter Meq/1= Milligram equivalents per liter Sodium chloride equivalent≈by Dunlap & Hawthorne calculation from components



BOX 3659 Ph. 307/237-9327 CASPER, WICHING BOX 1596 Ph. 701/225-6021 DICKINSON, NORTH DAKOTA

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## WATER ANALYSIS REPORT

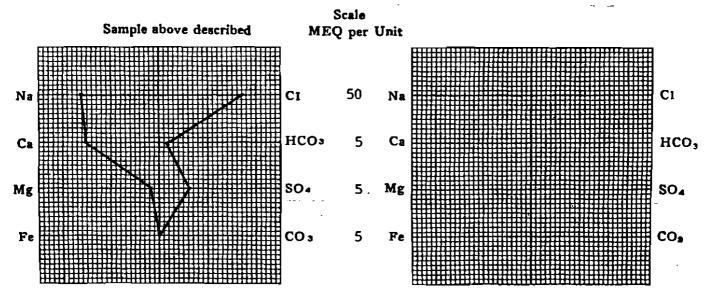
OPERATOR	Total Petroleum	DATE3/21/	185 LAB NO	2549-3
WELL NO.	Cedar Hills #1-22	LOCATION	Sec. 22-131N-105W	
FIELD		FORMATION	Red River "C"	
COUNTY	Bowman	INTERVAL	9321-9388	
STATE	N.D	SAMPLE FROM	DST #2 (Sample #3)	

## REMARKS & CONCLUSIONS: Light brown cloudy water, Light brown cloudy filtrate.

Nitrate, mg/1 --- negative Chromate, mg/1 -- trace

Cations         mg/1           Sodium         (Calc)         18,673           Potassium	76.00	Sulfate ]	mg/1         meq/1           1,500         31.20           0,380         856.72           0            512         8.40               896.32
Total dissolved solids, mg/1 NaCi equivalent, mg/1	51,584	Specific resistance @ 68°F.: Observed Calculated	0.149 ohm-meters 0.150 ohm-meters

#### WATER ANALYSIS PATTERN



(Na value in above graphs includes Na, K, and Ll) NOTE: Mg/i=Milligrams per liter Meq/i == Milligram equivalents per liter Sofium chloride equivalent=by Dunlap & Hawthorne calculation from components



BOX 3659 Ph. 307/237-9327 CASPER, WIONING BOX 1596 Ph. 701/225-6021

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## WATER ANALYSIS REPORT

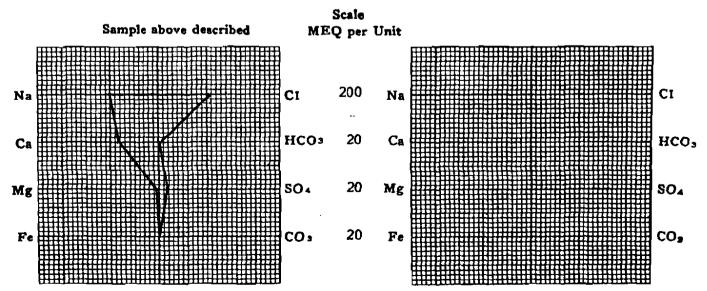
OPERATOR Total Petroleum WELL NO. Ceilar Hills #1-22	DATE3/21/85         LAB NO2549-2           LOCATIONSec22-131N-105W           FORMATIONRed River "C"
PIELD     Bowman       COUNTY     Bowman       STATE     N.D.	INTERVAL 9321-9388 SAMPLE FROM DST #2 (Sample #2)

REMARKS & CONCLUSIONS: Brown cloudy water, Light brown cloudy filtrate.

Nitrate, mg/1 - 60Chromate, mg/1 - 15

Cations       mg/1       meq/1         Sodium       (Calc)       47.051       2046.70         Potassium	Anions         mg/1         meq/1           Sulfate         1,860         38.69           Chloride         77,420         2183.24           Carbonate         0            Bicarbonate         293         4.81           Hydrogen sulfide             Totel Anions         2226.74
Total dissolved solids, mg/1         130,153           NsC1 equivalent, mg/1         128,961           Observed pH         7.92	Specific resistance @ 68°F.: Observed 0.073 ohm-meters Calculated 0.074 ohm-meters

#### WATER ANALYSIS PATTERN



(No volue in above graphe includes No. K. and Li) NOTE: Mg/1=Milligrams per liter Meq/1= Milligram equivalents per liter Sodium chloride equivalent=by Dunlap & Hawthorne calculation from components



BOX 3659 Ph. 307/237-9327 CASPER, WIOHING BOX 1596 Ph. 701/225-6021 OIL & GA DICKINSON, NORTH DANOTA DIVISION

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## WATER ANALYSIS REPORT

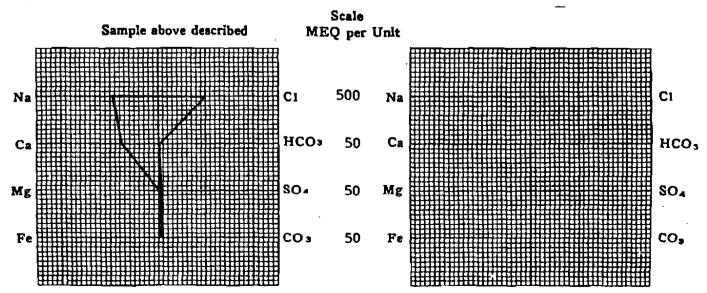
OPERATOR	Total_Petroleum	DATE 3/21/	185 LAB NO. 2	<u>549–1</u>
WELL NO	Cedar Hills #1-22	LOCATION	<u>Sec. 22-131N-105W</u>	h,)
FIELD	1 uildcut	FORMATION	Red River "C"	V.C.M
COUNTY	Bowman	INTERVAL	9321-9288	
STATE	N.D	SAMPLE FROM_	DST #2 (Top Sample)	

## REMARKS & CONCLUSIONS: Mud, Chemical on top, Yellow brown cloudy filtrate.

	Annonia Present	
Nitrate, mg/1 200		
Chromate, mg/1 85		

Cations       mg/1       meq/1         Sodium       (Calc)       107,183       4662.46         Potassium	Anions         mg/l           Sulfate         1,120           Chloride         174,440           Carbonate         1,020           Bicarbonate         0           Hydroxide         1,122           Hydrogen sulfide         -	<u>meq/1</u> 23.30 4919.21 33.97  65.97  5042.45
Total Cations         3042.43           Total dissolved solids, mg/1         292,500           NaC1 equivalent, mg/1         291,824           Observed pH         9.48	Total Anions	ohm-meters

#### WATER ANALYSIS PATTERN



(Na value in obove graphs includes Na. R. and Ll) NOTE: Mg/1=Milligrams per liter Mog/1= Milligram equivalents per liter Bodium chloride equivalent=by Dunlap & Hawiborge calculation from components



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BOX 3659 Ph. 307/237-65 BOX 1596 Ph. 701/225-6021 5

DICKINSON, NORTH DAKOTA

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CASPER, WYOMING

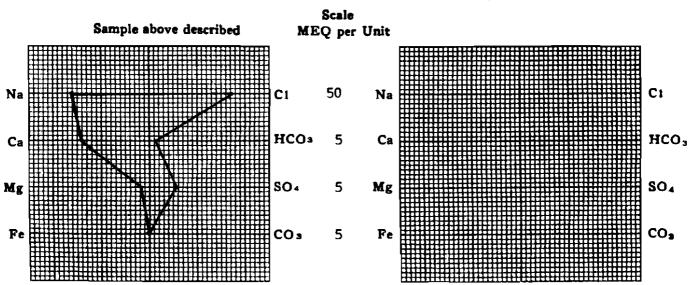
OPERATOR	Total Petroleum	DATE 3/21	/85	LAB N	<b>10</b> 2549-7
WELL NO	Cedar Hills #1-22	LOCATION		131N-105W	
FIELD		FORMATION_	Red River	<u>r "C" _</u>	
COUNTY	Bowman	INTERVAL	<u>9321-938</u>		
STATE	N.D	SAMPLE PROP	DST #2	(Sample (	hamber)

REMARKS & CONCLUSIONS: Orange brown cloudy water, Light orange brown cloudy filtrate.

Nitrate, mg/1 negative	
Chromate, $mg/1 \rightarrow trace$	

Cations         mg/1         meq/1           Sodium         (Calc)         18,647         811,15           Potassium	Chlorids       30,380       856.72         Carbonate       0          Bicarbonate       366       6.00         Hydrogen sulfide
Total dissolved solids, mg/1         52,304           NaC1 equivalent, mg/1         51,378           Observed pH         6.82	Specific resistance @ 68°F.: ObservedO.149ohm-meters

#### WATER ANALYSIS PATTERN

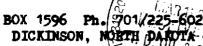


(Na value in above graphs includes Na. X, and Li) NOTE: Mg/I=Milligrams per liter Meq/I= Milligram equivalente per liter Sodium chloride equivalent=by Dunlep & Hawthorne calculation from components





BOX 3659 Ph. 307/237-9327 CASPER, WYOMING





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## WATER ANALYSIS REPORT

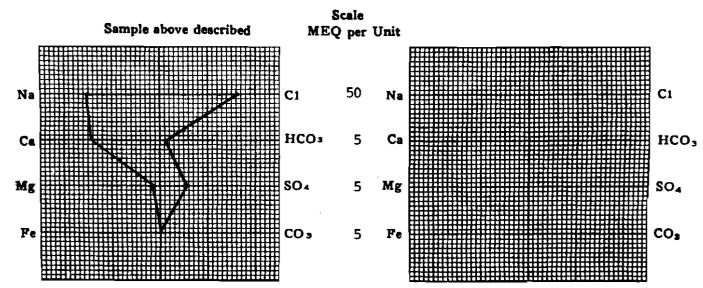
OPERATOR	Total Petroleum	DATE 3/21/8	15 LAB NO2549-6
WELL NO.	Cedar Hills #1-22	LOCATION	Sec. 22-131N-105W
FIELD		FORMATION	Red River "C"
COUNTY	Bowman	INTERVAL	9321-9388
STATE	N.D	SAMPLE FROM_	DST #2 (Sample #6)

## REMARKS & CONCLUSIONS: Orange brown cloudy water, Light orange brown cloudy filtrate.

Nitrate, mq/l - negative Chromate, mg/1 - negative

Cations	mg/1	<u>meq/1</u>	Anions	<u>mg/1</u>	meq/1
	  98_	769.69  72.01 8.06		366	28.50 815.26 6.00
Iron Total Ca		849.76	Hydrogen sulfide Total Ani		849.76
Total dissolved solids, mg NaCl equivalent, mg/1 Observed pH	• • • • • • • •	48,955	Specific resistence @ 68°F. Observed Calculated	0 1 5 0	ohm-meters ohm-meters

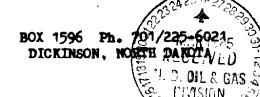
#### WATER ANALYSIS PATTERN



(Na value in above graphs includes Na, K, and Li) NOTE: Mg/1=Milligrams per liter Meq/1= Milligram equivalents per liter Sodium chioride equivalent=by Dunlap & Hawthorne calculation from com



BOX 3659 Ph. 307/237-9327 CASPER, WTONING



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## WATER ANALYSIS REPORT

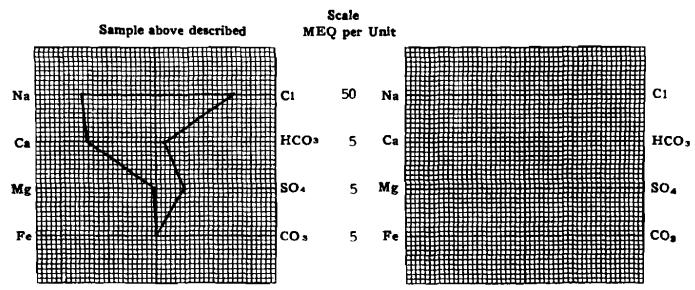
OPERATOR	Total Petroleum	DATE 3/21/85 LAB NO. 2549-5
WELL NO	Cedar Hills #1-22	DATE 3/21/85 LAB NO. 2549-5 LOCATION Sec. 22-131N-105W
FIELD		FORMATION Red River "C"
COUNTY	Bowman	INTERVAL 9321-9388
STATE	N.D.	SAMPLE FROM DST #2 (Sample #5)

REMARKS & CONCLUSIONS: Light brown cloudy water, Light brown cloudy filtrate.

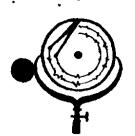
<u>Nitrate, mg/1 negative</u>	
Chromate, mg/1 negative	

Cations	<u>mg/1</u>	meq/1	Anions	mg/1	meq/1
Sodium - (Calc) Potassium Lithium Magnesium Iron	<u>    17.538                                    </u>	<u>762,92</u> <u></u>	Sulfate Chloride Carbonate Bicarbonate Hydroxide Hydrogen sulfide	$     \frac{1,400}{28,420} \\     \hline     0 \\     \overline{512} \\     \hline    $	<u>29.12</u> <u>801.44</u> <u></u>
Total Ca	tione	838.96	Total Ania		838.96
Total dissolved solids, mg NaCl equivalent, mg/l Observed pH			Specific remistance @ 68°F.: Observed Calculated	0.159	ohm-meters ohm-meters

#### WATER ANALYSIS PATTERN



(Na value in above graphs includes Na, K, and Li) NOTE: Mg/t≈Millgrams per liter Meq/t= Millgram equivalents per liter Bodium chloride, equivalent=by Dunlap & Hewthorne calculation (ross composed)



BOX 3659 Ph. 307/237-9327 CASPER, WTOMING BOX 1596 Pt 701/225-6021 DICKINSON, NORTH DARTA X

### WATER ANALYSIS REPORT

OPERATOR	Total Petroleum
WELL NO	Cedar Hills #1-22
FIELD	
COUNTY	Bowman
STATE	N.D.

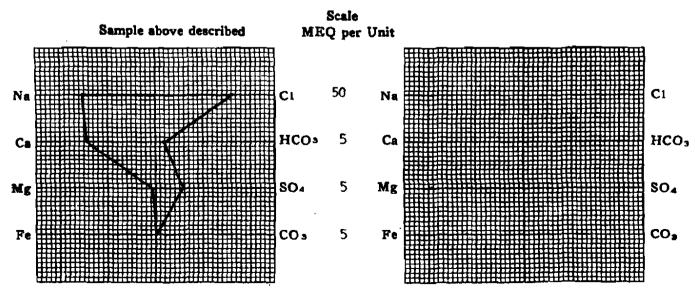
_	DATE 3/21	LAB 1	10. <u>2549-4</u>
-	LOCATION_	Sec. 22-131N-105W	
-	POPMATION	Red River "C"	
	INTERVAL	9321-9388	
-	SAMPLE FROM	MDST #2 (Sample #	4)
-	SAMPLE FROM		

## REMARKS & CONCLUSIONS: Light brown cloudy water, Light brown cloudy filtrate.

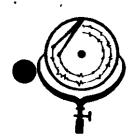
Nitrate,	mg/1	 negative
Chromate		negative

Cations Sodium (Calc) Potassium Lithium Calcium Magnesium	<u>mg/1</u> 17,524  1,443  49	<u>meq/1</u> 762.30 	Anions     mg/1       Sulfate     1,37       Chloride     28,42       Carbonate     -       Bicarbonate     -       Hydrozide     -       Hydrogen sulfide     -	20 <u>28.50</u> 20 <u>801.44</u> 0 <u>-</u>
Total Car Total dissolved solids, mg, NaCi equivalent, mg/1 - Observed pH	/1	838.34 49,318 48,236 7.25		0.162 ohm-meters

#### WATER ANALYSIS PATTERN



(Na value in above graphs includes Na, K, and Li) NOTE: Mg/1=Milligrams per liter Meq/1≃ Milligram equivalents per liter Sodium chloride equivalent=by Dunlap & Hewthorne calculation from components



BOX 3659 Ph. 307/237-9327 CASPER, WYOMING BOX 1596 Ph. 701/225-6024 DICKINSON, NORTH DARDTA (AS ELECTON S

### WATER ANALYSIS REPORT

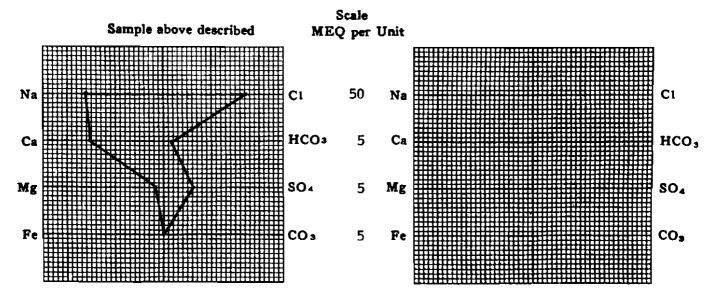
OPERATOR	Total Petroleum	DATE 3/21/	85 LAB NO. 2549-3
WELL NO.	Cedar Hills #1-22	LOCATION	Sec. 22-131N-105W
FIELD		FORMATION	Red River "C"
COUNTY	Bowman	INTBRVAL	9321-9388
STATE	N.D.	SAMPLE FROM	DST #2 (Sample #3)

## REMARKS & CONCLUSIONS: Light brown cloudy water, Light brown cloudy filtrate.

Nitrate, mg/1 --- negative Chromate, mg/1 -- trace

	meq/1         Anions           312.26         Sulfate         -         -           Chloride         -         -         -           Carbonate         -         -         -           76.00         Bicarbonate         -         -           8.06         Hydroxide         -         -	$     \frac{m_{g}/1}{1,500} \\     - 30,380 \\     - 0 \\     - 512 \\    $	<u>meq/1</u> 31.20 856.72 — 8.40
Total dissolved solids, mg/1	Hydrogen sulfide B96.32 Total 52,686 Specific resistance @ 51,584 Observed 7.19 Calculated	Anions	ohm-meters

#### WATER ANALYSIS PATTERN



(Na value in above graphs includes Na. K. and LJ) NOTE: Mg/1=Millgrams per liter Meq/1= Millgram equivalents per liter Sodium chloride equivalent=by Dunlap & Hawthorne calculation from components



BOX 3659 Ph. 307/237-9327 CASPER, WYONING **Inc.** Box 1596 Ph. 701/225-6021 DICKINSON, NORTH DATOTA GAS

## WATER ANALYSIS REPORT

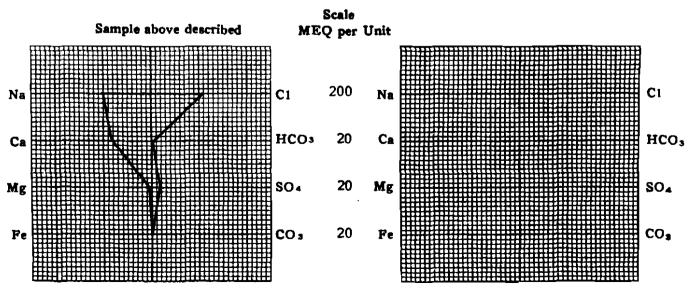
OPERATOR	Total Petroleum	DATE3/2	21/85 Sec. 22-13	LAB NO. 2549-2
WELL NO.	Cedar Hills #1-22	LOCATION	Sec. 22-13 Red River	
FIELD COUNTY	Bowman	FORMATION INTERVAL	9321-9388	
STATE	N.D.	SAMPLE FROM	DST #2 (S	ample #2)

## REMARKS & CONCLUSIONS: Brown cloudy water, Light brown cloudy filtrate.

Nitrate, mg/1 - 60Chromate, mg/1 - 15

<u>Cations</u> Sodium - (Calc) Potassium	<u>mg/1</u> 47.051 	<u>meq/1</u> 2046.70  <u>170.01</u> 10.03  2226.74	Anions         mg/1           Sulfate         1,860           Chloride         77,420           Carbonate         0           Bicarbonate         293           Hydrogen sulfide         -           Total Anions         -	<u></u>
Total dissolved solide, mg/1 NaCi equivalent, mg/1 - Observed pH		130,153 128,961 7.92	Specific resistance @ 68°F.: Observed 0.0 Celculated 0.0	

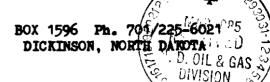
#### WATER ANALYSIS PATTERN



(Na volue in above graphs includes No. K. and Li) NOTE: Mg/1=Miligrams per liter Meq/1= Miligram equivalents per liter Sodium chloride equivalent=by Dunlap & Hawthorne calculation from components



BOX 3659 Ph. 307/237-9327 CASPER, WYONING



## WATER ANALYSIS REPORT

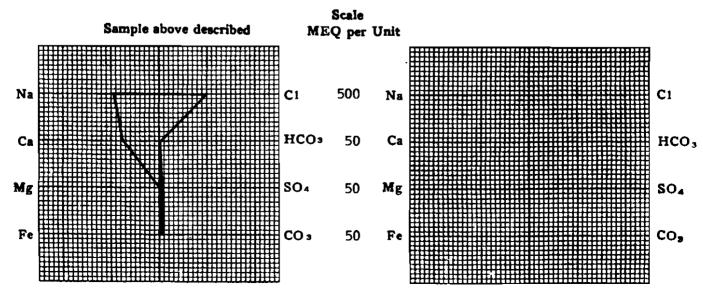
OPERATOR	Total Petroleum	DATE 3/21/	185 LAB NO2549-1
WELL NO	Cedar Hills #1-22	LOCATION	Sec. 22-131N-105W NENW
FIELD	Wildcat	FORMATION	Red River "C"
COUNTY	Bowman	INTERVAL	<u>9321–9288</u>
STATE	N.D.	SAMPLE FROM_	DST #2 (Top Sample)

## REMARKS & CONCLUSIONS: Mud, Chemical on top, Yellow brown cloudy filtrate.

	Ammonia Present		
Nitrate, mg/1 200		_	
Chromate, mg/1 85			

	mg/1         meq/           L07,183		$\begin{array}{c} 174,440 \\ 1,020 \\ 0 \\ 1,122 \\ 1,122 \\ \end{array}$	<u>meq/1</u> 23.30 4919.21 33.97  65.97
Total Cations	5042	.45 Total	Anions	5042.45
Total dissolved solids, mg/1 - NaCi equivalent, mg/1 Observed pH			<b></b>	ohm-meters

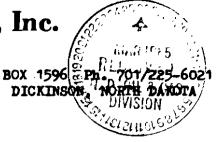
#### WATER ANALYSIS PATTERN



(No value in above graphs includes Na. K. and Li) NOTE: Mg/1=Milligrams per liter Meq/1= Milligram equivalents per liter Sodium chloride equivalent=by Dunlap & Hawthorne calculation from components



BOX 3659 Ph. 307/237-9327 CASPER, WYOHING



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## WATER ANALYSIS REPORT

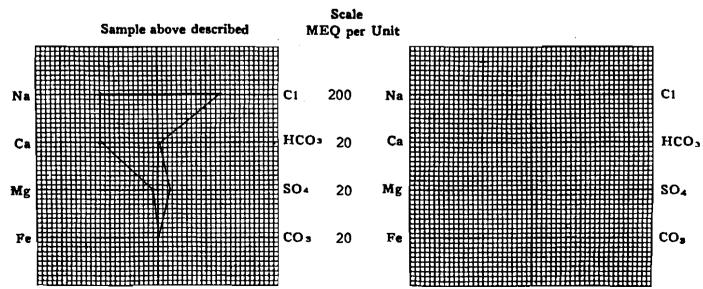
OPERATOR	Total Petroleum	DATE 3/18/8	15 LAB NO. 2545-5
WELL NO	Cedar Hills 1-22	LOCATION	Sec. 22-131N-105W
FIELD		FORMATION	Red River "A"
COUNTY	Bowman	INTERVAL	9152-9206
STATE	N.D.	SAMPLE FROM	DST #1 (Sample Chamber)
•••••			

## REMARKS & CONCLUSIONS: Brown cloudy water, oil on top, Light brown cloudy filtrate.

 Nitrate,	mg/1 —	30
Chromate,	mg/1 —	35

Cationa         mg/1         meq/1           Sodium         - (Calc)         55,116         2397.56           Potassium	Chlorida         92,120         2597.78           Carbonate         0            Bicarbonate         390         6.40
Total Cations 2657.64	Total Anions 2657.64
Total dissolved solids, mg/1         155,250           NaCl equivalent, mg/1         153,684           Observed pH         6.50	Observed 0.067 ohm-meters

#### WATER ANALYSIS PATTERN



(Na value in above graphe includes Ne, K, and Li) NOTE: Mg/t≂Milligrams per liter Meq/1= Milligram equivalents per liter Sodium chloride equivalent=by Dunlap & Hawtherne calculation from components



BOX 3659 Ph. 307/237-9327 CASPER, WIOMING e, Inc. IVR 1925 RECEIVED TO N. D. OIL & GAS & BOX 1596 PHIVISON/225-6021 DICKINSON (NORTH DAKOTA X

## WATER ANALYSIS REPORT

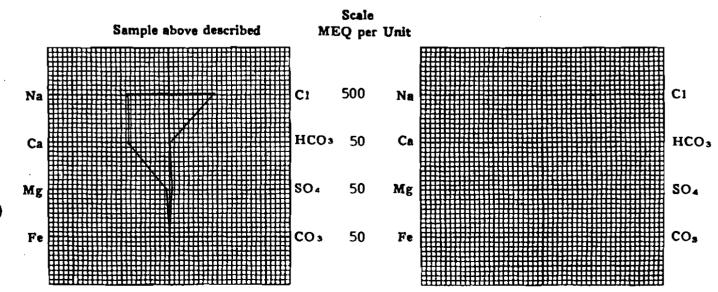
OPERATOR	Total Petroleum	DATE 3/18/8	35 LAB NO2545-4_
WELL NO	Cedar Hills 1-22	LOCATION	Sec. 22-131N-105W
FIELD		FORMATION	Red River "A"
COUNTY	Bowman	INTERVAL	9152-9206
STATE	N.D	SAMPLE FROM_	DST #1 (Sample #4) Bottom Spl.

## REMARKS & CONCLUSIONS: Dark brown muddy water, trace of oil, Brown cloudy filtrate.

Nitrate, mg/1 --- 100 Chromate, mg/1 -- 400

Cations         Sodium       (Calc)         Potassium       -         Lithium       -         Calcium       -         Magnesium       -         Iron       -         Total       Cat	<u>mg/1</u> 101,952 	<u>meq/1</u> 4434.90 	Anions Sulfate	<u>mg/1</u> 1,050 172,480 0 561	<u>meq/1</u> 21.84 4863.94  9.20  4894.98
Total dissolved solids, mg/ NaCl squivalent, mg/l - Observed pH		285,105 283,974 6,54	Specific resistance @ 68°F. Observed Calculated	.: • • <u>0.049</u> • • <u>0.048</u>	ohm-meters

#### WATER ANALYSIS PATTERN



(Na value in above graphs includes Na, K, and Ll) NOTE: Mg/1=Millgrams per liter Meq/Î= Millgram equivalents per liter - Sodium chloride equivalent-be Duplen A Newtherne extentation from components



BOX 3659 Ph. 307/237-9327 CASPER, WYOMING BOX 1596 Ph. 1201/225-602 DICKINSON NORTH DAKOTA ×

# WATER ANALYSIS REPORT

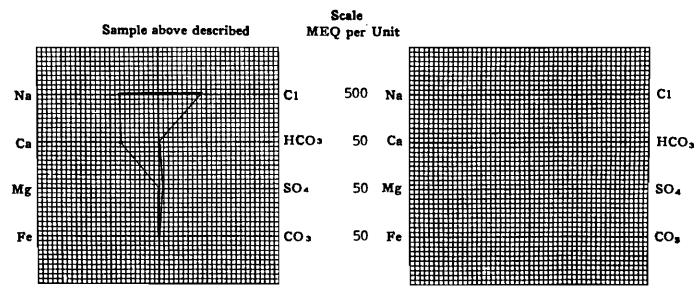
OPERATOR	Total Petroleum	DATE 3/18/	85 LAB NO. 2545-3
WELL NO.	Cedar Hills 1-22	LOCATION	Sec. 22-131N-105W
FIELD		FORMATION	Red River "A"
COUNTY	Bowman	INTERVAL	9152-9206
STATE	N.D	SAMPLE FROM	DST #1 (Sample #3)

### REMARKS & CONCLUSIONS: Black muddy water, oil & oil cut mud on top, Brown cloudy filtrate.

Nitrate,	mg/l	 40
Chromate,	, mg/1	 90

Cations       mg/1       meq/1         Sodium       - (Calc)       95,833       4168.73         Potassium	Anions         mg/1         meq/1           Sulfate         1,540         32.03           Chloride         160,720         4532.30           Carbonate         0            Bicarbonate         268         4.40           Hydrogen sulfide             Total Anions         4568.73
Total dissolved solids, mg/1         266,377           NaCl equivalent, mg/1         265,011           Observed pH         6.25	Specific resistance @ 68°F.: Observed 0.051 ohm-meters Calculated 0.049 ohm-meters

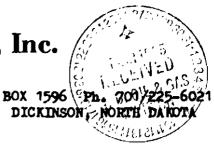
### WATER ANALYSIS PATTERN



(Na value in ebove grephs includes Na, K, and Li) NOTE: Mg/i=Millgrams per liter Meq/i= Millgram equivalents per liter Sodium chloride equivalent=by Dunlap & Hewthorae calculation from components



BOX 3659 Ph. 307/237-9327 CASPER, WIOMING



# WATER ANALYSIS REPORT

OPERATOR	Total Petroleum	DATE 3/18		LAB NO	2545-2
WELL NO.	Cedar Hills 1-22	LOCATION	Sec. 22-1		
		FORMATION_	Red River	<u>"A"</u>	
COUNTY	Bowman	INTERVAL	9152-9206	<u> </u>	
STATE	N.D.	SAMPLE FRO	<u>M</u> DST #1	(Sample #2)	
W 4 / L	•				

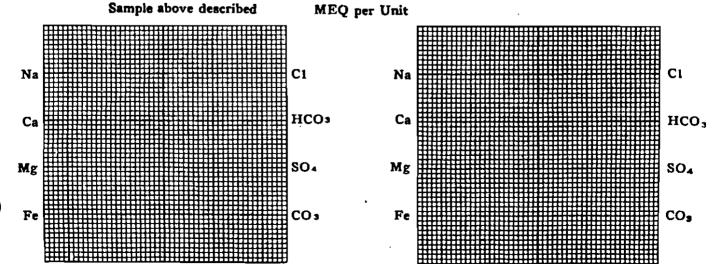
REMARKS & CONCLUSIONS: Oil sample, some oil cut mud, (5% est.)

### (Insufficient water for analysis)

Cations	<u>mg/1</u>	<u>meq/1</u>	Aniona	<u>mg/1</u>	meq/1
Sodium - (Calc)	•		Sulfate	• ·	
Potassium	·	<u></u>	Chloride		
Lithium			Carbonate		
Calcium	,		Bicarbonate		
Magnesium	, <u></u>	<u> </u>	Hydrozide	•	
Iron		•	Hydrogen sulfide		
Total C	tiona		Total A	nions	
Total dissolved solids, mg	./1		Specific resistance @ 68*	F.:	
NaCi equivalent, mg/l		<u> </u>	Observed	• • •	ohm-meter
Observed pH		<u> </u>	Calculated -	·	ohm-mete

### WATER ANALYSIS PATTERN





(Na value in above graphs includes Na. K. and Li) NOTE: Mg/1=Milligrams per liter Meq/1= Milligram equivalents per liter Bodium chloride equivalent=by Dunlap & Hawthorne calculation from composed



BOX 3659 Ph. 307/237-9327 CASPER, WYOHING BOX 1596 Ph. 701/225-6021 DICKINSON, NORTH DAROTA

## WATER ANALYSIS REPORT

ODBRATOR	Total Petroleum	DATE3/18	3/85	LAB NO	2545-1
WELL NO	Cedar Hills 1-22	DATE 3/18 LOCATION	<u>Sec. 22-131</u>	<u>N-105W</u>	
FIELD		FORMATION_		<u>A"</u>	
COUNTY	Bowman	INTERVAL	<u>9152-9206</u>		
STATE	N.D.	SAMPLE PRO	<u></u>	op Sample)	
91 V 1 V					

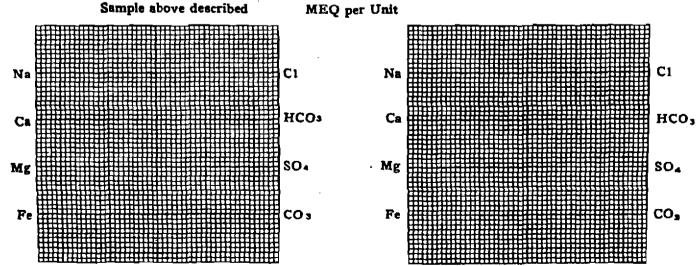
## REMARKS & CONCLUSIONS: Oil sample, some oil cut mud, 10% est.

(Insufficient water for analysis)

Cations	<u>mg/1</u>	meg/1	Anions	<u>mg/1</u>	meq/t
			Chloride		
Magnesium	·		Bicarbonate Hydroxide Hydrogen sulfide		
Total Cat	tions		Total An	ions	
Total dissolved solids, mg/ NaCl equivalent, mg/l - Observed pH		1.1		.: 	

### WATER ANALYSIS PATTERN

Scale



(Na value in above graphs includes Na, R, and Li)
 NOTE: Mg/1=Milligrams per liter Meg/1= Milligram equivalants per liter
 Sodium chloride equivalent=by Dunlap & Hawtherno calculation from composent



BOX 3659 Ph. 307/237-9327 CASPER, WYONING BOX 1596 Ph. 701/225-6021 DICKINSON, NORTH DARDTA

## WATER ANALYSIS REPORT

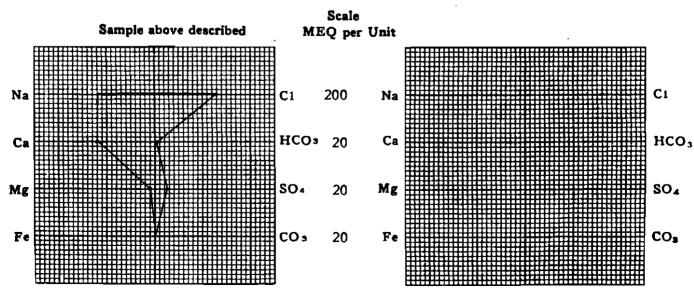
OPERATOR Total Petroleum DATE 3/18/85 LAB NO. 2545-5	
WELL NO Cedar Hills 1-22 LOCATION Sec. 22-131N-105W	
FIELD FORMATION Red River "A"	_
COUNTY Bowman INTERVAL 9152-9206	_
STATE N.D. SAMPLE FROM DST #1 (Sample Chamber)	_

### REMARKS & CONCLUSIONS: Brown cloudy water, oil on top, Light brown cloudy filtrate.

Nitrate, mg/1 --- 30 Chromate, mg/1 --- 35

Cations       mg/1         Sodium       (Calc)       55,116         Potassium       -       -         Lithium       -       -         Calcium       -       -         Magnesium       -       -         Iron       -       -	<u>meq/1</u> 2397.56 — 240.02 20.06	Aniona Sulfate Chioride Carbonate Bicarbonate Hydroxide	<u>mg/1</u> 2,570 92,120 0 390	<u>meq/1</u> 53.46 2597.78  6.40
Total Cations	2657.64	Total A	nions	2657.64
Total dissolved solids, mg/1 NaCl equivalent, mg/1	- 153,684	Specific resistance @ 68°] Observed Calculated	F.: <u>0.067</u> <u>0.066</u>	ohm-meters

### WATER ANALYSIS PATTERN



(Na value in above graphs includes Na, K, and Ll) NOTE: Mg/1=Milligrams per liter Meq/1= Milligram equivalents per liter Sodium chlorida equivalent=by Dunlap & Hawthorne calculation from components



BOX 3659 Ph. 307/237-9327 CASPER, WYONING BOX 1596 Ph. 701/225-6021 DICKINSON, NORTH DAKOTA

## WATER ANALYSIS REPORT

OPERATOR	Total Petroleum	DATE3/18/8	35 LAB NO. 2545-4
WELL NO	Cedar Hills 1-22	LOCATION	Sec. 22-131N-105W
FIELD		FORMATION	Red River "A"
COUNTY	Bowman	INTERVAL	9152-9206
STATE	N.D.	SAMPLE FROM	DST #1 (Sample #4) Bottom Spl.

### REMARKS & CONCLUSIONS: Dark brown muddy water, trace of oil, Brown cloudy filtrate.

Nitrate, mq/1 --- 100 Chromate, mg/1 -- 400

	meq/1       01,952     4434.90	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
Total dissolved solids, mg/1 - NaC1 equivalent, mg/1 Observed pH		 0.049

### WATER ANALYSIS PATTERN

Scale Sample above described MEQ per Unit 500 CI CI Na Na HCO<sub>3</sub> 50 Ca HCO3 Ca SO₄ 50 Mg SO₄ Mg Fe CO3 50 Fe CO,

> (Na value in above graphs includes Na. K, and Li) NOTE: Mg/1=Milligrams per liter Meg/1= Milligram equivalents per liter South m chloride equivalent why Dunian A Hawthores calculation from compose



BOX 3659 Ph. 307/237-9327 CASPER, WYOMING BOX 1596 Ph. 701/225-6021 DICKINSON, NORTH DAKOTA

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# WATER ANALYSIS REPORT

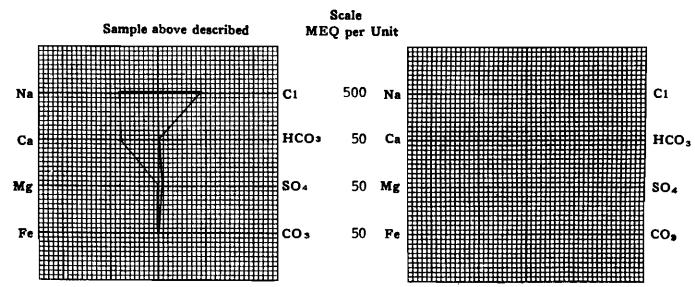
OPERATOR	Total Petroleum	DATE 3/18/	/85 LAB NO. 2545-3
WELL NO.	Cedar Hil <u>ls 1-22</u>	LOCATION	Sec. 22-131N-105W
FIELD		FORMATION	Red River "A"
COUNTY	Bowman	INTERVAL	9152-9206
STATE	N.D.	SAMPLE FROM	DST #1 (Sample #3)

### REMARKS & CONCLUSIONS: Black muddy water, oil & oil cut mud on top, Brown cloudy filtrate.

Nitrate,	mg/l	 40
Chromate	, mg/]	 90

Cationsmg/1Sodium(Calc)95,83PotassiumLithiumCalcium-8,01MagnesiumIron	<u>6</u> 400.00 <u>2</u> <u>-</u>	Anions         mg/1           Sulfate         1,540           Chloride         160,720           Carbonate         0           Bicarbonate         268           Hydroxide         -           Hydrogen sulfide         -	<u>meq/1</u> 32.03 4532.30  4.40
Total Cations Total dissolved solide, mg/1 NaCl equivalent, mg/1 Observed pH	<u> </u>	Total Anions	ohm-meters

### WATER ANALYSIS PATTERN



(Na value in above graphs includes Na, K, and Li) NOTE: Mg/I=Milligrams per liter Meq/I = Milligram equivalents per liter Sodium chloride equivelent=by Dunlap & Hawthorne calculation from components



BOX 3659 Ph. 307/237-9327 CASPER, WYONING BOX 1596 Ph. 701/225-6021 DICKINSON, NORTH DAKOTA

## WATER ANALYSIS REPORT

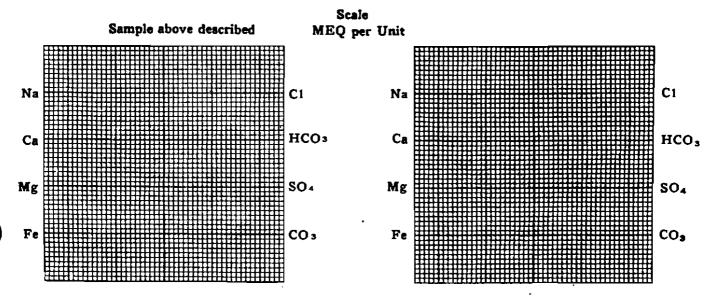
OPERATOR	Total Petroleum	DATE 3/18	
WELL NO.	Cedar Hills 1-22	LOCATION	<u>Sec. 22-131N-105W</u>
FIELD		FORMATION_	Red River "A"
COUNTY	Bowman	INTERVAL	9152-9206
STATE	N.D.	SAMPLE FROM	M DST #1 (Sample #2)

## REMARKS & CONCLUSIONS: Oil sample, some oil cut mud, (5% est.)

(Insufficient water for analysis)

Cations	mg/1	meq/1	Anions	<u>mg/1</u>	meq/1
Sodium - (Calc) Potassium Lithium Calcium Magnesium			Chloride	•	
	ons		Total A Specific resistance @ 68° Observed -	inione	ohm-meters

### WATER ANALYSIS PATTERN



(Na value in above graphs includes Na, K, and Li) NOTE: Mg/1=Milligrams per liter Meq/1= Milligram equivalents per liter Sodium chloride equivalent=by Dunlap & Hawthorne calculation from component



BOX 3659 Ph. 307/237-9327 CASPER, WYONING BOX 1596 Ph. 701/225-6021 DICKINSON, NORTH DAKOTA

### WATER ANALYSIS REPORT

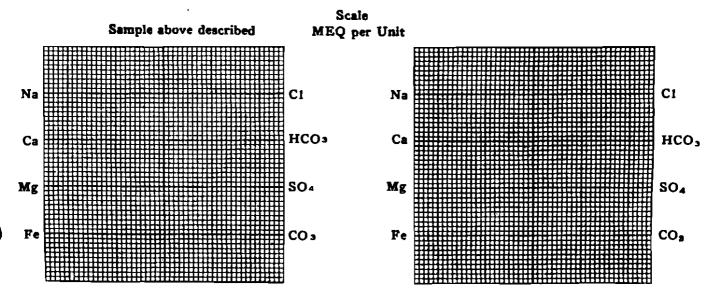
OPERATOR	Total Petroleum	DATE3/18	3/85 LAB NO	2545 <u>1</u>
WELL NO.	Cedar Hills 1-22	LOCATION	Sec. 22-131N-105W	
FIELD		FORMATION_	Red River "A"	
COUNTY	Bowman	INTERVAL	9152-9206	
STATE	N.D	SAMPLE FROM	M DST #1 (Top Sample)	

REMARKS & CONCLUSIONS: Oil sample, some oil cut mud, 10% est.

(Insufficient water for analysis)

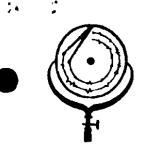
Cations	<u>mg/1</u>	meq/1	Aniona	<u>mg/1</u>	meq/1
			Chloride	·	
Magnesium			Hydrozide Hydrogen sulfide Total A		
Total dissolved solids, mg/ NaCl equivalent, mg/l - Observed pH				F.: 	

#### WATER ANALYSIS PATTERN



(Na value in above graphs includes Na. K. and Li) NOTE: Mg/1=Milligrams per liter Meg/1= Milligram equivalents per liter Sodium chloride equivalent=by Dunlap & Hawthorne calculation from component





BOX 3659 Ph. 307/237-9327 CASPER, WYOHING

BOX 1596 Ph. 701/225-6021 DICKINSON, NORTH DAKOTA

11409

COMPANY	Total Petro	ol <b>eum_</b>	DATE	3/18/85	WO #	2545
LOCATION	Cedar Hills	s 1-22	COUNTY	Bowman	STAT	TE N.D.
REMARKS	Sec. 22-13	IN-105W NENW				
					wild	Cat
	<u>DST #1</u>	Red River "A"		<u>9152-9206</u>		

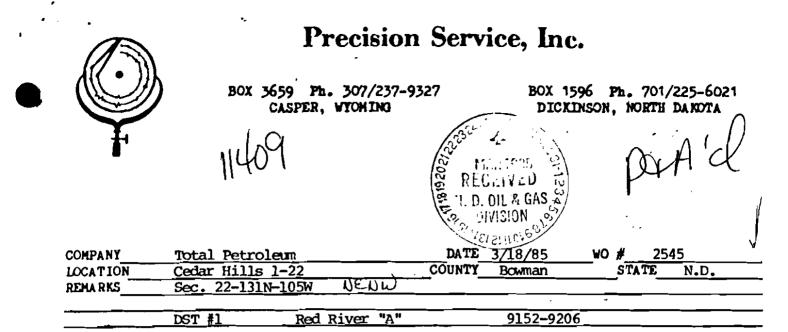
	<u>Chloride</u>	<u>Nitrate Chromate</u>		Bs <u>&amp;W</u>	0i1
	mg/1	mg/1	mg/1	% by vol	<pre>% by vol.</pre>
Start				40%	60%
2 minute reverse out				10%	90%
4 minute reverse out				88	928
6 minute reverse out				20%	808
8 minute reverse out				85%	15%
10 minute reverse out	184,240	100	500+	100%	0
12 minute reverse out	184,240	100	500+	100%	0
Sample Chamber	92,120	30		95%	± 5%
······································					
		<u> </u>			

CONCLUSIONS OIL SAMPLE

 Specific Gravity @ 60°F ----- 0.9087

 API Gravity @ 60°F ----- 24.2

J



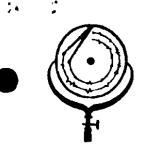
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	<u>Chloride</u>	Nitrate Chromate	Bs & W	011
	mg/1 (	mg/l mg/l	* by vol	<pre>% by vol.</pre>
Start			40%	60%
2 minute reverse out			10%	90%
4 minute reverse out			88	928
6 minute reverse out			20%	808
8 minute reverse out			85%	15%
10 minute reverse out	184,240	100 500+	100%	0
12 minute reverse out	184,240	100 500+	100%	0
Sample Chamber	92,120	30	95%	± 58
	<del></del> }		<u> </u>	
			-	
		<u> </u>		

CONCLUSIONS OIL SAMPLE

Specific Gravity @ 60°F 0.9087
API Gravity @ 60°F 24.2





BOX 3659 Ph. 307/237-9327 CASPER, WYOHING

BOX 1596 Ph. 701/225-6021 DICKINSON, NORTH DAKOTA

11409

COMPANY	Total Petro	ol <b>eum_</b>	DATE	3/18/85	WO #	2545
LOCATION	Cedar Hills	s 1-22	COUNTY	Bowman	STAT	TE N.D.
REMARKS	Sec. 22-13	IN-105W NENW				
					wild	Cat
	<u>DST #1</u>	Red River "A"		<u>9152-9206</u>		

	<u>Chloride</u>	<u>Nitrate Chromate</u>		Bs <u>&amp;W</u>	0i1
	mg/1	mg/1	mg/1	% by vol	<pre>% by vol.</pre>
Start				40%	60%
2 minute reverse out				10%	90%
4 minute reverse out				88	928
6 minute reverse out				20%	808
8 minute reverse out				85%	15%
10 minute reverse out	184,240	100	500+	100%	0
12 minute reverse out	184,240	100	500+	100%	0
Sample Chamber	92,120	30		95%	± 5%
······································					
		<u> </u>			

CONCLUSIONS OIL SAMPLE

 Specific Gravity @ 60°F ----- 0.9087

 API Gravity @ 60°F ----- 24.2

J



BOX 3659 Ph. 307/237-9327 CASPER, WYONING BOX 1596 Ph. 701/225-6021 DICKINSON, NORTH DARDTA

## WATER ANALYSIS REPORT

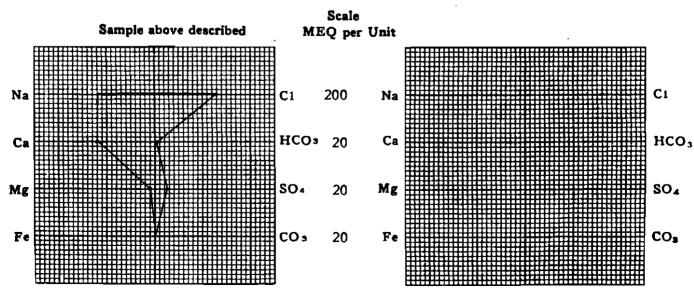
OPERATOR Total Petroleum DATE 3/18/85 LAB NO. 2545-5	
WELL NO Cedar Hills 1-22 LOCATION Sec. 22-131N-105W	
FIELD FORMATION Red River "A"	_
COUNTY Bowman INTERVAL 9152-9206	_
STATE N.D. SAMPLE FROM DST #1 (Sample Chamber)	_

### REMARKS & CONCLUSIONS: Brown cloudy water, oil on top, Light brown cloudy filtrate.

Nitrate, mg/1 --- 30 Chromate, mg/1 --- 35

Cations       mg/1         Sodium       (Calc)       55,116         Potassium       -       -         Lithium       -       -         Calcium       -       -         Magnesium       -       -         Iron       -       -	<u>meq/1</u> 2397.56 — 240.02 20.06	Aniona Sulfate Chioride Carbonate Bicarbonate Hydroxide	<u>mg/1</u> 2,570 92,120 0 390	<u>meq/1</u> 53.46 2597.78  6.40
Total Cations	2657.64	Total A	nions	2657.64
Total dissolved solids, mg/1 NaCl equivalent, mg/1	- 153,684	Specific resistance @ 68°] Observed Calculated	F.: <u>0.067</u> <u>0.066</u>	ohm-meters

### WATER ANALYSIS PATTERN



(Na value in above graphs includes Na, K, and Ll) NOTE: Mg/1=Milligrams per liter Meq/1= Milligram equivalents per liter Sodium chlorida equivalent=by Dunlap & Hawthorne calculation from components



BOX 3659 Ph. 307/237-9327 CASPER, WYONING BOX 1596 Ph. 701/225-6021 DICKINSON, NORTH DAKOTA

## WATER ANALYSIS REPORT

OPERATOR	Total Petroleum	DATE3/18/8	35 LAB NO. 2545-4
WELL NO	Cedar Hills 1-22	LOCATION	Sec. 22-131N-105W
FIELD		FORMATION	Red River "A"
COUNTY	Bowman	INTERVAL	9152-9206
STATE	N.D.	SAMPLE FROM	DST #1 (Sample #4) Bottom Spl.

### REMARKS & CONCLUSIONS: Dark brown muddy water, trace of oil, Brown cloudy filtrate.

Nitrate, mq/1 --- 100 Chromate, mg/1 -- 400

	meq/1       01,952     4434.90	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
Total dissolved solids, mg/1 - NaC1 equivalent, mg/1 Observed pH		 0.049

### WATER ANALYSIS PATTERN

Scale Sample above described MEQ per Unit 500 CI CI Na Na HCO<sub>3</sub> 50 Ca HCO3 Ca SO₄ 50 Mg SO₄ Mg Fe CO3 50 Fe CO,

> (Na value in above graphs includes Na. K, and Li) NOTE: Mg/1=Milligrams per liter Meg/1= Milligram equivalents per liter South m chloride equivalent why Dunian A Hawthores calculation from compose



BOX 3659 Ph. 307/237-9327 CASPER, WYOMING BOX 1596 Ph. 701/225-6021 DICKINSON, NORTH DAKOTA

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# WATER ANALYSIS REPORT

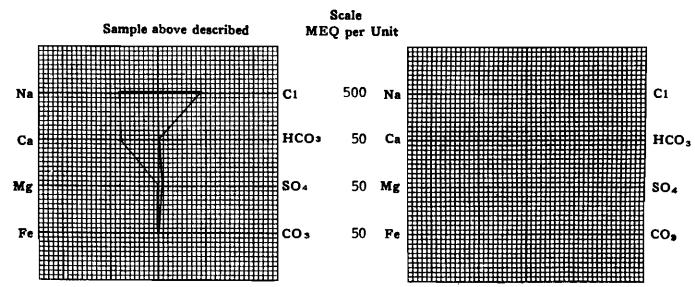
OPERATOR	Total Petroleum	DATE 3/18/	/85 LAB NO. 2545-3
WELL NO.	Cedar Hil <u>ls 1-22</u>	LOCATION	Sec. 22-131N-105W
FIELD		FORMATION	Red River "A"
COUNTY	Bowman	INTERVAL	9152-9206
STATE	N.D.	SAMPLE FROM	DST #1 (Sample #3)

### REMARKS & CONCLUSIONS: Black muddy water, oil & oil cut mud on top, Brown cloudy filtrate.

Nitrate,	mg/l	 40
Chromate	, mg/]	 90

Cationsmg/1Sodium(Calc)95,83PotassiumLithiumCalcium-8,01MagnesiumIron	<u>6</u> 400.00 <u>2</u> <u>-</u>	Anions         mg/1           Sulfate         1,540           Chloride         160,720           Carbonate         0           Bicarbonate         268           Hydroxide         -           Hydrogen sulfide         -	<u>meq/1</u> 32.03 4532.30  4.40
Total Cations Total dissolved solide, mg/1 NaCl equivalent, mg/1 Observed pH	<u> </u>	Total Anions	ohm-meters

### WATER ANALYSIS PATTERN



(Na value in above graphs includes Na, K, and Li) NOTE: Mg/I=Milligrams per liter Meq/I = Milligram equivalents per liter Sodium chloride equivelent=by Dunlap & Hawthorne calculation from components



BOX 3659 Ph. 307/237-9327 CASPER, WYONING BOX 1596 Ph. 701/225-6021 DICKINSON, NORTH DAKOTA

## WATER ANALYSIS REPORT

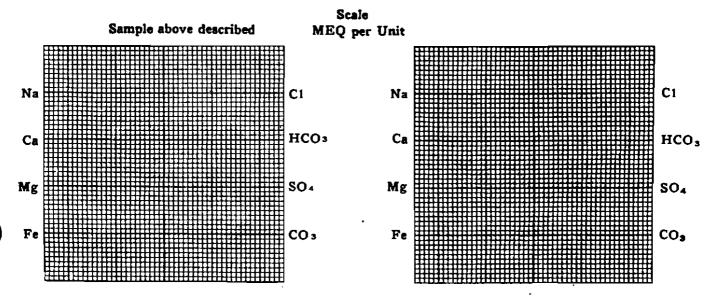
OPERATOR	Total Petroleum	DATE 3/18	
WELL NO.	Cedar Hills 1-22	LOCATION	<u>Sec. 22-131N-105W</u>
FIELD		FORMATION_	Red River "A"
COUNTY	Bowman	INTERVAL	9152-9206
STATE	N.D.	SAMPLE FROM	M DST #1 (Sample #2)

## REMARKS & CONCLUSIONS: Oil sample, some oil cut mud, (5% est.)

(Insufficient water for analysis)

Cations	mg/1	meq/1	Anions	<u>mg/1</u>	meq/1
Sodium - (Calc) Potassium Lithium Calcium Magnesium			Chloride	•	
	ons		Total A Specific resistance @ 68° Observed -	inione	ohm-meters

### WATER ANALYSIS PATTERN



(Na value in above graphs includes Na, K, and Li) NOTE: Mg/1=Milligrams per liter Meq/1= Milligram equivalents per liter Sodium chloride equivalent=by Dunlap & Hawthorne calculation from component



BOX 3659 Ph. 307/237-9327 CASPER, WYONING BOX 1596 Ph. 701/225-6021 DICKINSON, NORTH DAKOTA

### WATER ANALYSIS REPORT

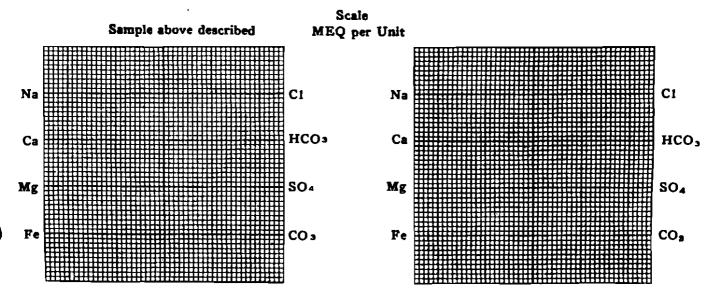
OPERATOR	Total Petroleum	DATE3/18	3/85 LAB NO	2545 <u>1</u>
WELL NO.	Cedar Hills 1-22	LOCATION	Sec. 22-131N-105W	
FIELD		FORMATION_	Red River "A"	
COUNTY	Bowman	INTERVAL	9152-9206	
STATE	N.D	SAMPLE FROM	M DST #1 (Top Sample)	

REMARKS & CONCLUSIONS: Oil sample, some oil cut mud, 10% est.

(Insufficient water for analysis)

Cations	<u>mg/1</u>	meq/1	Aniona	<u>mg/1</u>	meq/1
			Chloride	·	
Magnesium			Hydrozide Hydrogen sulfide Total A		
Total dissolved solids, mg/ NaCl equivalent, mg/l - Observed pH				F.: 	

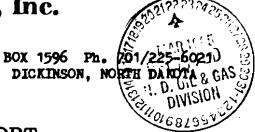
#### WATER ANALYSIS PATTERN



(Na value in above graphs includes Na. K. and Li) NOTE: Mg/1=Milligrams per liter Meg/1= Milligram equivalents per liter Sodium chloride equivalent=by Dunlap & Hawthorne calculation from component



BOX 3659 Ph. 307/237-9327 CASPER, WYONING



## WATER ANALYSIS REPORT

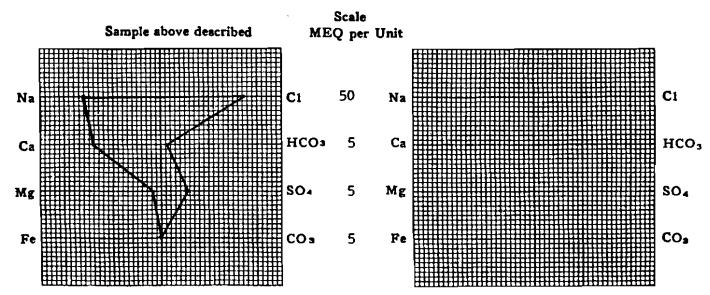
OPERATOR	Total Petroleum	DATE 3/21/85	LAB NO. 2549-7
WELL NO	Cedar Hills #1-22		<u>22–131N–105W</u>
FIELD		FORMATION Red	River "C"
COUNTY	Bowman	INTERVAL 932	-9388
STATE	N.D	SAMPLE FROM DST	1 #2 (Sample Chamber)

### REMARKS & CONCLUSIONS: Orange brown cloudy water, Light orange brown cloudy filtrate.

<u>Nitrate, mq/l --- negative</u> Chromate, mg/l -- trace

<u>Cations</u> Sodium - (Calc) Potassium Lithium Magnesium Iron Total Catio		<u>meq/1</u> 811,15  72.01 8.06  891.22	Anions         mg/1           Sulfate         1,370           Chloride         30,380           Carbonate         0           Bicarbonate         366           Hydroxide         -           Hydrogen sulfide         -	<u>meq/1</u> 28.50 856.72 
Total dissolved solids, mg/i NaCl equivalent, mg/l - Observed pH	-	52,304 51,378 6.82	Specific resistance @ 68°F.: Observed 0.149 Calculated 0.150	ohm-meters ohm-meters

### WATER ANALYSIS PATTERN



(Na value in above graphs includes Na, K, and Li) NOTE: Mg/1=Milligrams per liter Meq/1= Milligram equivalents per liter Bodium chloride equivalent=by Dunlap & Heathorne calculation from components



BOX 3659 Ph. 307/237-9327 CASPER, WYOMING BOX 1596 Ph. 701/225-6021

# WATER ANALYSIS REPORT

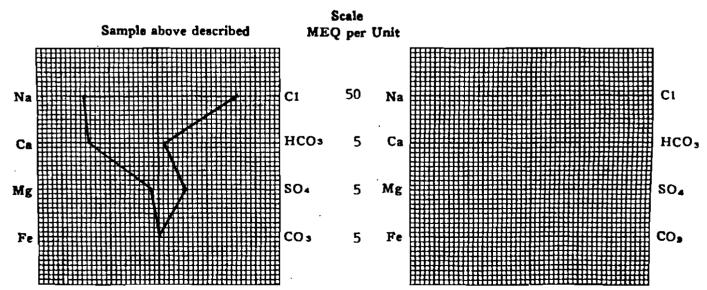
OPERATOR	Total Petroleum	DATE 3/21/8	35 LAB NO2549-6
WELL NO.	Cedar Hills #1-22	LOCATION	Sec. 22-131N-105W
FIELD		FORMATION	Red River "C"
COUNTY	Bowman	INTERVAL	9321-9388
STATE	N.D	SAMPLE FROM_	DST #2 (Sample #6)

# REMARKS & CONCLUSIONS: Orange brown cloudy water, Light orange brown cloudy filtrate.

<u>Nitrate, mg/1 — negative</u> Chromate, mg/1 — negative

Lithium	<u>mg/1</u> 17.694  1.443  98 	<u>meq/1</u> 769.69  72.01 8.06  849.76	Anions         mg/1           Sulfate         1,370           Chloride         28,910           Carbonate         0           Bicarbonate         366           Hydroxide         -           Hydrogen sulfide         -	<u></u>
Total dissolved solids, mg/l NaCl equivalent, mg/l - Observed pH		<u>49,881</u> <u>48,955</u> <u>6.79</u>	Specific resistance @ 68°F.: Observed 0.159 Calculated 0.154	

### WATER ANALYSIS PATTERN



(Na value in above graphs includes Na, K, and Li) NOTE: Mg/1=Milligrams per liter Meq/1= Milligram equivalents per liter Sodium chloride equivalent=by Dunlap & Hawthorne calculation from components



BOX 3659 Ph. 307/237-9327 CASPER, WYOMING BOX 1596 Ph. 701/225-6021 JIVED DICKINSON, NORTH DAKOTA TO OIL & GAS DIVISION

### WATER ANALYSIS REPORT

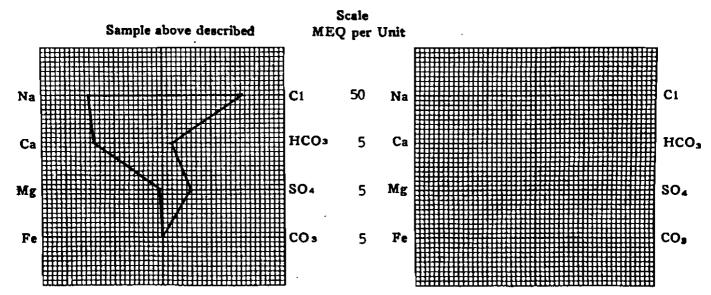
OPERATOR	Total Petroleum	DATE 3/21	/85	_ LAB N	ro. 2549-5
WELL NO.	Cedar Hills #1-22	LOCATION	Sec. 22-13		
FIELD		FORMATION_	Red River	"C"	
COUNTY	Bowman	INTERVAL	9321-9388		
STATE	N.D.	SAMPLE FROM	nDST #2	(Sample	<b>#5)</b>

## REMARKS & CONCLUSIONS: Light brown cloudy water, Light brown cloudy filtrate.

<u>Nitrate, mg/l --- negative</u> Chromate, mg/l -- negative

	38 762.92	Anions         mg/1           Sulfate         1,400           Chloride         28,420           Carbonate         0           Bicarbonate         512           Hydroxide         -	<u>1</u> 29.12 801.44  8.40
Total dissolved solids, mg/1	<u>838.96</u> <u>49,362</u> <u>48,265</u>	Hydrogen aulfide Total Anions · Specific reaistance @ 68°F.: Observed <u>0.159</u> Calculated <u>0.156</u>	ohm-meters

### WATER ANALYSIS PATTERN



(Na value in above graphs includes Na. K. and Li) NOTE: Ng/1=Milligrams per liter Meq/1= Milligram equivalents per liter Bodium chloride equivalent=by Dunisp & Hawthorne calculation from composenu



BOX 3659 Ph. 307/237-9327 CASPER, WYONING BOX 1596 Ph. 701/225-6021 DICKINSON, NORTH DAROTA

## WATER ANALYSIS REPORT

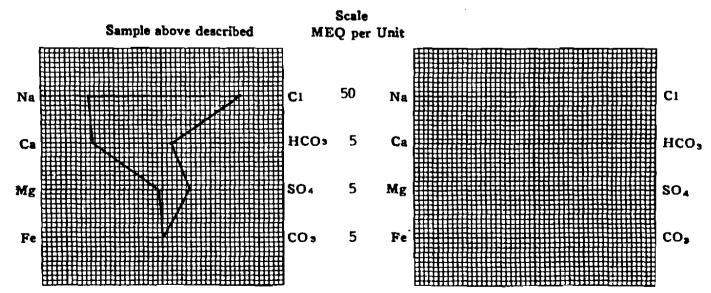
OPERATOR	Total Petroleum	DATE LAB M	NO. 2549-4
WELL NO	Cedar Hills #1-22	LOCATION Sec. 22-131N-105W	<b>__</b> _
FIELD		FORMATION Red River "C"	<u> </u>
COUNTY	Bowman	INTERVAL 9321-9388	
STATE	N.D	SAMPLE FROM DST #2 (Sample #4	4)

# REMARKS & CONCLUSIONS. Light brown cloudy water, Light brown cloudy filtrate.

Nitrate, mg/1 --- negative Chromate, mg/1 --- negative

	•	<u>meq/1</u> 762.30 72.01 4.03 838.34	Anions Sulfate	N . 20	<u></u>
Total dissolved solids, m NaCl equivalent, mg/l Observed pH	• • • • • • •		Specific resistance @ 68°F.: Observed Calculated	0.162 0.156	ohm-meters

### WATER ANALYSIS PATTERN



(Na value in above graphs includes Na, K, and Li) NOTE: Mg/1=Milligrams per liter Meq/1= Milligram equivalents per liter Sodium chloride equivalent≈by Dunlap & Hawthorne calculation from components



BOX 3659 Ph. 307/237-9327 CASPER, WICHING BOX 1596 Ph. 701/225-6021 DICKINSON, NORTH DAKOTA

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## WATER ANALYSIS REPORT

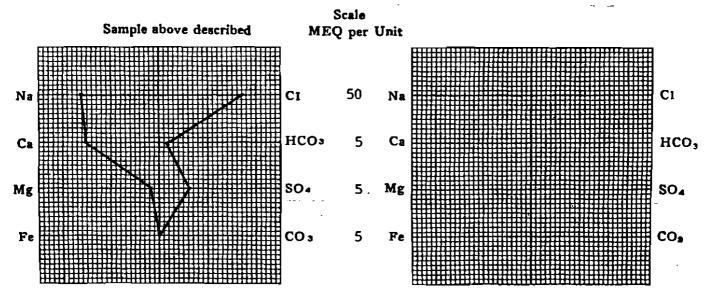
OPERATOR	Total Petroleum	DATE3/21/	185 LAB NO	2549-3
WELL NO.	Cedar Hills #1-22	LOCATION	Sec. 22-131N-105W	
FIELD		FORMATION	Red River "C"	
COUNTY	Bowman	INTERVAL	9321-9388	
STATE	N.D	SAMPLE FROM	DST #2 (Sample #3)	

# REMARKS & CONCLUSIONS: Light brown cloudy water, Light brown cloudy filtrate.

Nitrate, mg/1 --- negative Chromate, mg/1 -- trace

Cations         mg/1           Sodium         (Calc)         18,673           Potassium	76.00	Sulfate ]	mg/1         meq/1           1,500         31.20           0,380         856.72           0            512         8.40               896.32
Total dissolved solids, mg/1 NaCi equivalent, mg/1	51,584	Specific resistance @ 68°F.: Observed Calculated	0.149 ohm-meters 0.150 ohm-meters

### WATER ANALYSIS PATTERN



(Na value in above graphs includes Na, K, and Ll) NOTE: Mg/i=Milligrams per liter Meq/i == Milligram equivalents per liter Sofium chloride equivalent=by Dunlap & Hawthorne calculation from components



BOX 3659 Ph. 307/237-9327 CASPER, WIONING BOX 1596 Ph. 701/225-6021

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## WATER ANALYSIS REPORT

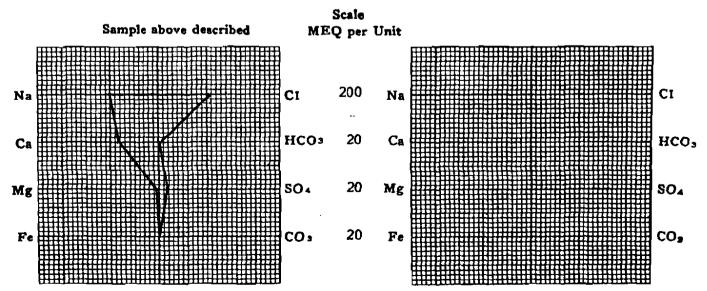
OPERATOR Total Petroleum WELL NO. Ceilar Hills #1-22	DATE3/21/85         LAB NO2549-2           LOCATIONSec22-131N-105W           FORMATIONRed River "C"
PIELD     Bowman       COUNTY     Bowman       STATE     N.D.	INTERVAL 9321-9388 SAMPLE FROM DST #2 (Sample #2)

REMARKS & CONCLUSIONS: Brown cloudy water, Light brown cloudy filtrate.

Nitrate, mg/1 - 60Chromate, mg/1 - 15

Cations         mg/1         meq/1           Sodium         (Calc)         47.051         2046.70           Potassium	Anions         mg/1         meq/1           Sulfate         1,860         38.69           Chloride         77,420         2183.24           Carbonate         0            Bicarbonate         293         4.81           Hydrogen sulfide             Totel Anions         2226.74
Total dissolved solids, mg/1         130,153           NsC1 equivalent, mg/1         128,961           Observed pH         7.92	Specific resistance @ 68°F.: Observed 0.073 ohm-meters Calculated 0.074 ohm-meters

### WATER ANALYSIS PATTERN



(No volue in above graphe includes No. K. and Li) NOTE: Mg/1=Milligrams per liter Meq/1= Milligram equivalents per liter Sodium chloride equivalent=by Dunlap & Hawthorne calculation from components



BOX 3659 Ph. 307/237-9327 CASPER, WIOHING BOX 1596 Ph. 701/225-6021 OIL & GA DICKINSON, NORTH DANOTA DIVISION

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## WATER ANALYSIS REPORT

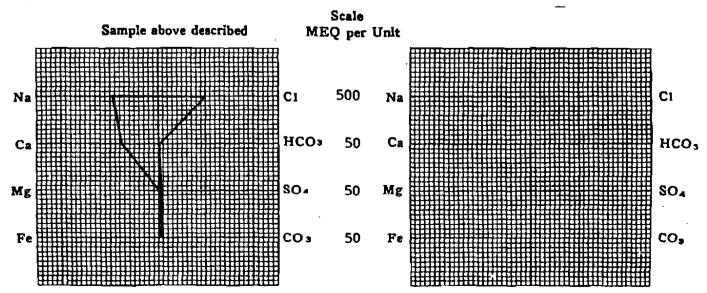
OPERATOR	Total_Petroleum	DATE 3/21/	185 LAB NO. 2	<u>549–1</u>
WELL NO	Cedar Hills #1-22	LOCATION	<u>Sec. 22-131N-105W</u>	h,)
FIELD	1 uildcut	FORMATION	Red River "C"	V.C.M
COUNTY	Bowman	INTERVAL	9321-9288	
STATE	N.D	SAMPLE FROM_	DST #2 (Top Sample)	

# REMARKS & CONCLUSIONS: Mud, Chemical on top, Yellow brown cloudy filtrate.

	Annonia Present	
Nitrate, mg/1 200		
Chromate, mg/1 85		

Cations       mg/1       meq/1         Sodium       (Calc)       107,183       4662.46         Potassium	Anions         mg/l           Sulfate         1,120           Chloride         174,440           Carbonate         1,020           Bicarbonate         0           Hydroxide         1,122           Hydrogen sulfide         -	<u>meq/1</u> 23.30 4919.21 33.97  65.97  5042.45
Total Cations         3042.43           Total dissolved solids, mg/1         292,500           NaC1 equivalent, mg/1         291,824           Observed pH         9.48	Total Anions	ohm-meters

### WATER ANALYSIS PATTERN



(Na value in obove graphs includes Na. R. and Ll) NOTE: Mg/1=Milligrams per liter Mog/1= Milligram equivalents per liter Bodium chloride equivalent=by Dunlap & Hawiborge calculation from components



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BOX 3659 Ph. 307/237-65 BOX 1596 Ph. 701/225-6021 5

DICKINSON, NORTH DAKOTA

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CASPER, WYOMING

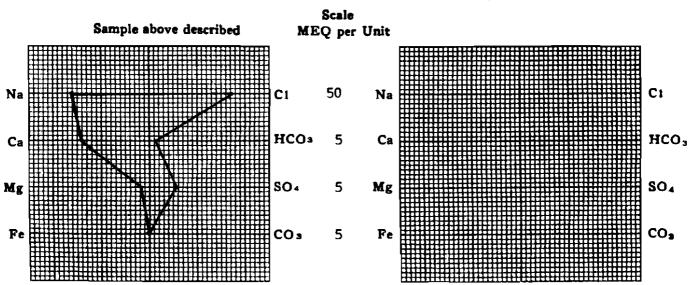
OPERATOR	Total Petroleum	DATE 3/21	/85	LAB N	<b>10</b> 2549-7
WELL NO	Cedar Hills #1-22	LOCATION		131N-105W	
FIELD		FORMATION_	Red River	<u>r "C" _</u>	
COUNTY	Bowman	INTERVAL	<u>9321-938</u>		
STATE	N.D	SAMPLE PROP	DST #2	(Sample (	hamber)

REMARKS & CONCLUSIONS: Orange brown cloudy water, Light orange brown cloudy filtrate.

Nitrate, mg/1 negative	
Chromate, $mg/1 \rightarrow trace$	

Cations         mg/1         meq/1           Sodium         (Calc)         18,647         811,15           Potassium	Chlorids       30,380       856.72         Carbonate       0          Bicarbonate       366       6.00         Hydrogen sulfide
Total dissolved solids, mg/1         52,304           NaC1 equivalent, mg/1         51,378           Observed pH         6.82	Specific resistance @ 68°F.: ObservedO.149ohm-meters

### WATER ANALYSIS PATTERN

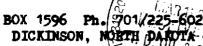


(Na value in above graphs includes Na. X, and Li) NOTE: Mg/I=Milligrams per liter Meq/I= Milligram equivalente per liter Sodium chloride equivalent=by Dunlep & Hawthorne calculation from components





BOX 3659 Ph. 307/237-9327 CASPER, WYOMING





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### WATER ANALYSIS REPORT

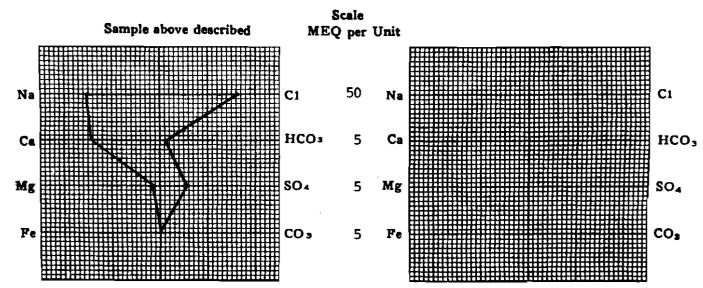
OPERATOR	Total Petroleum	DATE 3/21/8	15 LAB NO2549-6
WELL NO.	Cedar Hills #1-22	LOCATION	Sec. 22-131N-105W
FIELD		FORMATION	Red River "C"
COUNTY	Bowman	INTERVAL	9321-9388
STATE	N.D	SAMPLE FROM_	DST #2 (Sample #6)

# REMARKS & CONCLUSIONS: Orange brown cloudy water, Light orange brown cloudy filtrate.

Nitrate, mq/l - negative Chromate, mg/1 - negative

Cations	<u>mg/1</u>	<u>meq/1</u>	Anions	<u>mg/1</u>	meq/1
	  98_	769.69  72.01 8.06		366	28.50 815.26 6.00
Iron Total Ca		849.76	Hydrogen sulfide Total Ani		849.76
Total dissolved solids, mg NaCl equivalent, mg/1 Observed pH	• • • • • • • •	48,955	Specific resistence @ 68°F. Observed Calculated	0 1 5 0	ohm-meters ohm-meters

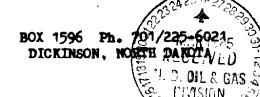
### WATER ANALYSIS PATTERN



(Na value in above graphs includes Na, K, and Li) NOTE: Mg/1=Milligrams per liter Meq/1= Milligram equivalents per liter Sodium chioride equivalent=by Dunlap & Hawthorne calculation from com



BOX 3659 Ph. 307/237-9327 CASPER, WTONING



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## WATER ANALYSIS REPORT

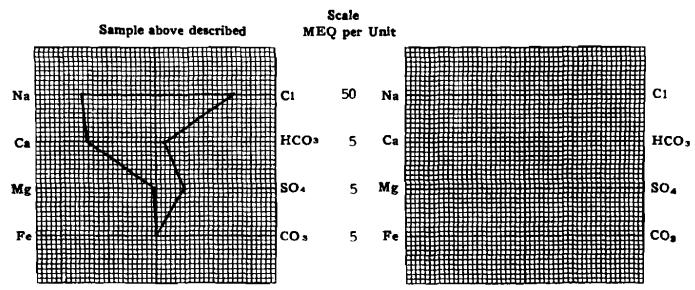
OPERATOR	Total Petroleum	DATE 3/21/85 LAB NO. 2549-5
WELL NO	Cedar Hills #1-22	DATE 3/21/85 LAB NO. 2549-5 LOCATION Sec. 22-131N-105W
FIELD		FORMATION Red River "C"
COUNTY	Bowman	INTERVAL 9321-9388
STATE	N.D.	SAMPLE FROM DST #2 (Sample #5)

REMARKS & CONCLUSIONS: Light brown cloudy water, Light brown cloudy filtrate.

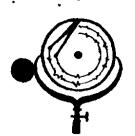
<u>Nitrate, mg/1 negative</u>	
Chromate, mg/1 negative	

Cations	<u>mg/1</u>	meq/1	Anions	mg/1	meq/1
Sodium - (Calc) Potassium Lithium Magnesium Iron	<u>    17.538                                    </u>	<u>762,92</u> <u></u>	Sulfate Chloride Carbonate Bicarbonate Hydroxide Hydrogen sulfide	$     \frac{1,400}{28,420} \\     \hline     0 \\     \overline{512} \\     \hline    $	<u>29.12</u> <u>801.44</u> <u></u>
Total Ca	tione	838.96	Total Ania		838.96
Total dissolved solids, mg NaCl equivalent, mg/l Observed pH			Specific remistance @ 68°F.: Observed Calculated	0.159	ohm-meters ohm-meters

### WATER ANALYSIS PATTERN



(Na value in above graphs includes Na, K, and Li) NOTE: Mg/t≈Millgrams per liter Meq/t= Millgram equivalents per liter Bodium chloride, equivalent=by Dunlap & Hewthorne calculation (ross composed)



BOX 3659 Ph. 307/237-9327 CASPER, WTOMING BOX 1596 Pt 701/225-6021 DICKINSON, NORTH DARTA X

### WATER ANALYSIS REPORT

OPERATOR	Total Petroleum
WELL NO	Cedar Hills #1-22
FIELD	
COUNTY	Bowman
STATE	N.D.

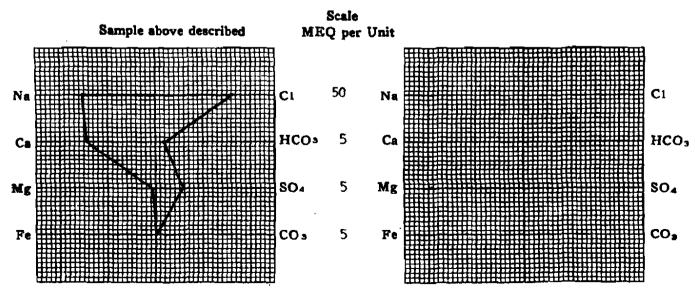
_	DATE 3/21	LAB 1	10. <u>2549-4</u>
-	LOCATION_	Sec. 22-131N-105W	
-	POPMATION	Red River "C"	
	INTERVAL	9321-9388	
-	SAMPLE FROM	MDST #2 (Sample #	4)
-	SAMPLE FROM		

# REMARKS & CONCLUSIONS: Light brown cloudy water, Light brown cloudy filtrate.

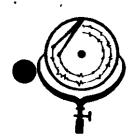
Nitrate,	mg/1	 negative
Chromate		negative

Cations Sodium (Calc) Potassium Lithium Calcium Magnesium	<u>mg/1</u> 17,524  1,443  49	<u>meq/1</u> 762.30 	Anions     mg/1       Sulfate     1,37       Chloride     28,42       Carbonate     -       Bicarbonate     -       Hydrozide     -       Hydrogen sulfide     -	20 <u>28.50</u> 20 <u>801.44</u> 0 <u>-</u>
Total Car Total dissolved solids, mg, NaCi equivalent, mg/1 - Observed pH	/1	838.34 49,318 48,236 7.25		0.162 ohm-meters

### WATER ANALYSIS PATTERN



(Na value in above graphs includes Na, K, and Li) NOTE: Mg/1=Milligrams per liter Meq/1≃ Milligram equivalents per liter Sodium chloride equivalent=by Dunlap & Hewthorne calculation from components



BOX 3659 Ph. 307/237-9327 CASPER, WYOMING BOX 1596 Ph. 701/225-6024 DICKINSON, NORTH DARDTA (AS ELECTON S

### WATER ANALYSIS REPORT

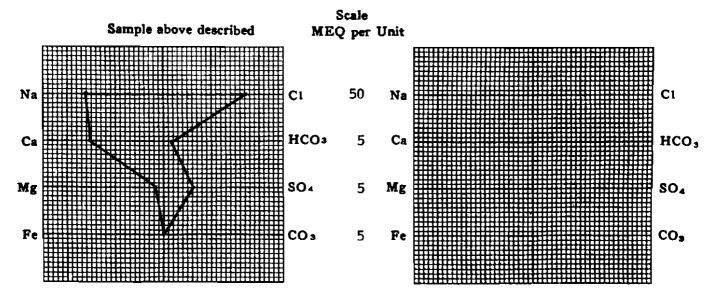
OPERATOR	Total Petroleum	DATE 3/21/	85 LAB NO. 2549-3
WELL NO.	Cedar Hills #1-22	LOCATION	Sec. 22-131N-105W
FIELD		FORMATION	Red River "C"
COUNTY	Bowman	INTBRVAL	9321-9388
STATE	N.D.	SAMPLE FROM	DST #2 (Sample #3)

# REMARKS & CONCLUSIONS: Light brown cloudy water, Light brown cloudy filtrate.

Nitrate, mg/1 --- negative Chromate, mg/1 -- trace

	meq/1         Anions           312.26         Sulfate         -         -           Chloride         -         -         -           Carbonate         -         -         -           76.00         Bicarbonate         -         -           8.06         Hydroxide         -         -	$     \frac{m_{g}/1}{1,500} \\     - 30,380 \\     - 0 \\     - 512 \\    $	<u>meq/1</u> 31.20 856.72 — 8.40
Total dissolved solids, mg/1	Hydrogen sulfide B96.32 Total 52,686 Specific resistance @ 51,584 Observed 7.19 Calculated	Anions	ohm-meters

### WATER ANALYSIS PATTERN



(Na value in above graphs includes Na. K. and LJ) NOTE: Mg/1=Millgrams per liter Meq/1= Millgram equivalents per liter Sodium chloride equivalent=by Dunlap & Hawthorne calculation from components



BOX 3659 Ph. 307/237-9327 CASPER, WYONING Box 1596 Ph. 701/225-6021

### WATER ANALYSIS REPORT

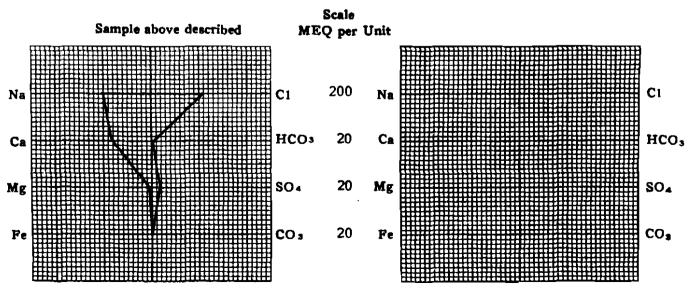
OPERATOR	Total Petroleum	DATE3/2	21/85 Sec. 22-13	LAB NO. 2549-2
WELL NO.	Cedar Hills #1-22	LOCATION	Sec. 22-13 Red River	
FIELD COUNTY	Bowman	FORMATION INTERVAL	9321-9388	
STATE	N.D.	SAMPLE FROM	DST #2 (S	ample #2)

# REMARKS & CONCLUSIONS: Brown cloudy water, Light brown cloudy filtrate.

Nitrate, mg/1 - 60Chromate, mg/1 - 15

<u>Cations</u> Sodium - (Calc) Potassium	<u>mg/1</u> 47.051 	<u>meq/1</u> 2046.70  <u>170.01</u> 10.03  2226.74	Anions         mg/1           Sulfate         1,860           Chloride         77,420           Carbonate         0           Bicarbonate         293           Hydrogen sulfide         -           Total Anions         -	<u></u>
Total dissolved solide, mg/1 NaCi equivalent, mg/1 - Observed pH		130,153 128,961 7.92	Specific resistance @ 68°F.: Observed 0.0 Celculated 0.0	

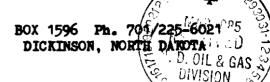
### WATER ANALYSIS PATTERN



(Na volue in above graphs includes No. K. and Li) NOTE: Mg/1=Miligrams per liter Meq/1= Miligram equivalents per liter Sodium chloride equivalent=by Dunlap & Hawthorne calculation from components



BOX 3659 Ph. 307/237-9327 CASPER, WYONING



# WATER ANALYSIS REPORT

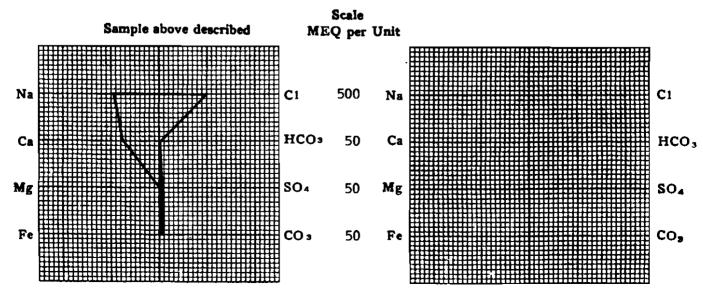
OPERATOR	Total Petroleum	DATE 3/21/	185 LAB NO2549-1
WELL NO	Cedar Hills #1-22	LOCATION	Sec. 22-131N-105W NENW
FIELD	Wildcat	FORMATION	Red River "C"
COUNTY	Bowman	INTERVAL	<u>9321–9288</u>
STATE	N.D.	SAMPLE FROM_	DST #2 (Top Sample)

# REMARKS & CONCLUSIONS: Mud, Chemical on top, Yellow brown cloudy filtrate.

	Ammonia Present		
Nitrate, mg/1 200		_	
Chromate, mg/1 85			

	mg/1         meq/           L07,183	.46 Sulfate Chloride Carbonate	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	3.30
Total Cations	5042	.45 Total	Anions 5042	.45
Total dissolved solids, mg/1 - NaCi equivalent, mg/1 Observed pH			5°F.: <u>0.048</u> ohm-n <u>0.048</u> ohm-n	

### WATER ANALYSIS PATTERN



(No value in above graphs includes Na. K. and Li) NOTE: Mg/1=Milligrams per liter Meq/1= Milligram equivalents per liter Sodium chloride equivalent=by Dunlap & Hawthorne calculation from components

Contract         Marce         Marce         Marce           Dox 3559         Ph. 307/237-9327         Box 1596         Ph. 707/2225-5021:00           Dox 3559         Ph. 307/237-9327         Box 1596         Ph. 707/2225-5021:00           Dox Marce         Dox 1596         Ph. 707/2225-5021:00         Ph. 507/237-9327           Marce         WATER ANALYSIS REPORT         Atta Carrow           Varter         Dox 1596         Ph. 707/2225-5021:00           PERATOR         Total Petroleum         Dox 727/35         Locatrom           Varter         Annon         Sec. 22-131A-105M         Portion           ONNTY         Exeman         Dox 1996         Ph. 707/223-4021:00           NDD         Exeman         Portal Anton         Sec. 22-131A-105M           ONNTY         Exeman         Portal Anton         Sec. 22-131A-105M           NDD         Exeman         Portal Anton         Sec. 22-131A-105M           Name         Name         Portal Anton         Sec. 22-131A-105M           Name         Name         Sec. 1000 Not 1000 Sec. 22-135         Name           Name         Sample above described         Annonia         End 20         Car.30           Name         Carlona         End 20         C		
BOX \$559 FL. 507/237-9327       BOX 1596 FL. 707/222-5621:::: DICLINSOF, NORTLDAKUTA.         WATER ANALYSIS REPORT         WATER ANALYSIS REPORT         PERATOR       Total Petroleum         DONNT       BOX 100         BOX 100       Cedar Hills #1-22         LELD       DOCATION         BOX 100       BOX 100         PERATOR       Codar Hills #1-22         LELD       BOXMAD         ILL       SAMPLE PROM         DOCATION       BOX 20198         PERATOR       BOXMAD         ILL       Annonia Present         Nitrate, mg/1       20         Chords       11/120         Caliban       11/20         Caliban       10/20         Scale       11/20         Scale       11/20         Caliban       11/20         Caliban       11/20         Caliban       11/20         Caliban       10/20         Scale       Calib	Duranicia	n Service Inc
CASPER, WTONING       DICKINSON, NORTH-DARTA       DICKINSON, NORTH-DARTA         WATER ANALYSIS REPORT       N. Las. Gardent         PBRATOR       Total Petroleum       DATE       3/21/95       LAB NO. 2549-1         DOCATION       Sec. 22-131N-105N       Petroleum       Sec. 22-131N-105N         OUNTY       Rooman       INTERVAL       922-928         OUNTY       Rooman       INTERVAL       922-928         RARKS & CONCLUSIONS.       Mid. Chemical on top, Yellow brown cloudy filtrate.       Intervention         NLTrate, mg/1       200       Chromate, mg/1       22.30         Cations	<b>Frecisio</b>	
CASPER, WTONING       DICKINSON, NORTH-DARTA       DICKINSON, NORTH-DARTA         WATER ANALYSIS REPORT       N. Las. Gardent         PBRATOR       Total Petroleum       DATE       3/21/95       LAB NO. 2549-1         DOCATION       Sec. 22-131N-105N       Petroleum       Sec. 22-131N-105N         OUNTY       Rooman       INTERVAL       922-928         OUNTY       Rooman       INTERVAL       922-928         RARKS & CONCLUSIONS.       Mid. Chemical on top, Yellow brown cloudy filtrate.       Intervention         NLTrate, mg/1       200       Chromate, mg/1       22.30         Cations		
And any data and any data and any data and any data		
Image: Second State Sta		
PERATOR         Total Petroleum         DATE         3/21/85         LAB NO         2549-1           FELD	+ $MUQ$	Survey Survey
PERATOR       10111 Felciolation       Sec. 22-1311-105W         PELL NO.       Cedar Hills #1-22       LOCATION       Formation       Formation         IELL       DOUNTY       Bowman       INTERVAL 9321-9228         OUNTY       Bowman       INTERVAL 9321-9228         SAMPLE FROM       LST #2       (Top Sample)         EMARKS & CONCLUSIONS:       Mid, Chemical on top, Yellow brown cloudy filtrate.         Nitrate, mg/1 200       Ammonia Present         Cartonate, mg/1 85       Sulfate       1174,440         Cartonate       107,183       4662.46         Sulfate       1.120       23.30         Cartonate       7.615       379.99         Bicarbonate       1.020       33.97         Iagnesium        1.020         Total Cetions       5042.45       Total Aniona       5042.45         Total disolved solids, mg/1       292,500       Specific resistance @ 65*P:       0.048       ohm-metere         Cal soulvalet, mg/1       292,500       Specific resistance @ 65*P:       0.048       ohm-metere         Calculated        9.45       Observed       0.048       ohm-metere         Calculated <td< td=""><td>• WATER ANA</td><td>ALYSIS REPORT</td></td<>	• WATER ANA	ALYSIS REPORT
DAMADOL       Cgedar Hills #1-22       LOCATION       Sec. 22-131N-105W         IELL       OUNTY       DOMATION       Red River "C"         IBLD       OUNTY       DOMATION       Red River "C"         INTERVAL       9321-9228       INTERVAL       9321-9228         CATTON       SAMPLE       PROM_DET #2 (Too Sample)       SAMPLE PROM_DET #2 (Too Sample)         EMARKS & CONCLUSIONS:       Mud, Chemical on top, Yellow brown cloudy filtrate.       Natrate, mg/1 - 200         Cations       mg/1       meg/1       Amonia Present         Nitrate, mg/1 - 200       Catonate       174,440       4919.21         Cations	Total Petroleum	
ELD	PERATOR	_ LOCATION Sec. 22-131N-105W
OUNTION         N.D.         SAMPLE PROM_DET #2 (Too Sample)           RTTE         N.D.         Ammonial present           Nitrate, mg/1 200         Ammonia Present           Caronate, mg/1 95         Includy filtrate.           Caronate.         Includy filtrate.           Odium         (Calc)         107.183           Affinite         Includy filtrate.           Caronate.         Includy filtrate.           Odium         Includy filtrate.           Includy filtrate.         Includy filtrate.           Caronate.         Includy filtrate.           Includy filtrate.         Includy filtrate.           Incla filtrate.         Includy filtrate.     <	Der man	
BMARKS & CONCLUSIONS: Mid, Chemical on top, Yellow brown cloudy filtrate.         Nitrate, ng/1 — 200         Chromate, ng/1 — 200         Chromate, ng/1 — 200         Chromate, ng/1 — 200         Cations         Gaine         Mater and 1 and		10
Armonia Present         Nitrate, mg/1 200         Chromate, mg/1 200         Chromate, mg/1 200         Cations       mg/1       mg/1       mg/1         Odium       mg/1       mg/1       mg/1       mg/1       23.30         Odium       174/440       4919-21         Armonia Present       174/440       4919-21         Addium        174/440       4919-21         Addium        174/440       4919-21            174/440       4919-21         Addium              Total Cetione            Total Cetione            Total Cetione		
Nitrate, mg/1 200 Chromate, mg/1 85         Cations       mg/1       men/1       Aniona       mg/1       men/1         odum	EMARKS & CONCLUSIONS: Mud, Chemical o	on top, Yellow brown cloudy filtrate.
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Amm	nonia Present
Cations       mg/1       meq/1       Anions       mg/1       1,120       23.30         odium		
Odium       . (Calc)       . 107,183       . 4662.46       Suifate       . 1,120       . 23.30         Obassium	Chromate, mg/1 85	
Odium       . (Cal.c)       107,183       4662.46       Suifate       1,120       23.30         Odium          1,020       33.97         Obiestium        7,615       379.99       Bicarbonate        1,020       33.97         Suifate        1,020       33.97       Bicarbonate        1,122       65.97         Bicarbonate          1,122       65.97       Hydrogen sulfide <t< td=""><td></td><td></td></t<>		
Catasium		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		Chloride <u>174,440</u> 4919.21
agressium       0        Hydroxide       1,122       65,97         ou        Hydrogen sulfide         Hydrogen sulfide          Total Cations       5042.45       Total Anions        5042.45         orsi dissolved solids, mg/1       292,500       Specific resistance @ 68°P.:       0.048       ohm-meters         aCi equivalent, mg/1        9.48       Observed        0.048       ohm-meters         Calculated        9.48       Calculated        0.048       ohm-meters         WATER ANALYSIS PATTERN       Scale       MEQ per Unit       Ci       500       Na       Ci       Ci       500       Na       Ci	ation and a second s	
Hydrogen sulide         Total Cations         Total Cations         Total Cations         Total Cations         Total Cations         Total Cations         Total Anions         Total Anions         Sold2.45         Total Anions         Sold2.45         Total Anions         Sold2.45         Total Anions         Sold2.45         Total Anions         Calculated         Otherved solids, mg/1         Sold2.45         Otherved solids, mg/1         Otherved solids, mg/1         Otherved solids, mg/1         WATER ANALYSIS PATTERN         Scale         MEQ per Unit         Clause of the solid sol		
Total Cations		
$\begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} $	Total Cations 5042.45	5 Total Anions
$WATER ANALYSIS PATTERN$ $Scale$ $Sample above described$ $MEQ per Unit$ $Ci 500 Na$ $HCO_{2} 50 Ca$ $Mg$ $Fe$ $Co_{3} 50 Fe$	292,500	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	VaCi equivalent, $mg/1$	4 Observed <u>0.048</u> ohm-meters
Scale MEQ per Unit Na Ca Ca Mg Fe CO3 SOA SOA SOA CO3 SOA Co3 SOA Co3 CO3 SOA CO3	Observed pH 9.48	8 Calculated <u>0.048</u> ohm-meters
Scale MEQ per Unit Na Ca Ca Mg Fe CO3 SOA SOA SOA CO3 SOA Co3 SOA Co3 CO3 SOA CO3		
Scale MEQ per Unit Na Ca Ca Mg Fe CO, 50 Fe Co, 50 Fe Ca		
Sample above described MEQ per Unit Na Ca Mg Fe $e^{-}$ $e^{-}$	WATER AN	
Na       C1       500       Na       C1       C1         Ca       HCO3       50       Ca       HCO3       HCO3         Mg       SO4       50       Mg       SO4       SO4         Fe       CO3       50       Fe       CO3       CO3	Sample above described MI	
Na Ca HCO <sub>3</sub> 50 Ca Mg Fe Fe CO <sub>3</sub> 50 Fe $CO_3$ 50 Fe		
Na Ca HCO <sub>3</sub> 50 Ca Mg Fe Fe CO <sub>3</sub> 50 Fe $CO_3$ 50 Fe		
$M_{g}$ $F_{e}$ $CO_{3}$ $SO_{4}$ $SO_$	Na Ci	500 Na Ci
$M_{g}$ $F_{e}$ $CO_{3}$ $SO_{4}$ $SO_$		
$Mg$ $Fe$ $Fe$ $CO_3   50   Fe$ $Fe$ $CO_3   50   Fe$	Са НСОз	3 50 Ca
Mg         CO3         50         Fe         CO3		
Ге СО3 50 Fe CO3	Ma SOA	50 Mg
		50 Fe CO.

್ಷಕ್ರಿ ಕ್ಷೇತ್ರಗಳ ಸಂಶೇಷ ಸಿಕ್ಷಿಸಿ ಸಿಕ್ಕಿಸಿದ್ದರೆ ಪ್ರಶಸ್ತಿ ಪ್ರಶಸ್ತಿ ಪ್ರಶಸ್ತಿ ಪ್ರಶಸ್ತಿ ಪ್ರಶಸ್ತಿ ಪ್ರಶಸ್ತಿ ಪ್ರಶಸ್ತಿ ಪ್ ಕ್ಷೇತ್ರ ಸಂಶೇಷ ಸಿಕ್ಕಿಸಿ ಸಿಕ್ಕಿಸಿಸಿ ಸಿಕ್ಕಿಸಿಸಿ ಸಿಕ್ಕಿಸಿಸಿದ್ದರೆ ಪ್ರಶಸ್ತಿ ಸಿಕ್ಕಿಸಿಗಳು ಸಿಕ್ಕಿಸಿಗಳು ಸಿಕ್ಕಿಸಿಗಳು ಸಿಕ್ಕಿ need of the state of the second state of the state

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(Na value in above graphs includes Na, K, and Li) NOTE: Mg/I=Milligrams per liter Meq/I= Müllgram equivalents per liter Sodium chloride equivalent=by Dunlap & Hawthorns calculation from components

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BOX 3659 Ph. 307/237-9327 CASPER, WIOMING

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BOX 1596 Ph. 701/225-602 DICKINSON, NORTH DANOTA

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# WATER ANALYSIS REPORT

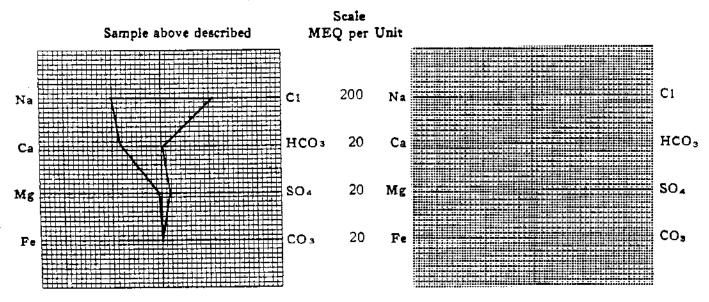
OPERATOR	Total Petroleum Cedar Hills #1-22	DATE <u>3/2</u> LOCATION <u></u> FORMATION	1/85         LAB NO. 2549-2           Sec. 22-131N-105W
COUNTYSTATE	Bowman	INTERVAL	9321-9388 DST #2 (Sample #2)

# REMARKS & CONCLUSIONS: Brown cloudy water, Light brown cloudy filtrate.

<u>Nitrate, mg/1 --- 60</u> Chromate, mg/1 -- 15

Cations Sodium (Cale) Potassium Lithium Calcium Iron	<u>mg/1</u> 47,051 	<u>meq/1</u> 2046.70 	Anionsmg/1Sulfate1,860Chloride77,420Carbonate0Bicarbonate293Hydrogen sulfideTotal Anions	<u>meq/1</u> 38.69 2183.24 4.81 2226.74
Total dissolved solids, mg/1 NaCl equivalent, mg/1 Observed pH	• • • • •	130,153 128,961 7.92	Specific resistance @ 68°P.: Observed 0.073 Calculated 0.074	ohm-meters

### WATER ANALYSIS PATTERN



(Na velue in above graphs includes Na, K, and Ll) NOTE: Mg/1=Milligrams per liter Meq/1= Milligram equivalents per liter Sodium chloride equivalent=by Dunlap & Hawthorae calculation from compon



BOX 3659 Ph. 307/237-9327 CASPER, WYOMING

BOX 1596 Ph DICKINSON, NORTH



# WATER ANALYSIS REPORT

ODBRATOR	Total Petroleum	DATE 3/21/	85 LAB NO	<u>2549-3</u>
WELL NO.	Codar Hills #1-22	LOCATION	85 LAB NO Sec. 22-131N-105W Red River "C"	
COOM11			9321-9388 DST #2 (Sample #3)	
STATE	14.0	SAMPLE FROM		

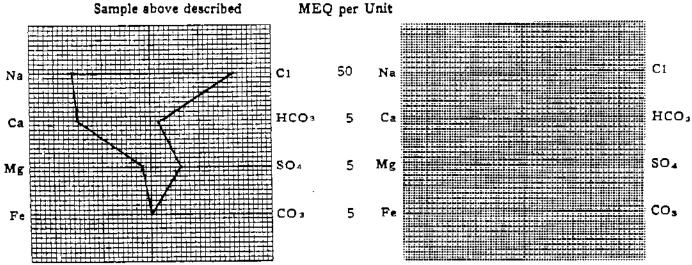
# REMARKS & CONCLUSIONS: Light brown cloudy water, Light brown cloudy filtrate.

negative Nitrate, mg trace Chromate, mg/1

Cations Sodium - (Calc) Potassium Lithium Magnesium Iron	<u>mg/1</u> 18,673 1,523 98	<u>meq/1</u> 812.26 76.00 8.06 896.32	Anionsmg/1Suifate1,500Chloride30,380Carbonate0Bicarbonate512HydroxideHydrogen sulfideTotal Anions	<u>meq/1</u> 31.20 856.72  8.40  896.32
Total dissolved solids, mg/ NaCl equivalent, mg/1 - Observed pH		52,686 51,584 7.19	Specific resistance @ 68°F.: Observed <u>0.149</u> Calculated <u>0.150</u>	

### WATER ANALYSIS PATTERN

Scale



(Na value in above graphs includes Na. R. and Li) NOTE: Mg/I=Milligrams per liter Meq/I= Milligram equivalents per liter Sodium chloride equivalent=by Duniap & Hawthorne calculation from components



BOX 3659 Ph. 307/237-9327 CASPER, WYOMING

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BOX 1596 Pb. 201/225-60 DICKINSON, NORTH DAKOTA

# WATER ANALYSIS REPORT

OPERATOR	Total Petroleum Cedar Hills #1-22	DATE 3/21
FIELD		FORMATION
COUNTY STATE	N.D.	SAMPLE FROM

 DATE\_\_\_\_\_3/21/85
 LAB NO.\_\_\_2549-4

 LOCATION\_\_\_\_\_Sec.\_\_22-131N-105W

 FORMATION\_\_\_\_\_Red\_River "C"

 INTERVAL\_\_\_\_\_9321-9388

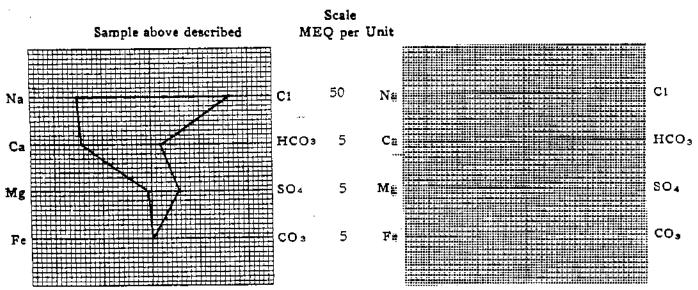
 SAMPLE\_FROM\_DST #2\_\_\_\_\_Sample #4)

# REMARKS & CONCLUSIONS: Light brown cloudy water, Light brown cloudy filtrate.

Nitrate, mg/1 negative	
Chromate, mg/1 — negative	
—	

Magnesium	.30 Sulfate Chloride Carbonate .01 Bicarbonate .03 Hydromide Hydrogen sulfide -	
Total Cations       838         Total dissolved solids, mg/1       49,         NaC1 equivalent, mg/1       48,         Observed pH       7	318 Specific resistance @ (	Anions

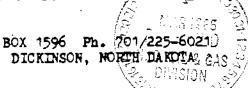
### WATER ANALYSIS PATTERN



(Na value in above graphs includes Na. K, and Li) NOTE: Mg/1=Milligrams per liter Meq/1= Milligram equivalents per liter Sodium chloride equivalent=by Dunlap & Hawthorns calculation from components



BOX 3659 Ph. 307/237-9327 CASPER, WYOMING



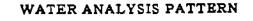
# WATER ANALYSIS REPORT

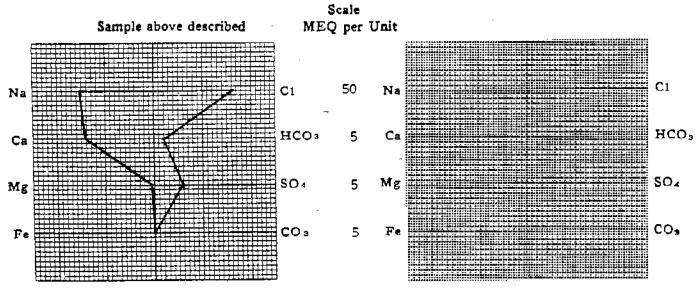
	Total Petroleum Cedar Hills #1-22	DATE 3/21/85 LAB NO. 2549-5 LOCATION Sec. 22-131N-105W FORMATION Red River "C"
COUNTYSTATE	Bowman	INTERVAL 9321-9388 SAMPLE FROM DST #2 (Sample #5)

# REMARKS & CONCLUSIONS: Light brown cloudy water, Light brown cloudy filtrate.

Nitrate, mg/l --- negative \_\_\_\_\_\_

Cations Sodium - (Calc) Potassium	<u>mg/1</u> <u>17,538</u> <u>1,443</u> <u>49</u>	<u>meq/1</u> 762.92 72.01 4.03 838.96	Anions     mg/1       Sulfate     1,400       Chloride     28,420       Carbonate     0       Bicarbonate     512       Hydroxide	<u>meq/1</u> 29.12 801.44  8.40  838.96
Total dissolved solids, mg/1 NaCl equivalent, mg/1 - Observed pH		49,362 48,265 7,39	Specific resistance @ 68°F.: Observed <u>0.159</u> Calculated <u>0.156</u>	ohm-meters ohm-meters





(Na value in above graphs includes Na. K. and Li) NOTE: Mg/1=Milligrams per liter Meq/1= Milligram equivalents per liter Sodium chloride equivalent=by Dunlap & Hawdotte calculation from compen-

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BOX 3659 Ph. 307/237-9327 CASPER, WYOMING

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BOX 1596 Ph. 701/225-6021

## WATER ANALYSIS REPORT

OPERATOR	Total Petroleum	DAT
WELL NO	Cedar Hills #1-22	LOC
FIELD		FOR
COUNTY	Bowman	INTI
STATE	N.D.	SAM

 DATE
 3/21/85
 LAB NO.
 2549-6

 LOCATION
 Sec.
 22-131N-105W
 2549-6

 CORMATION
 Red River
 "C"
 2549-6

 FORMATION
 Red River
 "C"
 2549-6

 INTERVAL
 9321-9388
 2549-6

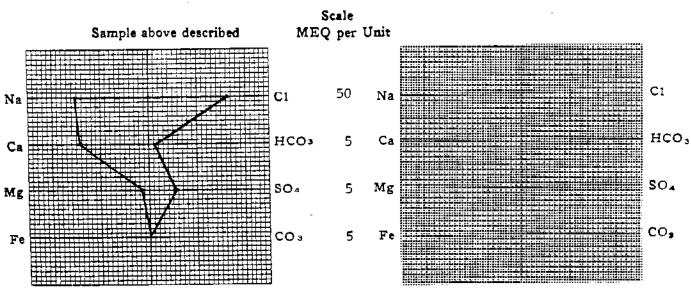
 SAMPLE
 FROM
 DST #2
 (Sample #6)

# REMARKS & CONCLUSIONS: Orange brown cloudy water, Light orange brown cloudy filtrate.

Nitrate, mc/1 negative	
Chronate, mg/1 negative	

Cations Sodium - (Calc) Potassium Lithium Magnesium Iron Total Cati	<u>mg/1</u> 	<u>meg/1</u> 769.69  72.01 8.06  849.76	Anionsmg/1Sulfate1,370Chloride28,910Carbonate0Bicarbonate366Hydrogen sulfideTotal Anions	<u>28.50</u> 815.26 6.00 849.76
Total dissolved solids, mg/ NaCl equivalent, mg/1 - Observed pH		49,881 48,955 6.79	Specific resistance @ 68°F.: Observed <u>0.159</u> Calculated <u>0.154</u>	ohm-meters ohm-meters

### WATER ANALYSIS PATTERN



(Na value in above graphs includes Na. K. and Li) NOTE: Mg/l=Millgrams per liter Meq/1 ≈ Millgram equivalents per liter Sodium ehlands equivalent=by Duniap & Hawthorse calculation from components



BOX 3659 Ph. 307/237-9327 CASPER, WYOMING

BOX 1596 Ph. 701 DICKINSON, NORTH

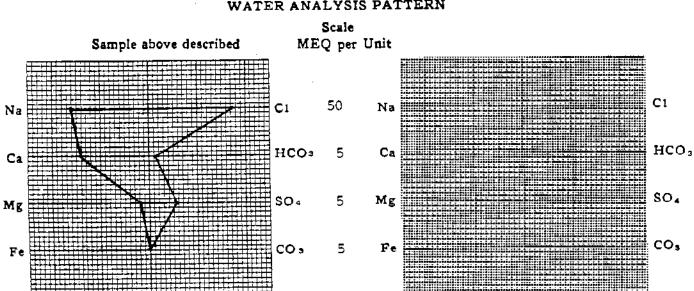
#### WATER ANALYSIS REPORT

	Total Petroleum Cedar Hills #1-22	DATE <u>3/21</u> LOCATION FORMATION	Sec. 22-131N-105W Red River "C"
STATE	Bowman	INTERVAL SAMPLE FRO	9321-9388

#### Orange brown cloudy water, Light orange brown cloudy filtrate. REMARKS & CONCLUSIONS:

negative Nitrate, mg/1 trace Chromate, mq/1

Cations Sodium (Calc) Potassium Lithium Magnesium Iron	<u>mg/1</u> 18.647  1,443  98 	<u>meq/1</u> 811.15 72.01 8.06 	Anions         mg/1           Sulfate         1,370           Chloride         30,380           Carbonate         0           Bicarbonate         366           Hydrogen sulfide            Total Anions	<u>m•q/1</u> 28.50 856.72 6.00 891.22
Total dissolved solids, mg/ NaCl equivalent, mg/1 - Observed pH		52,304 51,378 6.82	Specific resistance @ 68°F.: Observed • • • <u>0.1</u> Calculated • • • • <u>0.1</u>	49 ohm-meters 50 ohm-meters



(Na value in above graphs includes Na. K, and Li) NOTE: Mg/1=Milligrams per liter Meq/1= Milligram equivalents per liter Sodiam chlonde squivalent mby Dunlap & Hawthorne calculation from co

#### WATER ANALYSIS PATTERN

	Precisi	с.	
	BOX 3659 Ph. 307/23 CASPER, VYOMING		1596 Ph. 701/225-6021 KINSON, NORTH DAKDTA
Ŧ	11409	RECRIVED BUILD OIL & GAS & DIVISION	
COMPANY	Total Petroleum	DATE 3/18/85	wo #2545
LOCATION	Cedar Hills 1-22	COUNTY Bowman	STATE N.D.
REMARKS	Sec. 22-131N-105W NENU	<u>)</u>	
	DST #1 Red River "7	9152-92	06

indicat

Chloride	<u>Nitrațe</u>	<u>Chranate</u>	Bs & W	Oil
mg/l	mg/l	mg/l	t by vol	9 by vol.
		<u> </u>	40%	60%
			10%	90%
			88	92%
			20%	808
			85%	15%
184,240	100	500+	100%	0
184,240	100	500+	100%	0
92,120	30		95%	<u>+</u> 5%
			-	
	тд/1 184,240 184,240	mg/l mg/l	mg/l     mg/l     mg/l       mg/l     mg/l       l     l       l     l       l     l       l     l       l     l       l     l       l     l       l     l       l     l       l     l       l     l       l     l       l     l       l     l       l     l       l     l	mg/l     mg/l     mg/l     % by vol       mg/l     mg/l     % by vol       40%     40%       10%     10%       20%     8%       184,240     100       184,240     100       184,240     100

CONCLUSIONS OIL SAMPLE

	Specific Gravity @ 60°F 0.908	7
	Specific Gravity & 60-r - 0.90	/
	APT Gravity & 60°F 24.	2
·	API Gravity & bull	<u> </u>

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BOX 3659 Pb. 307/237-9327 CASPER, WYOMING

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BOX 1596 Ph. 701/225-6021 DICKINSON, NORTH DAKOTA

### WATER ANALYSIS REPORT

OPERATOR Total Petroleum WELL NO. Cedar Hills 1-22 FIELD	DATE         3/18/85         LAB NO.         2545-1           LOCATION         Sec.         22-131N-105W           FORMATION         Red River "A"           INTERVAL         9152-9206
COUNTY Bowman STATE N.D.	SAMPLE FROM DST #1 (Top Sample)

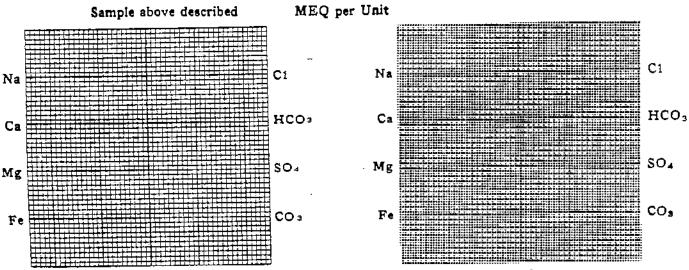
### REMARKS & CONCLUSIONS: Oil sample, some oil cut mud, 10% est.

(Insufficient water for analysis)

Cations	<u>mg/1</u>	meq/1	Anions	<u>mg/1</u>	meq/1
Sodium (Calc) Potassium -	·		Bicarbonate Hydrogen sulfide		
Total C	ations	<u> </u>		ions	
Total dissolved solids, m NaCl equivalent, mg/l Observed pH		<u></u>		.: • • <u></u>	

#### WATER ANALYSIS PATTERN

Scale



(Na value in above graphs includes Na, K, and Ll) NOTE: Mg/i≂Milligrams per liter Meq/i = Milligram equivalents per liter Sodium chloride equivalent=by Dunlap & Hawthorne calculation (rom components)



BOX 3659 Ph. 307/237-9327 CASPER, WYOMING

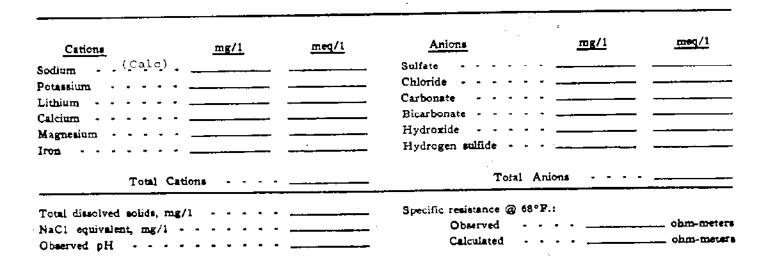
BOX 1596 Ph. 201/22 DICKINSON NORTH DAKOTA

#### WATER ANALYSIS REPORT

WELL NO Cedar Hills 1-22	DATE         3/18/85         LAB NO         2545-2           LOCATION         Sec. 22-131N-105W           FORMATION         Red River "A"
Bowman Bowman	INTERVAL 9152-9206 SAMPLE FROM DST #1 (Sample #2)

## REMARKS & CONCLUSIONS: Oil sample, some oil cut mud, (5% est.)

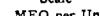
(Insufficient water for analysis)



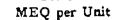
#### WATER ANALYSIS PATTERN

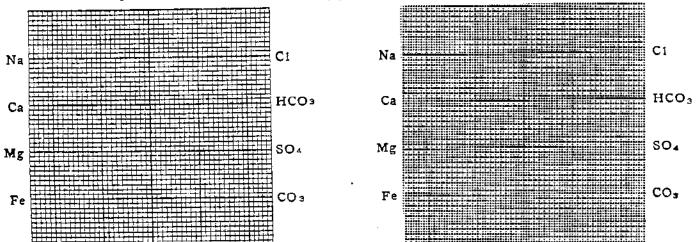
Scale

Sample above described









(Na value in above graphs includes Na. K, and Li) NOTE: Mg/1=Milligrams per liter Meq/1= Millgram equivalents per liter Sodium chioride equivalent=by Dunlap & Hawthorne estaulation from



BOX 3659 Ph. 307/237-9327 CASPER, WIOMING BOX 1596 Ph. 701/225-602 DICKINSON NORTH DANOTA

#### WATER ANALYSIS REPORT

OPERATOR	Total Petroleum	DATE3/18/	<u>185</u> LAB NO. 2545-3
WELL NO.	Cedar Hills 1-22	LOCATION	Sec. 22-131N-105W
FIELD		FORMATION	Red River "A"
	Bowman	INTERVAL	9152-9206
STATE	N.D.	SAMPLE FROM	DST #1 (Sample #3)

### REMARKS & CONCLUSIONS: Black muddy water, oil & oil cut mud on too, Brown cloudy

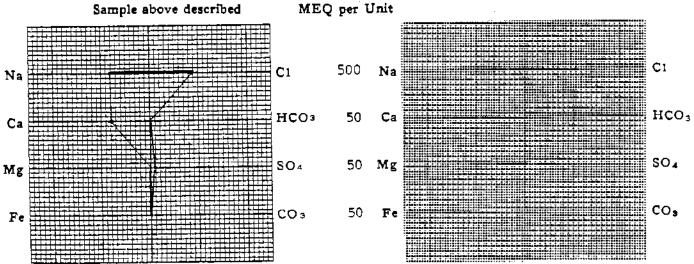
filtrate

Nitrate, mg/1 -- 40 Chromate, mg/1 -- 90

<b>G</b>		meq/1	Aniona	mg/1	meq/1
Cations Sodium - (Calc) - Potassium Lithium Calcium Magnesium	<u>mg/1</u> 95,833 	<u>4168.73</u> <u>400.00</u>	Sulfate	<u>1,540</u> <u>160,720</u> <u>0</u> <u>268</u>	<u>32.03</u> 4532.30 <u>4.40</u>
Iron	ions	4568.73	Total Ani	ons	4568.73
Total dissolved solids, mg/ NaCi equivalent, mg/l - Observed pH	/1 	266,377 265,011 6.25	Specific resistance @ 68°P. Observed Calculated	: 0.051 0.049	ohm-meters

#### WATER ANALYSIS PATTERN

Scale



(Na value in above graphs includes Na, X, and Li) NOTE: Mg/1=:Milligrams per liter Meq/1= Milligram equivalents per liter Sodium chloride equivalent=by Dunlap & Hawthorne calculation from et al. 1998 (No. 1998) (No.



Na

Ca

Mg

Fe

BOX 3659 Ph. 307/237-9327 CASPER, WYOMING

(2) 17-411710 (2017.71)

BOX 15962 Ph. 701/225-6021 DICKINSON, NORTH DAKOTA

M. D. OIL & GAS 🗟

### WATER ANALYSIS REPORT

OPERATOR	Total Petroleum	DATE3/18/8	5 LAB NO2545-4_ Sec. 22-131N-105W
WELL NO	Cedar Hills 1-22	LOCATION	Red River "A"
FIELD COUNTY	Bowman	INTERVAL SAMPLE FROM	9152-9206 DST #1 (Sample #4) Bottom Spl.

## REMARKS & CONCLUSIONS: Dark brown muddy water, trace of oil, Brown cloudy filtrate.

100 Nitrate, mg/1 400 Chromate, mg/l

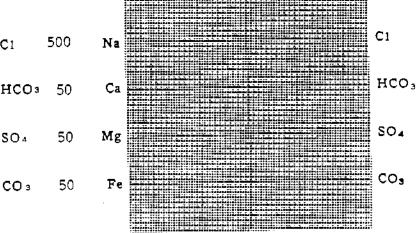
Cationsmg/1Sodium(Calc)101,Potassium	$     \frac{meq/1}{4434.90} \\                                    $	Anions     mg/1       Sulfate     1,050       Chloride     172,480       Carbonate     0       Bicarbonate     561       Hydrogen sulfide     —	<u>meq/1</u> 21.84 4863.94 9.20
Total Cations Total dissolved solids, mg/1 NaCl equivalent, mg/1 Observed pH	285,105 283,974 6.54	Total Anions Specific resistance @ 68°F.: Observed <u>0.049</u> Calculated <u>0.048</u>	ohm-meters

#### WATER ANALYSIS PATTERN



MEQ per Unit Sample above described Ci 500 Na HCO3 50 Ca

SO4



(Na vanue in above graphs includes Na. K. and LI) NOTE: Mg/1=Milligrams per liter Meq/i= Milligram equivalents per liter -Stonida antitual an-hu Muntan & Hawrinson extentatio



Na

Ca

BOX 3659 Ph. 307/237-9327 CASPER, WYOMING

BOX 1596 SPh DICKINSON.

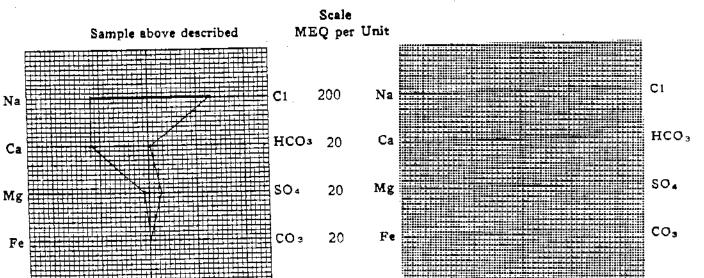
### WATER ANALYSIS REPORT

OPERATOR 7		FORMATION	Sec. 22-131N-105W Red River "A"
COUNTY I	Bowman	INTERVAL SAMPLE FROM	9152-9206 DST #1 (Sample Chamber)

## REMARKS & CONCLUSIONS: Brown cloudy water, oil on top, Light brown cloudy filtrate.

<u>3</u>0 Nitrate, mg/l 35 Chromate, mg/1

<u>Cations</u> Sodium - (Calc) Potassium Lithium Calcium Magnesium Iron	<u>mg/1</u> 55,116 	<u>meq/1</u> 2397.56 240.02 20.06 2657.64	Anionsmg/1Sulfate2,570Chloride92,120Carbonate0Bicarbonate390Hydroxide—Hydrogen sulfide—Total Anions—	<u>53.46</u> 2597.78 6.40 2657.64
Total dissolved solids, mg/1 NaCl equivalent, mg/1 - Observed pH		155,250 153,684 6.50	Specific resistance @ 68°F.; Observed <u>0.067</u> Calculated - <u>0.066</u>	ohm-meters ohm-meters



WATER ANALYSIS PATTERN

(Na value in above graphs includes Na, K, and Li) NOTE: Mg/1=Miligrams per liter Meq/1= Miligram equivalents per liter Sodium chloride equivalent=by Dunlap & Hawthome calculation from e TECHNICAL SERVICES, Security Life Bidg. • Suite 1350 • 1616 Grenarm • Deriver, Obiosago 80202 • Phone 1303) 573-8027

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Form 1

Conserver       Top Crobe       No       No<			(	
Sol       22       Size Mode       7.7/3"       Flow No. 2       17.9       Work No. 2       17.9         Size       Size Market       Size Mix De Ark" XH 16.60#       Flow No. 3       17.9       17.9         Ann       Size Wix De Ark" XH 16.60#       Flow No. 3       17.9       Work No. 3       17.9         Ann       Size Wix De Ark" XH 16.60#       Size Wix De Ark" XH 16.60#       Flow No. 3       17.9       Work No. 3       17.9         Size       Did Conty Section       Size Nix Pre       Size Nix Pre       17.9       Work No. 3       17.9         Size       Did Conty Section       Size Nix Pre       Size Nix Pre       17.9       Work No. 3       17.9         Size Nix Pre       Size Nix Pre       Size Nix Pre       Size Nix Pre       10.4       Size Nix Pre       17.9       Work No.9       17.9       17.9       Work No.9       17.9       17.9       17.9       17.9       17.9       17.9 <th>11 6 9</th> <th>Top Choke</th> <th>2 II 0 / A II</th> <th></th>	11 6 9	Top Choke	2 II 0 / A II	
Sec       22       Size Rai Hole	5 F.		<u>- 3/4</u> 7 7/81	
Two.       1331K       Size & Wit D P Add Wit 16.60 F       File Wit 16.60 F         Prog.       1035K       Size Wit D P Add Wit 16.60 F       File Wit 16.60 F         County       Downan       Length of D C .725 ff.       Size Wit Prog.         Size Minorth Dakota       Length of D C .725 ff.       Size Wit Prog.       Size Minorth Dakota         Elevation 2842 ff.       Interval Tested 0321-9385 ff.       Yee Gottom Hold       Gravity         Yee of Test       Lonventional       Gravity       Size County         Yee of Test       Lonventional       Gravity       Gravity	spot			
Prog.       105k       Size Wi, Pipe       Size Pipe       Size Pipe       Size Pipe<			, 4%" XH 16,60#	
Paid will deat       Lo of D. C       2007 447 H-90         County				
County Bownen State North Dakota Formation 2942 ft. Formation 2		-	2½" 4½" H <b>-</b> 90	
State       North Dakota       Tota Depth       9388 ft.       Hole Temp.       226.0 ft         Formation       Red River       "D"       Interval Teste       9321-9388 ft.       Gravity			735 ft.	
Elevation 2942 ft. Formation Red River "C" Type of Test Bottom Hole Conventional Type of Test Bottom Hole Conventional Type of Test Bottom Hole Conventional Type of Test Bottom Hole Conventional Tool opened © 6:23 p.m. Inside Recorder A D Avec Ruster K-3 Ne24743 cop 2100 © 93411 Page Converse A D Avec Ruster K-3 Ne24743 cop 2100 © 93411 Page Converse Final Hydrostate < 5135 Final Hydrostate < 5105 Final Hydrostate < 5105	State North Dakot	-	9388 ft.	Hole Temp 220.0 F
Image: State State       Image: State State       Image: State State       Image: State State         Image: State State       Image: State       Image: State       Image: State       Image: State         Image: State       Image: State       Image: State       Image: State       Image: State       Image: State         Image: State	Elevation 2942 ft.	Interval Tested		10.48
Tool opened @ <u>6:23 p.m</u> . Tool opened @ <u>6:23 p.m</u> . Inside Recorder Pape Mark Kuster K-3 No24742 Cos 9100 @ 9341' Pape Mark Kuster K-3 No24743 Cos 9100 @ 9341' No24743 Cos 9100 @ 9040 @ 1000 No24743 Cos 9100 @ 1000 No24743 Cos 9100 @ 1000 No24743 Cos 9100 No24743 Cos 9100 No24743 No24743 Cos 9100 No24743 No24743 Cos 9100 N		1 (2) []		Gravity
A       Inside Recorder         A       A         A       A         B       B         B       C         B       C         B       C         B       C         C       C <t< td=""><td></td><td></td><td>Conventional</td><td>Viscosity38</td></t<>			Conventional	Viscosity38
A       Inside Recorder         A       A         A       A         B       A         B       A         B       B <t< td=""><td></td><td></td><td>·····</td><td>- Tool opened @ 6:23 p.m.</td></t<>			·····	- Tool opened @ 6:23 p.m.
PAD Make Kuster K-3 No.24743 co.9100 p. 9341 Provestic A 5165 No.24743 co.9100 p. 9341 Provestic A 5165 No.2474 Provestic A 5165 No.2474 Provestic A 5165 No.2474 Prove A 518 Provestic A 5165 No.2474 Provestic A 5165 Provestic A 5165 Provestic A 5165 Provestic A 5165 No.2474 Provestic A 5165 Provestic A 5165 Provestic A 5165 Provestic A 5165 Provestic A 5165 Provestit A 5165	19	A 24 25 26 27 2	n1:01 5.627 2	
A       Classify       Classi		1 A 33	A * 3	Inside Recorder
A A A A A A C C C C C C C C C C C C C	00	n Mapa B)	🛃 MAR (2005 —	PRD Make Kuster K-3
A A A A A A C C C C C C C C C C C C C	le y	15021185 三十	EREC. VED	
A A A A A A C C C C C C C C C C C C C		0.01 (40-5)	N. Dak, Geological	Press         Corrected           V         Desired         A         5165
A A A A A A C C C C C C C C C C C C C	100	IVISIO GAS SI	Survey Survey	
A       First In tis Fiew       C       1045         B       First In tis Fiew       C       1045         B       First In tis Fiew       C       1045         B       First In tis Fiew       First In tis Fiew       First In tis Fiew       First Fiew         B       First Fiew       First Fiew<	¥4	AND	Gilnes	
Initial Shuthin       D       4128         Second Initial Flow       F       1053         Second First Flow       F       1053         Second First Flow       F       2053         Second First Flow       G       4098         Third Initial Flow       H       356.9         Third Flow       H       356.9         Third Shuthin        4075         Third Shuthin        4075         Third Shuthin           Did Well Flow       Gas No       01         Wiressed By       L.F. Scott          Did Well Flow       Gas No       01         No       Water       No       No         Pol25 ft. Total Recovery       = 121.31 Bbls         310 ft. Ammonia & inhibitor-cut mud       = 4.40 Bbls         8715 ft. Water       = 116.91 Bbls         Blow       E       Tool opened with a surface blow, increasing to a 18" blow at the end of the flow.         2rd Flow:       Tool opened with a ½" blow, increasing to a 21" blow in 20 minutes and a surface blow at the end of the flow.         Comments:       The test results indicate a mechanically successful test. The flow and shut-in curves suggest excellent permeability within the zone tested. Lost approximately 2 bbl	· •	<u>K</u>		
B       G       Second Inital Flow       E 1053         B       F       I       Second First Flow       F 3818         Second First Flow       G       4098         Third Inital Flow       I       4098         Third Inital Flow       I       4098         Third Inital Flow       I       4098         Third First Flow       I       4075         Third First Flow       I       1007         Blow       Second First Flow       Initibitor         Second First Flow       Initibitor       Initibitor         Second First Flow       Inital Flow       Initibitor	· /	r.	$\nabla$	
B       F       H       I         B       CE       F       3818         Second Firat Flaw       F       3818         Second Firat Flaw       G       4098         Third Initial Flow       H       3849         Third Firat Flow       H       4075         Third Firat Flow       H       4075         Third Shutin          Lynes Dist       Dickinson, N2         Cu: Tester       Darren Buchholz         Witnessed By: L.F. Scott       Witnessed By: L.F. Scott         Did Well Flow - Gas       No       water         No       Ran 5 gallons ammonia and 5 gallons         RECOVERY IN PIPE       inhibitor.         9025 ft. Total Recovery       = 121.31 Bbls         8715 ft. Water       = 116.91 Bbls         8715 ft. Water       = 116.91 Bbls         Blow:       Tool opened with a surface blow, increasing to an 18" blow at the end of the flow.         2rd Flow:       Tool opened with a ½" blow, increasing to an 18" blow in 20 minutes, then decreasing steadily to an 1/8" blow in 170 minutes and a surface blow at the end of the flow.         Comments:       The test results indicate a mechanically successful test. The flow and shut-in curves suggest excellent permeability within the zone tested. Lost approximately 2 bbls of mud in annulus <td><b>ب</b> ' ' ا</td> <td>G' X</td> <td>₹</td> <td></td>	<b>ب</b> ' ' ا	G' X	₹	
B       E       H       1         B       CE       Second Shutin       C       4098         Third Initial Flow       H       3849         Third Trial Flow       1       4075         Third Shutin		\ \		
B       CE         B       CE         In 'd Shutin	ja 1	F H + N	- 1 1	
B       Thid Shutin          B       Thid Shutin          B       Thid Shutin          Lynes Dist       Dickinson, N2         Our Tester       Darren Buchholz         Witnessed By:       L.F. Scott         Did Well Flow       Gas_No         OH       No         Water       No         B       2025 ft. Total Recovery         9025 ft.       Total Recovery         310 ft.       Ammonia & inhibitor-cut mud         9025 ft.       Total Recovery         310 ft.       Ammonia & inhibitor-cut mud         9025 ft.       Total Recovery         9025 ft. <t< td=""><td></td><td><math display="block">\sum_{i=1}^{n} \sum_{j=1}^{n} \sum_{i=1}^{n} \sum_{i</math></td><td>1 5</td><td>Third Initial Flow H 3849</td></t<>		$\sum_{i=1}^{n} \sum_{j=1}^{n} \sum_{i=1}^{n} \sum_{i$	1 5	Third Initial Flow H 3849
B       CE         B       CE         Lynes Dist.       Dickinson, NO         Our Tester       Darren Buchholz         Witnessed By: L.F.       Scott         Did Well Flow - Gas NO       Ou         Did Well Flow - Gas NO       Ou         Did Well Flow - Gas NO       Ou         No       Ran 5 gallons ammonia and 5 gallons         Blow Description:       9025 ft. Total Recovery         1st Flow:       Tool opened with a surface blow, increasing to an 18" blow at the end of the flow.         2rd Flow:       Tool opened with a ½" blow, increasing to a 21" blow in 20 minutes, then decreasing steadily to an 1/8" blow in 170 minutes and a surface blow at the end of the flow.         Comments:       The test results indicate a mechanically successful test. The flow and shut-in curves suggest excellent permeability within the zone tested. Lost approximately 2 bbls of mud in annulus		• • • • • • • • • • • • • • • • • • •		
Our Tester       Darren Buchholz         Our Tester       Darren Buchholz         Witnessed By: L.F. Scott         Did Well Flow - Gas No       Our No         Water No       Ran 5 gallons ammonia and 5 gallons         RECOVERY IN PIPE:       inhibitor.         9025 ft. Total Recovery       = 121.31 Bbls         310 ft. Ammonia & inhibitor-cut mud       = 4.40 Bbls         8715 ft. Water       = 116.91 Bbls         Blow Description:       1st Flow:         1st Flow:       Tool opened with a surface blow, increasing to an 18" blow at the end of the flow.         2r.d Flow:       Tool opened with a ½" blow, increasing to a 21" blow in 20 minutes, then decreasing steadily to an 1/8" blow in 170 minutes and a surface blow at the end of the flow.         Comments:       The test results indicate a mechanically successful test. The flow and shut-in curves suggest excellent permeability within the zone tested. Lost approximately 2 bbls of mud in annulus	B, CE		<u>*</u>	
RECOVERY IN PIPE:inhibitor.9025 ft. Total Recovery= 121,31 Bbls310 ft. Ammonia & inhibitor-cut mud= 4.40 Bbls8715 ft. Water= 116.91 BblsBlow Description:Ist Flow:1st Flow:Tool opened with a surface blow, increasing to an 18" blow at the end of the flow.2rd Flow:Tool opened with a ½" blow, increasing to a 21" blow in 20 minutes, then decreasing steadily to an 1/8" blow in 170 minutes and a surface blow at the end of the flow.Comments:The test results indicate a mechanically successful test. The flow and shut-in curves suggest excellent permeability within the zone tested. Lost approximately 2 bbls of mud in annulus				Our Tester Darren Buchholz
310 ft. Ammonia & inhibitor-cut mud = 4.40 Bbls 8715 ft. Water = 116.91 BblsBlow Description: 1st Flow:St Flow:Tool opened with a surface blow, increasing to an 18" blow at the end of the flow.2nd Flow:Tool opened with a ½" blow, increasing to a 21" blow in 20 minutes, then decreasing steadily to an 1/8" blow in 170 minutes and a surface blow at the end of the flow.Comments:The test results indicate a mechanically successful test. The flow and shut-in curves suggest excellent permeability within the zone tested. Lost approximately 2 bbls of mud in annulus		_Oil_NoWater_No	5	is ammonia and 5 gallons
310 ft. Ammonia & inhibitor-cut mud = 4.40 3bls 8715 ft. Water = 116.91 BblsBlow Description: 1st Flow:St Flow:Tool opened with a surface blow, increasing to an 18" blow at the end of the flow.2rd Flow:Tool opened with a ½" blow, increasing to a 21" blow in 20 minutes, then decreasing steadily to an 1/8" blow in 170 minutes and a surface blow at the end of the flow.Comments:The test results indicate a mechanically successful test. The flow and shut-in curves suggest excellent permeability within the zone tested. Lost approximately 2 bbls of mud in annulus				
Blow Description: Ist Flow:8715 ft. Water= 116.91 BblsBlow Description: Ist Flow:Tool opened with a surface blow, increasing to an 18" blow at the end of the flow.2rd Flow:Tool opened with a ½" blow, increasing to a 21" blow in 20 minutes, then decreasing steadily to an 1/8" blow in 170 minutes and a surface blow at the end of the flow.Comments:The test results indicate a mechanically successful test. The flow and shut-in curves suggest excellent permeability within the zone tested. Lost approximately 2 bbls of mud in annulus				i = 4.40 Bbls
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flow and shut-in curves suggest excellent permeability within the zone tested. Lost approximately 2 bbls of mud in annulus				
	2nd Flow:	minutes, then decrea	asing steadily to	o an 1/8" 51ow in 170 minutes

STAL PETROLEUM INC.

CEDAR HILLS \$1-22 9321 - 9388ft,

Location: SEC, 22 T131N R105W Test Type: BOTTOM HOLE CONVENTIONAL Formation: RED RIVER "C"

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Recorder Number: 1738 Recorder Depth: 9299 ft.

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#### TIME-PRESSURE LISTING

CHART LABEL COMMENTS	TIME Min,	DELTA P psi	PRESSUR psi	E (T+dt)/dt <sup>.</sup> ABSCISSA	PRESSURE SQUARED psi^2/10^6
A INITIAL HYDROSTATIC	0.00		5120,0		•
B START OF ist FLOW	0.00		715.0		
ist FLOW PERIOD	1.00 2.00 3.00		800.0 848.0 703.0		
C END OF 1st FLOW	4.00		980.0		
1st SHUTIN PERIOD	0.00 1.00 3.00 4.00 5.00 7.00 8.00 7.00 12.00 12.00 12.00 22.00 22.00 24.00 20.00 30.00 35.00 45.00 45.00 55.00 40.00	2180.0 2723.0 2803.0 2858.0 2875.0 2928.0 2928.0 2970.0 3010.0 3028.0 3043.0 3043.0 3043.0 3043.0 3043.0 3098.0 3098.0 3103.0 3108.0 3108.0 3110.0	980.0 3140.0 3703.0 3783.0 3838.0 3975.0 39750.0 39750.0 39750.0 39750.0 4008.0 4023.0 4043.0 4043.0 4045.0 4055.0 4070.0 4078.0 4095.0 4095.0 4095.0	0.0000 5.0000 2.3333 2.0000 1.8000 1.6667 1.5714 1.5000 1.4444 1.3333 1.2857 1.2500 1.2500 1.2500 1.1818 1.1429 1.1429 1.1333 1.1143 1.000 1.0889 1.0727 1.0467	
E START OF 2nd FLOW	0.00		983,O		
2nd FLOW PERIOD	10.00 20.00 30.00 40.00	815,0 1150,0	1393.0 1798.0 2133.0 2408.0		

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COTAL PETROLEUM INC. CEDAR HILLS \$1-22 9321 - 9388ft.

Location: SEC. 22 T131N R105W Test Type: BOTTOM HOLE CONVENTIONAL Formation: RED RIVER "C"

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Recorder Number: 1738 Recorder Depth: 9299 ft.

### TIME-PRESSURE LISTING

CHART LABEL COMMENTS	TIME MIN,	DELTA P psi	PRESSURE (T+dt)/dt psi ABSCISSA	PRESSURE SQUARED psi^2/10^6
F END OF 2nd FL	50.00 60.00 70.00 80.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00	$\begin{array}{c} 1850.0\\ 2012.0\\ 2150.0\\ 2270.0\\ 2372.0\\ 2457.0\\ 2595.0\\ 2650.0\\ 2650.0\\ 2495.0\\ 2650.0\\ 2495.0\\ 2735.0\\ 2772.0\\ \end{array}$	2638,0 2833,0 2995,0 3133,0 3253,0 3355,0 3440,0 3515,0 3578,0 3678,0 3678,0 3718,0 3718,0 3755,0	p31 <b>2</b> , 10 0
2nd SHUTIN PE	RIOD 0.00 1.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 12.00 14.00 22.00 24.00 24.00 30.00 35.00 40.00 45.00 55.00	90,0 125.0 135.0 135.0 143,0 143,0 143,0 143,0 150.0 155.0 155.0 163.0 170.0 170.0 178,0 180.0 193.0 195.0 200.0 200.0 200.0 213.0 215.0	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	·

CEDAR HILLS \$1-22 9321 - 9386ft.

Location; SEC, 22 T131N R105W Test Type; BOTTOM HOLE CONVENTIONAL Formation; RED RIVER "C"

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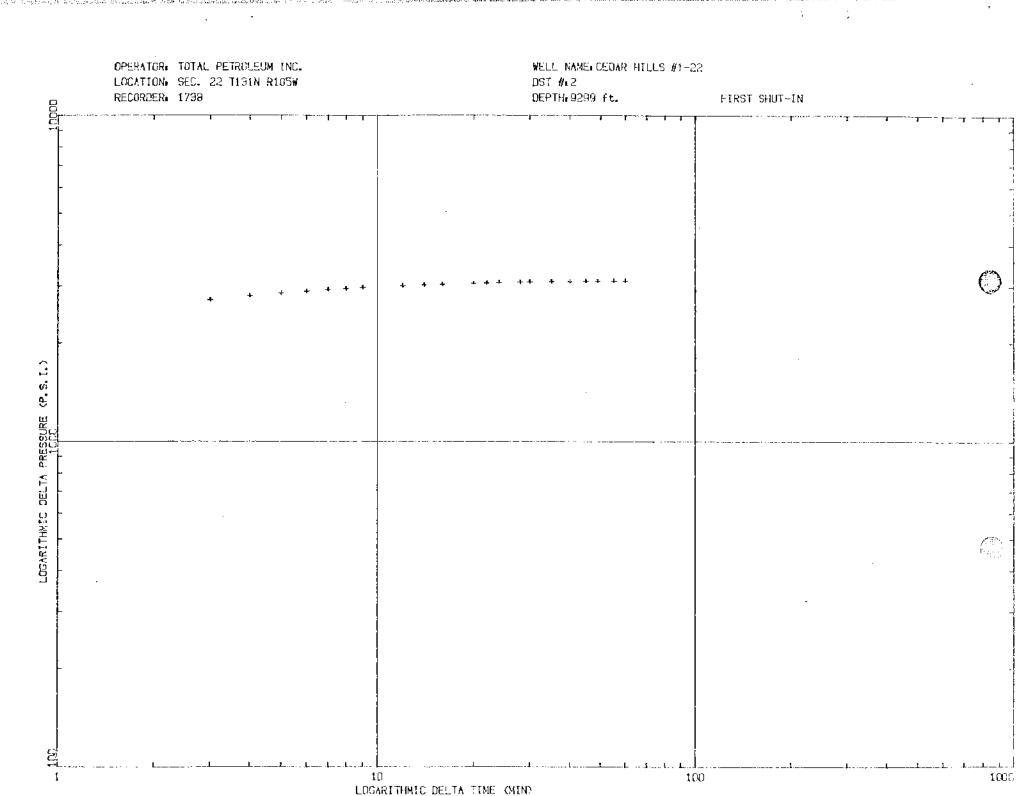
Recorder Number: 1738 Recorder Depth: 9299 ft.

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### TIME-PRESSURE LISTING

CHART Label comments	TIME MIN,	DELTA P psi	PRESSUR psi	E (T+dt)/dt Abscissa	PRESSURE SQUARED psi^2/10^6
		228.0 230.0 238.0 240.0 245.0 245.0 253.0 253.0 255.0 258.0	4013.0 4015.0 4023.0 4025.0 4030.0 4035.0 4035.0 4038.0 4040.0 4043.0	3,2975 3,0562 2,8300* 2,6636* 2,5250* 2,4186* 2,3071* 2,2200* 2,1438* 2,0828*	ps1~~/iu~o
G END OF 2nd SHUTIN	180,00		4045.0	2.0167*	
H START OF 3rd FLOW	0,00		3793,0		
3rd FLOW PERIOD	10.00 20.00 30.00 40.00 50.00 70.00 80.00 90.00 100.00 120.00 130.00 140.00 150.00 140.00 150.00 179.00	190.0 202.0 210.0 217.0 222.0 230.0 232.0 237.0 242.0 247.0	3840.0 3875.0 3903.0 3925.0 3943.0 3940.0 3973.0 3983.0 3995.0 4010.0 4015.0 4023.0 4025.0 4035.0 4035.0 4040.0 4043.0		
J END OF 3rd SHUTIN	-1.00		-i,O		
Q FINAL HYDROSTATIC	0.00		5113,0		
×	VALUES	USED FOR	EXTRAPO	LATIONS	
2nd SHUT-IN HORNER EXTRAPOLAT: HORNER SLOPE		92.60 PSI 57.61 psi			

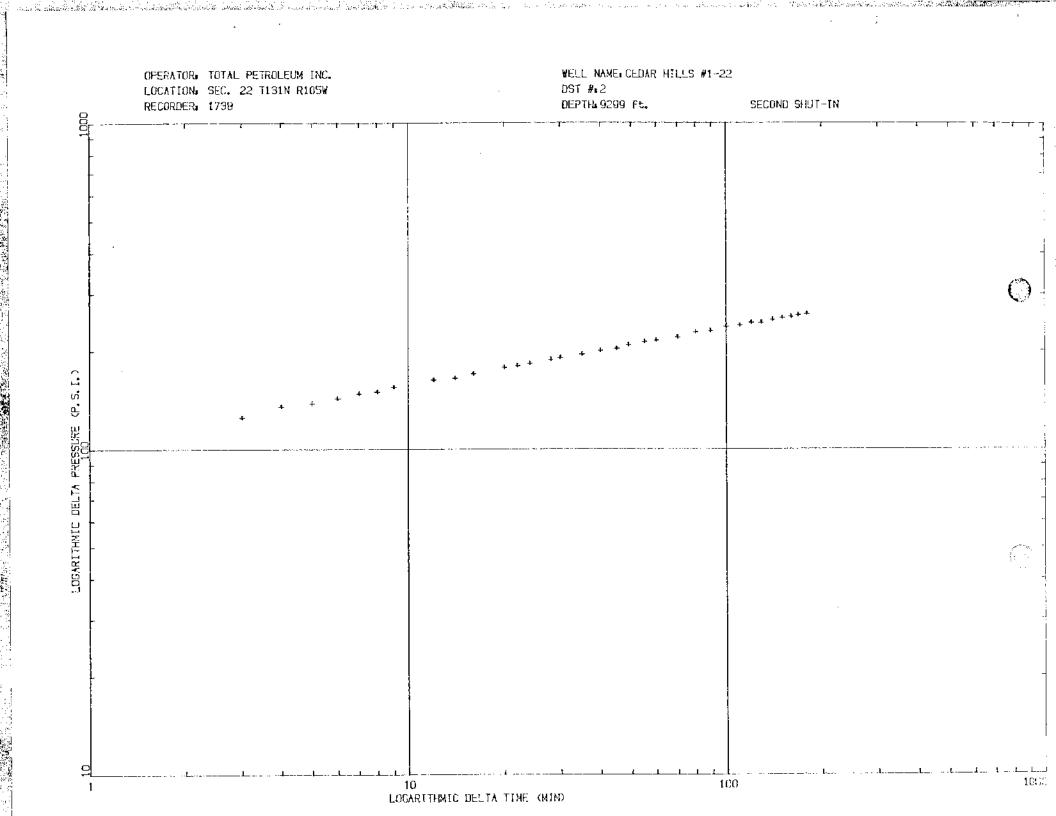
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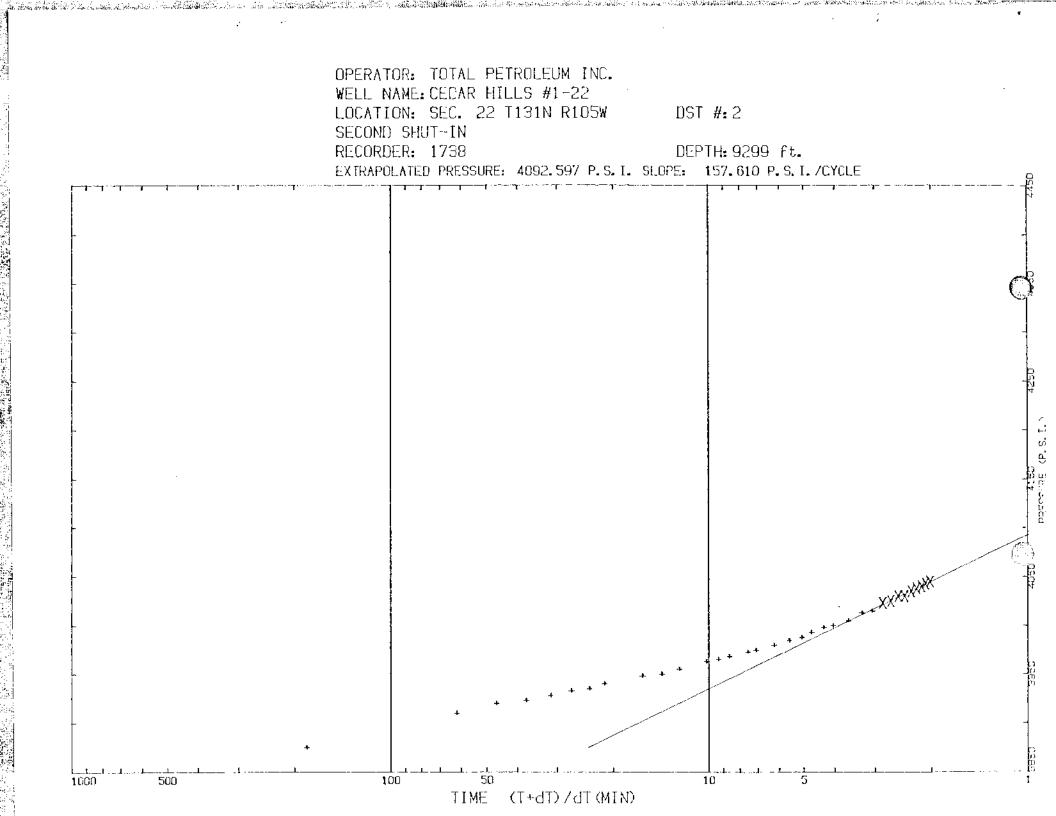


OPERATOR: TOTAL PETROLEUM INC. WELL NAME:CEDAR HILLS #1-22 LOCATION: SEC. 22 T131N R105W FIRST SHUT-IN	DST #:2		
 RECORDER: 1738	DEPTH:9299 ft.		
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OTAL PETROLEUM INC, ST&: 2 CEDAR HILLS \$1-22 9321 - 9389ft.

Location: SEC, 22 T131N R105W Test Type: BOTTOM HOLE CONVENTIONAL Formation: RED RIVER "C" Recorder Number: 1738 Recorder Depth: 9299

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SAMPLE DATA

SAMPLE CHAMBER:

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Sampler contained: Water 2300 cc

RESISTIVITY DATA: xxxxxxxxxxxxxxxxxx

 Top.....
 164 000 PPM NACL

 Middle....
 25 000 PFM NACL

 Bottom....
 20 000 PFM NACL

 Sampler...
 25 000 PFM NACL

 Mud pit,...
 190 000 PFM NACL

 Make-up Water...
 190 000 PFM NACL



WWWSERS CONTRACT

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THE CONTRACT

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DMR-312 DIGITAL MEMORY RECORDER NO. 1738 CAP 10000 AT 9299 ft.

5.								ń
	Petroleum Inc.	DUCT NAME	Cedar H	il1s ≇1-22		TICKET NO. 3	S794 DS	ST. NO 14
OPERATOR OTAL	Sectored and	MELC NAME						
18:13:20 - 202,437	19:25:30 T 21/ 40: End 1st Shutin 40: Start 2nd Flow 98: 97: 10: 10:	€. 437 <sup>™</sup> 28∔37	-33 T i	226.625 🗌	21:49:30	7 226.375	23:5113	8 7 223.500
Initial Hydro. 5120.00	405	97.50		2995.30		3640.00		3930,00
5123.00	End 1st Shutin 40	97.58		5010.00		3645.00		3933.00
5125.98	Start 2nd Flow	2.503		3025.00		3650.00		3988.00
5120.30	Q7:	2 588		3040.33		3657.53		3762.50
E120.50		17 53		3052.50		3660.03		3965.00
5117 55	10	17.00 19 50		306Z.58		3665.03		3985.00
5117.50	11	12.50		3080.33		3670.03		3985.00
16:21:30 T 203.750	1 19:33:38 T 21	10,00 4 497 - 90:45	. 30 T	226.687	01157100	T 226,312	0.0.00.00	
18:21:30   203.700 5198.00	19:33:38   21:	97.50 97.50		3107.50	EI • J7 • 98	3677.50	23:09:31	ат 282,937 -
		55.03		3120,00		3682.50		3987.50 Door Es
Start 1st Flow 715.000		03.00 02.50		3132.50		3665,00		3987.50
600.300 867.539				3147,50		3690.00		3987.53
		47.58 22 53		3160,98		2695.03		3990.00
902.500		92.50		3172,56				3992.50
End 1st Flow     ୨୫୦.୦୦୦		37.50		3195.00		3700.03		3992,53
3168.00	14	80.00 				3705.00		3992.50
18:29:30 T 210.562		2.520 20100 /= 00	1.30	620.00/ 3207.52	55:02:20	T 226.250	23:17:3	a T 222.375
3702.50		65.00		3217.53		3710.03		3995.00
3763,50		05.03				3715.00		3995.00
3327.50		45.00		3230.33		3717.50		2995.00
3875.00		82.50		3242.53		3722.50		3997.50
3907.50		25.00		3252.50		3727.50		3997.50
3933.00		63.00		3262,58		3733.00		3997.50
3950.30	17	92.50		3275.00		3735.00		3997,53
13:37:38 7 215.937		4.756 21:01		226.520	22:13:38	Т 226.125	23:25:3	
3980.00		20.00		3295.00		3742.50		4000.00
3995.04		05.00		3305.00		3/40,60		4000.00
4000.00		37.50		3317.58		3747.50		4000.33
4387.53		72,50		3325.88		3750.08		4002.50
4015.00		35.20		3335.00		3755.38		4002.50
4022.50		37.50		5345.00		3757.53		4332.50
4027.50	20	67.50		3355.00		3760.03		4002.50
18:45:30 T 215.687	( 19:57:30 T 22	5.687 21:05	1301	226.620	22:21:30	T 226.062	23:33:3	3 7 221.500
4037.59				3372.50		3767.50		4005.00
4042,50	21	62.53		3360.00		3773.00		4905.98
4045.20	21	92.50		3387,50		3775.38	l .	4005.30
4047.50		23.00		3433.00		3777.50		4205.02
4052.50		47.50		3405.20		3780.03		4005.00
4055.00		75.00			nd 2nd Flow	-3785.00 3875.00		4007 50
4057,50	31 23	02.50		3422.50				4007.50
13:53:30 7 214.812			1:36 1	226.000	28:59:30	T 225.000	23:41:3	0 T 221.062 -
4062.50		57.50		3440.00		3910.30	1	4007.50
4065.00		\$52,50		3447.00 Addin AD	22129130	3920.00		4010.00
4957.5		137.50		3455.00		3922.53		4010.00
4070.0		132.50		3462.50		2254,00		4010.30
4072.5		57.50		3462.50) 3473.00		3932.50		4010.00
4372.5	-	; <u>22.50</u>		3477.50 3485.30		3935.00		4012.50
40.75.8		05.00		3485.30		3940.00		4012.50
19:01:30 7 213.93	7 20:13:38 T 23	се.375 21:25	5-30 T	225.552	22:37:39	7 225.625	23:49:3	6 T 280.697 -
4077.5		50.00		3500.03	22.0/.00	3945.20	1	4812,58
4377.5	원, 25 주	572.50		3507.50		3947.50		4012.50
4030.0	ଅ 25 ଚ	595.00		3515.00(		3950.20		4015.00

50 50 4015.20 4082.50 2615.00 2637.50 3523.00 3950.02 | 4015.00 4082.53 3525.00 3952.50 4015.00 4082.50 2657.58 3532.58 ( 3955.00 4015.00 4085.00 3537,50 2680.00 3957.50 4315,00 19:09:33 T 213,312 20:21:30 T 226.500 21:33:30 T 226.500 | 22:45:30 T 224.937 | 820.375 23:57:30 7 4087.53 3558.03 2720.00 3960,00 4017.50 4087.50 4087.50 3557.50 3565.30 4017.50 4017.50 4017.50 2740.00 3362.50 2757,50 2777,50 3962.50 3965.00 4087.50 3578,00 3577,50 4087.50 2795.00 3965.00 4017.70 3582,58 4090.00 2315.00 3967.50 4020.00 4398,00 3587.50 2332.50 3967.50 4020,00 19:17:20 T 212.575 20:29:30 T 226.562 21:41:30 T 226.437 22:53:30 T 224.187 00:05:30 T 220.062 4692.50 3600,30 3972.50 3972.50 3972.50 2365.00 4020.00 4095.00 3605.00 2885.00 4022.53 4032.50 3610.00 2900.00 4028.50 4095,00 3617.50 3975.00 2917.50 4620.00 4095.00 3623.00 3975.00 2935.00 4022.50 4022.50 3627,50 4095.00 3977.50 3977.50 2950.00 4097.58 3632.50 2965.00 4822.50



DMR-312 DIGITAL MEMORY RECORDER NO. \_\_\_\_\_\_\_ CAP \_\_\_\_\_\_ 0000 \_\_\_\_\_47 \_\_\_\_ 9299 ft.

OPERATOR Total Petroleum inc. WELL NAME Cedar Hills #1-22

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	57 [01:25:30]] 218.062	ταοίοτ∙αα'τ'οσ≓ αυσ	- <u></u>
- 80:13:30   219.87: 4022.50	5 01:25:36   218.662 0 4845.00	3972.50	4027.50 / 284.157
-	0 . End 2nd Shutin-4045.00	3975.00	4027.58
4022.50		3975.03	4027.58
4025.00	0 3899.93		4327.50
4025.03		3977.50	
4025.00		3965.60 3982.50	4027.50 4030.00
4027.50 00:21:30 T 219.543	c 01:33:30 7 220,625	02:45:30 T 225.000	03:57:30 T 224.062
4027.59	8 3825.00	3982.50	4030.38
4027.59	0 3827.50	3982.50	4030.00
4027.50		3982.50	4030.30
4027.50 4027.50		3985.00 3987.58	4032.50 4032.50
4027.30		3987.50	4032,50
4027.54		3987.50	4032.50
00:29:30 T 219.375	5 - 01:41:30 T 223.312 <sup>-</sup>	°02:53:30 T 224,937	04:05:30 T 223.675
4030.00		3993.00 3992.50	4035.00 4035.00
4030.20 4030.00		3992.50	4035.03
4000.00			
4838.00	0 3870.00 -	3995.00	4035.00
4039.00		3997.50	
4030.00 		3997.50 03:01:30 T 224,812	4035.00 04:13:30 T 223.753
00:37:30 T 219.125 4032.50		3997.50	4037.50
4032.52		3997.50	4037.50
4032.50		4333.00	4037.50
4035.00		4888.00	
4032,53 4035.00		4000.00 4002.50	4040,00 4007.50
4035.00		4002.50	
00:45:30 7 219.937		03:09:30 T 224,750	
4035.00	6 3902.50	4002.50	4040.00
4035,69		4005.00 4005.00	4040.00
4035.00 4035.00		4005.00	4040.30 4040.30
4035.00		4005.00	
4037.50		4007.50	End 3rd Flow -4042.50
4035.00	0, 3917,50,	4007.50	5075.89
03:53:30 T 218.750		- 03:1/130 / 224.625 4010 03	04:29:30 T 223.437
4037.50 4037.50		4010.00 4007.50	5085.00
4037.50		4007.53 4010.03	5128.00
4037,50		4010.00	5387.50
4037.50		4012.50	5065.00
4640.00 3943-00		4012.50 4012 50	5112.50 Final Hydro 5112.50
4043.00 01:01:33 T 219.563		03:25:30 7 224.500	64:37:30 T 219.625
4040.00	_	4012.50	4980.03
4349.50		4012.50	5092.50
4040.00		4015.00	5050.38
4040.00 4040.00		4017.50 4017.50	! 5007.50 5037.50
4040.00 4040.00		4017.50	
4042.59		4017.50	4977.50
01:09:30 7 218,437		03:33:30 T 224.427	
4042.50		4017.50 4020.00	4970.00
4042.50 4042.50		4020.00	
4042.53		4020.00	
4042.5		4922.50	
4042.50	· · · · · · ·	4020.20	
4042.50 - 01117120 T 210 250		4022.50 03:41:30 T 224.312	
01:17:38 T 218.250 4045.80		93:41:30   224.312 4025.80	
4045.0%		4022.50	
4045.00	e 3965.00 j	4025.00	
4045.00		4025,00	
4245.00 ADAR 00		4025.00 4025.00	
4045,00 4047.50		4025.00	

1. S. C. S. M. T. S. S.

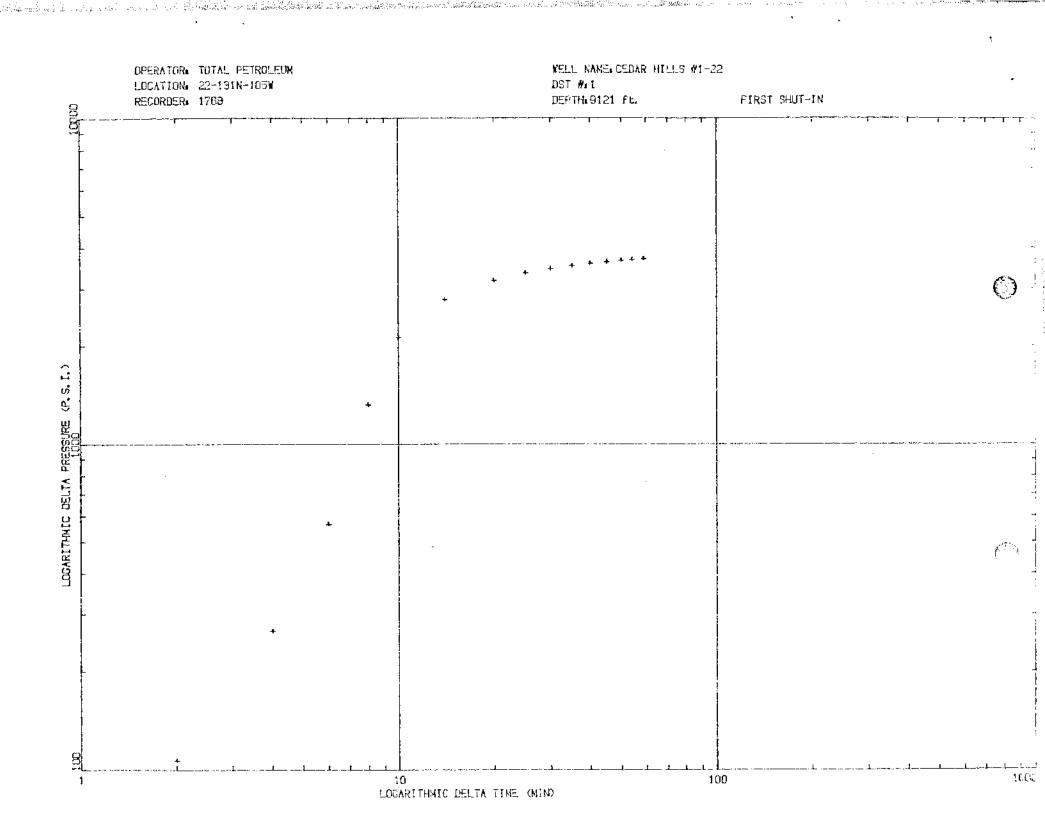
e (Frankling)

TICKET NO. 20794 DST. NO. 2

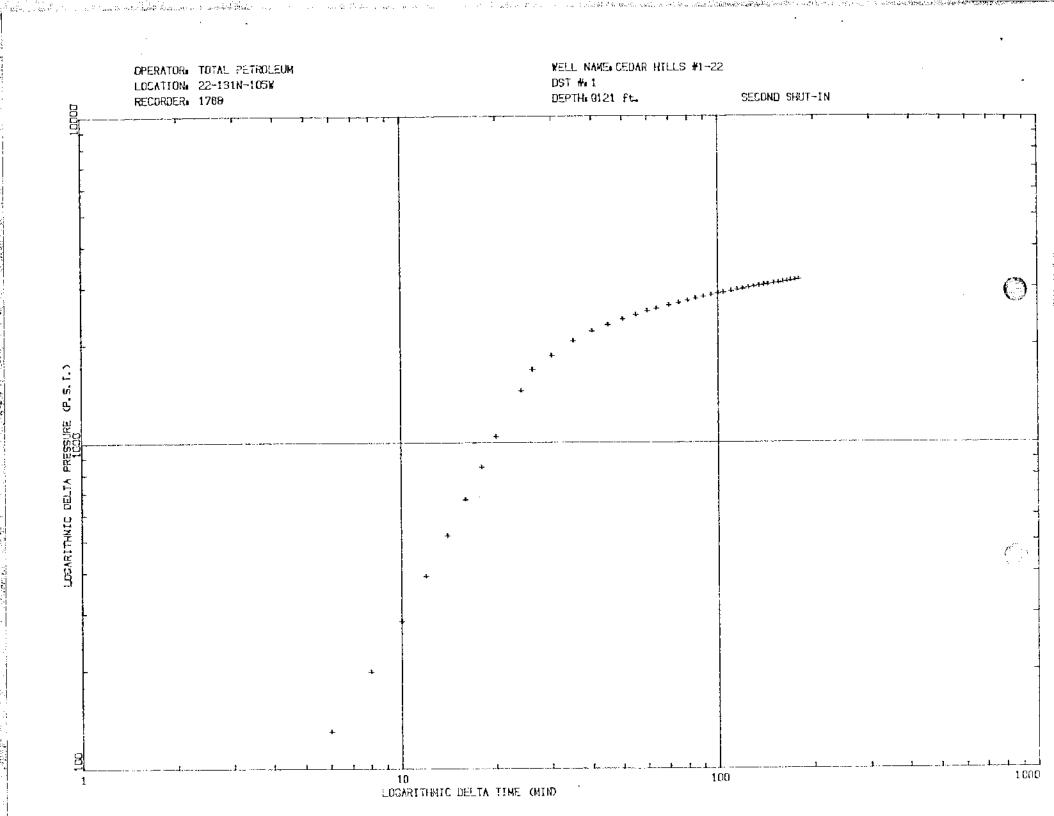
1.576

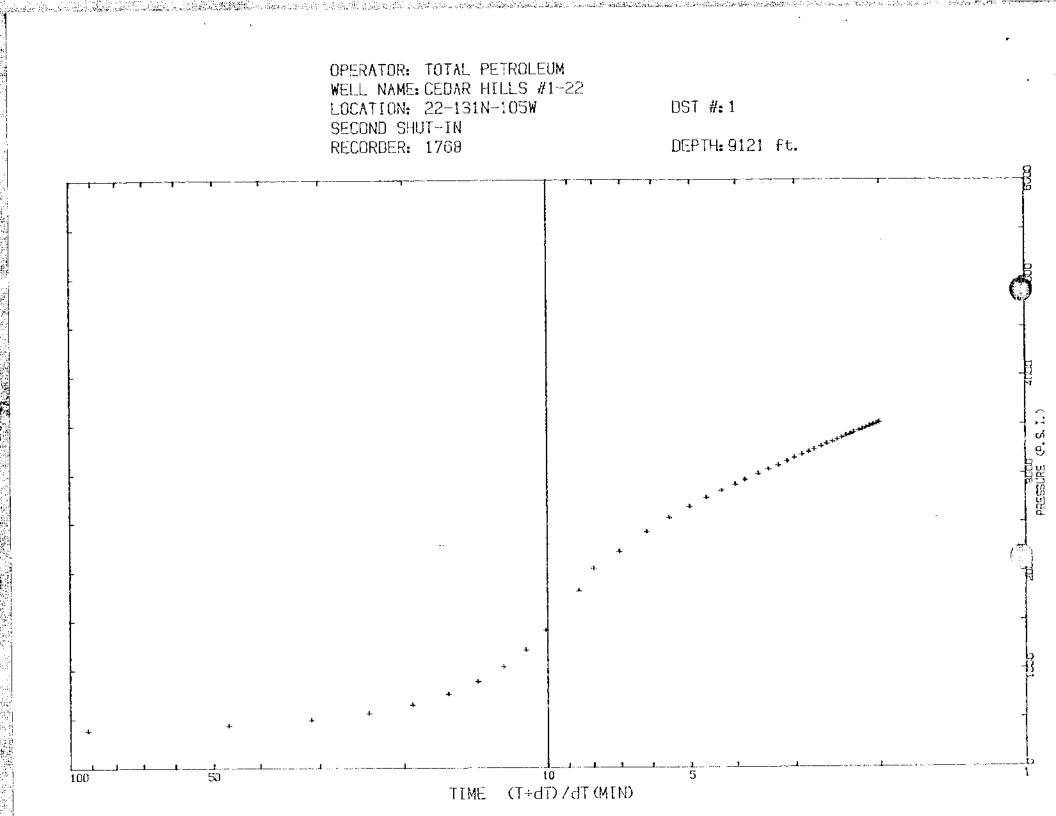
	ODAR HILLS \$1-22	
	9321 ~ 9388ft.	
ECORDER NUMBE	R   1738	
9299.00ft,	LOCATION : INSIDE CAPACITY : 10000.00	psi PRES
		A)Initial Hydro : 5 B)Ist Flow Start: 5 D)Ist Flow End : 7 D)END Ist Shutin: 4 E)2nd Flow Start: 7 F)2nd Flow End : 3 G)END 2nd Shutin: 4 H)3rd Flow Start: 3 I)3rd Flow End : 4 Q)Final Hydro. : 5
		TEST TIMES(M 1st FLOW 1 SHUTIN: 2nd FLOW : SHUTIN: 3nd FLOW ;

No	ble			1211			4 (8)	
Contractor <u>NO</u> Rig No. <u>N-</u>			Top Choke Bottom Choke_	- A 2 4 11	···• <b>•</b> ····•	Flow No. 1 Shut-in No. 1	59, 🝧	<u> </u>
Spot			Size Hole	7 7/8"		Flow No. 2	1782	ಸದಲ್ಲಿ
Sec 22			Size Rat Hole			Shut-in No 2	180,2	N. Dax Par
Twp. 13			Size & Wt, D. P	. <u>4⊰</u> ″ XH	16.60#	Flow No. 3	180 🗸	Survey
Rng. 10			Size Wt. Pipe			Shut-in No. 3	`	KUG ME
	!dcat		l. D. of D. C	705 5+	" <u>H-</u> 90	-	_	
Sound	wman rth Dakota		Length of D. C.	9205 f		Bottom	218 <sup>0</sup> F	$\mathcal{V}$
0.0.0	42 ft.		Total Depth		206 ft.	Hole Temp Mua Weight	10.3#	
Elevation <u>29</u> Formation <u>Rec</u>	d River "A"		Interval Tested. Type of Test	Bottom		Gravity		
				Conven	tional	Viscosity	35	
							10.40	
			· · ·			Tool opened @	10:42	p.m.
						Outs	ice Red	order
· — · · • · · ·	••••		· · ·			PRD Make Kust	er K-3	<u></u>
					- · · · · ·	No20791_Cap	8650	@ 9162'
			133-1 C	200 87 90 D		Press		Corrected
			· /3	- <u>-</u>		Initial Hydrostat		4935
				AR 192 <b>5</b> -	-1	Final Hydrostatic Initial Flow	: K S	4888
· 1		1	je Kel	ili≇is≢ Saun An≣	2] 23	Final Initial Flow	_	
· ·	- А 			OIL & SAS	A.	Initial Shut-In	D	3843
	$/$ $n^{1}$	· · · · ·		M308	<b>Y</b>	Second Initial FI	ow E	-238
	1.7	-6		10, 10, 10		Second Final Flo		357
	$f \in \mathbb{N}_{+}$ , where		· /			Second Shutlin	G	3496
/	. !	7 - 1 -	1 i V.			Third Initial Flow Third Final Flow		450 521
	1 		• • <b>•</b> • • • •			Third Shuton		<u> </u>
		e statu	and he	N. N				
- F	BCE F	· ·	·	<u>k</u> ,				
·		· · · ·	<u>⊥</u>					
						L a Di	ckinsor	n. ND
								urckhard
						Witnessed By	F. Scot	tt
			<u> </u>			·		
						verse circula		
Did Well Flow -		011 <u>No</u> w	Vater <u>NO</u>	R	an 5 gal.	ammonia and 5	gal.	innibito
RECOVERY IN		260 f+ '	Total Recov	(0.20)	=	10.50 Bb]s		
			Highly gas-			5.82 Bbls		
			Salt water			4.68 Bbls		
Blow Descr	iption:			<b>n</b> .	, . <u>-</u>		<u>.</u>	
15						increasing t	:o 2" in	n one
	ľ	nute and	d remaining	, inroug	nout the T	IUW.		
2n	d Flow: T	ool opene	ed with a 🍇	≨" under	water blow	increasing t	:o 3 ps-	i in 10
211	n	ninutes an	nd remainin	ng throu	ghout the	flow, (gas t	o surfa	ace 55
			nto the fin			_		
-		• •		<b>. .</b> .	<b>E</b> 200000	ئ		+~ 1
3r	d Flow: T	ool opene	ed with gas	s to sur	tace immed doomooring	liately, incre	asing : in 170	to 1 psi N minuto
			(U) in 30 mi ning throug			i to a 7" blov	a (N ±∕(	J II. LITUCE
	c	ana remain		gnout th				
Commonter	The test :	results i	ndicate a m	mechanic	ally succe	essful test.	The fl	ow and
LENGUR HELL N.		inves suc	gest low pe	ermeabil	ity within	the zone te	sted.	The
	snut-in cu		U 1 1 1 1		¥			
Y-230	initial an	nd final	shut-in cui	rves wer	re incremen	nted and plot e to insuffic	ted, bu	t no



	OPERATOR: TOTAL PETROLEUM WELL NAME:CEDAR HILLS #1-22 LOCATION: 22-131N-105W FIRST SHUT-IN	DST #: 1	
	RECORDER: 1768	DEPTH: 9121 ft.	
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		+	
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Payer 1 Recorder Number: 1768

Recorder Depth: 9121 ft.

Location: 22-131N-105W Test Type: BOTTOM HOLE CONVENTIONAL Formation: RED RIVER A

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TIME-PRESSURE LISTING

(CINE SETROLEUM T#: 1 AR HILLS #1-22

9152 - 9206ft.

CHART LABEL COMMENTS A INITIAL HYDROSTATIC	TIME MIN, 0,00	DELTA P psi	PRESSURI psi 4925.0	E (T+dt)/dt Abgcissa	
B START OF 1st FLOW	0.00		85.0		
ist FLOW PERIOD C END OF ist FLOW	$1.00 \\ 2.00 \\ 4.00$	30.0 53.0 73.0			
1st SHUTIN PERIOD D END OF 1st SHUTIN		0.0 107.0 267.0 567.0 1322.0 2122.0 2787.0 3180.0 3450.0 3525.0 3525.0 3622.0 3680.0 3680.0 3680.0 3705.0	158.0 265.0 425.0 725.0 1480.0 2280.0 2945.0 3503.0 3608.0 3608.0 3738.0 3780.0 3780.0 3615.0 3838.0 3843.0	0.0000 3.0000 2.0000 1.6667 1.5000 1.4000 1.2857 1.2000 1.1600 1.1333 1.1143 1.1000 1.0889 1.0800 1.0800 1.0741 1.0678	
E START OF 2nd FLOW	0.00		218.0		
2nd FLOW PERIOD	$\begin{array}{c} 10.00\\ 20.00\\ 30.00\\ 40.00\\ 50.00\\ 60.00\\ 70.00\\ 80.00\\ 90.00\\ 100.00\\ 100.00\\ 120.00\end{array}$	20,0 5.0 7.0 27.0 25.0 45.0 45.0 50.0 80.0 85.0 90.0	198.0 213.0 245.0 245.0 243.0 263.0 263.0 268.0 298.0 303.0 308.0		

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CEDAR HILLS #1-22 9152 - 9206Pt,

Location: 22-131N-105W Test Type: BOTTOM HOLE CONVENTIONAL Formation: RED RIVER A

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Recorder Number: 1768 Recorder Depth: 9121 ft.

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### TIME-PRESSURE LISTING

CHART Label comments	TIME MIN.	DELTA P psi	PRESSURE (T+d+)/d+ psi ABSCISSA	PRESSURE SQUARED psi^2/10^6
	130.00 140.00 150.00 160.00 170.00	100,0 112,0 125,0 130,0 135,0	318,0 330,0 343,0 348,0 353,0	
F END OF 2nd FLOW	178.00	142,0	360,0	
2nd SHUTIN PERIOD	0.00 2.00 4.00 4.00 6.00 10.00 12.00 14.00 14.00 24.00 24.00 24.00 35.00 40.00 55.00 45.00 55.00 60.00 55.00 60.00 75.00 85.00 95.00 10.00	0, 0 23, 0 73, 0 130, 0 198, 0 293, 0 518, 0 548, 0 1043, 0 1440, 0 1670, 0 1643, 0 2043, 0 2188, 0 2188, 0 2298, 0 2465, 0 2465, 0 2465, 0 2465, 0 2578, 0 2465, 0 2578, 0 2685, 0 2725, 0 2685, 0 2725, 0 28833, 0 2885, 0 2915, 0 2 915, 0	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	
	115,00 120,00	2940.0 2963.0	3300.0 2.5826 3323.0 2.5167	

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TAL PETROLEUM CEDAR HILLS \$1-22 9152 - 9206ft.

Location: 22-131N-105W Test Type: BOTTOM HOLE CONVENTIONAL Formation: RED RIVER A

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Recorder Number: 1768

Recorder Depth: 9121 ft.

#### TIME-PRESSURE LISTING

CHART LABEL COMMENTS	TIME MIN,	DELTA P psi	PRESSURI Psi	E (T+dt)/dt ABSCISSA	PRESSURE SQUARED psi^2/10^6
	125.00 130.00 135.00 140.00 144.00 150.00 155.00 140.00 145.00 145.00 120.00	2993.0 3003.0 3023.0 3040.0 3055.0 3075.0 3088.0 3105.0 3120.0 3133.0	3343.0 3363.0 3400.0 3415.0 3435.0 3448.0 3465.0 3480.0 3480.0 3480.0 3493.0	2.4560 2.4000 2.3491 2.3000 2.2639 2.2133 2.1742 2.1375 2.1030 2.0706 2.0400	
G END OF 2nd SHUTIN	175,00 180,00	3145.0 3160.0	3505.0 3520.0	2.0111	
H START OF 3rd FLOW	0,00		488.0		
3rd FLOW PERIOD	$\begin{array}{c} 11.00\\ 20.00\\ 30.00\\ 40.00\\ 51.00\\ 60.00\\ 70.00\\ 90.00\\ 91.00\\ 100.00\\ 120.00\\ 120.00\\ 131.00\\ 131.00\\ 130.00\\ 130.00\\ 130.00\\ 131.00\\ 130.00\\ 100.00\\ 100.00\\ 100.00\\ 100.00\\ 100.00\\ 100.00\\ 100.00\\ 100.00\\ 100.00\\ $	53.0 45.0 38.0 33.0 29.0 20.0 10.0 5.0 10.0 12.0 22.0 27.0	390,0 388.0 408.0 420.0 435.0 435.0 450.0 455.0 455.0 468.0 428.0 488.0 493.0 493.0 500.0 510.0 515.0		
I END OF 3rd FLOW	180.00	35.0	523.0		
J END OF 3rd SHUTIN	-1.00		1.0		
Q FINAL HYDROSTATIC	0.00		4915.0		

\* VALUES USED FOR EXTRAPOLATIONS

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TOTAL PETROLEUM TH: 1 CEDAR MILLS #1-22 9152 - 9204ft

Location: SEC. 22 T131N R105W Test Type: BDTTOM HOLE CONVENTIONAL Formation: RED RIVER "A" Recorder Number: 1768 Recorder Depth: 9121

### SAMPLE DATA

SAMPLE CHAMBER: \*\*\*\*

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新生产的 计表示 法问题,这次的时候,如此这些"这些资源"的"中国的"的时候,这些人的问题。"这个时间的","",""这些最高级的最高级的"有限"的最高级最高级的"高级"。 1995年,1996年,1996年,1996年,1996年,1996年,1996年,1997年,1997年,1997年,1997年,1998年,1998年,1998年,1998年,1998年,1998年,1998年,199

Capacity of sample chamber 2500 cc Volume of sample..... 2100 cc Pressure in sampler..... 120 psig Where sampler was drained... on location

Sampler contained: Oil 500 cc 41 0 60 Degrees F Water 1600 cc Gas .15 cu-ft GOR 48

RESISTIVITY DATA: \*\*\*\*\*\*\*\*

 Top.....
 41 API @ 62 F

 Middle....
 30 000 PPM NACL

 Bottom....
 35 000 PPM NACL

 Sampler....
 55 000 PPM NACL

 Mud pit....
 200 000 PPM NACL

 Make-up Water...
 200 000 PPM NACL

**38**2

194.00 946.5

S. Million & Million

10. <sub>10</sub> -

# O LYNES INC.

DMR-312 DIGITAL MEMORY RECORDER NO. 1768 CAP 10000 AT 9121 ft.

-	DIGITAL MEMORY RECORDER		
OPERATOR Total Petrole	WELL NAME	Cedar Hills ∦1-22	T:OKET NO. 20792 - DST NO. 1
22:29:00 7 <sup></sup> (95)000 4925.00 4925.00 4925.00 4925.00 4925.00	23:41:00 T 203.6.2 2847.50 3852.50 3857.50 8857.50 End 1st Shutin 43922.50	ებ:53:00 7 207.5°5 267.500 263.000 262.500 267.500	233.000 320.000 332.500 233.500
4925.00 4925.00 Initial Hydro4925.00	Start 2nd Flow.217,500 182,500 187,500	267.500 260.000 ( 262.500	235,300 337,530 337,530
22:37:60 T 198,812 4945,00 4957,50 4957,50	20:49:00 T 203.687 225.080 217.500 217.500	31:61(03 7 203.185 260.003 262.500 262.500	342,500 '
4915.00 Start 1st Row 85.0000 115.000 197.500	242.500 242.503 207.503 197.500	262.500 268.500 265.200 265.200 262.500	342,500 345,300 ( 345,306) 347,500
22:45:30 T 199,8 15 End 1st Flow 197,500 207,500 265,300	23:57:20 T 204.407 197.500 205.000	01:09:00 7 208.875	82:21:36 T 213,607 347,500 347,500 347,500
283,000 395,000 425,000 545,000 725,000	202,500 202,500 205,300 207,500 207,500 207,500	279.000 267.500 270.000 270.000	347,500 347,500 347,500 347,500
22:53:00 T 201.4% 2480.00 2940.00 2200.00	00:05:00 T 305.042 212.500 217.500 217.500	01:17%200 T 208.625 . 277.500 270.800 277.500 277.500	350,000, 350,000, 350,000,
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3037,40 3275,00 3412,50 20:00:00 T 200,107 20:00:00 T 200,107	205.000 232.500 235.000 235.000 235.000 7 206.125	297.500 302.500 ; 01:33:30 T 209.187	357,500 357,500 End 2nd Flow (360,300) (02:45:00 T 211,312 (392,500)
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3707.53 3717.33 20:25:30 7 200.5.2 2737.50 2747.50 2747.50	245.000 242.500 30:37:30 T 237.002 257.530 267.530	9 812.503 2 81:49:00 7 209.750 312.500 9 812.500	1200.00
3757,50 5745,00 3775,00 3760,00 2737,50	255.000 275.000	9	1537,50
23:33:00 T 200.607 3332.50 3310.00 3815.00 3825.00	30:45:30 <sup>°</sup> T 307,43 262,50 263,90 263,90 266,53	- 01:57:00 T 210.000 322.500 325.000 325.500 322.500	
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C	) LYNES INC.	
DMB312 DIGITAL ME	EMORY RECORDER NO 1768 CAP AT 9121 ft.	
Dial Petroleum	WELL NAME Cedar Hills #1-22 TICKET NO. 20792 DST. NO 1	
65:17:60 T 911,562 04129:00 7	211.332       35:41:00 T 210.937       06:53:00 T 214.375 35:05:30 T 215.425         3252.55       3512.50       447.503       495.000         3257.50       3515.00       447.500       497.503         3257.50       3517.50       447.500       497.503         3257.30       457.500       497.503       497.503         3257.40       2517.50       447.500       497.503         3277.40       2517.50       447.500       497.500         3277.40       2517.50       452.500       497.500         3277.40       S200.40       452.500       497.500         3277.40       210.500       452.500       497.500         3287.40       210.500       452.500       497.500         3282.50       412.500       452.500       497.500         3282.50       412.500       67:01:00 T 214.625 08:13:00 T 215.607       215.607         210.537       35:49:00 T 210.637       67:01:00 T 214.625 08:13:00 T 215.607       215.600         2235.00       407.500       452.500       497.500       215.600	
2370,00° 2370,00°	9252.80         9512.50         447.500         1.2.103           3457.50         947.500         457.503           3457.50         947.500         497.503           3257.50         947.500         497.503           3257.50         947.500         497.503           3257.30         1517.50         497.503           3257.30         1517.50         497.500           3257.30         1520.00         497.500           3257.30         1520.00         497.500           3277.30         5117.500         452.500           3277.30         1452.500         497.500           3275.30         415.000         452.500           3283.30         412.500         452.500	
2435.00 <sup>-</sup>	8265.00 2517.50 457.000 457.50 comp. to red 2nd Shutte -3520.00 457.50	
是本ら気。0回 空体分野。00	3272.00 End 2nd Flow - 427.500 452.500 497.500 3877.00 Start 3rd Flow - 427.500 452.500 452.500 497.500	
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63:35:00 T 211.635 04:37:00 T	- 210,937 05:49:00 T 210,637 67:01:00 T 414.040 69:17:00 T 497,500 - 497,500 - 497,500 - 497,500 - 452,500	
2595,00 2617,50	3261.50       412.00       67.01:00       214.625.06:13:00       215.607         210.537       35:49:00       510.637       67:01:00       452.500       497.500         2255.00       407.500       455.000       500.000       500.000         3262.50       407.500       455.000       500.000         3262.50       405.000       455.000       500.000         3262.50       405.000       455.000       502.500         3312.50       402.500       455.000       502.500         3312.50       402.500       455.000       502.500         3312.50       402.000       455.000       502.500         3322.60       400.000       502.500       502.500         3222.60       405.57:00       211.437       57.600       502.500         3220.00       593.00       593.000       502.500       502.500	
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2715.00 		
- 83:83:08 T 211,562° 04:45:00 7 8750.00	210.987     05:57:50     7     21:4:57     07:09:00     7     21:4:57     50:2.5:00       3320.00     393.000     455.000     502.5:00       3327.500     395.000     457.500     507.500       3327.500     3327.500     507.500     507.500	
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- 2762.50 2797.50	- 9921-1081	
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2343.00) 2343.00)	3355.00. 332.500. 332.500 T 214.907 38:25:00 T 215.575 T 210 917 96:05:00 T 212.312. 07:17:00 T 214.907 38:25:00 T 215.575	
그는 다신 김 것 같아.	T 210,907, 06105109 1 212,312 - 0,011,000 - 260,000 - 510,000 3362,00 - 385,000 - 462,500 - 512,500 3365,00 - 390,000 - 462,500 - 512,500 2370,00 - 390,000 - 465,000 - 515,000	
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3160.00	- 347년, 3억 (	3
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3200.00 94:21:30 T 211,362 35:33:30	T 210,937; 06:45:30 T 214,052 07:57:00 T 215,562 09:39:00 T 209.33; T 210,937; 06:45:30 T 214,052 07:57:00 T 215,562 09:39:00 T 209.34	
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#### ○ IYNES INC. f.

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	9152 - 9206ft,	Poyer 1
RESSURE RECORDER NUMBER		
DEPTH : 9121.00ft. TYPE : DMR	LOCATION : INSIDE CAPACITY : 10000.00psi	PRESSURF psi A)Initial Hydro : 4925 B)1st Flow Start: 85 C)1st Flow End : 158 D)END 1st Shutin: 3863 E)2nd Flow End : 360 G)END 2nd Shutin: 3520 H)3rd Flow End : 3520 H)3rd Flow End : 523 G)Final Hydro. : 4915
PRESSURE RECORDER NUMBE	R : 24748	TEST TIMES(MIN) 1st FLOW : SHUTIN: 5 2nd FLOW : 17 SHUTIN: 18 3rd FLOW : 18
DEPTH : 9200.00ft. TYPE : K-3		PRESSUF psi A)Initial Hydro : 501( B)Ist Flow Start: 680 C)Ist Flow End : 141 D)END Ist Shutin: 3873 E)2nd Flow Start: 239 F)2nd Flow Start: 239 F)2nd Flow End : 340 G)END 2nd Shutin: 3530 H)3rd Flow End : 3530 D)Final Hydro. : 4933

FORM 4		Ň	Arth Dakot a S	state Industr	ial commissio	NE / SALE	Well File
			Oil a	ind Gas Divis	sion BEC	1985 <b>11</b>	
			T BOULEVARD		- \S_N. D. 011	& GAS 3	
		SUNE	ORY NOTICE	S AND REP	OR LO STAL	IDAS OF	
1. Notice a 2. Notice a	f Intention to Dr f Intention to Ch	rill or Redrill hange Plans			7. Report of G 8. Report of R		air
3. Notice o	f Intention to PL	ull Casing bandon Well			9. Supplement 10. Well Potenti	ary History	
5, Report d	of Water Shut-Of	· · · · · · · · · · · · · · · · · · ·			<ol> <li>Drilling Prog</li> </ol>	inosis	· ·· · · · · · · · · · · · · · · · · ·
	Shooting of At	cidizing			12.		
		CEDAR HILLS			•	Ma	rch 7
		is located					
		Township					
		Field		<u>r</u>	_ Pool. The elev	vation of the _	<u></u>
··· <u>··· 27</u>	27.0	feet above sea le	evel.				
Noble	Drilling Co		(DET	AILS OF WO	RK)		
	(State name	es of, and expected (	(DET depth of object: weights, cemen	AILS OF WO ve sand; show iting points, ar	RK)	d lengths of pro	
	(State name. Spudded we	es of, and expected ( indicate mud	(DET depth of objecti weights, cemen .m. 2/28/83	AILS OF WO ve sand: show iting points, ar	RK) sizes, weight, ar nd all other deta	d lengths of pro	oposed casing,
3/1/83:	(State name Spudded we Ran 48 jts Sumped plu	es of, and expected of indicate muc all at 9:00 p a. 8-5/8" 24#; ig at 5:30 a.;	(DET depth of object; weights, cemen .m. 2/28/83 , J-55. Set n.	CSg, at	RK) sizes, weight, an nd all other deta 20181 K.B.	d lengths of pro ils of work) Good retu	prosed casing,
3/1/83:	(State name Spudded we Ran 48 jts Bumped plu Cement: L (1.84 ft	es of, and expected of indicate mud all at 9:00 p a. 8-5/8" 24# ig at 5:30 a.f lead off with t <sup>3</sup> /sk, 12.9 P3	(DET depth of object: weights, cemen .m. 2/28/83 , J-55. Set n. 660 sx HAL PG).	CSg. at 100 Control Co	RK) sizes, weight, an id all other deta 2018: K.B. eight w/2%	d lengths of pro ils of work) Good retu CaCL + 눈#/	prosed casing, The sk flocel
3/1/83:	(State name Spudded we Ran 48 jts Bumped plu Cement: L (1.84 ft	es of, and expected of indicate muc all at 9:00 p a. 8-5/8" 24#, ig at 5:30 a.t -gad off with	(DET depth of object: weights, cemen .m. 2/28/83 , J-55. Set n. 660 sx HAL PG).	CSg. at 100 Control Co	RK) sizes, weight, an id all other deta 2018: K.B. eight w/2%	d lengths of pro ils of work) Good retu CaCL + 눈#/	prosed casing, The sk flocel
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3/1/83:	(State name Spudded we Ran 48 jts Bumped plu Cement: L (1.84 ft	es of, and expected of indicate mud all at 9:00 p a. 8-5/8" 24# ig at 5:30 a.f lead off with t <sup>3</sup> /sk, 12.9 P3	(DET depth of object: weights, cemen .m. 2/28/83 , J-55. Set n. 660 sx HAL PG).	CSg. at 100 Control Co	RK) sizes, weight, an id all other deta 2018: K.B. eight w/2%	d lengths of pro ils of work) Good retu CaCL + 눈#/	pposed casing, This sk flocel
3/1/83:	(State name Spudded we Ran 48 jts Bumped plu Cement: L (1.84 ft Tailed in	es of, and expected of indicate mud all at 9:00 p a. 8-5/8" 24#, ig at 5:30 a.f Lead off with t <sup>3</sup> /sk, 12.9 P3 w/200 sx CL '	(DET depth of object: weights, cemen .m. 2/28/83 , J-55. Set n. 660 sx HAL PG).	CSg. at 100 Control Co	RK) sizes, weight, an id all other deta 2018 <sup>1</sup> K.B. eight w/2% k flocele (	d lengths of pro lls of work) Good retu CaCL + を#/ 1.13 ft <sup>3</sup> /s	pposed casing, rns. sk flocel k, 15.8 Pi
3/1/85: 3/2/85:	(State name Spudded we Ran 48 jts Bumped plu Cement: L (1.84 ft Tailed in <u>Total Pet</u> PO Box 50	es of, and expected of indicate mud all at 9:00 p. a. 8-5/8" 24# ig at 5:30 a. -ead off with t <sup>3</sup> /sk, 12.9 P3 w/200 sx CL ' w/200 sx CL '	(DET depth of object: weights, cemen .m. 2/28/83 , J-55. Set n. 660 sx HAL PG).	AILS OF WO ve sand; show thing points, an csg. at CC Lightwo CL + 2#/si	RK) sizes, weight, an id all other deta 2018 <sup>1</sup> K.B. eight w/2% k flocele (	d lengths of pro ils of work) Good retu CaCL + 눈#/	pposed casing, rns. sk flocel k, 15.8 Pi
3/1/85: 3/2/85: Company	(State name Spudded we Ran 48 jts Bumped plu Cement: L (1.84 ft Tailed in	es of, and expected of indicate mud all at 9:00 p. a. 8-5/8" 24# ig at 5:30 a. -ead off with t <sup>3</sup> /sk, 12.9 P3 w/200 sx CL ' w/200 sx CL '	(DET depth of object: weights, cemen .m. 2/28/83 , J-55. Set n. 660 sx HAL PG).	AlLS OF WO ve sand: show thing points, an CSg. at CO Lightwo CL + 2#/si Approve	RK) sizes, weight, an id all other deta 2018 <sup>1</sup> K.B. eight w/2% k flocele (	d lengths of pro lls of work) Good retu CaCL + を考/ 1.15 ft <sup>3</sup> /s Do not write in	pposed casing, rns. sk flocel k, 15.8 Pi
3/1/85: 3/2/85: Company Address	(State name Spudded we Ran 48 jts Bumped plu Cement: L (1.84 ft Tailed in <u>Total Pet</u> PO Box 50 <u>Denver, C</u> <u>Daniel J</u>	es of, and expected of indicate mud all at 9:00 p. a. 8-5/8" 24#, ig at 5:30 a. .ead off with to /sk, 12.9 P3 w/200 sx CL ' w/200 sx CL ' co 80201 wetri	(DET depth of object: weights, cemen .m. 2/28/83 , J-55. Set n. 660 sx HAL PG). 'G" w/2% Ca	AILS OF WO ve sand; show thing points, an CSg. at CC Lightwo CL + 2#/si CL + 2#/si Approve By	RK) sizes, weight, an id all other deta 2018 <sup>1</sup> K.B. eight w/2% k flocele (	d lengths of pro lls of work) Good retu CaCL + を考/ 1.15 ft <sup>3</sup> /s Do not write in	pposed casing, rns. sk flocel k, 15.8 Pi
3/1/85: 3/2/85: Company Address By	(State name Spudded we Ran 48 jts Bumped plu Cement: L (1.84 ft Tailed in <u>Total Pet</u> PO Box 50 <u>Denver, C</u> <u>Daniel J</u>	es of, and expected of indicate mud all at 9:00 p. a. 8-5/8" 24#; ig at 5:30 a. Lead off with to /sk, 12.9 P3 w/200 sx CL ' w/200 sx CL '	(DET depth of object: weights, cemen .m. 2/28/83 , J-55. Set n. 660 sx HAL PG). 'G" w/2% Ca	AlLS OF WO ve sand: show thing points, an CSg. at CO Lightwo CL + 2#/si Approve	RK) sizes, weight, an id all other deta 2018 <sup>1</sup> K.B. eight w/2% k flocele ( MA ed	d lengths of pro lls of work) Good retu CaCL + を考/ 1.15 ft <sup>3</sup> /s Do not write in	pposed casing, rns. sk flocel k, 15.8 Pi



IL AND GAS DIVISIO

WESLEY D. NORTON Chief Enforcement Officer

F. E. WILBORN Deputy Enforcement Officer

CLARENCE G. CARLSON Geologist

Second and filled house addressing and an interior of the

CHARLES KOCH Engineering Dept.

Field Supervisor

KEN KALLESTAD Reclamation Sup.

March 11, 1985

Laurna Miller Total Petroleum, Inc. P.O. Box 500 Denver, CO 80201 RE: Confidential Well Status Cedar Hills 1-22 NE NW Sec.22-131N-105W, Bowman Co Permit No. 11409

Dear Mr. Miller:

Your request for confidential status of all information furnished to the Enforcement Officer, or his representatives, is hereby granted. Such information shall remain confidential for six months commencing on the date such information, except production data, is required by statute and rule to be filed.

Confidential status notwithstanding, the Enforcement Officer and his representatives shall have access to all well records wherever located. Your company personnel, or any person performing work for your company, shall permit the Enforcement Officer and his representatives to come upon any lease, property, well, or drilling rig operated or controlled by them, complying with all safety rules, and to inspect the records and operation of such wells, and to have access at all times to any and all records of wells.

The Commission's field personnel periodically inspect producing and drilling wells. Any information regarding such wells shall be made available to them at any time upon request. The information so obtained by the field personnel shall be maintained in strict confidence, and shall be available only to the Commission, and its staff.

Sincerely yours,

ullow mj

F. E. Wilborn Deputy Enforcement Officer

FEW:10

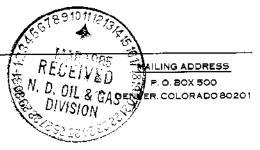
900 EAST BOULEVARD, BISMARCK, NORTH DAKOTA 58505 701-224-2969





TOTAL Total Petroleum, Inc.

ONE DENVER PLACE - SUITE 3100 999 18TH STREET DENVER, COLORADO TELEPHONE 303 291-2000



March /, 1985

North Dakota State Industrial Commission Oil and Gas Division 900 East Boulevard Bismarck, North Dakota 58505

> Re: Cedar Hills 1-22 Red River Pool Bowman County, North Dakota NE NW Sec. 22, T131N, R105W Permit No. 11409

Gentlemen:

In connection with the drilling of the above-referenced wildcat well, Total Petroleum Inc. requests that any and all information concerning this well be held tight.

Should you have any questions concerning this matter, please do not hesitate to contact this office.

Very truly yours Kulu

Vaurna Miller ( Production Department

and the second second

LM:1m





ONE DENVER PLACE - SUITE 3100 999 18TH STREET DENVER COLORADO

( )

TELEPHONE 303 291-2000

MAILING ADDRESS P. O. BOX 500 DENVER. COLORADO 80201

February 15, 1985



North Eakota Industrial Commission Oil & Gas Division 900 East Blvd. Bismarck, ND 58505

Attn: Mr. Jack Wilborn Deputy Enforcement Officer

> Re: Application to Drill Cedar Hills #1-22 NE NW Sec. 22, T131N, R105W Bowman County, ND

Dear Sir:

The captioned application to drill was mailed to your office on February 11, 1985. It included a copy of the surveyor's telecopied plat. Enclosed for your file, please find four direct and more legible copies of that same plat. Your assistance in gaining approval for this well is sincerely appreciated.

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Yours truly,

Daniel J/ Pétri Sr. Petroleum Engineer

DJP:cll

Encl.

February 15, 1985

Daniel J. Petro Total Petroleura, Inc. P.O. Box 500, Ste. 3100 Denver, CO 80201

Dear Mr. Petri:

Check No. 736422 in the amount of \$100.00 was received.

Enclosed is Permit No. 11409 to drill the Cedar Hills #1-22 well, located in the Bowman County, North Dakota.

It is requested that notification be given, immediately upon the spudding of the well. This information shall be relayed to the Oil and Gas Division, in Bismarck, via telephone. The following information should be included: well name, legal location, Permit Number, drilling contractor, company representative, and date and time of spudding. Office hours are 3:00 a.m. to 12:00 noon, and 1:00 p.m. to 5:00 p.m. Central Time. Our telephone number is Area Code 701, 224-2969.

Thank you for your cooperation.

Sincerely yours,

- allen

F. E. Wilborn Deputy Enforcement Officer

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FORM 4	Oil a	State Industrial Commission and Gas Division	Well File No.
	SUNDRY NOTICE	S AND REPORTS ON WELLS	
<ol> <li>Notice of Intention to Char</li> <li>Notice of Intention to Pull</li> <li>Notice of Intention to Abar</li> <li>Report of Water Shut-Off</li> </ol>	or Redrill X nge Plans Casing Indon Well	8. Report of Redrilling or Rep 9. Supplementary History 10. Well Potential Test 11. Drilling Prognosis	Dair
NAME OF LEASE Ced	ar Hills	Date	February 11 ,19
		ft. from (N) <b>(5X</b> line and1650	
of Section		Range <u>105%</u> in <u>3</u> 01	vīna r.
		Pool. The elevation of the	
is _ 2926.3			
	indicate mud weights, cemer	nting points, and all other details of work)	
<ol> <li>Pressure test c. Red River forma</li> <li>Run DLL/GR, BHC</li> <li>If productive,</li> </ol>	ace casing & cement to asing, BOP & drill 7- tion. Run DST's as no Sonic and FDC/CNL log	7/8" hole to 10,050' or suffic ecessary. g. asing will be run and cemented	
<ol> <li>Run 8-5/8" surf.</li> <li>Pressure test c. Red River forma</li> <li>Run DLL/GR, BHC</li> <li>If productive, cement to cover</li> </ol>	ace casing & cement to asing, BOP & drill 7-7 tion. Run DST's as no Sonic and FDC/CNL log 5½", 17#, 20# & 23# co	7/8" hole to 10,050' or suffic acessary. g. asing will be run and cemented a formation.	
<ol> <li>Run 8-5/8" surf.</li> <li>Pressure test c. Red River forma</li> <li>Run DLL/GR, BHC</li> <li>If productive, cement to cover</li> </ol> Attachment #1 - loc	ace casing & cement to asing, BOP & drill 7- tion. Run DST's as no Sonic and FDC/CNL log 5½", 17#, 20# & 23# ca the top of the Dakota	7/8" hole to 10,050' or suffic ecessary. 3. asing will be run and cemented a formation.	with sufficient
<ol> <li>Run 8-5/8" surf.</li> <li>Pressure test c. Red River forma</li> <li>Run DLL/GR, BHC</li> <li>If productive, cement to cover</li> <li>Attachment #1 - loc</li> <li>Company <u>Total Petr</u></li> <li>Address <u>Suite 3100</u></li> <li>By <u>Manuel</u></li> <li>By <u>Daniel J. Petri</u></li> </ol>	ace casing & cement to asing, BOP & drill 7- tion. Run DST's as no Sonic and FDC/CNL log 5½", 17#, 20# & 23# co the top of the Dakoto ation & elevation play	7/8" hole to 10,050' or suffic ecessary. 3. asing will be run and cemented a formation.	with sufficient

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QUER TOTAL PETRULEUM BROSZ ENGINEERING CEDAR HULL-1-1-32-12-50 P.O. BOX 357 Bowmen Lu. 522Z EIUS W. BOWMAN, NORTH DAKOTA 58623 LOCAT (701) 523-3340 1-11-85 pse MIE DELen 27 NUC 14 115 22 22 23 يع Fast Huus 1-22 ELEV, 2926.3 22 Scale 1 = 1000 - STONE FNO 21 23 ZZ 23 27 27 Ζ6 I, Danny S. Brosz, Registered Land Surveyor in the State of North Dakota, do hereby certify that the above survey was completed by me or under my direct Supervision and the location and Vinterspiritor rue and correc as shown.  $\Box$ LAND. N SURVEYOR L.S. 2679 HDAN Danny Brosz #2679 s.

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FORM 1	
	North Dakota State Industrial Commission Oil and Gas Division
900 E	AST BOULEVARD - BISMARCK, NORTH DAKOTA - 58505
	APPLICATION FOR PERMIT TO DRILL
(File original and 3 copies with the Oil & G	as Division, 900 East Boulevard, Bismarck, North Dakota 58505
Type of work: Drill new well $\underline{X}$ , Ree	enter old well, Drill directional well
Type of well: Oii, gas, dis	posal, injection, others
	eum, Inc.
ADDRESS: Suite 3100, P.O. Box	
NAME AND ADDRESS OF SURFACE OWN	ER OR TENNANT: Robert, Willard & Dennis Swanke, Rhame, ND
WELL NAME AND NO.: <u>Cedar Hill</u>	
LOCATION OF WELL: QtrQtr., <u>NE_NN</u>	Sec., <u>22</u> Twp., <u>131N</u> Rge., <u>105W</u> COUNTY: Bowman
Surface location is <u>1250</u> feet from (N	N) ${}$ section line and <u>1650</u> feet and from ${}$ (W) section line.
	rom (N) (S) section line and <u>NA</u> feet and from (E) (W) section line.
	spacing (driffing) unit line990ft.
	permitted or completed well in the same pool is $10,741$ ft.
	Description of spacing unit isNW_Section 22
ELEVATION: 2926.3 (GROUND)	(GRADED) ESTIMATED TOTAL DEPTH: 10,050
ROJECTED HORIZON (Pool Name):Re	d. RiverAPPROXIMATE DATE WORK WILL START:March, 1985
REMARKS: Spacing unit will be	N/2 Sec. 22 if 320 acres are found to be appropriate.

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; hereby swear or affirm that the information	herein provided	is true complete and	correct or determined	A
	ner provided	is made complete and	contect as determined.	trom ali available recor

<u>Af amet Jetre</u>	Sr. Petroleum Engineer Title	February 11, 1985
/		Date
STATE OF <u>CRAAD</u> SS		
On this 12th day of <u>Jebu</u>		ame personally appeared <u>Deutes</u>
and acknowledged that (s)he executed the same as hi	a dia mandri di seconda	a a me societed the foregoing astrona
annothisoged that (shie executed the same as hi	s/ner free act and deed.	_ ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` `
	Notary Public	Jurikuns)
_ · · · ·	My Commission expires	1-30-88
FOR STATE USE ONLY API NO. <u>33-011-00429</u>		
PERMIT NO. & WELL FILE NO409		
APPROVAL DATE FEB	1 5 1985 Not Se	
BY: _ Fellin		

### (SEE INSTRUCTIONS ON REVERSE SIDE)

FEB.11 185 11:37 TOTAL PETROLEUM BOWMAN N.D. P.01 WIN LUZAL مجمو*ل کنی ما در چو کو س*ر سر BROSZ ENGINEER ومستروجت 1250 FML K CEDAR HIL P.O. BOX 357 umen ho. 41.22 لمب يحدن امج B. BOWMAN, NORTH DAKOTA 58823 71311 LOČA (701) 523-3840 1-11-25 0=B 14 ALL 14 (n 15 Grand Hins 1-22 EFU, 2926,3 Scale 1 = 100 الج 25 Ζ4 **4**7 1, Danny S. Brosz, Registered Land Surveyor. in the State of North Dakota, do hereby certify that the above Survey was completed by me or under a direct supervision and the location and dimension frue and correct LAND SURVEYOR as shown. S. 2679 Danny Brosz S'.





TOTAL Total Petroleum, Inc.

and the second second

ONE DENVER PLACE - SUITE 3100 999 18TH STREET DENVER COLORADO TELEPHONE 303 291-2000

MAILING ADDRESS P. O. BOX 500 DENVER. COLORADO 80201

February 11, 1985



North Dakota Industrial Commission Oil & Gas Division 900 East Blvd. Bismarck, ND 58505

Attn: Mr. Jack Wilborn Deputy Enforcement Officer

> Re: Application to Drill Cedar Hills #1-22 NE NW Sec. 22, T131N, R105W Bowman County, ND

Dear Sir:

Please find enclosed, four copies of Form 1 Application to Drill, Form 4 Sundry Notice and location plat for the captioned well. This is a wildcat well located directly north of Skull Creek Field which is spaced on 320's. Your assistance in gaining approval for this well is sincerely appreciated.

Sincerely,

amer

Danie¥ J⁄. Petri Sr. Petroleum Engineer

DJP:cll

Encl.

Total Petroleum, Inc.         COMPANY:       Cedar Hills #1-22         MELL NAME:       Cedar Hills #1-22         LOCATION:       NE NW Sec.22-131N-105W, Bowman Co.         Permit Fee       X         Application to Drill       X         Organization Report       X         \$100,000 Bond       X         \$50,000 Sond       X         Certified Plat       X         Notice of Intention to Drill       X         Sundry Notice       X         Completion Report       X         Sundry Notice       X         Plugging Report       Anthorization to Transport Oil         DST Reports	DATE:	Febru	ary 15, 1985		FILE NO:	114
MELL NAME:     Cedar Hills #1-22       LOCATION:     NE NW Sec.22-131N-105W, Rowman Co.       Permit Fee     X       Application to Drill     X       Organization Feport     X       \$100,000 Bond     X       \$50,000 Bond     X       \$15,000 Bond     X       \$15,000 Bond     X       \$15,000 Bond     X       \$15,000 Bond     X       \$200,000 Bond     X       \$15,000 Bond     X       \$215,000 Bond     X       \$250,000 Bond     X    <	-	Total	Petroleum, Inc.		-	
LOCATION:       NE NN Sec.22-131N-105W, Rowman Co.         Permit Fee       x         Application to Drill       X         Organization Report       X         \$100,000 Bond       X         \$50,000 Bond       X         \$15,000 Bond       X         \$200,000 Bond       X         \$100 print       X         Study Wotice       X         Completion Report       X         Plugging Report       X         Anthorization to Transport Oil       X         DST Reports       X         Core Analysis Reports       X         Logs       11409       ISSUED: Pebru	-	Cedar	Hills #1-22			
X       X         Application to Drill       X         Organization Report       X         S100,000 Bond       X         S50,000 Sond       X         S15,000 Bond       X         Certified Plat       X         Notice of Intention to Drill       X         Sundry Notice       X         Completion Report       X         Plugging Report       Statement         Authorization to Transport Oil       Statement         DST Reports       Statement         Geological Reports       Statement         Logs       Statement         PERMIT NO.       11409	-	NE NW	Sec.22-131N-105W, Bowman	n Co.		
Application to Drill       X         Organization Report       X         S100,000 Bond       X         S50,000 Bond       X         S50,000 Bond       X         S15,000 Bond       X         S15,000 Bond       X         S15,000 Bond       X         S15,000 Bond       X         Certified Plat       X         Notice of Intention to Drill       X         Sundry Notice       X         Completion Report       X         Plugging Report       X         Authorization to Transport Oil       X         Off Reports       X         Geological Reports       X         Logs       X         PERMIT NO.       11409	-		x	<u> </u>		
Organization Report     X       \$100,000 Bond     X       \$50,000 Bond     X       \$50,000 Bond     X       \$15,000 Bond     X       Certified Plat     X       Notice of Intention to Drill     X       Sundry Notice     X       Completion Report     X       Plugging Report     X       Authorization to Transport Oil     X       OST Reports     X       Geological Reports     X       Logs     11409		-	Х			
S100,000 Bond     X       S50,000 Bond		-	X			
S50,000 Send	-	-	X			
\$15,000 Sond       X         Certified Plat       X         Notice of Intention to Drill       X         Sundry Notice       X         Completion Report       X         Plugging Report       Authorization to Transport Oil         DST Reports		-				
Certified Plat       X         Notice of Intention to Drill       X         Sundry Notice       X         Completion Report       X         Plugging Report       X         Authorization to Transport Oil       X         DST Reports       X         Geological Reports       X         Logs       11409         PERMIT NO.       11409		-				
Notice of Intention to Drill X Sundry Notice X Completion Report	Certified Plat	-	X			
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Completion Report	Sundry Notice	-	Х			
Authorization to Transport Oil DST Reports Geological Reports Core Analysis Reports Logs PERMIT NOI1409ISSUED: Februa	Completion Report	-				
DST Reports Geological Reports Core Analysis Reports Logs PERMIT NO. 11409 ISSUED: Febru	- Plugging Report					
Geological Reports Core Analysis Reports Logs PERMIT NO. 11409 ISSUED: Febru	Authorization to Tran	sport Oil	<u></u>			
Core Analysis Reports Logs PERMIT NOI1409IISSUED: Februa	DST Reports	-				
Logs PERMIT NOI1409ISSUED:_Febru	Geological Reports					
PERMIT NO. 11409 ISSUED: Febru	Core Analysis Reports					
PERMI NO	Logs			<u></u>		
	PERMIT NO.	11409			ISSUED: H	februa
			Inspector:			
Terrain: Tillable, Prairie, Badlands Type (Circle One)				ion is fir	st noticed	•
If Producer: Return check sheet promptly when reclamation is first noticed.		If no	o, please explain below.			
If Producer: Return check sheet promptly when reclamation is first noticed.	<u> </u>	· · · · · · · · · · · · · · · · · · ·				
<u>If Producer:</u> Return check sheet promptly when reclamation is first noticed. If Plugged and Abandoned: Is drill site acceptable for bond release? YesN			·····			
<u>If Producer:</u> Return check sheet promptly when reclamation is first noticed. If Plugged and Abandoned: Is drill site acceptable for bond release? YesN						
<u>If Producer:</u> Return check sheet promptly when reclamation is first noticed. If Plugged and Abandoned: Is drill site acceptable for bond release? YesN						

	<b>6</b> 3	CHECK SHEET		
DATE:	-	ary 15, 1985	FILE NO: 11409	
COMPANY:	Total	Petroleum, Inc.		
WELL NAME:	Cedar	Hills #1-22		
LOCATION:	NE NW	Sec.22-131N-105W, B	Well Jule to Bond Well Jule to Bond Jent Jetter war 87 Jent Jetter Jule 87 Belease H. 28 Jule	
Permit Fee		x		rlu 0' d
Application to Drill	-	X		1 Jun to Bon
Organization Report		X		Will Letter 87
\$100,000 Bond		X		lent e 128th
\$50,000 Bend	-			Paleare 4. C
\$15,000 Bond	-			He .
Certified Plat	-	Х		
Notice of Intention to Drill		Х	<u></u>	
Sundry Notice		<u> </u>	<u> </u>	
Completion Report				
Plugging Report		<u> </u>	<u> </u>	
Authorization to Trar	nsport Oil			
DST Reports		2- 24	<u>closed</u>	
Geological Reports		yes-en	<u>clase I</u>	
Core Analysis Reports	5	<u> </u>	<u>nelose</u> a	Bee'd
Logs		docn, DLL, w	) EL 4-248	5 - miss Jogs
PERMIT NO.	11409			ISSUED: February 15,
Inspection Date:		Inspector:		
Terrain: Tillable, H	Prairie, Ba	dlands Type (Circle	One)	
<u>If Producer:</u> Return	check shee	t promptly when real	amation is	first noticed.
If Plugged and Abando	oned: Isd Ifn	rill site acceptable o, please explain be	for bond r low.	elease? Yes <u>No</u>
<u> </u>				

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	6	CHECK SHEET		Node 57
DATE:	February	15, 1985		FILE NO: 11409
COMPANY: KK	Total Pet	roleum, Inc.		
WELL NAME:	Cedar Hil	ls #1-22	<u> </u>	
LOCATION:	NE NW Sec	.22-131N-105W, BC	owman Co.	
Permit Fee	; <u></u>	x		
Application to Drill		X		e K.
Organization Report		x		1. M File and I.B. R.
\$100,000 Bond		x		When Atter the 17
\$50,000 Bend				Well File OK. Bent Litter for BR Hent Litter 4-28.17
\$15,000 Bond				P
Certified Plat		X		
Notice of Intention to	Drill	X		
Sundry Notice		× K		
Completion Report				
Plugging Report	<u>_</u>	Χ		
Authorization to Trans	port Oil			
DST Reports	<b></b>	2- Enc		
Geological Reports	 . <del></del>	yes-Emc	<u></u>	• - ·
Core Analysis Reports		yes Ene		
Logs	CDC	N, DKL, WE1		
PERMIT NO.	11409			ISSUED: February 15, 1
Inspection Date: $4-($	<u>4-87</u> In:	spector: <u>Suit</u>	- Radu	<u>,</u>
Terrain: Tillable, Pr			1	J
If Producer: Return c	heck sheet prom	mptly when reclam	nation is	first noticed.
If Plugged and Abandon		site acceptable f ease explain belo	for bond r w.	elease? YesNo
<u> </u>				
<u>4-14-87</u> C	2K for De	nd release	? <u>, Fa</u>	df grass & clover
Bech. Appli. Be	cid.	·		<u> </u>

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