

State of New Mexico  
Energy, Minerals and Natural Resources Department

**Susana Martinez**  
Governor

**Ken McQueen**  
Cabinet Secretary

**Matthias Sayer**  
Deputy Cabinet Secretary

**Heather Riley**, Division Director  
Oil Conservation Division



New Mexico Oil Conservation Division approval and conditions listed below are made in accordance with OCD Rule 19.15.7.11 and are in addition to the actions approved by BLM on the following 3160-4 or 3160-5 form.

Operator Signature Date: 10/1/18

Well information:

API WELL #	Well Name	Well #	Operator Name	Type	Stat	County	Surf_Owner	UL	Sec	Twp	N/S	Rng	W/E
30-045-32447-00-00	CARSON UNIT WDW	242	DJR OPERATING, LLC	S	A	San Juan	F	C	24	25	N	12	W

Application Type:

- P&A   
  Drilling/Casing Change   
  Location Change  
 Recomplete/DHC (For hydraulic fracturing operations review EPA Underground injection control Guidance #84; Submit Gas Capture Plan form prior to spudding or initiating recompletion operations)  
 Other: Step rate test

Conditions of Approval:

- Notify NMOCD 24 Hours prior to commencing activities
- The previous MITs show pressure increases (2011: 500# to 518#; 2016: 510# to 515#). The bradenhead and intermediate annular spaces are required to be monitored during the SRT and recorded.
- Perform 30-minute steps due to prior fracking with sand which may cause a poor response.
- Verify the installation date of the 3.5-inch tubing on a record cleanup sundry.
- Provide the last 5 years of average injection pressure with the results of the Step rate test.
- See attached step rate test guidelines.

*Brandon Powell*  
NMOCD Approved by Signature

10/9/2018  
Date

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

FORM APPROVED  
OMB No. 1004-0137  
Expires: January 31, 2018

**SUNDRY NOTICES AND REPORTS ON WELLS**  
*Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.*

5. Lease Serial No. NMSF -078064

6. If Indian, Allottee or Tribe Name  
N/A

**SUBMIT IN TRIPLICATE - Other instructions on page 2**

1. Type of Well

Oil Well     Gas Well     Other

2. Name of Operator DJR Operating, LLC

3a. Address 1 Road 3263 Aztec, NM 87410-9521

3b. Phone No. (include area code)  
(505) 632-3476

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

719' FNL X 1802' FWL "C" - Section 24-T25N-R12W

7. If Unit of CA/Agreement, Name and/or No.  
N/A

8. Well Name and No. Carson WDW #242

9. API Well No. 30-045-32447

10. Field and Pool or Exploratory Area  
SWD; Entrada

11. Country or Parish, State  
San Juan County, NM

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Hydraulic Fracturing	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input checked="" type="checkbox"/> Other
	<input type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recomplete horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.)

DJR Operating requests permission to perform a "step rate test" per the attached procedure.

ACCEPTED FOR RECORD

OCT 01 2018

NMOCD

OCT 01 2018

DISTRICT III

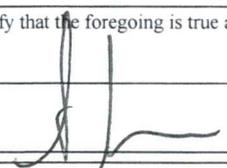
FARMINGTON FIELD OFFICE

By: 

14. I hereby certify that the foregoing is true and correct. Name (Printed/Typed)

Amy Archuleta

Title Regulatory

Signature 

Date

10/01/2018

THE SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by

Title

Date

Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Office

Title 18 U.S.C Section 1001 and Title 43 U.S.C Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.



**Step-Rate Test Procedure**  
**Carson WDW 242**  
NE/4 Section 24, T25N-R12W  
San Juan County, NM  
API 30-045-32447

**RE: Carson WDW #242: Administrative Order SWD-933 maximum injection pressure increase:**

DJR Operating, LLC (OGRID #371838) is operator of the Carson WDW No. 242, API No. 30-045-32447. Current allowable injection pressure is 1382 psi. In anticipation of applying for an increase to that maximum, we plan to conduct a step-rate test according to the following procedure:

1. Notify NMOCD of step-rate time and date.
2. Shut well in for 24 hours prior to running step-rate tests.
3. MI and begin filling 3-500 bbl frac tanks with produced water. Total water on location 1500 bbls.
4. Record SICP, SITP, BH pressures.
5. MIRU Tefteller. RIH and hang tandem recording bombs (gauges) capable of measuring pressures from 0 psi to 5,000 psi.
  - a. Program bombs to record data every 5 seconds throughout the test.
  - b. RIH with Tefteller slickline and hang bombs below 3 ½" tubing near top perforation 6910'.
  - c. Slickline will remain in hole during test with packoff / slickline lubricator.
  - d. Record exact time that the gauge is set.
6. MIRU pump truck and recording equipment. Set up to record surface rate and pressure.
7. Casing and bradenhead pressures are to be monitored during test.
8. Pressure test surface lines to 3000 psi.
9. Pump step-rate test via 3-1/2" tubing using produced water as follows:

<u>Step</u>	<u>Time (Min)</u>	<u>Injection (BPM)</u>	<u>Rate (BWPD)</u>	<u>Inj Vol (BW)</u>	<u>Cum Inj Vol (BW)</u>
1	15	0.5	720	7.5	7.5
2	15	1.0	1440	15.0	22.5
3	15	1.5	2160	22.5	45.0
4	15	2.0	2880	30.0	75.0
5	15	2.5	3600	37.5	112.5
6	15	3.0	4320	45.0	157.5
7	15	3.5	5040	52.5	210.0
8	15	4.0	5760	60.0	270.0
9	15	4.5	6480	67.5	337.5
10	15	5.0	7200	75.0	412.5
11	15	5.5	7920	82.5	495.0
12	15	6.0	8640	90.0	585.0
13	15	6.5	9360	97.5	682.5
14	15	7.0	10080	105.0	787.5

**Elapsed time: 210 min.**

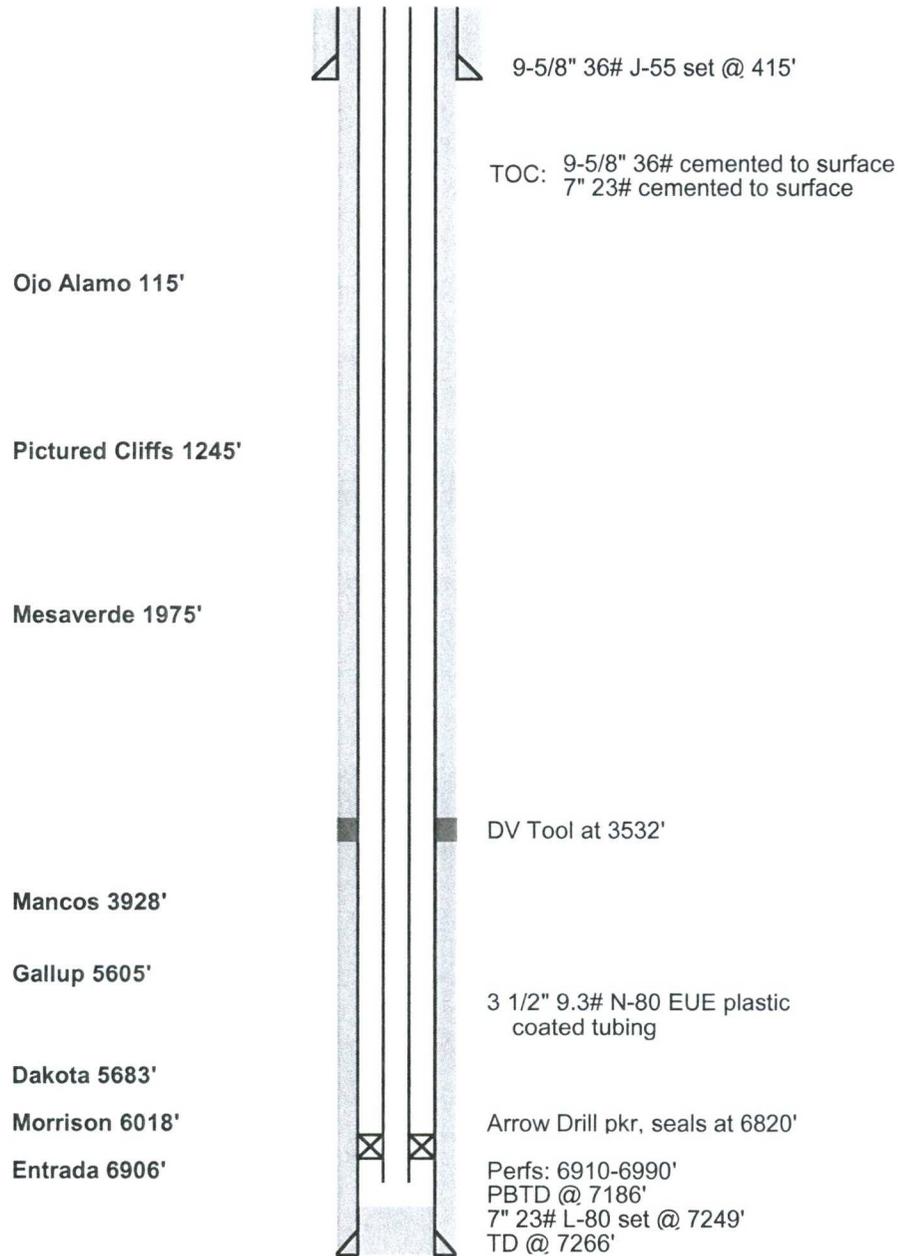
**Total = 787.5 bbls**

- Continuously monitor surface injection pressure and rate in a digital format.
- It is critical to maintain the set time steps. Do not shorten or lengthen the time steps.
- Once an injection rate has been established at or near the requested rate, the rate must be kept constant.

10. Shut down and record ISIP, and 5, 10, and 15 minute SI pressures.
11. Wait for SI pressure to decrease to a manageable level.
12. POOH with pressure gauges, and RD Tefteller. Process recorded data.
13. Return well to injection.



Wellbore Diagram  
Carson WDW 242  
NW/4, Sec 24, T25N, R12W  
San Juan, County, NM  
API: 30-045-32447





## Pertinent Data Sheet

**Well Name:** Carson WDW 242  
**Footage:** 719' FNL and 1802' FWL  
**Location:** Section 24, T25N, R12W  
**County:** San Juan County, NM  
**API#:** 30-045-32447  
**Lease:** NMSF 078064

**Project Summary:** Step Rate Test

**Field:** Entrada  
**Spud Date:** 4/21/05  
**Completion Date:** 5/18/06  
**Elevation:** 6425' GL  
**TD:** 7266' KB  
**PBTD:** 7186' KB

### Casing Record:

Hole Size	Casing Size	Wt.	Grade	Depth Set	Cement
12-1/4"	9-5/8"	36#	J-55	415'	250 sx (Circ. to Surface)
8-3/4"	7"	23#	L-80	7249'	1556 sx DV Tool @ 3532'

Stg 1: 1031 sx. TOC to DV tool. Stg. 2: 525 sx. Circulated to surface.

**tubing Record:** Bottom of tools at 6836'. 3-1/2" WL entry guide, 3-1/2"x2.75" R bottom No-Go (2.697" ID), SS SN (1.08'). 3-1/2" EUE N-80 nickel plated tubing sub (6.23'). Nickel plated mill out extension x-over to 3-1/2" EUE (0.64'). Nickel plated mill out extension (4.46'; 4.375" ID). 7"x4" nickel plated mill out extension packer bottom. (0.68'). 7"x4" Arrowdrill seal bore production packer (2.63'). Packer set at 6820'. 7"x4" locator seal assembly with 5 seal units and nickel plated 1/2" muleshoe guide (6.05'; 2.992" ID). 3-1/2"x2.81" SS SN at 6820'. 233 jts. 3-1/2" plastic coated N-80 tubing. 10', 6', 2', 3 1/2" N-80 plastic coated pups, 1 jt 3 1/2" plastic coated N-80 tbg.

**Logging Record:** SD, Ind, CBL

### Formation Tops:

Nacimiento	Surface
Ojo Alamo	115'
Pictured Cliffs	1245'
Mesaverde	1975'
Mancos	3928'
Gallup	5605'
Dakota	5683'
Morrison	6018'
Todilto	6878'
Entrada	6906'

**Perforation Record:** 6910-6990' (0.38"x320)

### Completion Record:

Acidized with 6000 gals. 7-1/2% MCA HCl acid with Musol. Formation broke at 250 psi at 10 BPM. Max rate 22.5 BPM at 1077 psi. ISIP 439 psi. 3 min. vacuum.

RU Stinger. Fraced with 125,524 gals of Delta 200. Placed 186,500 lbs. 20/40 Ottawa sand at 1-4.34ppg. All sand coated by Expedite. ISIP 1279 psi. 5 min: 1182 psi. 10 min: 1132 psi. 15 min: 1061 psi.

Site: CARSON UNIT 242 WDW		SWD SUMMARY			
Period: July-18					
Run	Meter	Run	Injected	Tubing	
Day	Reading	Hrs	BBLS	Prs	Comments
0	769				
1	0	24:00	0	50	
2	873	24:00	873	500	
3	0	24:00	0	50	
4	1,049	24:00	1,049	50	
5	795	24:00	795	50	
6	0	24:00	0	50	
7	0	24:00	0	50	
8	325	24:00	325	500	
9	1,234	24:00	1,234	500	
10	56	24:00	56	500	
11	1,000	24:00	1,000	500	
12	0	24:00	0	50	
13	1,466	24:00	1,466	500	
14	447	24:00	447	500	
15	0	24:00	0	50	
16	651	24:00	651	500	
17	267	24:00	267	500	
18	421	24:00	421	500	
19	451	24:00	451	500	
20	546	24:00	546	400	
21	0	24:00	0	0	
22	0	24:00	0	50	
23	860	24:00	860	500	
24	208	24:00	208	500	
25	455	24:00	455	500	
26	614	24:00	614	500	
27	111	24:00	111	539	
28	464	24:00	464	0	
29	123	24:00	123	500	
30	716	24:00	716	500	
31	0	24:00	0	0	
<b>TOTAL INJECTED</b>			<b>13,132</b>	<b>9,889</b>	



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Oil Conservation Division  
UIC Program Guidance

**Guidance for Conducting a Step-Rate Test**

1. The operator must submit Division Form C-103 to the OCD District office with the description of the procedure for the SRT. The procedure will include the following information:
  - A description of the equipment for measurement and data recording (manufacturer and model) Note: the pressure gauge and recorder must have an appropriate range for use during the test.
  - Summary of injection volumes for last five years with average injection pressure.
  - Summary of well treatments and pressures especially any historical Instantaneous Shut-in Pressure (ISIP).
2. Once the operator has an approved Sundry Notice, the operator shall notify the appropriate OCD District office at least 72 hours prior to the scheduled SRT so that OCD personnel may be present to witness the test.
3. A bradenhead test (if required by the District) and mechanical integrity test (MIT) will be performed before the SRT. If the subject well fails either test, then the SRT will be suspended until the mechanical integrity issue(s) has been remediated. The mechanical integrity testing may be modified at the discretion of the District Supervisor.
4. The casing and bradenhead pressures will be monitored during the test. All wellhead equipment must be rated for the anticipated pressures.
5. Bottomhole pressure measurements will be required for wells deeper than 1000 feet (ft) and injection rates greater than one (1) barrel per minute (BPM).
6. Wells currently injecting must be shut-in at least 48 hours before the test unless the shut-in pressures indicate that the well has not adequately stabilized and a longer time is required for the permitted interval to approximate pre-injection conditions.
7. Selection of rates for the SRT will be developed by the operator based on the proposed operation and the historical information of the well. Suggested rates for the test are 5%, 10%, 20%, 40%, 60%, 80% and 100% of the proposed maximum daily injection rate at the corresponding pressure. The intent is to complete a SRT with at least three (3) steps below the 0.5 psi/ft gradient and three (3) steps above the fracture parting pressure (breakdown pressure). Starting pump rates and pressures must be lower than the current rates and pressures if the well is currently injecting. It may be necessary to backflow the well to reduce initial SRT pressures.
8. Each step shall be at least 30 minutes in duration unless otherwise determined by the OCD. Longer step intervals of 60 minutes shall be required for low permeability injection intervals (less than 0.5 millidarcies) and for open-hole intervals greater than 500 feet in length. The operator may request, in the submission of the Sundry Notice of



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Intent, a modification of the time length for the step intervals with an explanation for the modification. The goal is for increments with equal time and rate and allow for downhole stabilization of pressure for each step.

9. The duration of the step intervals for the SRT must not change during the test or the test results will not be deemed adequate for determining an accurate fracture parting pressure.
10. Pumping equipment must be able to pump at the rates and pressures needed for the test. Rate changes will be 0.5 BPM or smaller unless the OCD witness determines that bigger rate changes are necessary due to small incremental increases in pressure.
11. The operator shall ensure that there is enough water to conduct the entire test.
12. The completed SRT results are to be submitted to the Engineering Bureau in Santa Fe and should include the following information:
  - Administrative application checklist (available on OCD website under Unnumbered Forms on Form webpage).
  - Cover letter with contact information, general description of test and pressure increase being proposed.
  - Complete data summary including injection rates, duration of each step, pressure measurements (surface and bottom hole) and the ISIP.
  - SRT-specific information: location of pressure gauges (depth); initial bottomhole pressure; injection fluid type and specific gravity.
  - Graph summary of pressure versus injection rate with interpretation.
  - Current well completion diagram.
  - Copy of the order authorizing the injection into the well.
13. If a pressure increase is granted, it shall be limited for use in the well with the same tubing, size, length, and type of interior coating as present for the SRT. If these components are changed, the operator must ask the Engineering Bureau to recalculate the surface pressure limit, which may require another SRT.

**Additional Sources:**

Martin Felsenthal, *Step-rate Test Determine Safe Injection Pressures in Floods* in The Oil and Gas Journal, October 28, 1974.

US Environmental Protection Agency, *Step-Rate Test Procedure*, Region VIII; January 12, 1999.