BW - 38

MITs

2019

Submit 1 Copy To Appropriate District Office
District I – (575) 393-6161
1625 N. French Dr., Hobbs, NM 88240
District II – (575) 748-1283
811 S. First St., Artesia, NM 88210
District III – (505) 334-6178
1000 Rio Brazos Rd., Aztec, NM 87410
District IV – (505) 476-3460
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-103
Revised July 18, 2013

WELL API NO.
30-025-20592

5. Indicate Type of Lease
STATE x FEE

6. State Oil & Gas Lease No.
Salt lease w/ SLO

SUNDRY NOTICES AND REPORTS ON WELLS
(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)

1. Type of Well: Oil Well Gas Well Other BSW

7. Lease Name or Unit Agreement Name
State 27

8. Well Number 1

2. Name of Operator
Llano Disposal, LLC

9. OGRID Number
370661

3. Address of Operator
PO Box 250, Lovington NM 88260

10. Pool name or Wildcat
Salado brine generation lease.

4. Well Location
Unit Letter L : 1980 feet from the S line and 660 feet from the W line
Section 27 Township 16S Range 33E NMPM County Lea

11. Elevation *(Show whether DR, RKB, RT, GR, etc.)*

12. Check Appropriate Box to Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
PERFORM REMEDIAL WORK	PLUG AND ABANDON	REMEDIAL WORK	ALTERING CASING
TEMPORARILY ABANDON	CHANGE PLANS	COMMENCE DRILLING OPNS.	P AND A
PULL OR ALTER CASING	MULTIPLE COMPL	CASING/CEMENT JOB	
DOWNHOLE COMMINGLE		NOV 12 2019 PM01:20	
CLOSED-LOOP SYSTEM			
OTHER:		OTHER: Casing and brine cavity pressure test.	

13. Describe proposed or completed operations. (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work). SEE RULE 19.15.7.14 NMAC. For Multiple Completions: Attach wellbore diagram of proposed completion or recompletion.

On 11/7/19, met on location w/ OCD Dist 1 rep Gary Hamilton to perform scheduled casing/brine cavity test on this well. Connected truck and chart pressure recorder (recorder w/ valid cal date) to perform 4 hour static pressure test. Ran test for 4+ hours. Well lost 1 psi according to chart. Per direction from Santa Fe OCD and Dist 1 rep, we returned the well to brine production immediately after conclusion of this test.

Spud Date: Rig Release Date:

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

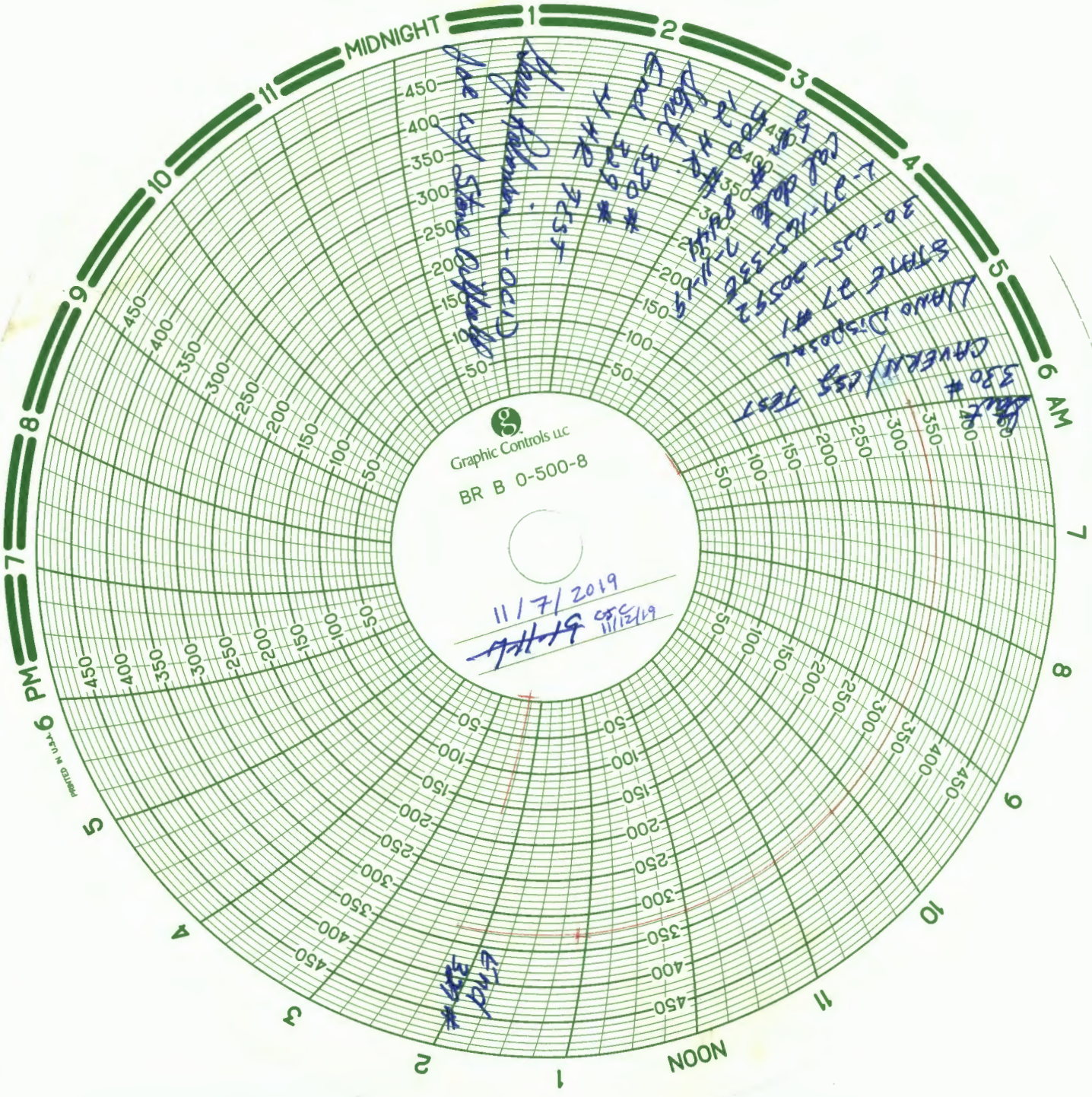
SIGNATURE Marvin Burrows TITLE Agent for DATE 11/08/19

Type or print name Marvin Burrows E-mail address: burrowsmarvin@gmail.com PHONE 575-631-8067

For State Use Only

APPROVED BY: Carl J. Chavez TITLE Environmental Engineer DATE 11/12/2019

Conditions of Approval (if any):


MIDNIGHT
NOON
6 AM
6 PM
Graphic Controls LLC
BR B 0-500-8
11/7/2019
11/12/19
PRINTED IN U.S.A.

CHARTS ltd.

GAS MEASUREMENT

CALIBRATION CERTIFICATE

Cert Date:	7/11/2019
Due Date:	7/11/2020

Customer: AMERICAN VALVE & METER INC
Model: BULLFROG 8"
Serial: 8441

This is to certify that this instrument has been inspected and tested against ADDITEL Digital Gauge ADT680-GP30K, SN: 218183B0028 Calibrated (04/25/2019) Due Date (04/25/2020) Reference Standard used in this calibration are traceable to the Si Units through NIST. This calibration is compliant to ISO/IEC 17025:2017 and ANSI/NCSL Z540-1:R2002.

This instrument is cerified to be accurate within +/- 1% of Full Scale

Input Type/ Range: 500# **Color: RRED**
Pen Number: 2

Ascending		Descending	
Applied:	Reading:	Applied :	Reading:
0	0	499	500
99	100	398	400
248	250	249	250
398	400	100	100
499	500	0	0

2031 TRADE DR.
MIDLAND, TX 79706
(432) 697-7801 (432) 520-3564

Technician: Susanna Lopez

PERFORMING BRADENHEAD TEST

General Procedure for Bradenhead Test

Identify: All valves prior to testing

Gauges: Install on each casing string to record pressure.

Assure: That all valves are in good working condition and **closed at least 24 hours prior to testing.**

Open: Each valve (Bradenhead, intermediate and casing valves) is to be opened separately.

Check Gauges: Record pressure on each gauge and casing string on BHT form. Open valves to atmosphere and record results on BHT form.

Designate what applies to the result of opening the valves for each string:

- Blow or Puff Yes or No
- Bled down to Nothing Yes or No
- Steady Flow Yes or No
- Oil or Gas Yes or No
- Water Yes or No

Start: Injection or SWD pump so tubing pressure can be read.

Instructions below apply to the District 1 Hobbs office since this must be reported on a form.

In case of pressure:

1. Record pressure reading on gauge.
2. Bleed and note time elapsed to bleed down.
3. Leave valve open for additional observation.
4. Note any fluids expelled.

In absence of Pressure:

1. Leave valve open for additional observation.
2. Note types of fluids expelled.
3. Note if fluids persist throughout test.

Note: Tubing pressure on injection or SWD wells.

Test will be signed by person performing test with a contact phone number.

District I
1625 N French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax. (575) 393-0720

State of New Mexico
Energy, Minerals and Natural Resources Department
Oil Conservation Division Hobbs District Office

BRADENHEAD TEST REPORT

Operator Name	API Number
LLANO Disposal	30-025-20592
Property Name	**Well No.**
STATE 27	1

Surface Location

UL - Lot	Section	Township	Range		Feet from	N/S Line	Feet From	E/W Line	County
L	27	16S	33E		1980	S	660	W	LEA

Well Status

TA'D WELL		SHUT-IN		INJECTOR		PRODUCER		DATE
YES	NO	YES	NO	INJ	SWD	OIL	GAS	11-7-19

BRINE WELL

OBSERVED DATA

	(A)Surface	(B)Interm(1)	(C)Interm(2)	(D)Prod Csng	(E)Tubing
Pressure	Cemented			0	0
Flow Characteristics					
Puff	Y / N	Y / N	Y / N	Y / (N)	CO2 ___
Steady Flow	Y / N	Y / N	Y / N	Y / (N)	WTR ___
Surges	Y / N	Y / N	Y / N	Y / (N)	GAS ___
Down to nothing	Y / N	Y / N	Y / N	Y / N	Type of Fluid Injected for Waterflood if applies.
Gas or Oil	Y / N	Y / N	Y / N	Y / (N)	
Water	Y / N	Y / N	Y / N	Y / (N)	

Remarks – Please state for each string (A,B,C,D,E) pertinent information regarding bleed down or continuous build up if applies.

BRINE WELL
MIT

C-103
chart
CAL. papers
BHT

> send to Carl and Hobbs office

Signature:		OIL CONSERVATION DIVISION
Printed name:		Entered into RBDMS
Title:		Re-test
E-mail Address:		
Date:	Phone:	
	Witness: Gary Robinson	

INSTRUCTIONS ON BACK OF THIS FORM

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Tuesday, October 22, 2019 11:00 AM
To: 'Marvin'
Cc: darrangell@gmail.com
Subject: RE: [EXT] Llano BW38

Marvin:

Sounds like a plan. Llano just needs to keep below the max. surface injection pressure, but our MIT guideline for salt caverns is 300 psi. OCD just doesn't want to fracture the salt as you know.....

Thank you.

-----Original Message-----
From: Marvin <burrowsmarvin@gmail.com>
Sent: Tuesday, October 22, 2019 10:08 AM
To: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>
Cc: darrangell@gmail.com
Subject: [EXT] Llano BW38

Carl : I've been on a well in Texas. Back in NM tomorrow. The well has been out of service per your email. Recall that I tested on my own a few days before we got Gary out, and got a 100% good test. Gary wanted a higher pressure than the 302 psi I used. I'm going to test on my own at 300, then get w you with results before we do anything else. Just wanted to keep you posted. Thanks.
M

Sent from my iPhone

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Thursday, October 17, 2019 1:57 PM
To: 'Marvin'
Cc: darrangell@gmail.com; Griswold, Jim, EMNRD; Robinson, Gary, EMNRD; Wade, Gabriel, EMNRD
Subject: BW-38 (Llano Disposal, L.L.C. State '27' BSW No. 1 API# 30-025-20592) Brine Well: CAVERN MIT 9/26/2019 OCD FAIL DETERMINATION

Marvin, et al.:

The New Mexico Oil Conservation Division (OCD) has determined the most recent "Cavern MIT" performed on September 26, 2019 by Llano Disposal, LLC (Llano) "Failed" because the pressure never stabilized over the 4-hour test period within the acceptable Relative Percent Difference- RPD pressure range of the OCD.

OCD hereby requires the above subject brine well to be shut-in immediately until Llano can determine the cause with repair of the mechanical integrity failure, and another "Cavern MIT" verifies well integrity by no later than December 26, 2019 (OCD UIC Program 90-day corrective action period).

Please contact Mr. Gary Robinson (Hobbs DO) to reschedule an appointment date and time to witness your Cavern MIT. Llano will need to meet Mr. Robinson's MIT appointment date and time as he will remain on site for at least 15 minutes before departing if there is nobody present on site to run the test at the scheduled time.

After review of the Administrative Records, OCD understands there was some confusion by Llano based on the well logging, etc. performed to determine the plugged and abandoned well was a good candidate for a brine well. OCD also requires a well MIT "pass" before authorizing injection and production on a brine well. In this case, based on the OCD approved well construction, the prescribed MIT requirement is a "Cavern MIT" (4-Hr. Test) instead of a "Casing MIT" (30-min. Test). The record shows Llano was and is still acting in good faith to complete the Cavern MIT.

Please contact me if you have any questions about the MIT(s) on this well.

Thank you in advance for your cooperation in this matter.

Mr. Carl J. Chavez, CHMM (#13099)
New Mexico Oil Conservation Division
Energy Minerals and Natural Resources Department
1220 South St Francis Drive
Santa Fe, New Mexico 87505
Ph. (505) 476-3490
E-mail: CarlJ.Chavez@state.nm.us
"Why not prevent pollution, minimize waste to reduce operating costs, reuse or recycle, and move forward with the rest of the Nation?" (To see how, go to: http://www.emnrd.state.nm.us/OCD and see "Publications")

-----Original Message-----
From: Marvin <burrowsmarvin@gmail.com>

Sent: Monday, October 14, 2019 6:00 AM
To: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>
Cc: darrangell@gmail.com
Subject: [EXT] St 27 # 1

Carl :
Sounds like we got way out of step on this project. Our apologies for our part in that. I haven't talked to Darr, but I know he is ready to do whatever is needed to come into compliance.
As for my earlier comments, I would add this : When the well is circulating normally, the pressure is around 260 psi. The water injected / brine recovered ratio that OCD likes to see is being achieved. The system isn't leaking, which I have always thought was the primary concern. But again, as the logs prove, among the layers of salt are layers non-salt, porous strata, including sandstone and other porous impurities as listed in the USGS and other technical teachings. We also proved this by monitoring drilling returns. What the pressure test involved as conducted, was raising the pressure 60 psi over what the well sees in normal operation. That the layers shown to have 25%+ porosity wouldn't take some fluid at the added pressure just makes no sense to me. I might have missed something in Reservoir Engineering 101, but the highly porous, non-salt strata should be injectable.
Again, we are eager to gain compliance, and look forward to doing whatever we need to do.
Thanks,
M

Sent from my iPhone

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Friday, October 11, 2019 8:29 AM
To: 'Marvin'
Cc: Wade, Gabriel, EMNRD; Griswold, Jim, EMNRD
Subject: RE: [EXT] Carl and Jim re: Llano Disposal BW38 (API# 30-025-20592)

Marvin:

Re: "We had to sledge hammer cement to weld on the head. At the start of every drill out day, we tested casing to 500 psi with no leak off, and never lost any water during drilling. As you know, Paul agreed that the well was in good condition, and was very safe."

Good morning! The New Mexico Oil Conservation Division (OCD) is reviewing well integrity information and your response to OCD's review of the Cavern MIT Chart of 9/26/2019 where the test pressure did not stabilize, but dropped from ~318 psig to ~290 psig for RPD of ~ 9.2%.

Please provide the Casing MIT mentioned in your response below to the OCD. The admin. record for Well API# 30-025-20592 appears to lack the Casing MIT mentioned by Llano Disposal, LLC (Llano). Could you please provide it before COB next Friday, 10/18? Also, I'm making sure the well tests performed and discussed with the OCD and Llano are in the record today.

Thank you.

Mr. Carl J. Chavez, CHMM (#13099)
New Mexico Oil Conservation Division
Energy Minerals and Natural Resources Department
1220 South St Francis Drive
Santa Fe, New Mexico 87505
Ph. (505) 476-3490
E-mail: CarlJ.Chavez@state.nm.us
"Why not prevent pollution, minimize waste to reduce operating costs, reuse or recycle, and move forward with the rest of the Nation?" (To see how, go to: http://www.emnrd.state.nm.us/OCD and see "Publications")

-----Original Message-----
From: Marvin <burrowsmarvin@gmail.com>
Sent: Wednesday, October 2, 2019 2:34 PM
To: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>
Subject: [EXT] Carl and Jim re: Llano Disposal BW38

Carl and Jim :
Thank you for your last email. Here are my comments :
Please recall that as soon as we drilled the cement plugs out of this well during re-entry, we ran a suite of logs and presented them to Paul K for his review. We ran a cement bond log to prove the integrity of the cement in this well. We ran a casing inspection log to prove that the internal (ID) condition of the casing was good, and we ran a gamma ray/compensated neutron log to total drill out depth to reveal the mineral characteristics and porosity nature of the strata (to full drillout depth). The well has heavy wall 13 3/8" casing set below known

GW depth, cemented to surface. It had heavy wall 9 5/8" casing ran to 4577', with cement circulated as well. We were able to further verify cement, as when we excavated the cellar to install wellhead equipment, all strings were cemented to surface. We had to sledge hammer cement to weld on the head. At the start of every drill out day, we tested casing to 500 psi with no leak off, and never lost any water during drilling. As you know, Paul agreed that the well was in good condition, and was very safe. I'm at a loss as to what else we could have done to prove suitability of use. Referring back to the gamma ray/neutron porosity log. Please refer to the images below. I have marked the porosity scale better in pencil so you can see that the -10% calibration mark is far right, then the porosity scale increases to 30% at far left. Now please look at strata porosity at salado depth to see that porosity well over 20% (up to off-scale) is scattered throughout the interval. The gamma ray (left) indicator on the log indicates that an array of various minerals exist in the steata. I've also included references from the USGS studies, as well as one done for WIPP and Waste Control. Many studies on the Salado note the intermingling of sandstones, dolomites, limestones, and anhydrite, along with granular clays. We did encounter all of those while drilling the open hole salt section in this well. Anything over 8% porosity is generally considered good SWD porosity, and would a target for completion for that purpose. Porosity values of 20-30% is considered to be "runaway" porosity, and a boon to water disposal. Considering the demonstrated mineral content of this well (other than salt), and considering the known (proven by cnl log) porosity of the strata, I think it would be a physical impossibility for these layers to not take some water during a pressure test. As you know, when we pressure up for a MI, the result is a purely hydraulic system. The loss of only a few gallons would show up as a pressure loss. Thinking further along about the future of this well, I don't see any reason why loosened clay and other fine clastics would not serve as LCM to plug this porosity.
Because the cased portion of this well was thoroughly proven and reviewed, and having also proved by logging that highly porous strata is intermingled into the salt, we ask that this well be allowed to produce for an additional test period to see if such thieving porosity is naturally shut off as we think it will be. Please further consider that our water injected ratio to brine water volume recovered is as it should be, and any water loss is not detectable under that consideration.
Thanks
M

contortion of the beds, which is on a much larger scale than the crenulations noted at previous localities, and involves masses 10 to 50 feet across. Most of the beds lie horizontally or dip gently, but in places they are sharply folded, and here and there they are vertical. This contortion may be related to the linear features described above, as aerial photographs indicate that some of the linear features extend through the locality.

HIGHER FORMATIONS OF OCHOA SERIES

The formations overlying the Castile formation are not exposed in the area studied, but their character is summarized here, on the basis of published descriptions of outcrops and of drill records farther east.

SALADO FORMATION

The Salado may be exposed here and there in the Gypsum Plain, near the west base of the Rustler Hills, but most of it is cut out in this region by the unconformity at the base of the Rustler formation. The Salado exhibits its full thickness east of the outcrops.

The formation contains the thickest beds of salt in the west Texas Permian section. They have been referred to as the "upper" or "main" salt in many of the older reports on the region. It contains numerous potash beds, some of which are being mined east of Carlsbad, N. Mex. (fig. 1).[21] There are some interbedded layers of anhydrite, and thin ones of dolomitic limestone and red beds. Some lamination is present, which is perhaps comparable to that in the underlying anhydrite of the Castile, but there are no bituminous layers. As indicated by the records of wells drilled east of the outcrops, the maximum thickness of the formation in the Delaware Basin is somewhat more than 2,000 feet. In the shelf areas, north and east of the basin, it is 1,000 feet or less.

[21]Mansfield, G. E., and Lang, W. B., The Texas-New Mexico potash deposits: Texas Univ. Bull. 3401, pp. 641-832, 1985.

being that the upper series was shaly, pinkish, and by analysis showed more than
percent of potassium oxide, while the lower series has a dull-grayish appearanc
and on analysis yields less than 1 percent of potassium oxide. The upper salt serie
is dominantly rock salt with massive anhydrite beds, redbeds, shaly sands, an
prominent beds and lenses of polyhalite that are characteristic of this formatio
only. Although this upper salt series underlies an area of over 60,000 sq mi it ha
no known outcrop, the nearest approach to an outcrop being in eastern Culberso
County, where weathering has so deeply altered the anhydrite to gypsum that i
the disrupted anhydrites of the upper series were present they would be difficul
to recognize. The name Salado halite is given to this upper salt series, from Salado
Wash, in northern Loving County, Texas, salado being the Spanish word for
"salted." The formation has suffered pre-Rustler erosional truncation in Eddy
County, New Mexico, and in Reeves, Culberson, and western Loving Counties,
Texas, and has also been affected in those areas where the more prominent reef
masses accumulated. In Means well (southeast corner sec. 23, Blk. C-26, PSL) it
extends from 920 feet depth to 2,350 feet. The lower salt series outcrops in Eddy
County, New Mexico, and Culberson County, Texas. It is the formation to which
Richardson gave name Castile gypsum as including all rocks between Delaware
Mountain and Rustler formations. Richardson was not then aware of what took
place in subsurface. As the outcropping gypsum is the lower salt series and but a
surficial alteration by weathering of the main mass of anhydrite in subsurface, it
seems fitting to apply to the lower salt series the name Castile anhydrite. The
Castile anhydrite extends downward from 2,350 feet depth to 4,990 feet, where it
is unconformable on Delaware Mountain formation. The Castile in Delaware basin
consists of massive beds of [illegible] rock salt, dolomitic and
[illegible] sandstones. Age is

Source: US geologic names lexicon (USGS Bull. 896, p. 1887).

Publication:

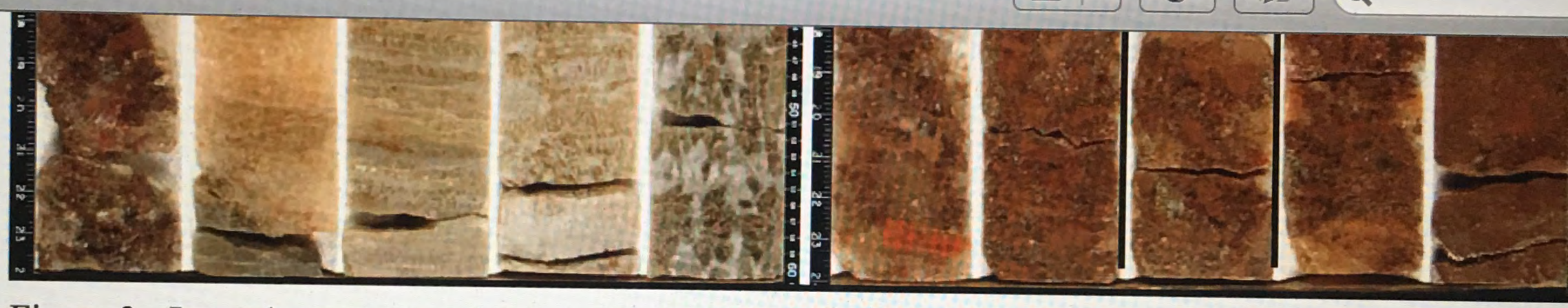


Figure 3 - Large bottom-growth gypsum crystals (arrow) partially pseudomorphed by halite and polyhalite (red). Each core column is 2 ft long.

Figure 4 - One of many desiccating upward zones (bracket) with infiltrated fine sand and silt. Displacive halite grown in silt (arrow). Each core column is 2 ft long.

- coarser, orangish to clear halite in the lower part with variable minor polyhalite blebs;
- increasing clastic content upward, dominated by fine to very fine sand that is subround to round;
- upward evidence increasing of vertical interconnections between clastic material along cracks and pipes (Fig. 4); and
- an upper sharp boundary overlain by coarser, clear halite.

These features are similar to those found in the Salado Formation in the Delaware Basin by Holt and Powers (1990a, b) and interpreted as desiccating upward depositional cycles. The scale and boundaries of the syndepositional dissolution pipes found there are not shown clearly in cores in CP-975, and they may not be as distinctively developed here. Nevertheless, the basic features are similar, and the processes are similar. The other difference here is that the infiltrated sand in these beds is coarser and more obviously rounded (possibly eolian) when compared to most of the depositional cycles observed in the Delaware Basin.

Rustler Formation (Permian). The standard for the Rustler Formation within the Delaware Basin, and even beyond, is five members with stratigraphic continuity. At CP-975, there is no unit identifiable as the Culebra Dolomite, although there is a natural gamma signature that mimics that of the Culebra in

COMPENSATED NEUTRON GAMMA-RAY / CCL LOG

Company LLANO DISPOSAL LLC.
Well STATE 27 #1
Field
County LEA
State NEW MEXICO Country U.S.A.

Location: API # : N/A

SEC TWP RGE

Other Services
RCBL
CIL

Elevation
K.B. ---
D.F. ---
G.L. ---

Permanent Datum GROUND LEVEL Elevation ---
Log Measured From GROUND LEVEL
Drilling Measured From KELLY BUSHING

Company LLANO DISPOSAL LLC.
Well STATE 27 #1
Field
County LEA
State NEW MEXICO
Country U.S.A.

Date	22-MAY-2018		
Run Number	ONE		
Depth Driller	13500'		
Depth Logger	4511'		
Bottom Logged Interval	4511'		
Top Log Interval	SURFACE		
Open Hole Size	---		
Type Fluid	WATER		
Density / Viscosity	---		
Max. Recorded Temp.	104 DEG.		
Estimated Cement Top	220'		
Time Well Ready	ROA		
Time Logger on Bottom	SEE LOG		
Equipment Number	113		
Location	LEVLELAND		
Recorded By	DEREK MOORE		
Witnessed By	MARVIN BURROWS		

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To

Casing Record	Size	Wgt/Ft	Top	Bottom
Surface String				
Prot. String				
Production String	9.625"	36# & 32#	SURFACE	13500'
Liner				

MAIN PASS

ano disposal state 27 #1.db
ass4.1
l2inch
e May 22 13:18:28 2018
pth in Feet scaled 1:600

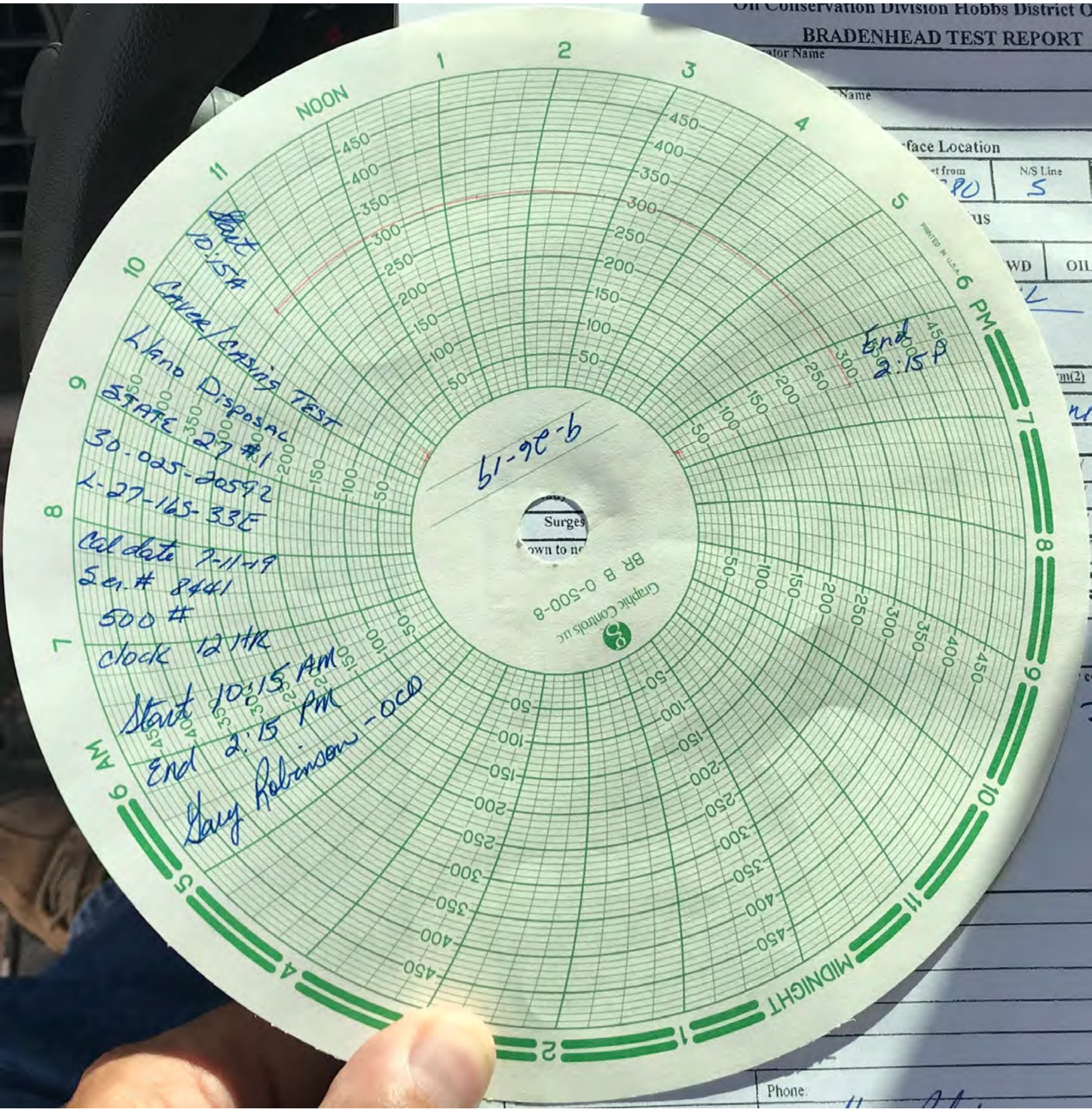
30%
20%
10%
0%
CALIBRATION

150	30	CNPOR (pu)	-10

1900

2000

2100



Oil Conservation Division Hobbs District O

BRADENHEAD TEST REPORT

Name

face Location

N/S Line

S

WD

OIL

Phone: