PMAM 1819 258
846

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL
RESOURCES DEPARTMENT

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, New Mexico 87505

FORM C-108
Revised June 10, 2003

APPLICATION FOR AUTHORIZATION TO INJECT

I. PURPOSE: _____Secondary Recovery _____Pressure Maintenance __X__Disposal
_____Storage Application qualifies for administrative approval? __X__Yes _____No

II. OPERATOR: Solaris Water Midstream, LLC

ADDRESS: 907 Tradewinds Boulevard, Midland, TX 79701

CONTACT PARTY: Bonnie Atwater PHONE: 432-203-9020

III. WELL DATA: Complete the data required on the reverse side of this form for each well proposed for injection. Additional sheets may be attached if necessary.

IV. Is this an expansion of an existing project? _____Yes __X__No
If yes, give the Division order number authorizing the project: _____

V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.

VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.

VII. Attach data on the proposed operation, including:

1. Proposed average and maximum daily rate and volume of fluids to be injected;
2. Whether the system is open or closed;
3. Proposed average and maximum injection pressure;
4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and,
5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).

*VIII. Attach appropriate geologic data on the injection zone including appropriate lithologic detail, geologic name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such sources known to be immediately underlying the injection interval.

IX. Describe the proposed stimulation program, if any.

*X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division, they need not be resubmitted).

*XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.

XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground sources of drinking water.

XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.

XIV. Certification: I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

NAME: Whitney McKee TITLE: Engineering Tech

SIGNATURE: Whitney B. McKee DATE: 11/7/18

E-MAIL ADDRESS: whitney.mckee@solarismidstream.com

* If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be resubmitted. Please show the date and circumstances of the earlier submittal: 7/6/18

DISTRIBUTION: Original and one copy to Santa Fe with one copy to the appropriate District Office

Application for Authorization to Inject

Well Name: Road Runner SWD 1

III – Well Data (*The Wellbore Diagram is included as Attachment 1*)

A.

(1) General Well Information:

Operator: Solaris Water Midstream, LLC

Lease Name & Well Number: Roadrunner SWD #1

Well Footage: 830' FNL & 200' FEL

Location: Sec 33, T25S-R27E

(2) Casing Information:

Type	Hole Size	Casing Size	Casing Weight	Setting Depth	Sacks of Cement	Estimated TOC	Method Determined
Surface	24"	20"	94.0 lb/ft	500'	700	Surface	Circulation
Intermediate 1	17-1/2"	13-3/8"	68.0 lb/ft	2,700'	1,600	Surface	Circulation
Intermediate 2	12-1/4"	9-5/8"	53.50 lb/ft	10,150'	2,700	Surface	Circulation
Liner	8.5"	7-5/8"	39 lb/ft	13,305'	230	9,950' (TOL)	CBL

(3) Tubing Information:

5-1/2" (23#) Internal Plastic Coated Tubing swedged down to 5" (18#) with setting depth of 13,285'

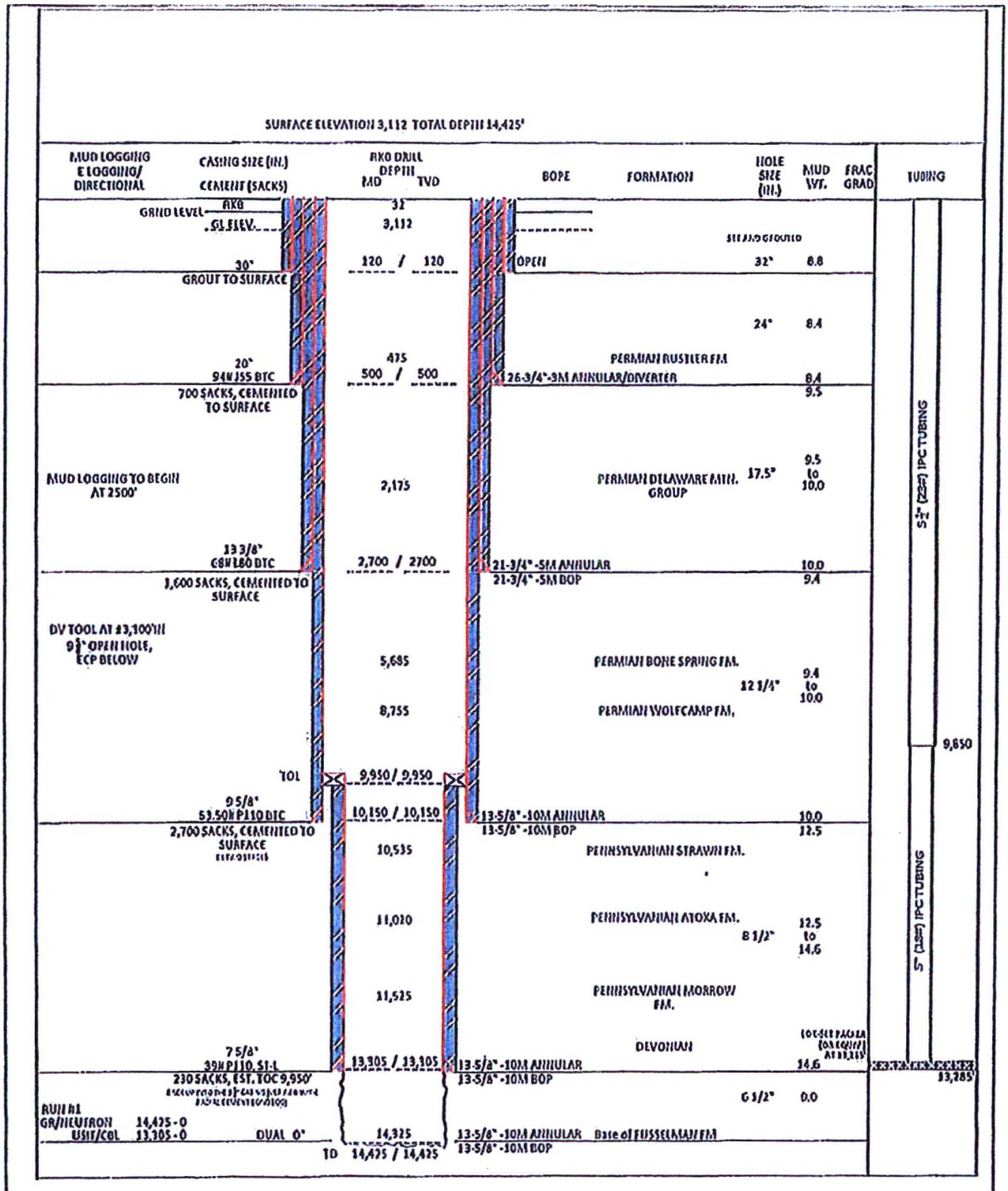
(4) Packer Information: Lok-set or equivalent packer set at 13,285'. Representative packer details are included in *Attachment 1*.

B.

(1) Injection Formation Name: Devonian and Silurian - Fusselman formations
(2) Injection Interval: Open-hole injection between 13,305' – 14,325'
(3) Drilling Purpose: New Drill for Salt Water Disposal
(4) Other Perforated Intervals: No other perforated intervals exist.
(5) Overlying Oil and Gas Zones :

- Delaware (2,175')
- Bone Springs (5,685')
- Wolfcamp (8,755')
- Atoka (11,020')
- Morrow (11,525')

Underlying Oil and Gas Zones: No underlying oil and gas producing formations



ROAD RUNNER SWD #1

SECTION 28 T-25-S, T27-E

830' FNL & 200' FEL

EDDY COUNTY, NEW MEXICO

PH # 1680.JIM.00 | JUNE 2018

SOLARIS WATER MIDSTREAM

ALL CONSULTING

SIZE: A | SCALE: NTS

WELL BORE DATA SHEET

DISTRICT I
1625 N. French Dr., Hobbs, NM 88240
Phone (575) 393-6161 Fax (575) 393-0720
DISTRICT II
811 S. First St., Artesia, NM 88210
Phone (575) 748-1283 Fax (575) 748-9720
DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone (505) 334-6178 Fax (505) 334-6170
DISTRICT IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone (505) 476-3460 Fax (505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources Department

OIL CONSERVATION DIVISION

1220 South St. Francis Dr.
Santa Fe, New Mexico 87505

Form C-102
Revised August 1, 2011

Submit one copy to appropriate District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number	Pool Code	Pool Name
30-015-45099	97969	SWD; Devonian-Silurian

Property Code	Property Name	Well Number
321647	ROADRUNNER SWD	1

OGRID No.	Operator Name	Elevation
371643	SOLARIS WATER MIDSTREAM	3121'

Surface Location

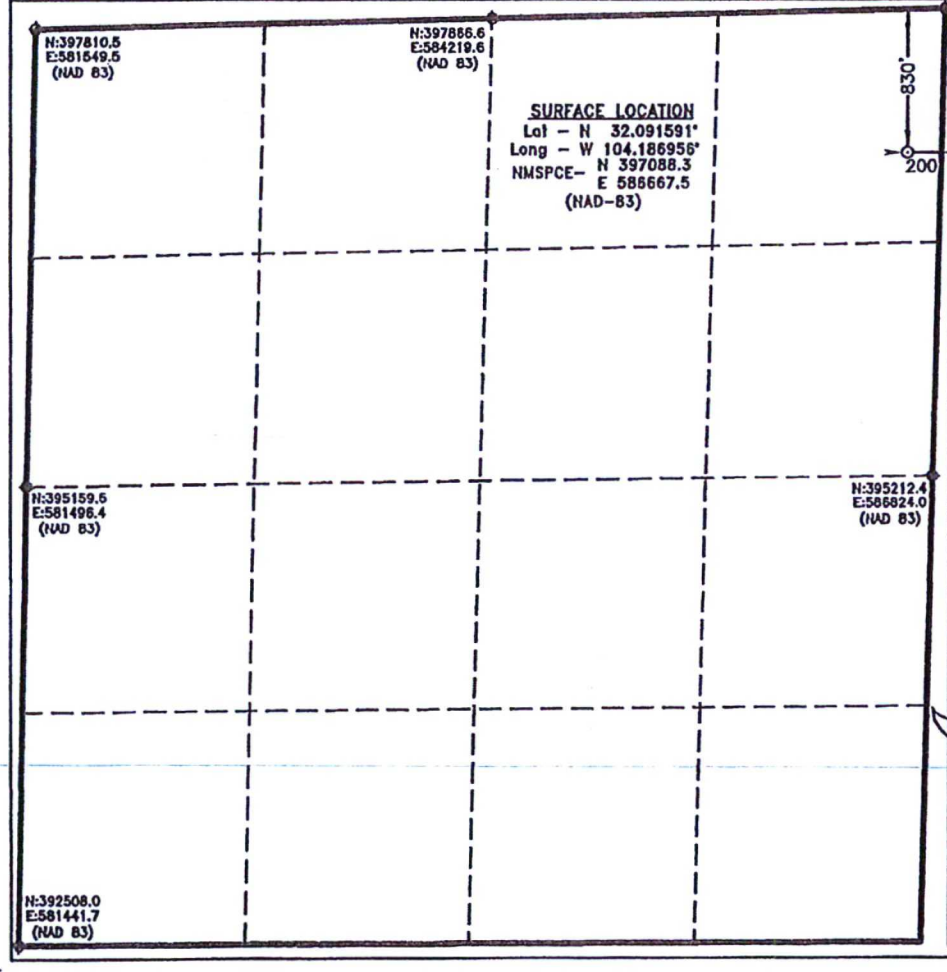
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
A	33	25 S	27 E		830	NORTH	200	EAST	EDDY

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
5.50			

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION



OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Signature Date

Bonnie Atwater
Printed Name

bonnie.atwater@solarismidstream.com
Email Address

SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervison, and that the same is true and correct to the best of my belief.

NOVEMBER 5, 2018
Date Surveyed

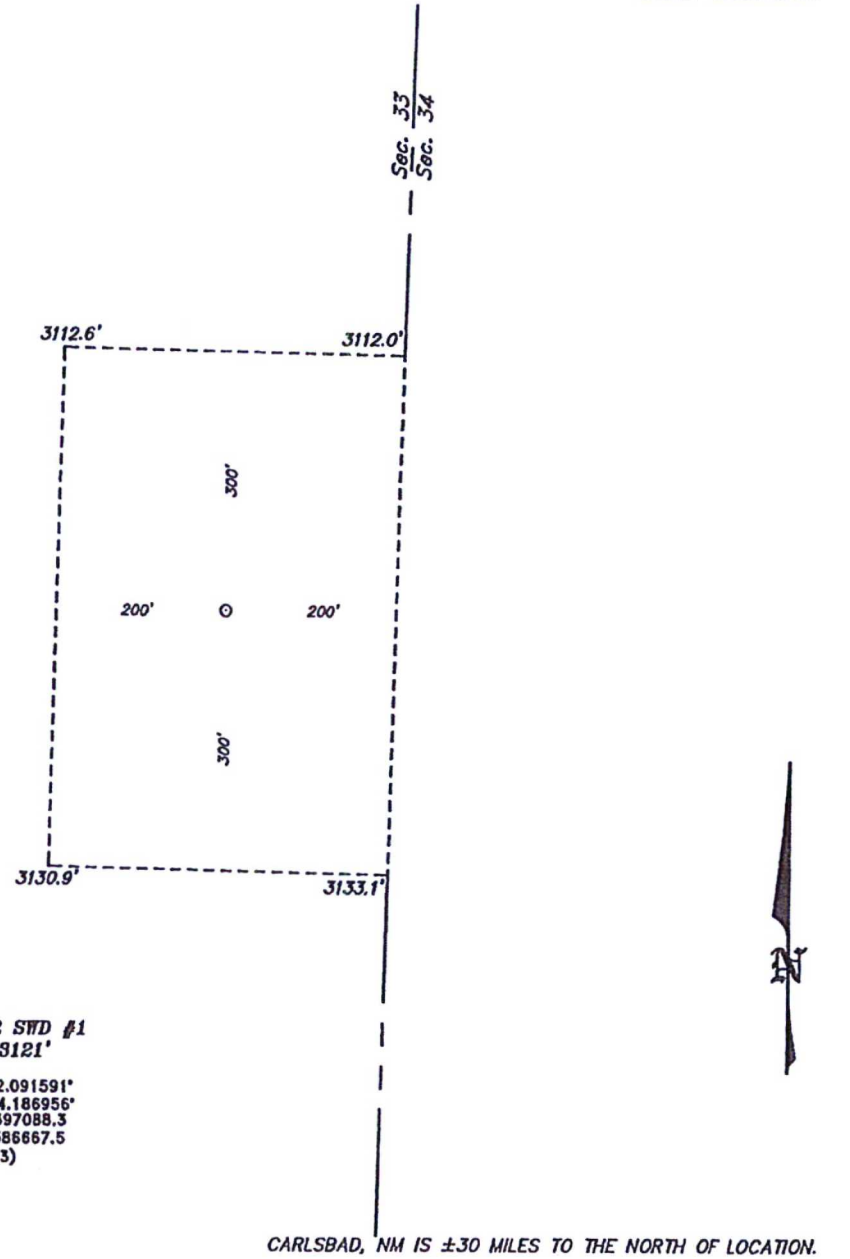
Signature & Seal of Professional Surveyor

NEW MEXICO 7977 PROFESSIONAL SURVEYOR

Certificate No. Gary L. Jones 7977

0' 500' 1000' 1500' 2000'
SCALE: 1" = 1000'
WO Num.: 34179

SECTION 33, TOWNSHIP 25 SOUTH, RANGE 27 EAST, N.M.P.M.,
EDDY COUNTY, NEW MEXICO.



ROADRUNNER SWD #1
ELEV. - 3121'

Lat - N 32.091591°
Long - W 104.186956°
NMSPCE- N 397088.3
E 586667.5
(NAD-83)

CARLSBAD, NM IS ±30 MILES TO THE NORTH OF LOCATION.

200 0 200 400 FEET
SCALE: 1" = 200'

SOLARIS WATER MIDSTREAM

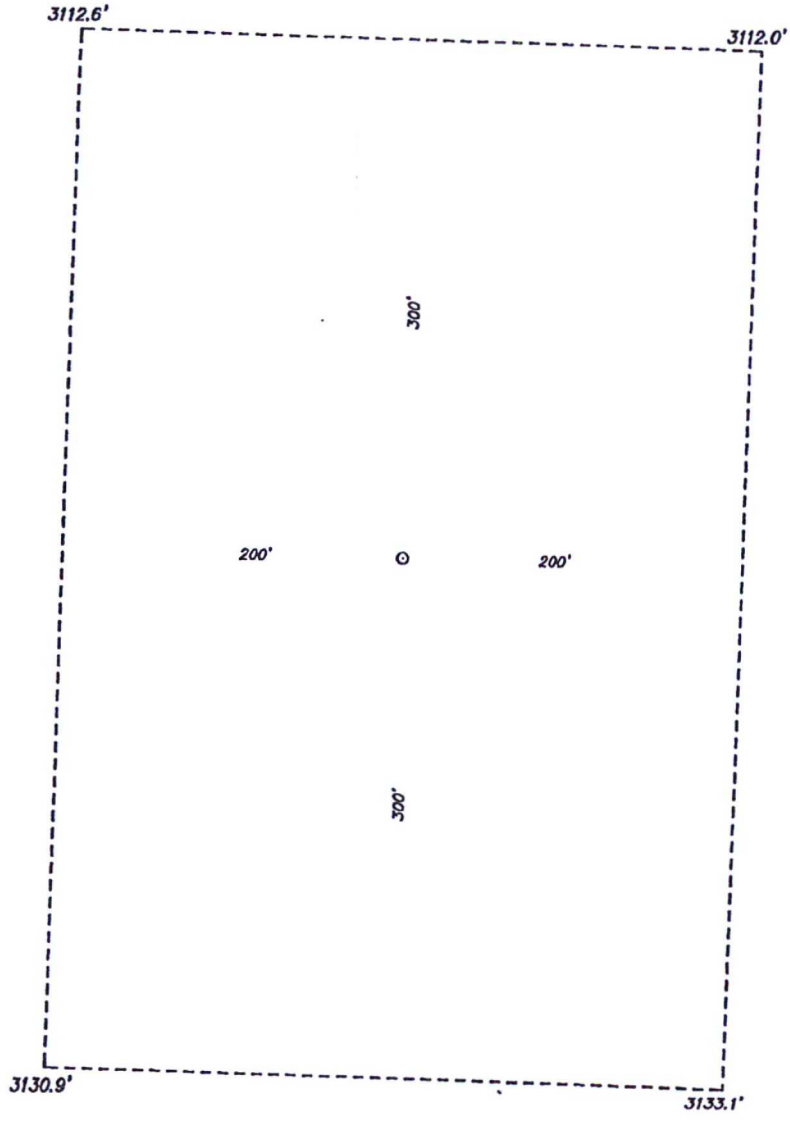
REF: ROADRUNNER SWD #1 / WELL PAD TOPO

THE ROADRUNNER SWD #1 LOCATED 830' FROM THE NORTH LINE AND 200' FROM THE EAST LINE OF SECTION 33, TOWNSHIP 25 SOUTH, RANGE 27 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO.

Basin Surveys
focused on excellence in the oilfield
P.O. Box 1786
1120 N. West County Rd.
Hobbs, New Mexico 88241
(575) 393-7316 - Office
(575) 392-2206 - Fax
basinsurveys.com

W.O. Number: 34179	Drawn By: K. GOAD	Date: 11-06-2018	Survey Date: 11-05-2018	Sheet 1 of 1 Sheets

SECTION 33, TOWNSHIP 25 SOUTH, RANGE 27 EAST, N.M.P.M.,
EDDY COUNTY, NEW MEXICO.



100 0 100 200 FEET

SCALE: 1" = 100'

SOLARIS WATER MIDSTREAM

REF: ROADRUNNER SWD #1 / WELL•PAD TOPO

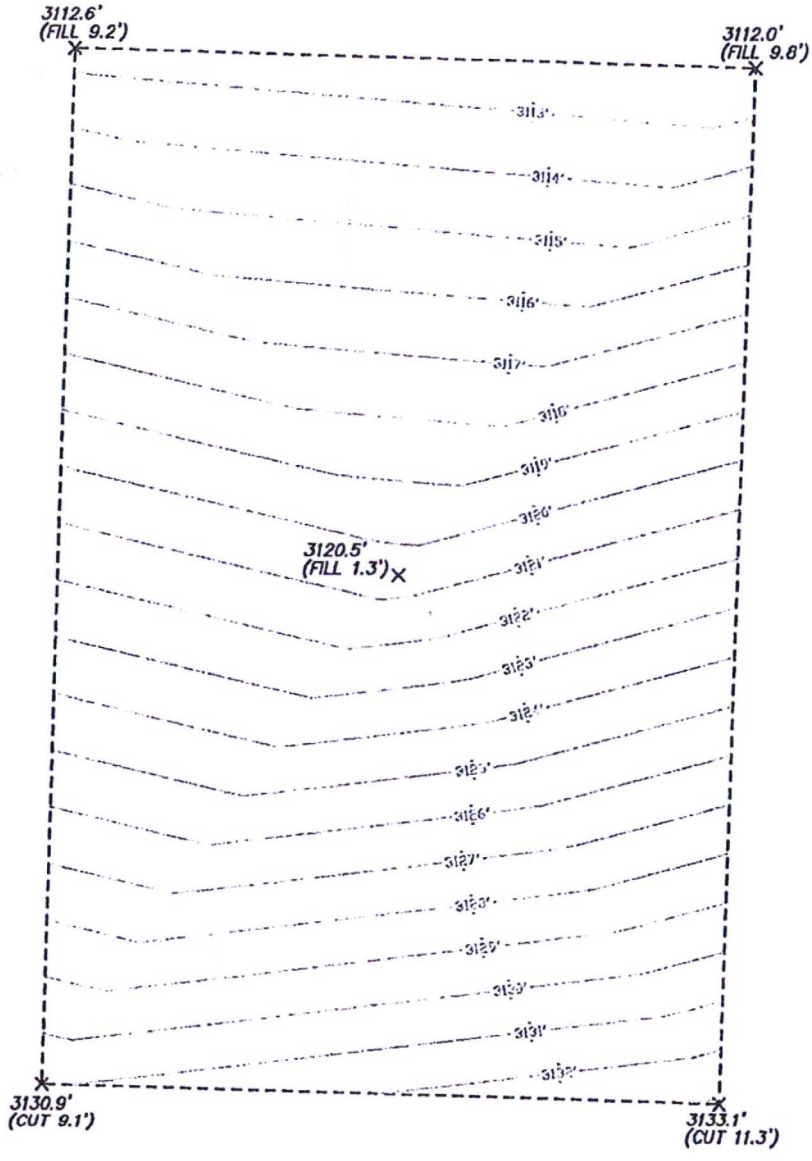
THE ROADRUNNER SWD #1 LOCATED 830' FROM THE NORTH LINE AND 200' FROM THE EAST LINE OF SECTION 33, TOWNSHIP 25 SOUTH, RANGE 27 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO.

Basin Surveys
focused on excellence in the oilfield
P.O. Box 1786
1120 N. West County Rd.
Hobbs, New Mexico 88241
(575) 393-7316 -- Office
(575) 392-2206 -- Fax
basinsurveys.com

W.O. Number: 34179	Drawn By: K. GOAD	Date: 11-06-2018	Survey Date: 11-05-2018	Sheet 1 of 1 Sheets

SECTION 33, TOWNSHIP 25 SOUTH, RANGE 27 EAST, N.M.P.M.,

EDDY COUNTY, NEW MEXICO.



100 0 100 200 FEET

SCALE: 1" = 100'

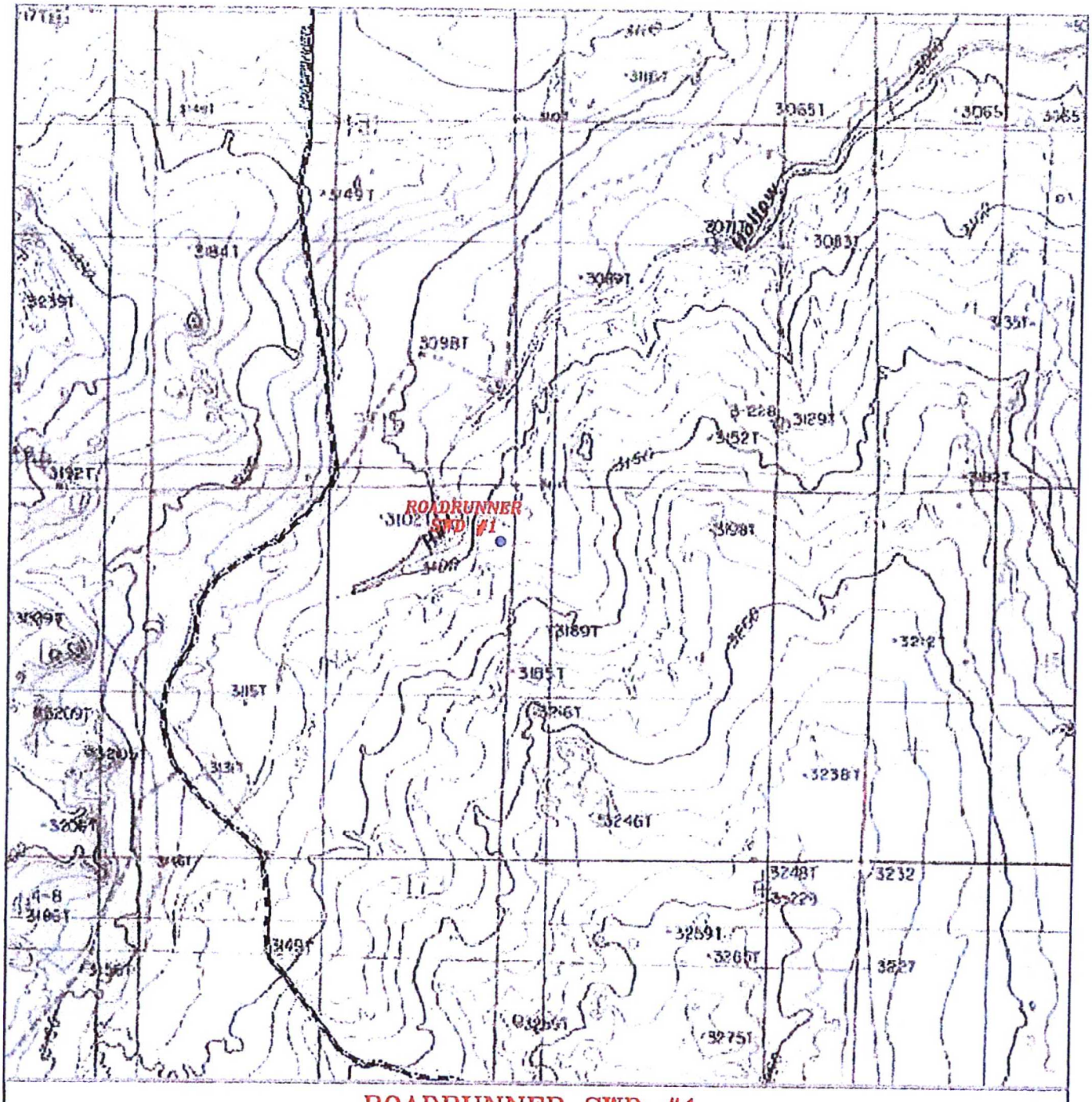
SOLARIS WATER MIDSTREAM

REF: ROADRUNNER SWD #1 / CUT & FILL

THE ROADRUNNER SWD #1 LOCATED 830' FROM THE NORTH LINE AND 200' FROM THE EAST LINE OF SECTION 33, TOWNSHIP 25 SOUTH, RANGE 27 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO.

basin surveys
focused on excellence in the oilfield
P.O. Box 1786
1120 N. West County Rd.
Hobbs, New Mexico 88241
(575) 393-7316 -- Office
(575) 392-2206 -- Fax
basinsurveys.com

W.O. Number: 34179	Drawn By: K. GOAD	Date: 11-06-2018	Survey Date: 11-05-2018	Sheet 1 of 1 Sheets



ROADRUNNER SWD #1

Located 830' FNL & 200' FEL
Section 33, Township 25 South, Range 27 East,
N.M.P.M., Eddy County, New Mexico.

Basin Surveys
focused on excellence in the oilfield
P.O. Box 1786
1120 N. West County Rd.
Hobbs, New Mexico 88241
(575) 393-7316 - Office
(575) 392-2206 - Fax
basinsurveys.com

0' 1000' 2000' 3000' 4000'
SCALE: 1" = 2000'

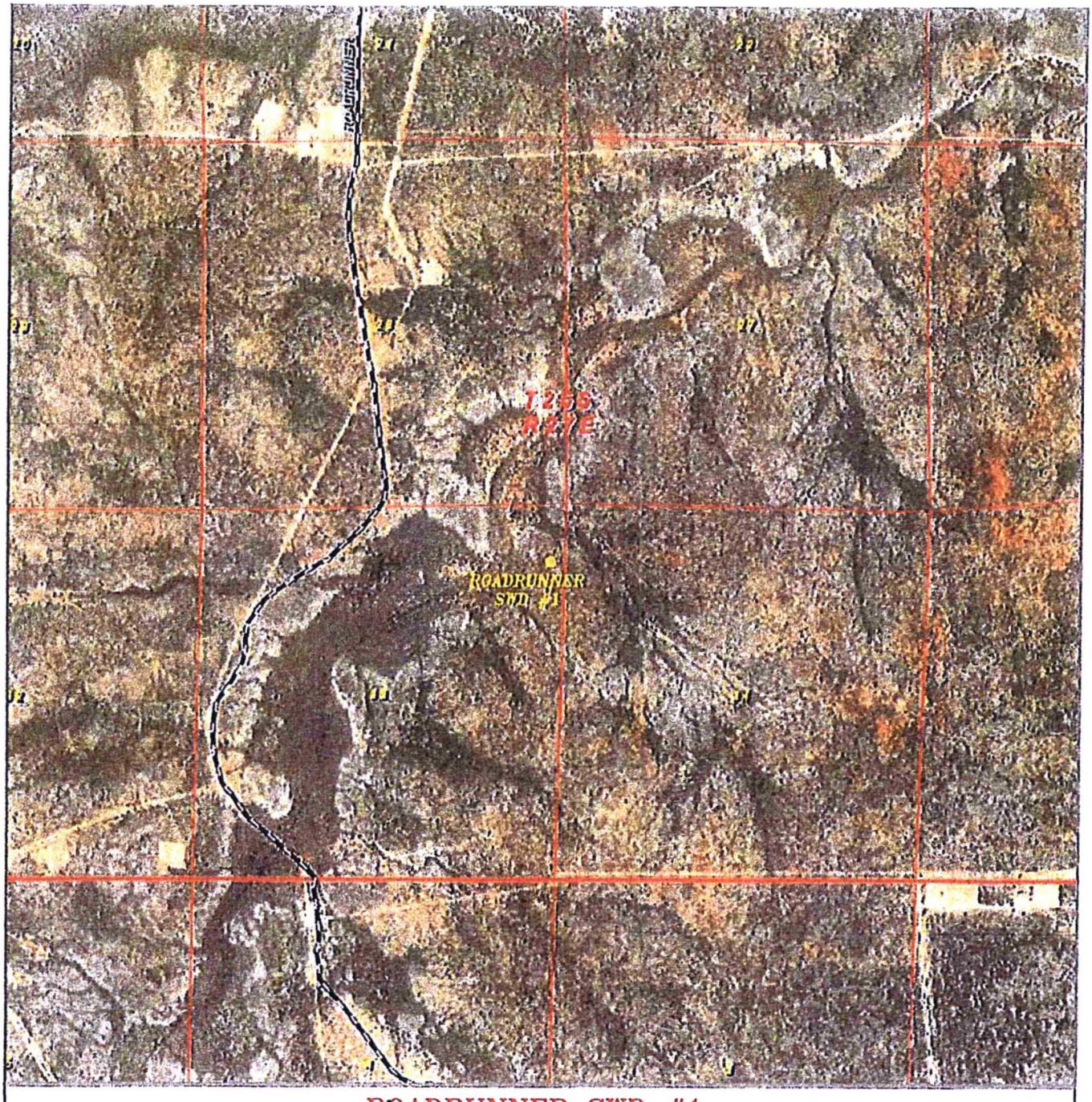
W.O. Number: KJG - 34179

Survey Date: 11-05-2018

YELLOW TINT - USA LAND
BLUE TINT - STATE LAND
NATURAL COLOR - FEE LAND

N

SOLARIS WATER MIDSTREAM



ROADRUNNER SWD #1

Located 830' FNL & 200' FEL
Section 33, Township 25 South, Range 27 East,
N.M.P.M., Eddy County, New Mexico.

Basin Surveys
focused on excellence in the oilfield

P.O. Box 1786
1120 N. West County Rd.
Hobbs, New Mexico 88241
(575) 393-7316 - Office
(575) 392-2206 - Fax
basinsurveys.com

0' 1000' 2000' 3000' 4000'
SCALE: 1" = 2000'

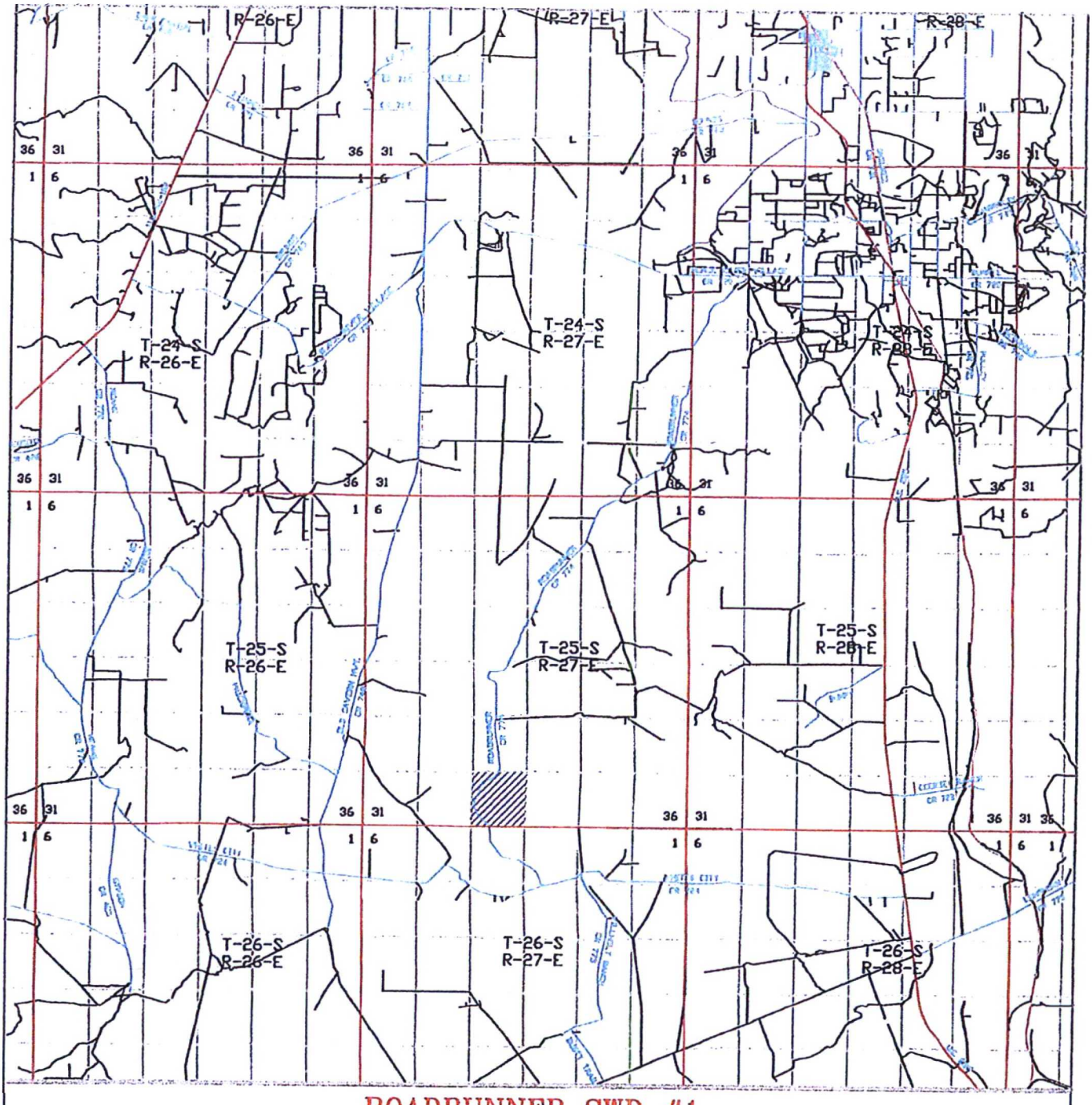
W.O. Number: KJG - 34179

Survey Date: 11-05-2018

YELLOW TINT -- USA LAND
BLUE TINT -- STATE LAND
NATURAL COLOR -- FEE LAND

N

SOLARIS WATER MIDSTREAM



ROADRUNNER SWD #1

Located 830' FNL & 200' FEL
Section 33, Township 25 South, Range 27 East,
N.M.P.M., Eddy County, New Mexico.

basin surveys
focused on excellence in the oilfield

P.O. Box 1786
1120 N. West County Rd.
Hobbs, New Mexico 88241
(575) 393-7316 -- Office
(575) 392-2206 -- Fax
basinsurveys.com

0 1 MI 2 MI 3 MI 4 MI
SCALE: 1" = 2 MILES

W.O. Number: KJG 34179

Survey Date: 11-05-2018

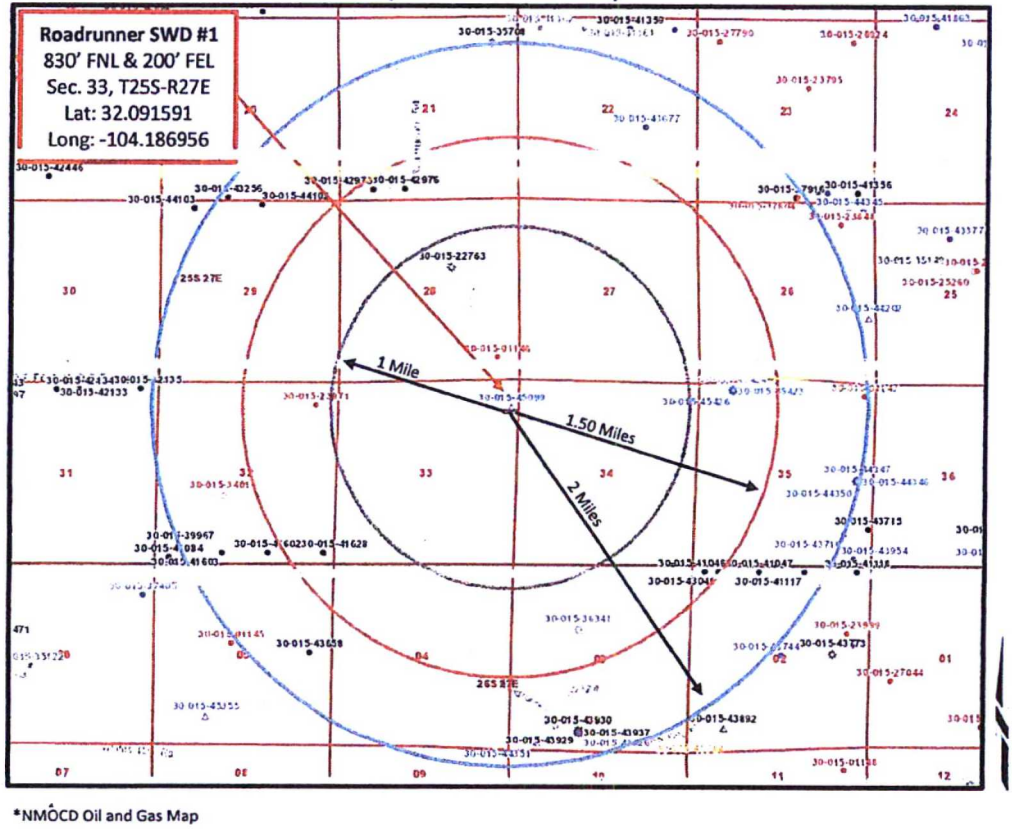
YELLOW TINT -- USA LAND
BLUE TINT -- STATE LAND
NATURAL COLOR -- FEE LAND

N

SOLARIS WATER MIDSTREAM

Roadrunner SWD #1 – Areal of Review: 2 Miles

(Form C-108 - Item V)

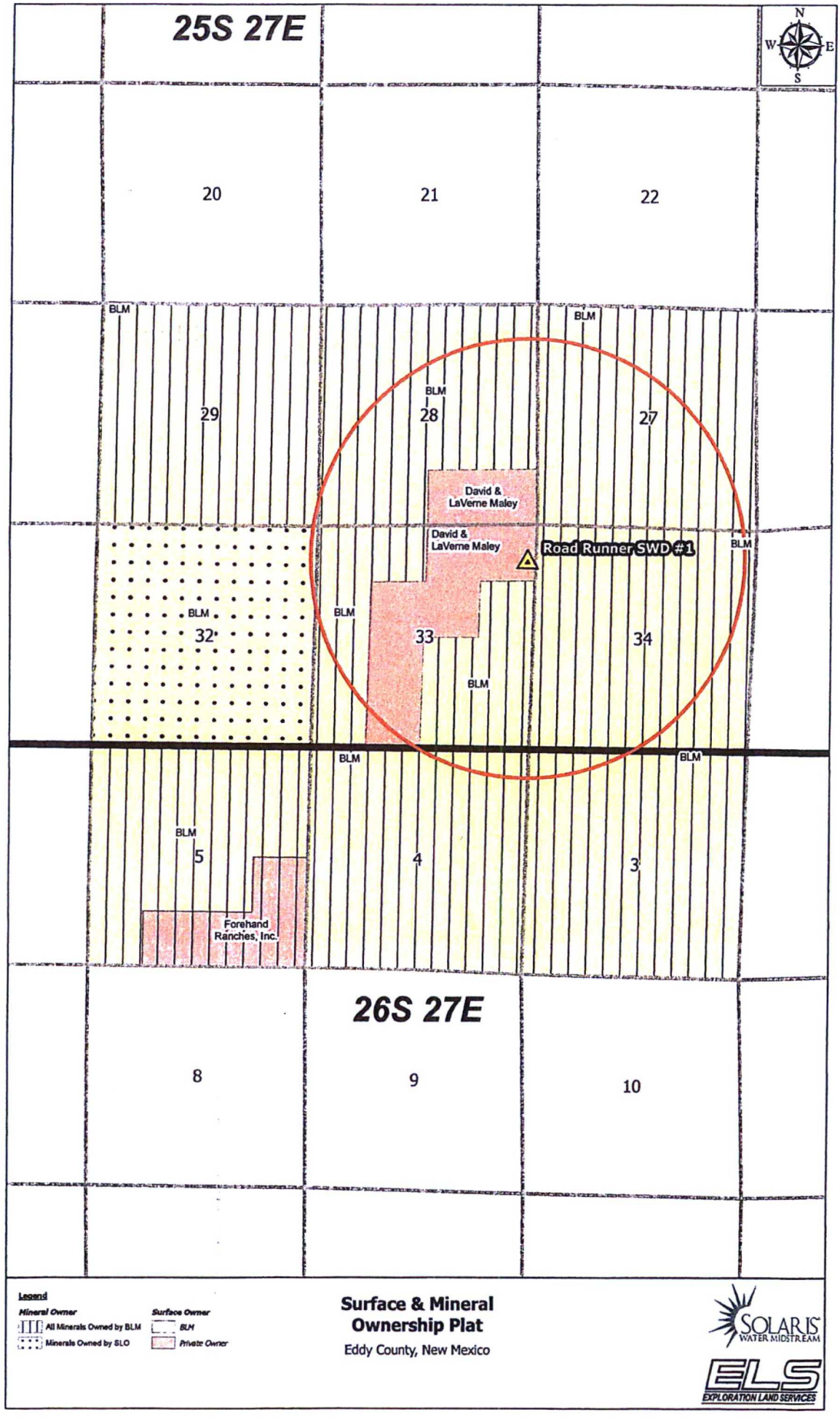


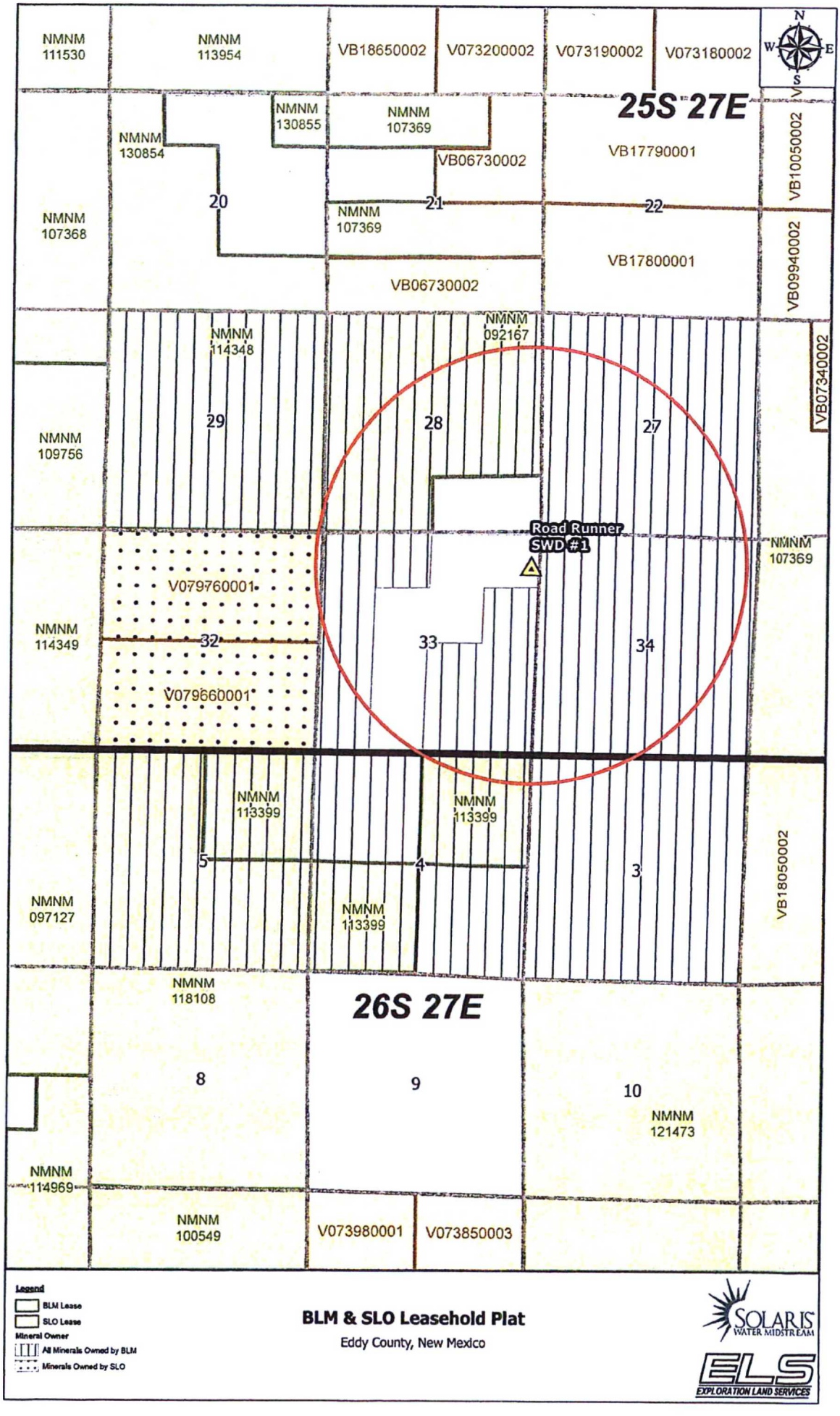
*NMOCD Oil and Gas Map

Solaris Water Midstream, LLC

1.50-mile AOR tabulation for Roadrunner SWD #1 (top of injection interval is 13,305') (Form C-108 - Item VI)							
Well Name	API	Well Type	Operator	Location	Footage Location	Total Depth	Penetrate Inj. Zone
Skeen 2 26 27 State #001H	30-015-41046	O	Chevron USA, Inc.	D-02-26S-27E	175' FNL & 400' FWL	7,786	No
White City 21 25 27 Federal Com #005H	30-015-42976	O	Chevron USA, Inc.	N-21-25S-27E	330' FSL & 1923' FWL	12,173	No
White City 21 25 27 Federal Com #005H	30-015-42975	O	Chevron USA, Inc.	M-21-25S-27E	330' FSL & 990' FWL	7,451	No
Midnight Sun 2 26 27 #005H	30-015-43040	O	Chevron USA, Inc.	D-02-26S-27E	175' FNL & 775' FWL	13,894	No
HH CE 26 23 Federal 001 #001H	30-015-45423	G	Chevron USA, Inc.	D-35-25S-27E	245' FNL & 985' FWL	n/a	No
HH CE 26 23 Federal 001 #002H	30-015-45424	G	Chevron USA, Inc.	D-35-25S-27E	245' FNL & 1010' FWL	n/a	No
HH CE 26 23 Federal 001 #003H	30-015-45425	G	Chevron USA, Inc.	D-35-25S-27E	245' FNL & 1035' FWL	n/a	No
HH CE 26 23 Federal 001 #004H	30-015-45426	G	Chevron USA, Inc.	D-35-25S-27E	245' FNL & 1060' FWL	n/a	No
Cottonwood Hills 32 State Com #005H	30-015-41628	O	Cimarex Energy Co.	P-32-25S-27E	330' FSL & 330' FEL	7,480	No
Leonardo BKL Federal Com #001	30-015-22763	G	EOG Y Resources, Inc.	G-28-25S-27E	1980' FNL & 1980' FEL	12,712	No
Scrabble BLE Federal #001	30-015-36341	G	EOG Y Resources, Inc.	F-03-26S-27E	1880' FNL & 1980' FWL	n/a	No
Pre-Ongard Well #001	30-015-01146	O	Pre-Ongard Well Operator	A-28-25S-27E	660' FSL & 660' FEL	n/a	No
Pre-Ongard Well #001	30-015-23971	O	Pre-Ongard Well Operator	A-32-25S-27E	660' FSL & 660' FEL	n/a	No

* NMOCD Oil and Gas Map


25S 27E
N
W
E
S
20
21
22
BLM
29
28
27
David &
LaVerne Maley
David &
LaVerne Maley
Road Runner SWD #1
BLM
32
33
34
BLM
5
4
3
Forehand
Ranches, Inc.
26S 27E
8
9
10
Legend
Mineral Owner
All Minerals Owned by BLM
Minerals Owned by SLO
Surface Owner
BLM
Private Owner
Surface & Mineral
Ownership Plat
Eddy County, New Mexico
SOLARIS
WATER MIDSTREAM
ELS
EXPLORATION LAND SERVICES


NMNM 111530
NMNM 113954
VB18650002
V073200002
V073190002
V073180002
N
W
E
S
25S 27E
NMNM 130855
NMNM 107369
NMNM 130854
VB06730002
VB17790001
VB10050002
20
21
22
NMNM 107368
NMNM 107369
VB17800001
VB09940002
VB06730002
NMNM 114348
NMNM 092167
VB07340002
29
28
27
NMNM 109756
Road Runner SWD #1
NMNM 107369
V079760001
NMNM 114349
32
33
34
V079660001
NMNM 113399
NMNM 113399
5
4
3
NMNM 097127
NMNM 113399
VB18050002
NMNM 118108
26S 27E
8
9
10
NMNM 121473
NMNM 114969
NMNM 100549
V073980001
V073850003
Legend
BLM Lease
SLO Lease
Mineral Owner
All Minerals Owned by BLM
Minerals Owned by SLO
BLM & SLO Leasehold Plat
Eddy County, New Mexico
SOLARIS WATER MIDSTREAM
ELS
EXPLORATION LAND SERVICES

Road Runner SWD #1		
Owner Category	**Name**	**Address**
Well Operator	Solaris Water Midstream, LLC	9811 Katy Freeway STE 700, Houston, TX 77024
Well Operator	EOG Resources, Inc.	4000 N. Big Spring, Suite 500, Midland, TX 79705
Lessee	EOG A Resources, Inc.	105 S. 4th St., Artesia, NM 882102
Lessee	EOG Y Resources, Inc.	105 S. 4th St., Artesia, NM 882102
Lessee	OXY Y-1 Company	P. O. Box 27570, Houston, TX 772277
Lessee	EOG M Resources	105 S. 4th St., Artesia, NM 882102
Lessee	Chevron USA, Inc.	6301 Deauville, Midland, TX 79706
Lessee	COG Operating, LLC	600 W. Illinois Ave., Midland, TX 79701
Lessee	Chevron Midcontinent, LP	6301 Deauville, Midland, TX 79706
Lessee	ABO Empire, LLC	P. O. Box 900, Artesia, NM 88211
Mineral Owner	David and Laverne Maley	P. O. Box 519, Carlsbad, NM 88221
Mineral Owner	Bureau of Land Management	620 E. Greene Street, Carlsbad, NM 88220
Mineral Owner	State of New Mexico	310 Old Sante Fe Trail, Sante Fe, NM 87501
Surface Owner	David and Laverne Maley	P. O. Box 519, Carlsbad, NM 88221
Surface Owner	Bureau of Land Management	620 E. Greene Street, Carlsbad, NM 88220

7016 0910 0000 9642 1268

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®
CARLSBAD, NM 88220

OFFICIAL USE

Certified Mail Fee	$3.50
Extra Services & Fees (check box, add fee as appropriate)	
☐ Return Receipt (hardcopy)	$2.80
☐ Return Receipt (electronic)	$0.00
☐ Certified Mail Restricted Delivery	$0.00
☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery	$0.00
Postage	$2.20
Total Postage and Fees	$8.50

0101
ALBUQUERQUE NM 87101
FEB 6 2019
Postmark Here
02/06/2019 USPS

Sent To: US BLM
Street and Apt. No., or PO Box No.: 620 E. Greene St.
City, State, ZIP+4®: Carlsbad, NM 88220

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7016 0910 0000 9642 1237

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®
MIDLAND, TX 79706

OFFICIAL USE

Certified Mail Fee	$3.50
Extra Services & Fees (check box, add fee as appropriate)	
☐ Return Receipt (hardcopy)	$2.80
☐ Return Receipt (electronic)	$0.00
☐ Certified Mail Restricted Delivery	$0.00
☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery	$0.00
Postage	$2.20
Total Postage and Fees	$8.50

0101
ALBUQUERQUE NM 87101
FEB 6 2019
Postmark Here
02/06/2019 USPS

Sent To: Chevron USA, Inc.
Street and Apt. No., or PO Box No.: 6301 Deauville
City, State, ZIP+4®: Midland, Texas 79706

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

SENDER: COMPLETE THIS SECTION

Complete items 1, 2, and 3.
Print your name and address on the reverse so that we can return the card to you.
Attach this card to the back of the mailpiece, or on the front if space permits.

Article Addressed to:
US. BLM
1920 E. Greene St.
Carlsbad, NM
88220

9590 9402 3313 7196 6966 73

Article Number (Transfer from service label)
7016 0910 0000 9642 1268

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X [signature] ☐ Agent ☐ Addressee

B. Received by (Printed Name) FEB 11 2019 C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☒ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

SENDER: COMPLETE THIS SECTION

■ Complete items 1, 2, and 3.
■ Print your name and address on the reverse so that we can return the card to you.
■ Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:
Chevron USA, Inc.
6301 Deauville
Midland, Texas
79706

9590 9402 3313 7196 6967 05

2. Article Number (Transfer from service label)
7016 0910 0000 9642 1237

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X [signature] ☐ Agent ☐ Addressee

B. Received by (Printed Name) [signature] C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☒ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricte Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

7016 0910 0000 9642 1213

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®
ARTESIA, NM 88210

OFFICIAL USE

Certified Mail Fee	$3.50
Extra Services & Fees (check box, add fee as appropriate)	$2.80
☐ Return Receipt (hardcopy)	$0.00
☐ Return Receipt (electronic)	$0.00
☐ Certified Mail Restricted Delivery	$0.00
☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery	$
Postage	$2.20
Total Postage and Fees	$8.50

ALBUQUERQUE NM 87101
FEB
Postmark Here
2019
USPS
02/06/2019

Sent To: EOG Resources, Inc.
Street and Apt. No., or PO Box No.: 105 S. 4th Street
City, State, ZIP+4®: Artesia, NM 88210

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7016 0910 0000 9642 1220

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®
HOUSTON, TX 77227

OFFICIAL USE

Certified Mail Fee	$3.50
Extra Services & Fees (check box, add fee as appropriate)	$2.80
☐ Return Receipt (hardcopy)	$0.00
☐ Return Receipt (electronic)	$0.00
☐ Certified Mail Restricted Delivery	$0.00
☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery	$
Postage	$2.20
Total Postage and Fees	$8.50

01 01
ALBUQUERQUE NM 87101
FEB
Postmark Here
6
2019
02/06/2019

Sent To: OXY Y-1 Company
Street and Apt. No., or PO Box No.: PO Box 27570
City, State, ZIP+4®: Houston, Texas 77227

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

SENDER: COMPLETE THIS SECTION

Complete items 1, 2, and 3.
Print your name and address on the reverse so that we can return the card to you.
Attach this card to the back of the mailpiece, or on the front if space permits.

Article Addressed to:
EOG Resources, Inc.
~~105 S. 4th Street~~
Artesia, NM 88210

9590 9402 3313 7196 6967 27

Article Number (Transfer from service label)
7016 0910 0000 9642 1213

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X [signature] ☐ Agent ☐ Addressee

B. Received by (Printed Name): Darrell Adkins — C. Date of Delivery: FEB 11 2019

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

104 S. 4th

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☒ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:
OXY Y-1 Company
PO Box 27570
Houston, Texas
77227

9590 9402 3313 7196 6967 10

2. Article Number (Transfer from service label)
7016 0910 0000 9642 1220

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X [signature] ☐ Agent ☐ Addressee

B. Received by (Printed Name): [illegible] — C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☒ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

7016 0910 0000 9642 1206

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®

MIDLAND, TX 79705

OFFICIAL USE

Certified Mail Fee	$3.50
Extra Services & Fees (check box, add fee as appropriate)	
☐ Return Receipt (hardcopy)	$0.00
☐ Return Receipt (electronic)	$0.00
☐ Certified Mail Restricted Delivery	$0.00
☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery	$
Postage	$2.20
Total Postage and Fees	$8.50

0101 ALBUQUERQUE NM 87101 Postmark Here FEB 6 2019 USPS 02/06/2019

Sent To: EOG Resources, Inc.
Street and Apt. No., or PO Box No.: 4000 N. Big Spring, Suite 500
City, State, ZIP+4®: Midland, Texas 79705

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7015 3010 0000 6360 8440

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®

CARLSBAD, NM 88221

OFFICIAL USE

Certified Mail Fee	$3.50
Extra Services & Fees (check box, add fee as appropriate)	
☐ Return Receipt (hardcopy)	$0.00
☐ Return Receipt (electronic)	$0.00
☐ Certified Mail Restricted Delivery	$0.00
☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery	$
Postage	$2.20
Total Postage and Fees	$8.50

0101 ALBUQUERQUE NM 87101 Postmark Here FEB 6 2019 USPS 02/06/2019

Sent To: David + Laverne Maley
Street and Apt. No., or PO Box No.: PO Box 519
City, State, ZIP+4®: Carlsbad, NM 88221

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7016 0910 0000 9642 1190

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®

SANTA FE, NM 87501

OFFICIAL USE

Certified Mail Fee	$3.50
Extra Services & Fees (check box, add fee as appropriate)	
☐ Return Receipt (hardcopy)	$0.00
☐ Return Receipt (electronic)	$0.00
☐ Certified Mail Restricted Delivery	$0.00
☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery	$
Postage	$2.20
Total Postage and Fees	$8.50

0101 ALBUQUERQUE NM 87101 Postmark Here FEB 6 2019 USPS 02/06/2019

Sent To: NM State Land Office
Street and Apt. No., or PO Box No.: 310 Old Santa Fe Trail
City, State, ZIP+4®: Santa Fe NM 87501

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

David + Laverne Maley
PO Box 519
Carlsbad, NM 88221

9590 9402 3313 7196 6967 41

2. Article Number (Transfer from service label)
7015 3010 0000 6360 8440

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X [signature] ☐ Agent ☐ Addressee

B. Received by (Printed Name) [illegible] C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

U.S. POSTAL SERVICE CARLSBAD NM 88220 FEB 11 2019

3. Service Type
- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☑ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
- ☐ Insured Mail
- ☐ Insured Mail Restricted Delivery (over $500)
- ☐ Priority Mail Express®
- ☑ Registered Mail™
- ☐ Registered Mail Restricted Delivery
- ☐ Return Receipt for Merchandise
- ☐ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

COG Operating LLC
600 W. Illinois Ave
Midland, Texas
79701

9590 9402 3313 7196 6966 97

2. Article Number (Transfer from service label)

7016 0910 0000 9642 1244

PS Form 3811, July 2015 PSN 7530-02-000-9053

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X [signature] ☐ Agent ☐ Addressee

B. Received by (Printed Name) Jennifer Wohlerking C. Date of Delivery 2/1/19

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☑ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
- ☐ Insured Mail
- ☐ Insured Mail Restricted Delivery (over $500)
- ☐ Priority Mail Express®
- ☐ Registered Mail™
- ☐ Registered Mail Restricted Delivery
- ☐ Return Receipt for Merchandise
- ☐ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

Domestic Return Receipt

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

ABO Empire LLC
PO Box 900
Artesia, NM
88211

9590 9402 3313 7196 6966 80

2. Article Number (Transfer from service label)

7016 0910 0000 9642 1251

PS Form 3811, July 2015 PSN 7530-02-000-9053

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X Donna Scott ☐ Agent ☐ Address

B. Received by (Printed Name) Donna Scott C. Date of Delive

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☑ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
- ☐ Insured Mail
- ☐ Insured Mail Restricted Delivery (over $500)
- ☐ Priority Mail Express®
- ☐ Registered Mail™
- ☐ Registered Mail Restric Delivery
- ☐ Return Receipt for Merchandise
- ☐ Signature Confirmation
- ☐ Signature Confirmation Restricted Delivery

Domestic Return Receip

9590 9402 3313 7196 6966 97

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®
MIDLAND, TX 79701

OFFICIAL USE

Certified Mail Fee	$3.50
$	$2.80
Extra Services & Fees (check box, add fee as appropriate)	
☐ Return Receipt (hardcopy)	$ $0.00
☐ Return Receipt (electronic)	$ $0.00
☐ Certified Mail Restricted Delivery	$ $0.00
☐ Adult Signature Required	$ $0.00
☐ Adult Signature Restricted Delivery	$
Postage	$2.20
$	
Total Postage and Fees	$8.50
$	

ALBUQUERQUE NM 87101 FEB 6 2019 Postmark Here USPS 02/06/2019

Sent To: COG Operating LLC
Street and Apt. No., or PO Box No.: 600 W. Illinois Ave
City, State, ZIP+4®: Midland, Texas 79701

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7016 0910 0000 9642 1244

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®
ARTESIA, NM 88211

OFFICIAL USE

Certified Mail Fee	$3.50
$	$2.80
Extra Services & Fees (check box, add fee as appropriate)	
☐ Return Receipt (hardcopy)	$ $0.00
☐ Return Receipt (electronic)	$ $0.00
☐ Certified Mail Restricted Delivery	$ $0.00
☐ Adult Signature Required	$ $0.00
☐ Adult Signature Restricted Delivery	$
Postage	$2.20
$	
Total Postage and Fees	$8.50
$	

ALBUQUERQUE NM 87101 FEB 6 2019 Postmark Here USPS 02/06/2019

Sent To: ABO Empire LLC
Street and Apt. No., or PO Box No.: PO Box 900
City, State, ZIP+4®: Artesia, New Mexico 88211

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7016 0910 0000 9642 1251

CARLSBAD
CURRENT-ARGUS

AFFIDAVIT OF PUBLICATION

Ad No.
0001276559

DOMENICI LAW FIRM, P.C.
320 GOLD AVENUE SW SUITE 1000

ALBUQUERQUE NM 87102

I, a legal clerk of the **Carlsbad Current-Argus**, a newspaper published daily at the City of Carlsbad, in said county of Eddy, state of New Mexico and of general paid circulation in said county; that the same is a duly qualified newspaper under the laws of the State wherein legal notices and advertisements may be published; that the printed notice attached hereto was published in the regular and entire edition of said newspaper and not in supplement thereof on the date as follows, to wit:

02/08/19

Legal Clerk

Subscribed and sworn before me this
8th of February 2019.

State of WI, County of Brown
NOTARY PUBLIC

11/9/22
My Commission Expires

Ad#:0001276559
P O :
# of Affidavits :0.00

APPLICATION FOR AUTHORIZATION TO INJECT

NOTICE IS HEREBY GIVEN: That Solaris Water Midstream, LLC, 9811 Katy Freeway, Suite 900, Houston, TX 77024, is requesting that the New Mexico Oil Conservation Division administratively approve the APPLICATION FOR AUTHORIZATION TO INJECT as follows:

PURPOSE: The intended purpose of the injection well is to dispose of salt water produced from permitted oil and gas wells.

WELL NAME AND LOCATION:Road Runner SWD #1, 830' FNL & 200' FEL, Section 33, Township 25S, Range 27E, Eddy County, New Mexico

NAME AND DEPTH OF DISPOSAL ZONE: Devonian-Silurian (13,305'-14,325')

EXPECTED MAXIMUM INJECTION RATE: 30,000 Bbls/day

EXPECTED MAXIMUM INJECTION PRESSURE: 2,661 psi (surface)

Objections or requests for hearing must be filed with the New Mexico Oil Conservation Division within fifteen (15) days. Any objection or request for hearing should be mailed to the Oil Conservation Division, 1220 South St. Francis Dr., Santa Fe, New Mexico, 87505. Additional information may be obtained by contacting Whitney McKee (Solaris-Regulatory Technician) at 432-203-9020.

Pub: Feb. 8, 2019
Legal ad #1276559

KAZOUA YANG
NOTARY PUBLIC
STATE OF WISCONSIN

Pete V. Domenici, Jr.
pdomenici@domenicilaw.com

Reed Easterwood
reasterwood@domenicilaw.com

DOMENICI LAW FIRM, P.C.
ATTORNEYS AT LAW
320 Gold Avenue SW
Suite #1000
Albuquerque, New Mexico 87102
-
(505) 883-6250 Telephone
(505) 884-3424 Facsimile

Lorraine Hollingsworth
lhollingsworth@domenicilaw.com

Jeanne Cameron Washburn
jwashburn@domenicilaw.com

April 8, 2019

HAND DELIVERED

Phillip Goetze
Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, NM 87505

RE: Solaris Water Midstream, LLC
Roadrunner SWD #1 – additional information for the record

Dear Mr. Goetze:

Enclosed please find the following information to be added to the record for the Solaris Roadrunner SWD #1 well:

1. FSP Analysis from FTI Platt Sparks
2. Reservoir Engineering Study by Paul James Taylor
3. Affidavit of Stephen M. Martinez

Thank you for your assistance in this matter.

Sincerely,

Lorraine Hollingsworth

Cc: Drew Dixon via email

AFFIDAVIT OF STEPHEN M. MARTINEZ

I, Stephen M. Martinez, make the following affidavit based on my personal knowledge.

1. I am over eighteen (18) years of age and am otherwise competent to make the statements contained herein.

2. I am Sr. Vice President – Drilling for Solaris Water Midstream, LLC. My responsibilities include engineering review and management of all drilling related activities for the company.

3. I am a Petroleum Engineer with over 25 years of oil and gas experience, both domestic and international, specializing in the drilling and stimulation of both vertical and extended reach horizontal wells as well as deep, salt water disposal (SWD) wells. I hold a Bachelor of Science in Petroleum Engineering from Texas Tech University (1993).

4. I am familiar with the Solaris Water Midstream Application, filed in this matter, for the Roadrunner SWD #1 well. I have reviewed and am familiar with the data on proposed operations included in the Application, including the information required by Section VII of Form C-108.

5. I am familiar with the casing and tubing design proposed by Solaris as set forth in Section III.A(2), (3) and (4) of the Application and the wellbore diagram included as Attachment A to the Application.

6. Section III.A(2) includes a description of the casing information, including hole size, casing size, casing weight, setting depth, and other relevant information.

7. As set forth in Section III.A(2), Solaris proposes 5 ½" (23#) Internal Plastic Coated Tubing swaged down to 5" (18#) with a setting depth of 13,285 feet. A lok-set or equivalent packer will be set at 13,285 feet and representative packer details are included in Attachment 1 to the Application.

8. I have also reviewed the proposed operations set forth in Section VII of the Application, including injection rates, the use of a closed system, the proposed injection pressures, the source water analysis, and the injection formation water analysis.

9. Based on my knowledge and experience, it is my opinion that the casing and tubing proposed will be safe and adequate to prevent leakage, and will prevent the movement of injected fluid from the injection zone into another zone or to the surface around the outside of a casing string.

10. Based on my knowledge and experience, it is my opinion that the well will be equipped and operated in manner that will facilitate periodic testing and assure continued mechanical integrity and that there will be no significant leaks or movement of fluid through vertical channels adjacent to the well bore.

11. Based on my knowledge and experience, it is my opinion that the well will be operated and maintained so as to confine the injected fluids to the intervals approved and will prevent surface damage or pollution resulting from leaks, breaks or spills.

SUBSCRIBED AND SWORN to before me this 1st day of April, 2019 by Stephen M. Martinez.

Bonnie Atwater
Notary Public

My commission expires: 1-26-21

BONNIE ATWATER
Notary Public, State of Texas
Notary ID 318441-3
My Commission Exp. 01-26-2021

FTI™
PLATT SPARKS
Texas Registered Engineering Firm No F – 16381

April 5, 2019

RE: FSP Analysis
Solaris Water Midstream, LLC **(Roadrunner SWD)**
Eddy County, New Mexico

FSP Analysis

The FSP software used for this analysis was jointly developed by Stanford University, Exxon Mobil and XTO Energy as a tool for estimating fault slip potential resulting from fluid injection.

I have reviewed the geology, seismic activity, injection history and future proposed injection in the Subject Area and I would conclude that the Proposed **Roadrunner SWD** well does not pose a risk of increasing seismicity in the area. The primary risk reduction factor is that the faults are not optimally oriented to slip, and significant pressure increases would be necessary to initiate slip on the faults analyzed.

Fault slip potential (FSP) was analyzed in the area of review shown on **Exhibit No. 1.** The analysis integrates the proposed well location as well as any existing injection wells in order to fully assess the pressure implications of injection in the area and the potential for slip along existing faults. There are no historical USGS earthquake locations within the review area. (see **Exhibit No. 1)**

Exhibit No. 2 shows the FSP input parameters for the local stress, average reservoir depth, pressure gradients and reservoir characteristics. Depths and reservoir characteristics were derived from nearby well logs and stress values were derived from the Lund Snee and Zoback (2018) paper related to Stress in the Permian Basin.

Exhibit No. 3 shows the location of existing wells and locations of the Proposed SWD well relative to the faults documented in this area. The faults are sourced from the Texas Bureau of Economic Geology

925-A Capital of Texas Highway, South | Austin, TX 78746
512.327.6930 telephone | 512.327.7069 fax | ftiplattsparks.com

and these are also the fault traces shown in the referenced Snee/Zoback paper (Figure 3 in the paper) and shown as **Exhibit No. 4** in my report. The Snee/Zoback paper only considers fault orientation relative to the stress orientation in determination of fault slip potential. Based on their limited analysis of the area they concluded the faults have low slip potential based on orientation/azimuth.

My analysis further incorporates the injection history and future injection projections and the injection reservoir characteristics to fully assess the potential for slip along these faults. Existing wells were incorporated into the analysis using their injection volume histories and holding them constant into the future at their last reported monthly injection volume. The Subject well was modelled at 30,000 bbls/day and held constant for the life of the analysis (+25 years). Recently permitted wells, with no injection history, were all modelled at 30,000 bbls/day and held constant for the life of the analysis (+25 years).

(Only wells within the 10 km radius are used in the model)

The wells in the model: (**Exhibit No. 3 and Exhibit No. 1)**

RR – Roadrunner SWD

1 - 30015330940000

3 - 30015414020000

4 – 30015418060000

5 - 30015423560000

6 - 30015438920000

9 – 30015430290000

10 – 30015453550000

11 – 30015454350000

12 – 30015454580000

13 – 30015453560000

14 - 30015442020000

Exhibit No. 5 illustrates the geomechanical properties of the fault segments in the area of review. It should be noted that the FSP software only calculates a single pressure change along a fault (at the fault mid-point) so it is critical that faults are broken into multiple segments to get a true evaluation of the

pressure increases associated with injection. **Exhibit No. 5** also shows the direction of max hor. stress as denoted by the grey arrows outside the circle on the stereonet in the lower right portion of this exhibit. Faults that align parallel or closer to this orientation will have the highest potential for slip or lowest ΔP to slip. Faults 1-7 have very low potential for slip.

Exhibit No. 6 shows that the input stress and fault values were varied by +/-10% to allow for uncertainty in the input parameters. Even considering the variability of the inputs the model results show low probability for slip on the faults in the area of review. An increase of 2,600 psi still only results in a 10% probability of fault slip.

Exhibit No. 7 takes a closer look at fault 1. The sensitivity analysis is highlighted in the lower right portion of this exhibit and shows that without any variability of inputs the ΔP needed to slip is 4,750 psi along this fault. A 10% change in the azimuth of the fault could lower ΔP needed to slip to 2,900 psi. The analysis is essentially the same for segments F1-F7.

Exhibit No. 8 illustrates the ΔP pressure in a "heat map" and shows ΔP pressure increases at the faults as of 1/1/2020. This map indicates ΔP pressure increases of 101 psi at F5 and 306 psi at F6.

Exhibit No. 9 illustrates the ΔP pressure in a "heat map" and shows ΔP pressure increases at the faults as of 1/1/2025. This map indicates ΔP pressure increases of 637 psi at F5 and 623 psi at F6.

Exhibit No. 10 illustrates the ΔP pressure in a "heat map" and shows ΔP pressure increases at the faults as of 1/1/2030. This map indicates ΔP pressure increases of 929 psi at F5 and 1,086 psi at F6. Note that these pressures are still well below the pressures that could initiate fault slip, which takes +2,900 psi.

Exhibit No. 11 illustrates the ΔP pressure in a "heat map" and shows ΔP pressure increases at the faults as of 1/1/2035. This map indicates ΔP pressure increases of 1,144 psi at F5 and 1,287 psi at F6. Note that these pressures are still well below the pressures that could initiate fault slip, which takes +2,900 psi.

Exhibit No. 12 illustrates the ΔP pressure in a "heat map" and shows ΔP pressure increases at the faults as of 1/1/2040. This map indicates ΔP pressure increases of 1,321 psi at F5 and 1,456 psi at F6. Note that these pressures are still well below the pressures that could initiate fault slip, which takes +2,900 psi.

Exhibit No. 13 illustrates the ΔP pressure in a "heat map" and shows ΔP pressure increases at the faults as of 1/1/2045. This map indicates ΔP pressure increases of 1,475 psi at F5 and 1,604 psi at F6. Note that these pressures are still well below the pressures that could initiate fault slip, which takes +2,900 psi.

The pressure analysis over time shows that pressure is expected to increase along the faults however pressures remain below critical levels. The table below shows the ΔP pressure increases needed to imitate fault slip along each fault segment and the corresponding ΔP pressure increases as of 2045:

Fault Segment	ΔP to slip (fixed inputs)	ΔP to slip (10% varied inputs)	ΔP at 2045
F1	4,757	2,900	159
F2	4,757	2,900	476
F3	4,757	2,900	1,000
F4	4,757	2,900	1,367
F5	4,757	2,900	1,475
F6	4,757	2,900	1,604
F7	4,757	2,900	706

This analysis demonstrates that there is a low likelihood of injection induced seismicity in the Subject Area.

Conclusion

The faults and fault trends in the area of review are not optimally oriented to slip. The orientation of the faults requires significant pressure changes (ΔP +4,750 psi) based on the fixed input parameters and the ΔP increase at the faults only reaches 1,604 psi by 2045. This model assumes constant injection rates over the next +25 years which is not a typical scenario as SWD wells tend to decrease injection volumes over time as the well ages and disposal demand decreases in the area. If injection volumes are lower over time than the model represents, then the risk for fault slip is lowered also.

In the event seismicity should occur in the future, the wells closest to the faults (proposed and existing) should be the wells considered for modification or reduction of injection rates. At this time there is no evidence to support rate reduction for any of the existing or proposed wells.

Should you have any questions, please do not hesitate to call me at (512) 327-6930 or email me at todd.reynolds@ftiplattsparks.com.

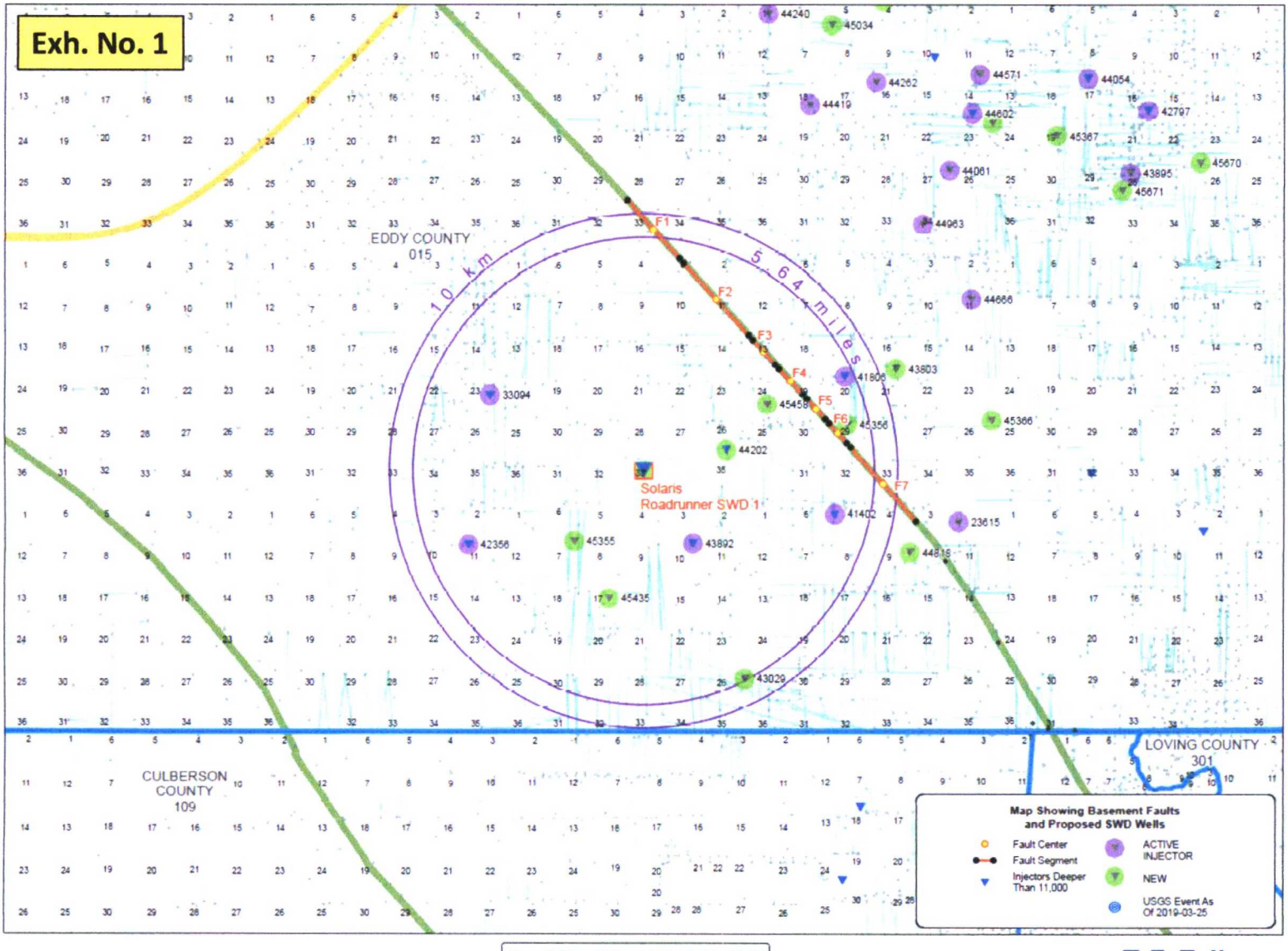
Regards,

Todd W. Reynolds – Geologist/Geophysicist
Managing Director, Economics/FTI Platt Sparks

Todd W. Reynolds

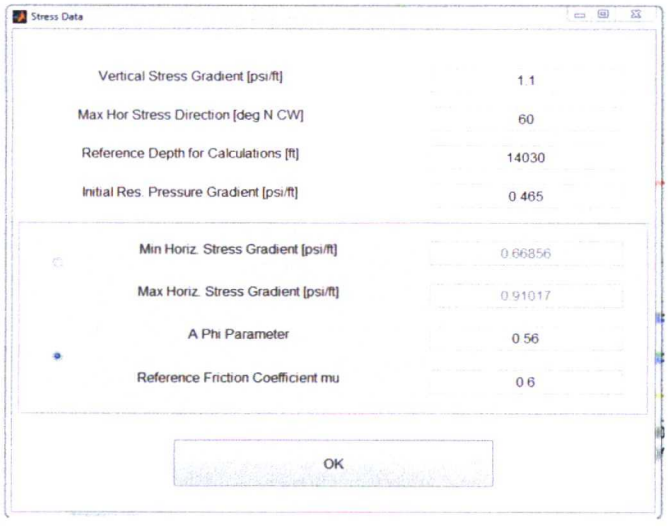
FTI Platt Sparks
512.327.6930 office

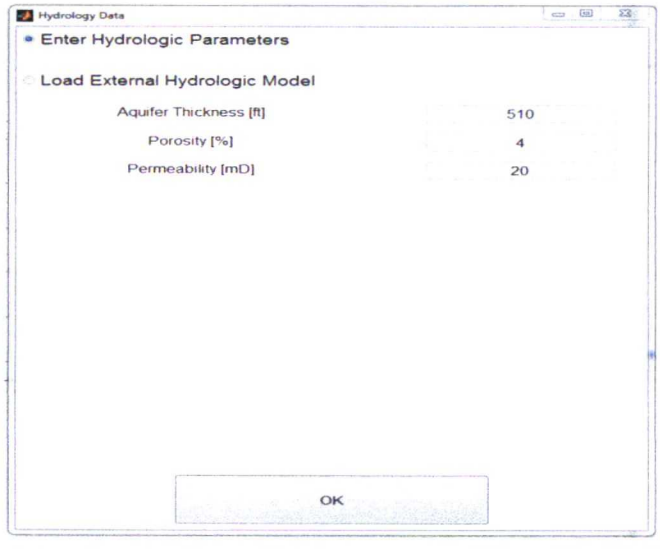
FTI™
PLATT SPARKS

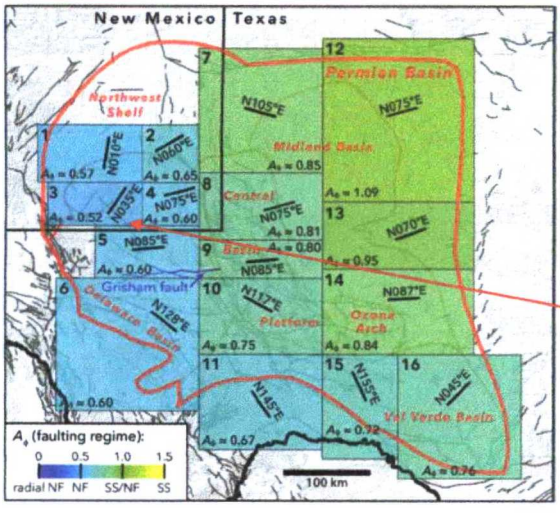

Exh. No. 1
EDDY COUNTY
015
CULBERSON
COUNTY
109
LOVING COUNTY
301
10 km
5.64 miles
F1
F2
F3
F4
F5
F6
F7
Solaris
Roadrunner SWD 1
44240
45034
44262
44571
44054
44419
44602
42797
45367
44061
43895
45670
45671
44963
44666
41806
43803
33094
45458
45356
45366
44202
41402
23615
42356
45355
43892
44818
45435
43029
Map Showing Basement Faults
and Proposed SWD Wells
Fault Center
Fault Segment
Injectors Deeper
Than 11,000
ACTIVE
INJECTOR
NEW
USGS Event As
Of 2019-03-25
0
6,000
12,000
18,000
24,000
30,000
Feet
Date Saved: 2019-04-05 8:55:21 AM
Path: P:_COMMON_FSP-PSP__cFaultDegl\01_FaultDeg_NM.mxd
FTI
PLATT S PARKS

Exh. No. 2

FSP INPUT PARAMETERS







Input Parameter Comments

Hydrologic Parameters – Derived from nearby logs

Stress Gradients – Derived from A Phi parameter from Snee/Zoback paper (.56)

Max Hor. Stress Direction - Derived from Snee/Zoback paper (N60E)

Exh. No. 3

Fault Slip Potential

MODEL INPUTS | GEOMECHANICS | PROB. GEOMECH | HYDROLOGY | PROB. HYDRO | INTEGRATED

Fault Selector:

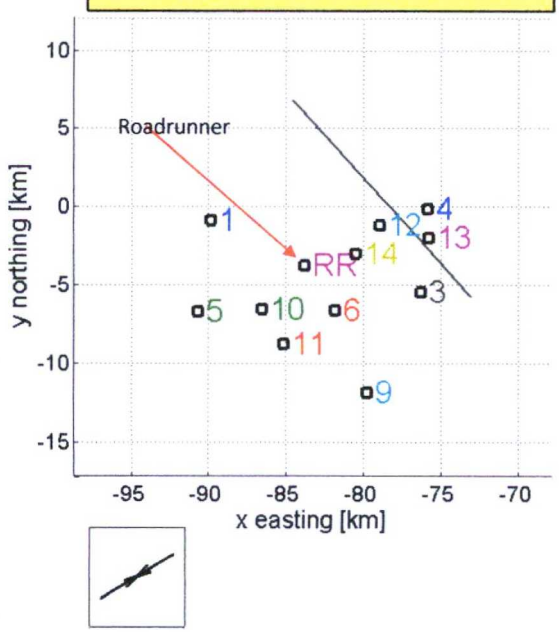
- All Faults
- Fault #1
- Fault #2
- Fault #3
- Fault #4
- Fault #5
- Fault #6
- Fault #7

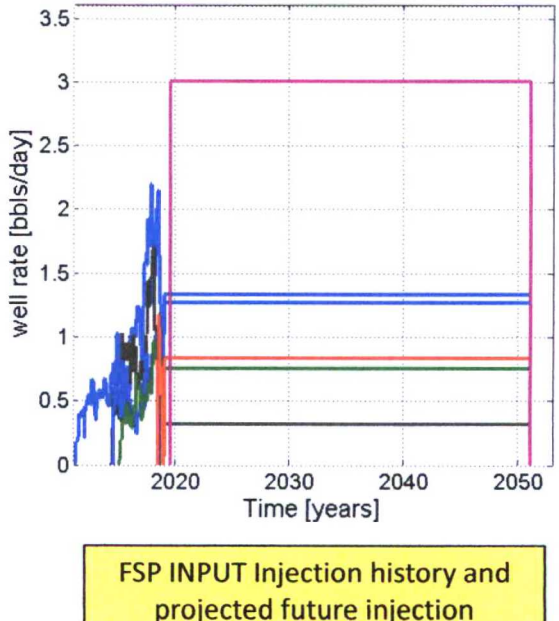
Calculate

Stress Regime: Normal Faulting

Select Well: All

FSP INPUT Fault and well locations





FSP INPUT Injection history and projected future injection

Exh. No. 4

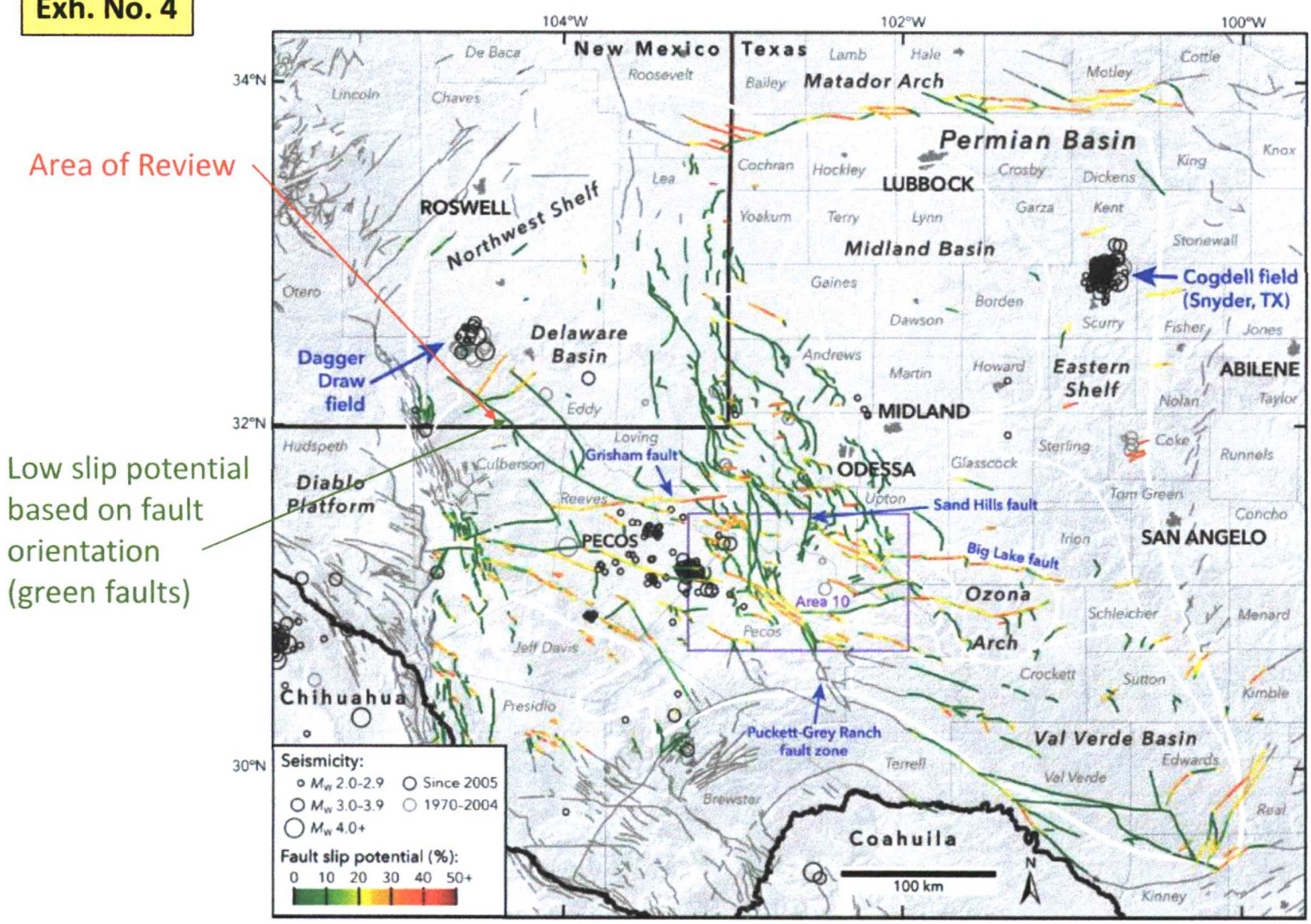
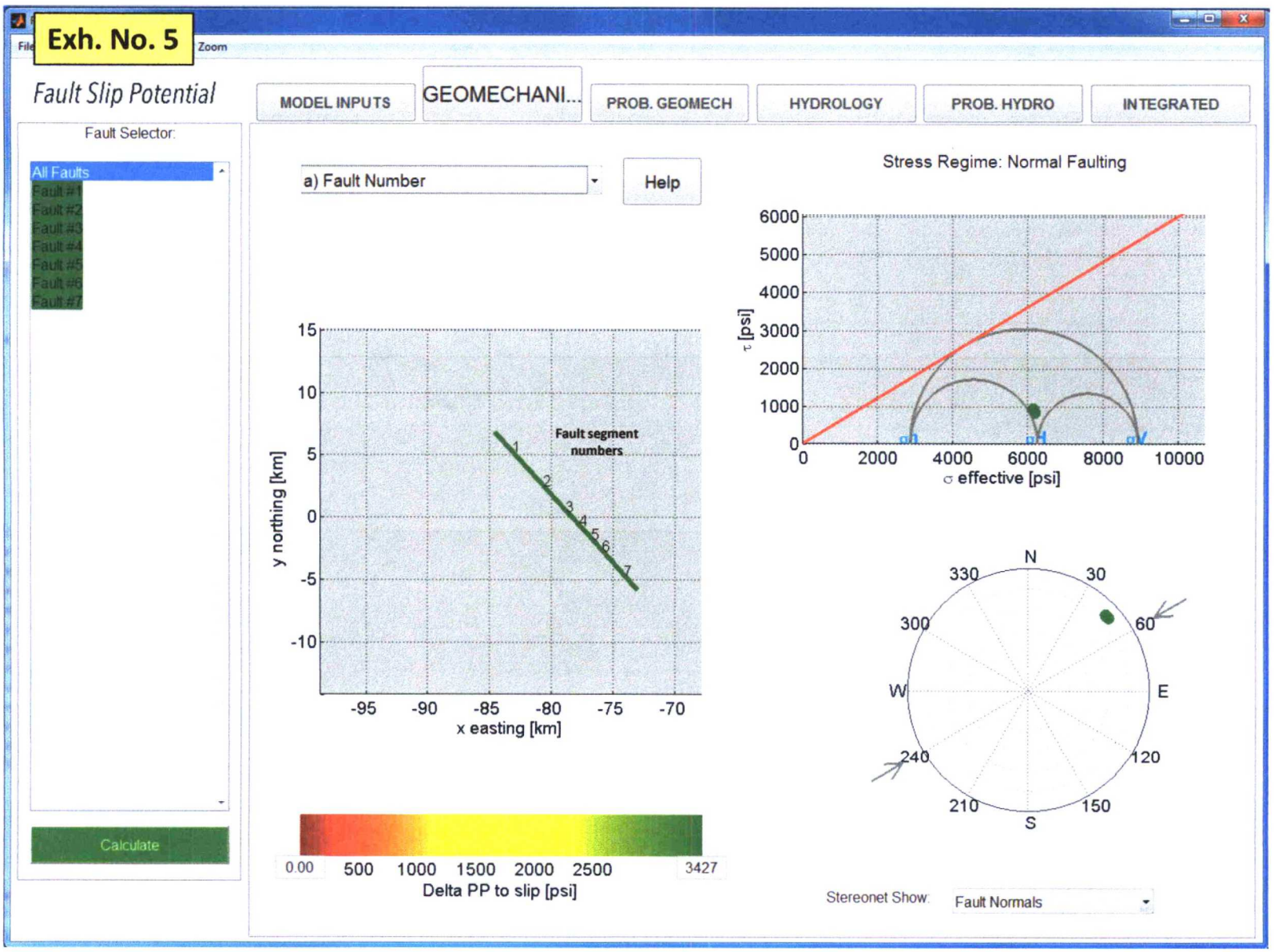


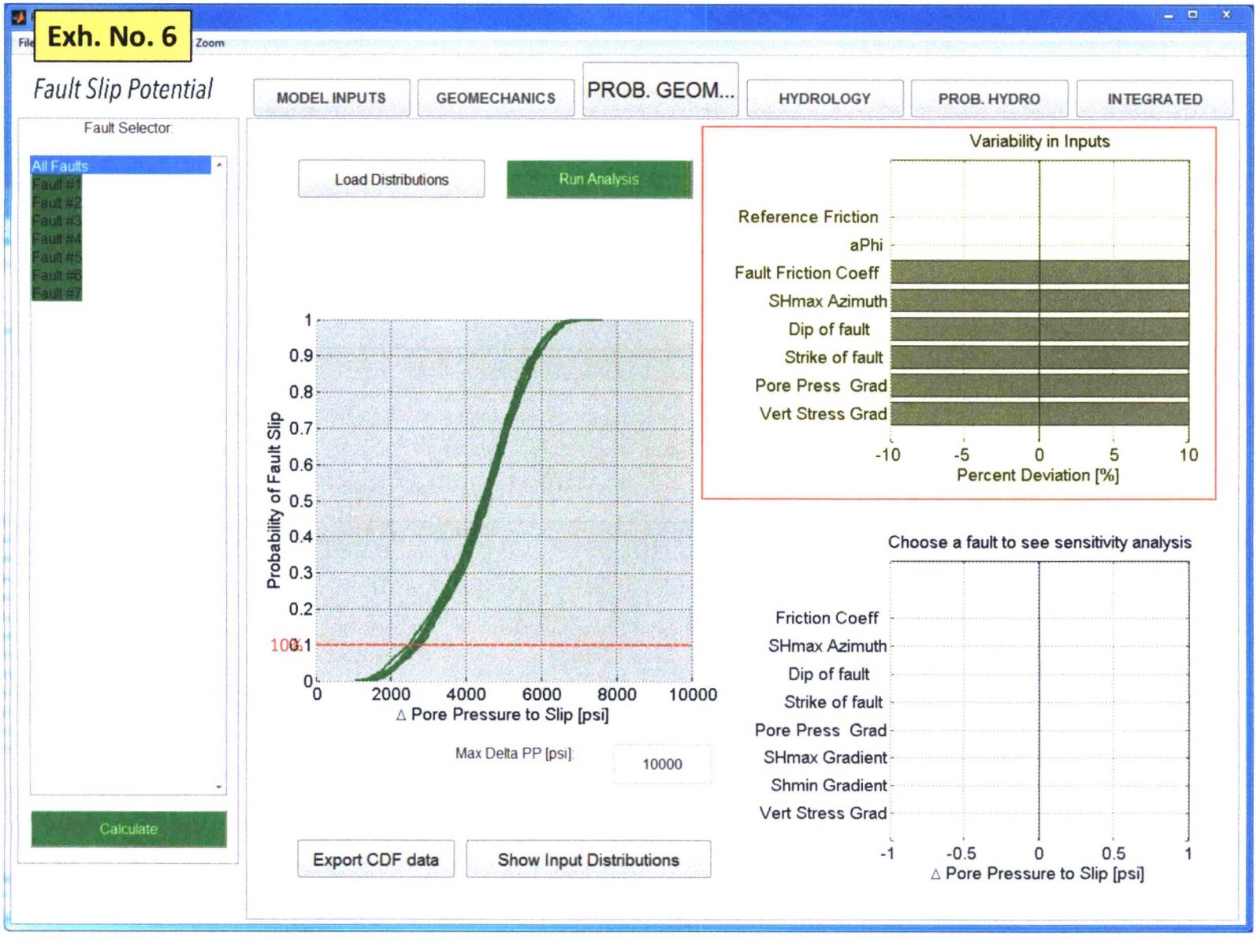
Figure 3. Results of our probabilistic FSP analysis across the Permian Basin. Data sources are as in Figures 1 and 2.

From Lund Snee and Zoback (2018)

Exh. No. 5


File
Zoom
Fault Slip Potential
MODEL INPUTS
GEOMECHANI...
PROB. GEOMECH
HYDROLOGY
PROB. HYDRO
INTEGRATED
Fault Selector:
All Faults
Fault #1
Fault #2
Fault #3
Fault #4
Fault #5
Fault #6
Fault #7
Calculate
a) Fault Number
Help
Stress Regime: Normal Faulting
τ [psi]
σ effective [psi]
σh
σH
σV
Fault segment numbers
y northing [km]
x easting [km]
Delta PP to slip [psi]
0.00
3427
N
30
60
E
120
150
S
210
240
W
300
330
Stereonet Show:
Fault Normals

Exh. No. 6


File
Zoom
Fault Slip Potential
MODEL INPUTS
GEOMECHANICS
PROB. GEOM...
HYDROLOGY
PROB. HYDRO
INTEGRATED
Fault Selector:
All Faults
Fault #1
Fault #2
Fault #3
Fault #4
Fault #5
Fault #6
Fault #7
Calculate
Load Distributions
Run Analysis
Probability of Fault Slip
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0
2000
4000
6000
8000
10000
Δ Pore Pressure to Slip [psi]
Max Delta PP [psi]
10000
Export CDF data
Show Input Distributions
Variability in Inputs
Reference Friction
aPhi
Fault Friction Coeff
SHmax Azimuth
Dip of fault
Strike of fault
Pore Press Grad
Vert Stress Grad
-10
-5
0
5
10
Percent Deviation [%]
Choose a fault to see sensitivity analysis
Friction Coeff
SHmax Azimuth
Dip of fault
Strike of fault
Pore Press Grad
SHmax Gradient
Shmin Gradient
Vert Stress Grad
-1
-0.5
0
0.5
1
Δ Pore Pressure to Slip [psi]

Exh. No. 7


Zoom
Fault Slip Potential
MODEL INPUTS
GEOMECHANICS
PROB. GEOM...
HYDROLOGY
PROB. HYDRO
INTEGRATED
Fault Selector:
All Faults
Fault #1
Fault #2
Fault #3
Fault #4
Fault #5
Fault #6
Fault #7
Calculate
Load Distributions
Run Analysis
Probability of Fault Slip
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0
2000
4000
6000
8000
10000
Δ Pore Pressure to Slip [psi]
Max Delta PP [psi]:
10000
Export CDF data
Show Input Distributions
Variability in Inputs
Reference Friction
aPhi
Fault Friction Coeff
SHmax Azimuth
Dip of fault
Strike of fault
Pore Press Grad
Vert Stress Grad
-10
-5
0
5
10
Percent Deviation [%]
Sensitivity Analysis for Fault #1
SHmax Azimuth
Strike of fault
Vert Stress Grad
Pore Press Grad
Dip of fault
Fault Friction Coeff
Reference Friction
aPhi
2000
3000
4000
5000
6000
Δ Pore Pressure to Slip [psi]

Exh. No. 8

File Zoom

Fault Slip Potential

MODEL INPUTS | GEOMECHANICS | PROB. GEOMECH | HYDROLOGY | PROB. HYDRO | INTEGRATED

Fault Selector:

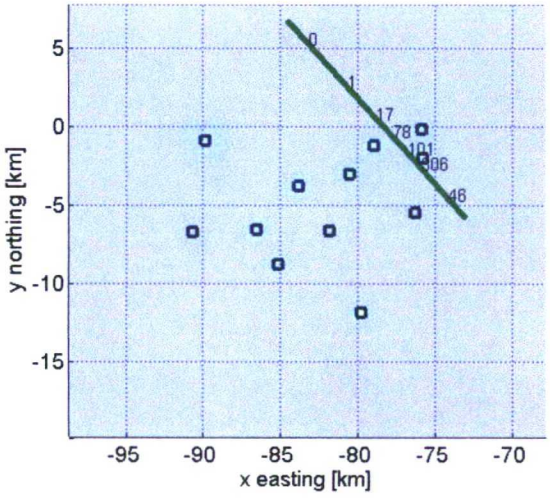
All Faults
Fault #1, 0.00 FSP
Fault #2, 0.00 FSP
Fault #3, 0.00 FSP
Fault #4, 0.00 FSP
Fault #5, 0.00 FSP
Fault #6, 0.00 FSP
Fault #7, 0.00 FSP

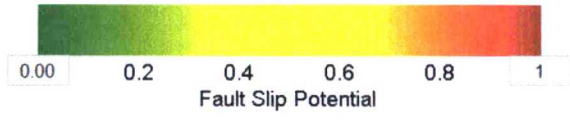
Calculate

Export

b) PP Change at fault [psi]

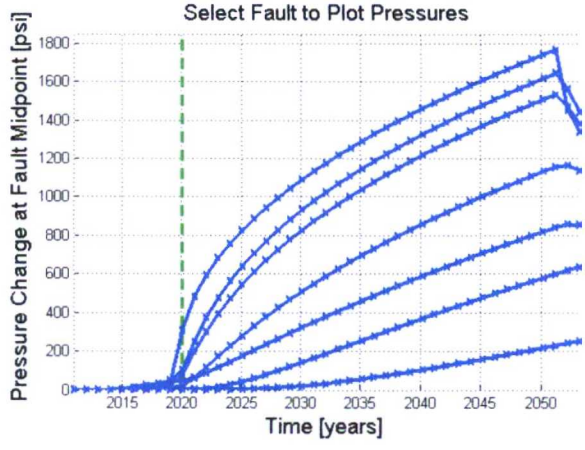
Summary Plots





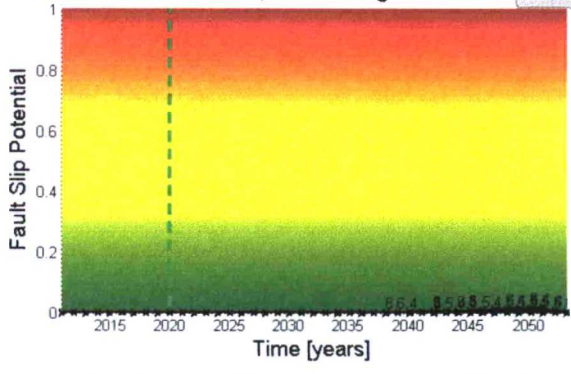
Year: 2020

Select Fault to Plot Pressures



Export

All Faults, FSP Through Time



Exh. No. 9

File Zoom

Fault Slip Potential

MODEL INPUTS | GEOMECHANICS | PROB. GEOMECH | HYDROLOGY | PROB. HYDRO | INTEGRATED

Fault Selector:

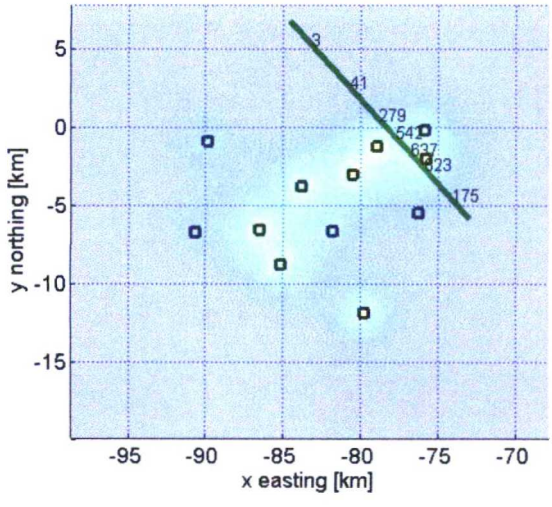
All Faults
Fault #1, 0.00 FSP
Fault #2, 0.00 FSP
Fault #3, 0.00 FSP
Fault #4, 0.00 FSP
Fault #5, 0.00 FSP
Fault #6, 0.00 FSP
Fault #7, 0.00 FSP

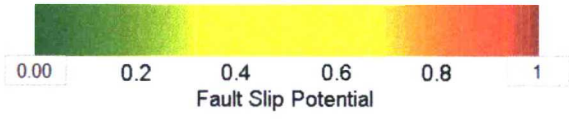
Calculate

Export

b) PP Change at fault [psi]

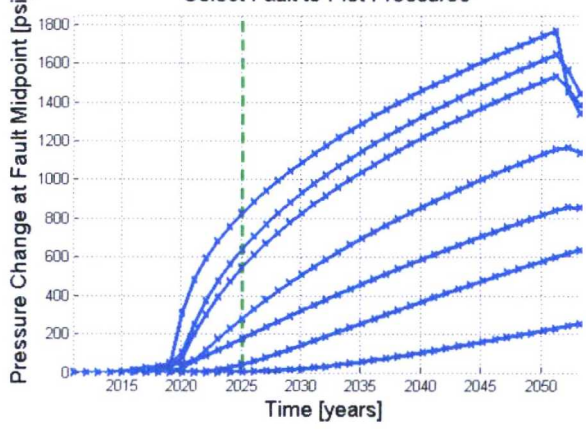
Summary Plots





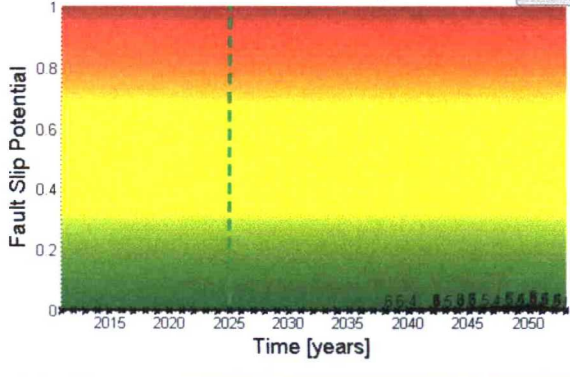
Year: 2025

Select Fault to Plot Pressures

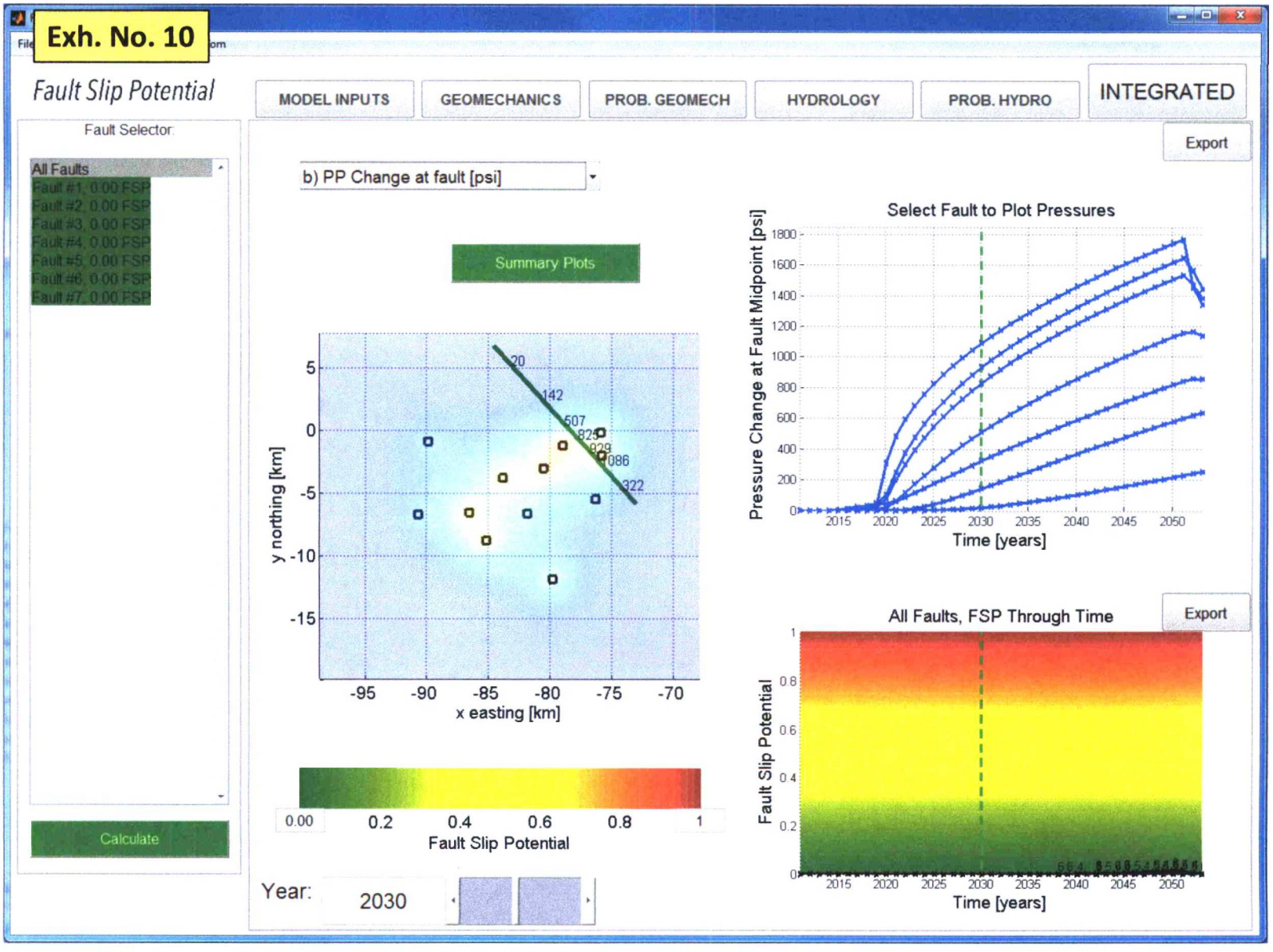


Export

All Faults, FSP Through Time



Exh. No. 10


Fault Slip Potential
MODEL INPUTS
GEOMECHANICS
PROB. GEOMECH
HYDROLOGY
PROB. HYDRO
INTEGRATED
Fault Selector
All Faults
Fault #1, 0.00 FSP
Fault #2, 0.00 FSP
Fault #3, 0.00 FSP
Fault #4, 0.00 FSP
Fault #5, 0.00 FSP
Fault #6, 0.00 FSP
Fault #7, 0.00 FSP
Calculate
Export
b) PP Change at fault [psi]
Summary Plots
Select Fault to Plot Pressures
Pressure Change at Fault Midpoint [psi]
Time [years]
y northing [km]
x easting [km]
20
142
507
825
929
086
322
0.00
0.2
0.4
0.6
0.8
1
Fault Slip Potential
All Faults, FSP Through Time
Export
Fault Slip Potential
Time [years]
Year:
2030

Exh. No. 11

Fault Slip Potential

MODEL INPUTS | GEOMECHANICS | PROB. GEOMECH | HYDROLOGY | PROB. HYDRO | INTEGRATED

Fault Selector:

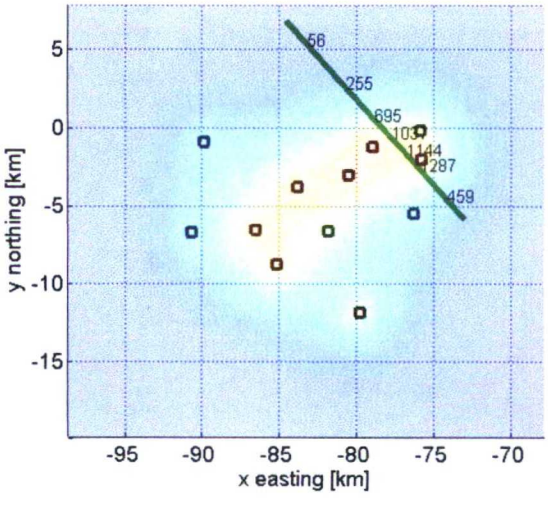
All Faults
Fault #1, 0.00 FSP
Fault #2, 0.00 FSP
Fault #3, 0.00 FSP
Fault #4, 0.00 FSP
Fault #5, 0.00 FSP
Fault #6, 0.00 FSP
Fault #7, 0.00 FSP

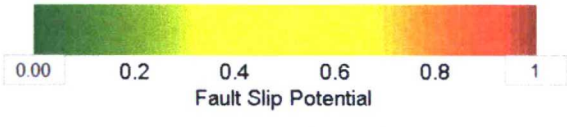
Calculate

Export

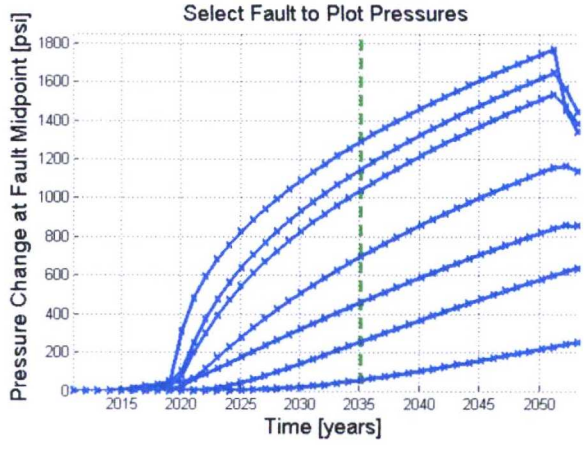
b) PP Change at fault [psi]

Summary Plots

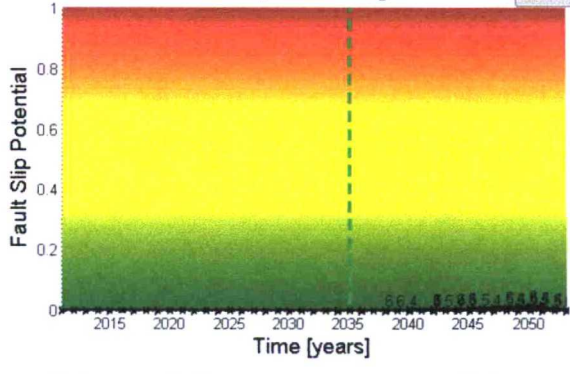




Year: 2035



Export



Exh. No. 12

Fault Slip Potential

MODEL INPUTS | GEOMECHANICS | PROB. GEOMECH | HYDROLOGY | PROB. HYDRO | INTEGRATED

Fault Selector:

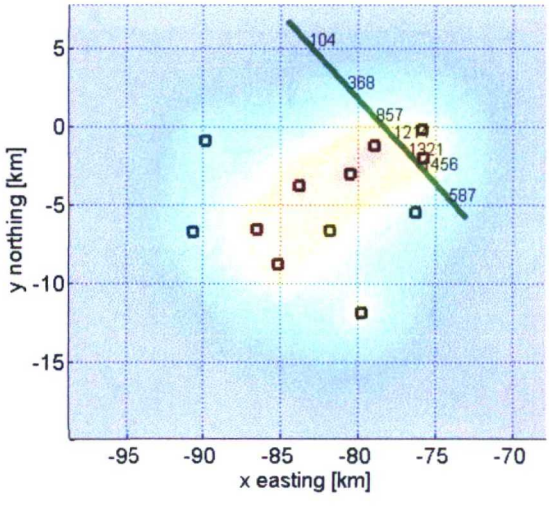
All Faults
Fault #1, 0.00 FSP
Fault #2, 0.00 FSP
Fault #3, 0.00 FSP
Fault #4, 0.00 FSP
Fault #5, 0.00 FSP
Fault #6, 0.00 FSP
Fault #7, 0.00 FSP

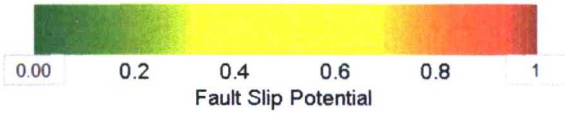
Calculate

Export

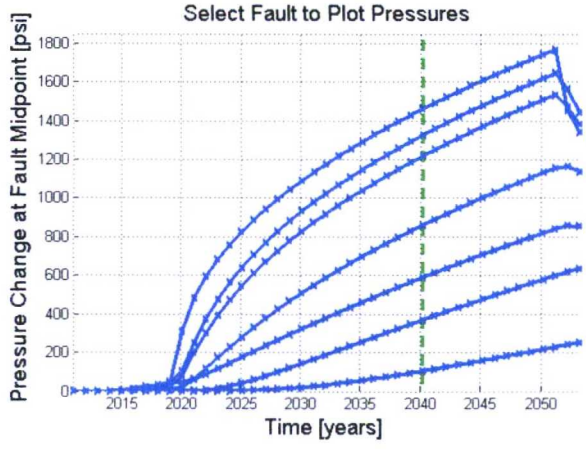
b) PP Change at fault [psi]

Summary Plots

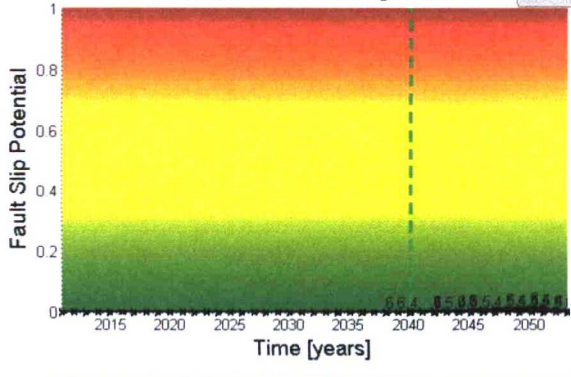




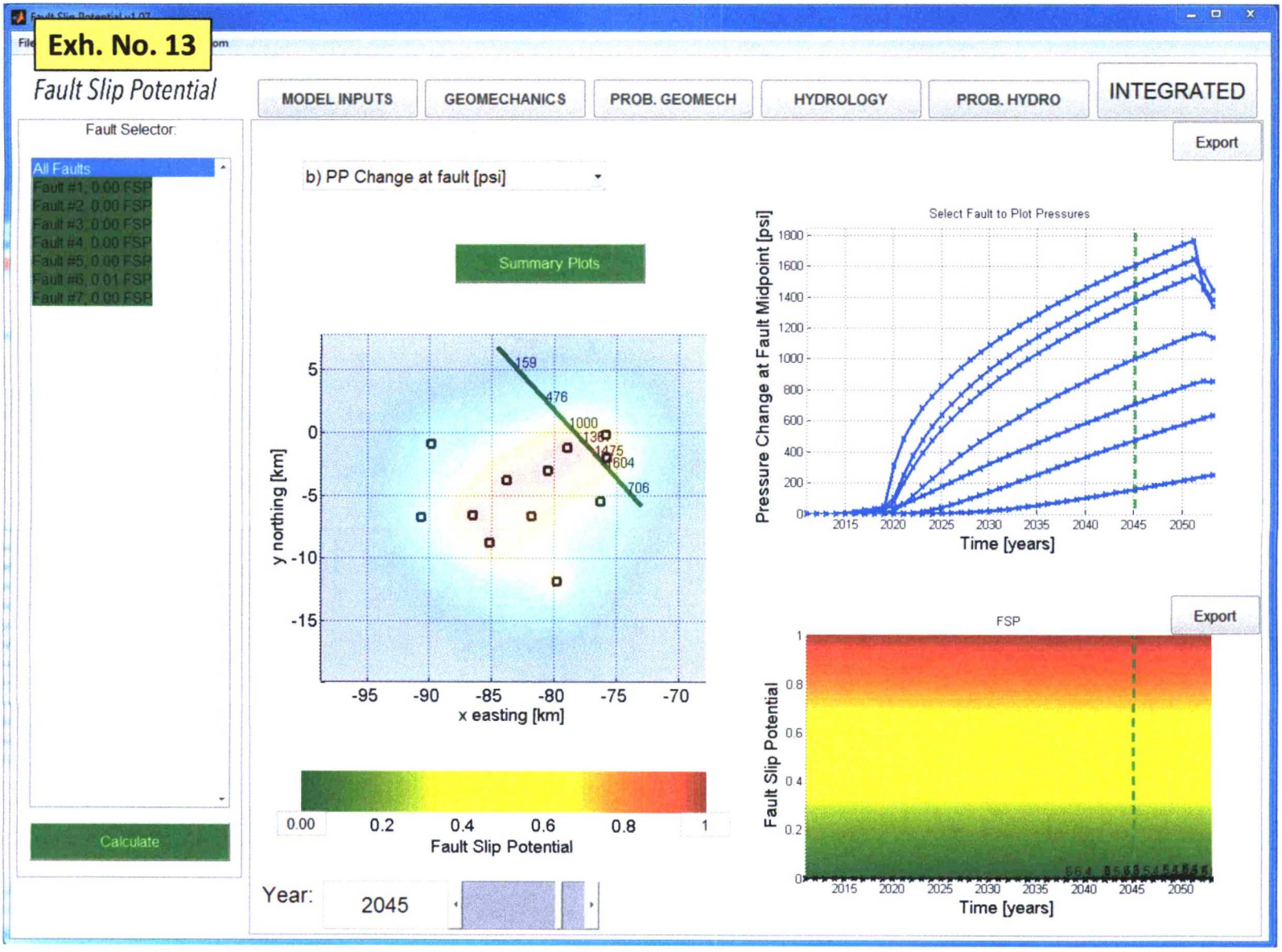
Year: 2040



Export



Exh. No. 13


Fault Slip Potential
MODEL INPUTS
GEOMECHANICS
PROB. GEOMECH
HYDROLOGY
PROB. HYDRO
INTEGRATED
Export
Fault Selector:
All Faults
Fault #1, 0.00 FSP
Fault #2, 0.00 FSP
Fault #3, 0.00 FSP
Fault #4, 0.00 FSP
Fault #5, 0.00 FSP
Fault #6, 0.01 FSP
Fault #7, 0.00 FSP
b) PP Change at fault [psi]
Summary Plots
Select Fault to Plot Pressures
Pressure Change at Fault Midpoint [psi]
Time [years]
159
476
1000
1475
604
706
y northing [km]
x easting [km]
0.00
0.2
0.4
0.6
0.8
1
Fault Slip Potential
Year:
2045
FSP
Export
Fault Slip Potential
Time [years]

Roadrunner SWD #1 Application

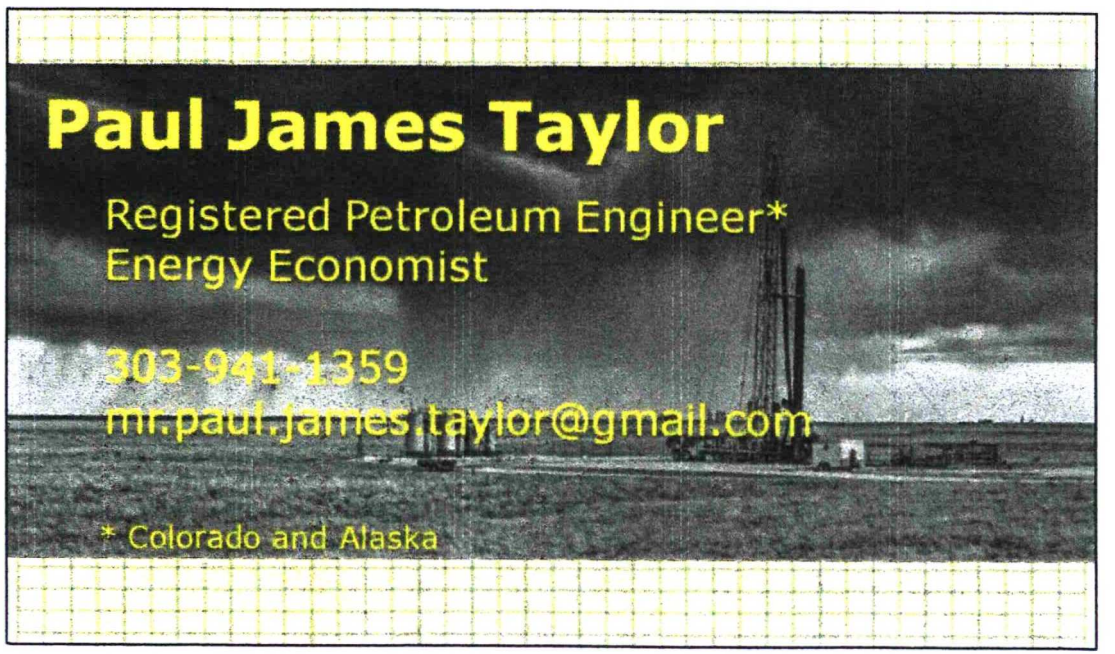
To: The State of New Mexico Oil Conservation Division

From: Solaris Water Midstream LLC

Reservoir Engineering Summary

By Paul James Taylor

April 2019



Purpose: To study the injection performance of the Roadrunner SWD #1 well and evaluate reservoir behavior away from the well as a result of injected disposal water.

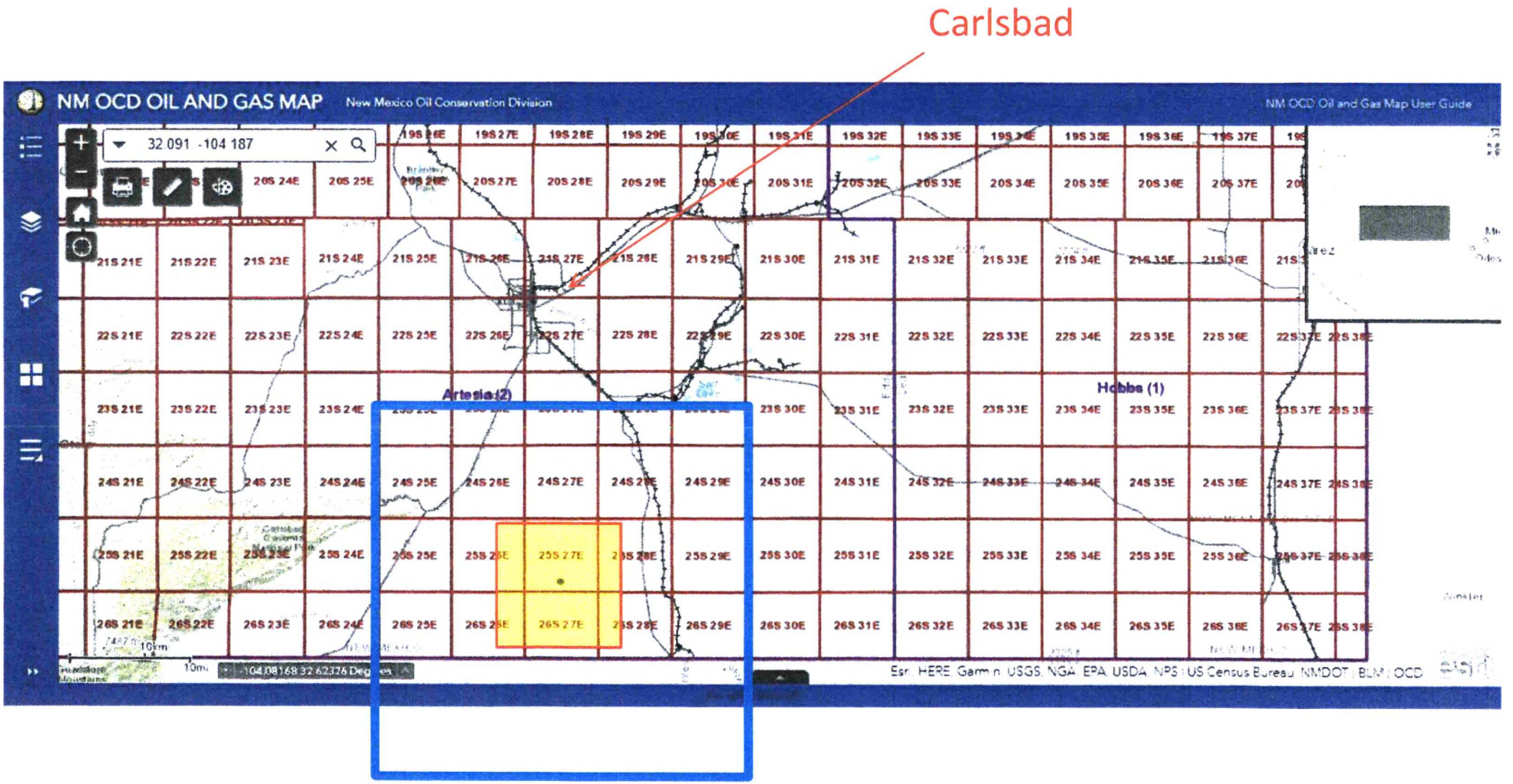
Methodology: Construct a variety of simulation models and run different scenarios that show what happens in the reservoir.

Reseroir Model Assumptions:

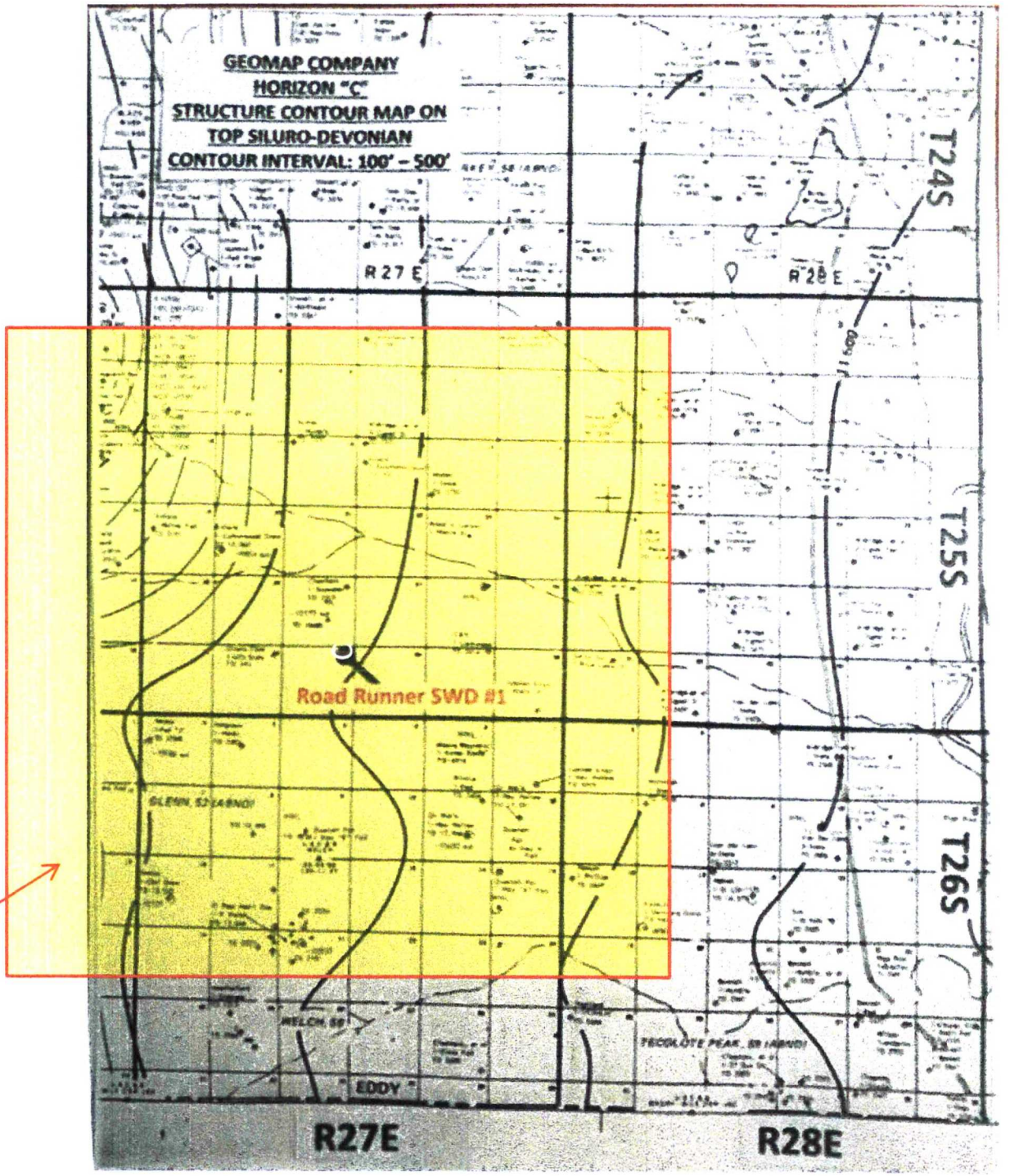
Depth: ~13,305 ft
Gross height: 1020 ft
Net to gross: 50%
Porosity: 4%
Permeability: 20 md
Temperature: 300 deg F
Salinity of water: 200,000 mg/L TDS

Water Density: 1.15 g/cc
Zone: Devonian / Silurian-Fusselman
Initial Pressure Gradient: 0.46 psi / ft
Rock Compressibility: 3e-6 vol/vol/psi
Area: 30 x 30 miles
Detailed Grid: 10 x 10 miles
Detailed Cells: 160 x 160 (330 ft on a side)

Well location and model configuration showing 30 x 30 mile area (blue) and 10 x 10 mile detailed grid area (yellow).

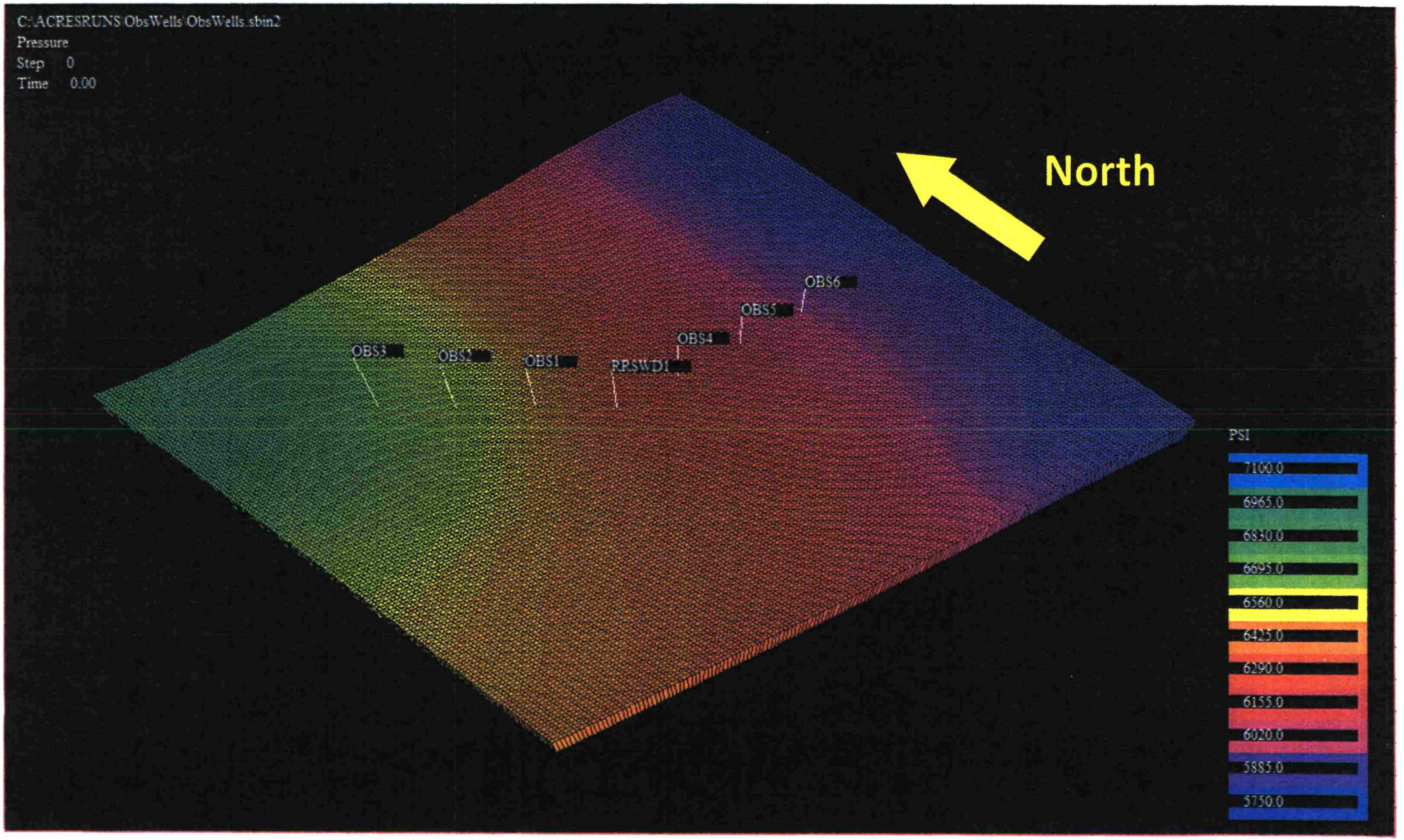


Scenario 1: Use structure per the map to the right (source: Jim Brannigan) and inject at proposed 30,000 BWPD, 2661 psi well head pressure for 20 years, then shut in for 5 years, interrogate observation wells located 1, 2, and 3 miles away both up and down structure. Note the structure varies about 1000' over the 10 mile span covered by the detailed grid. Also note the structure was adjusted to fit the estimated well top at 13,305 ft.

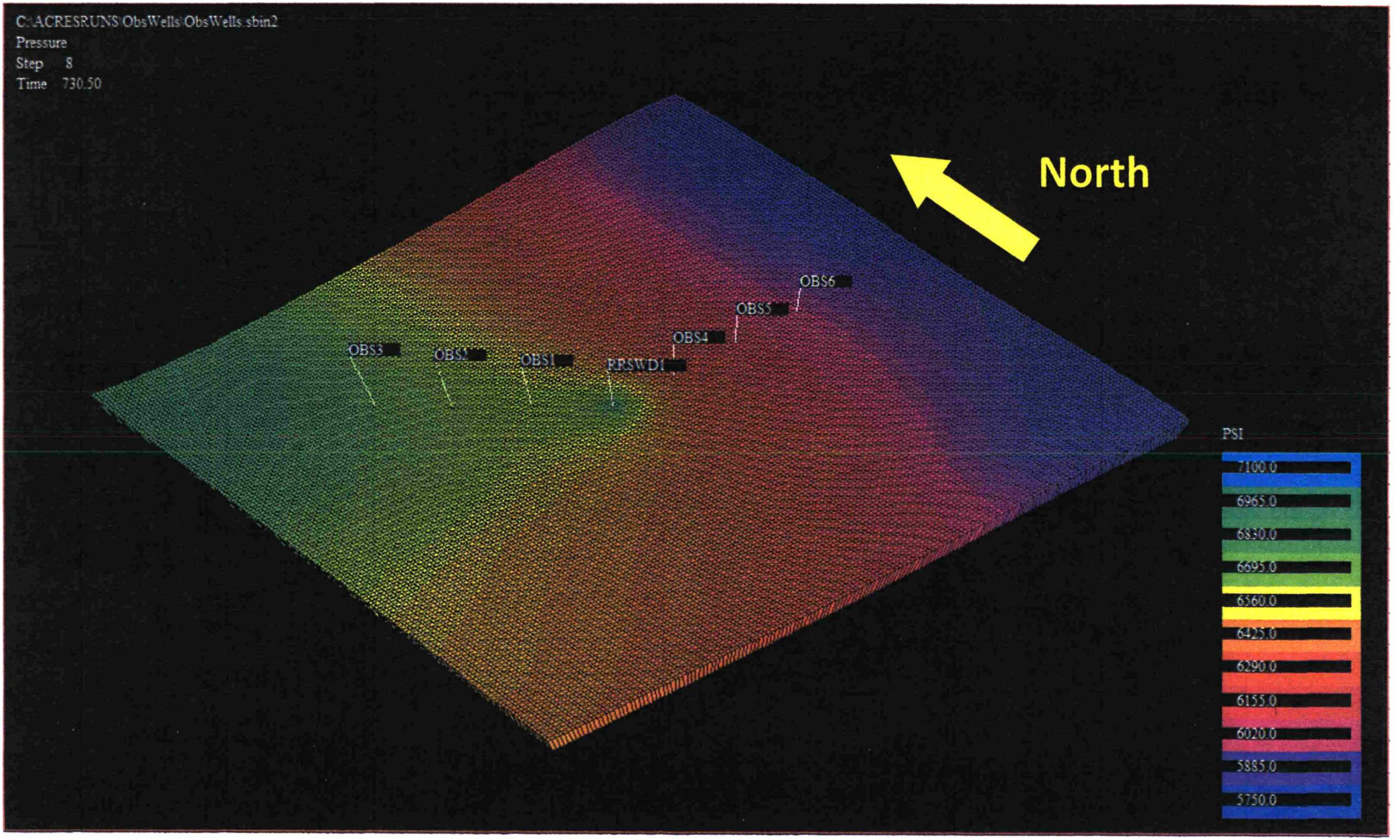


10 x 10 mile detailed grid

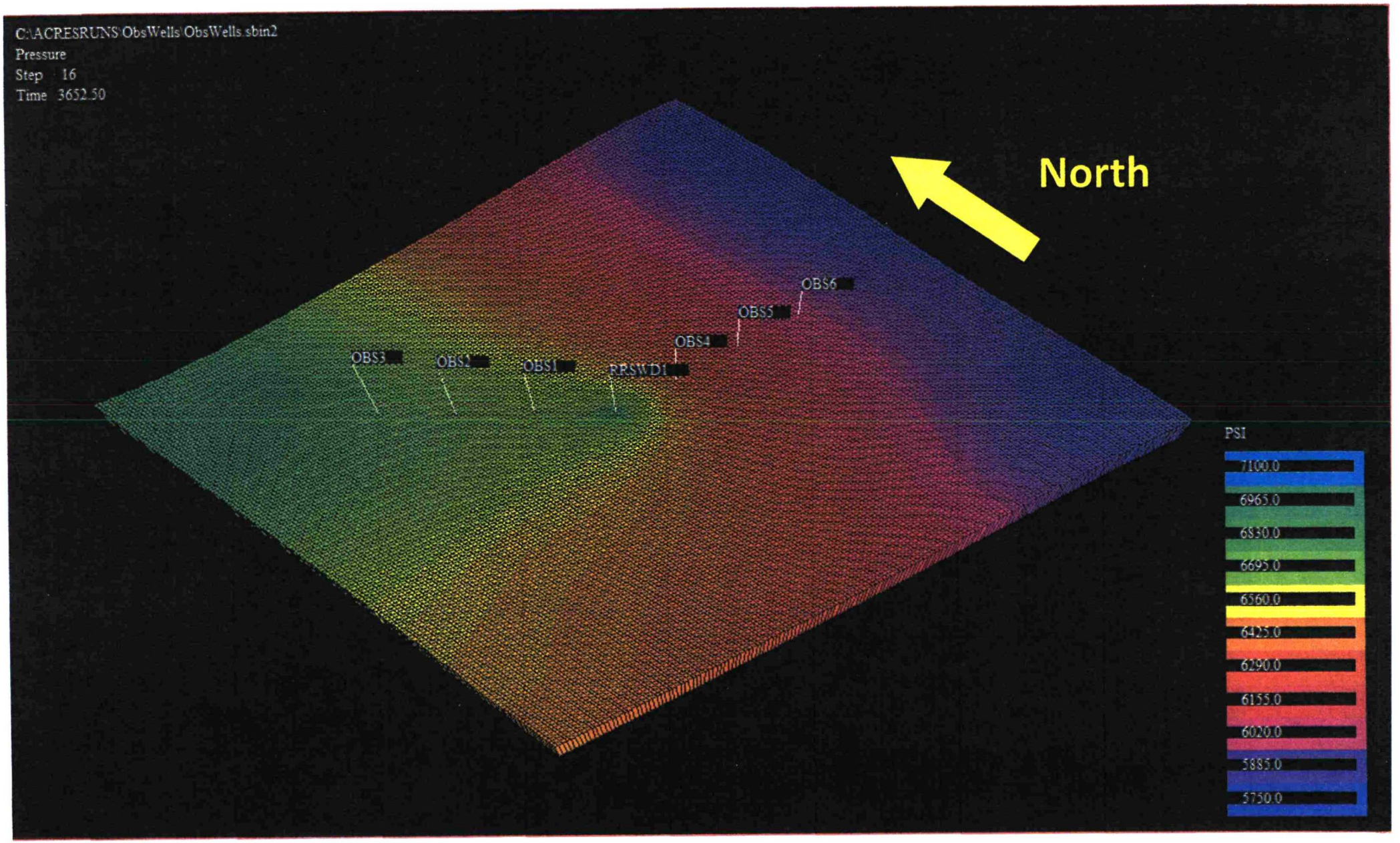
Scenario 1: Initial pressures



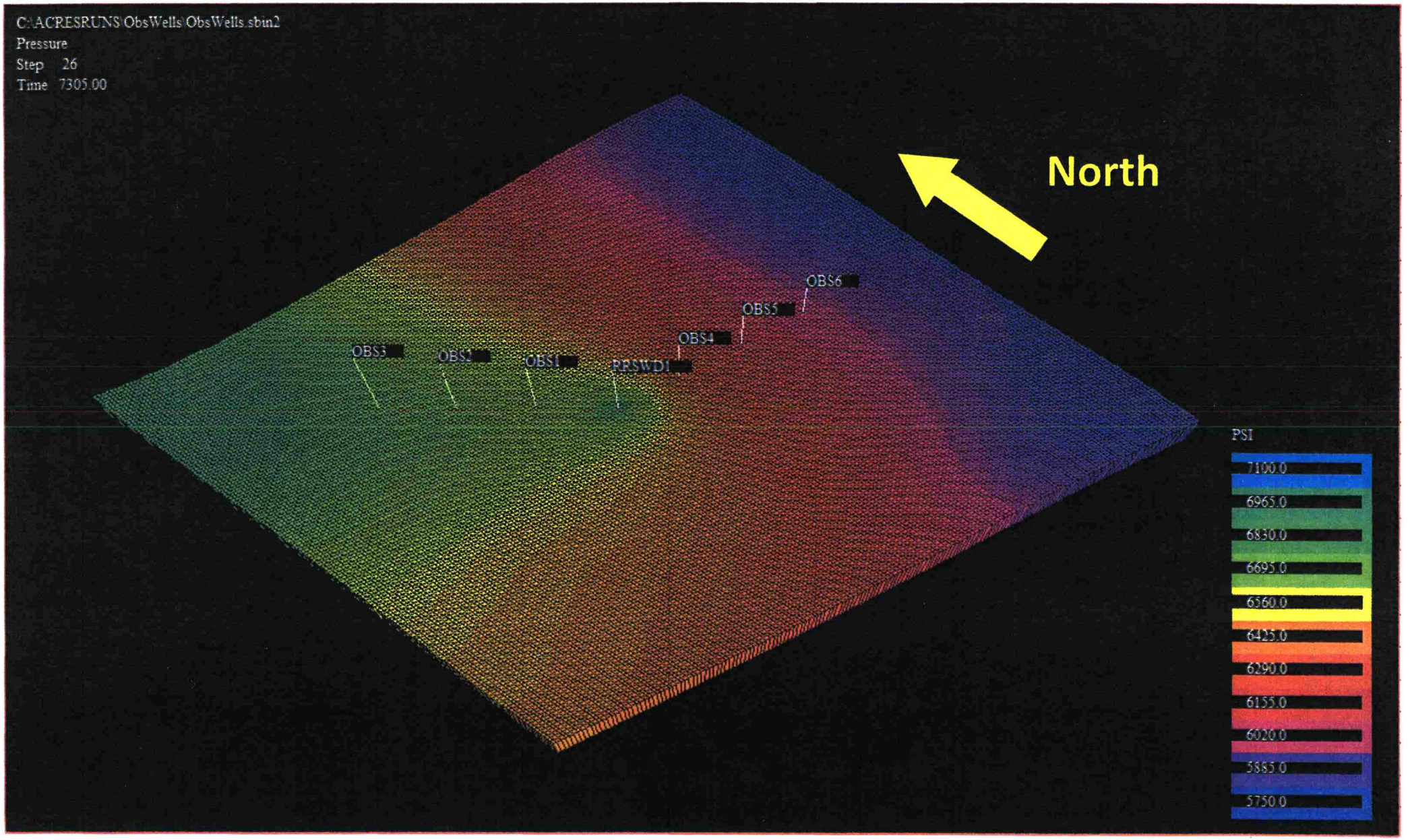
Scenario 1: Pressures after 2 years



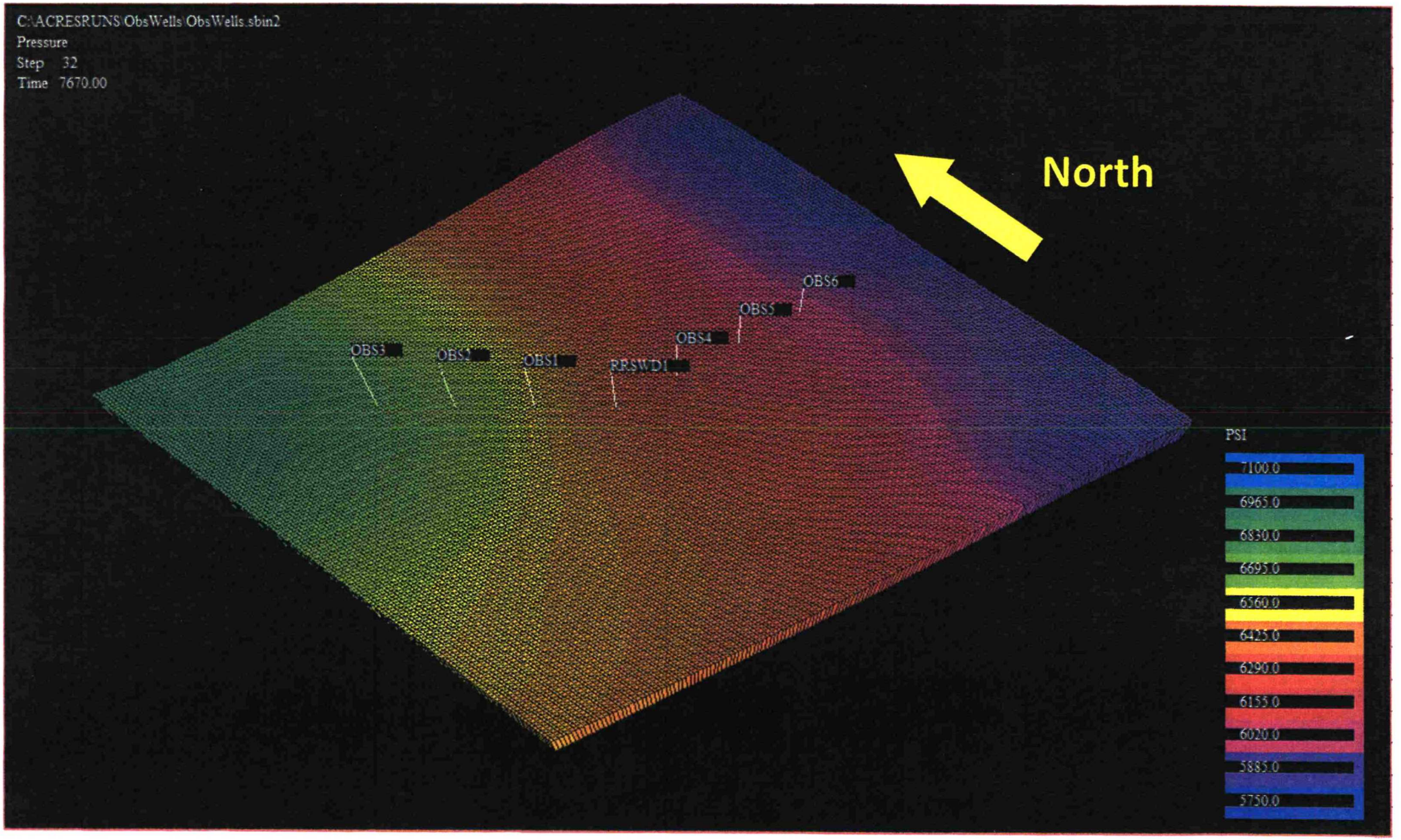
Scenario 1: Pressures after 10 years



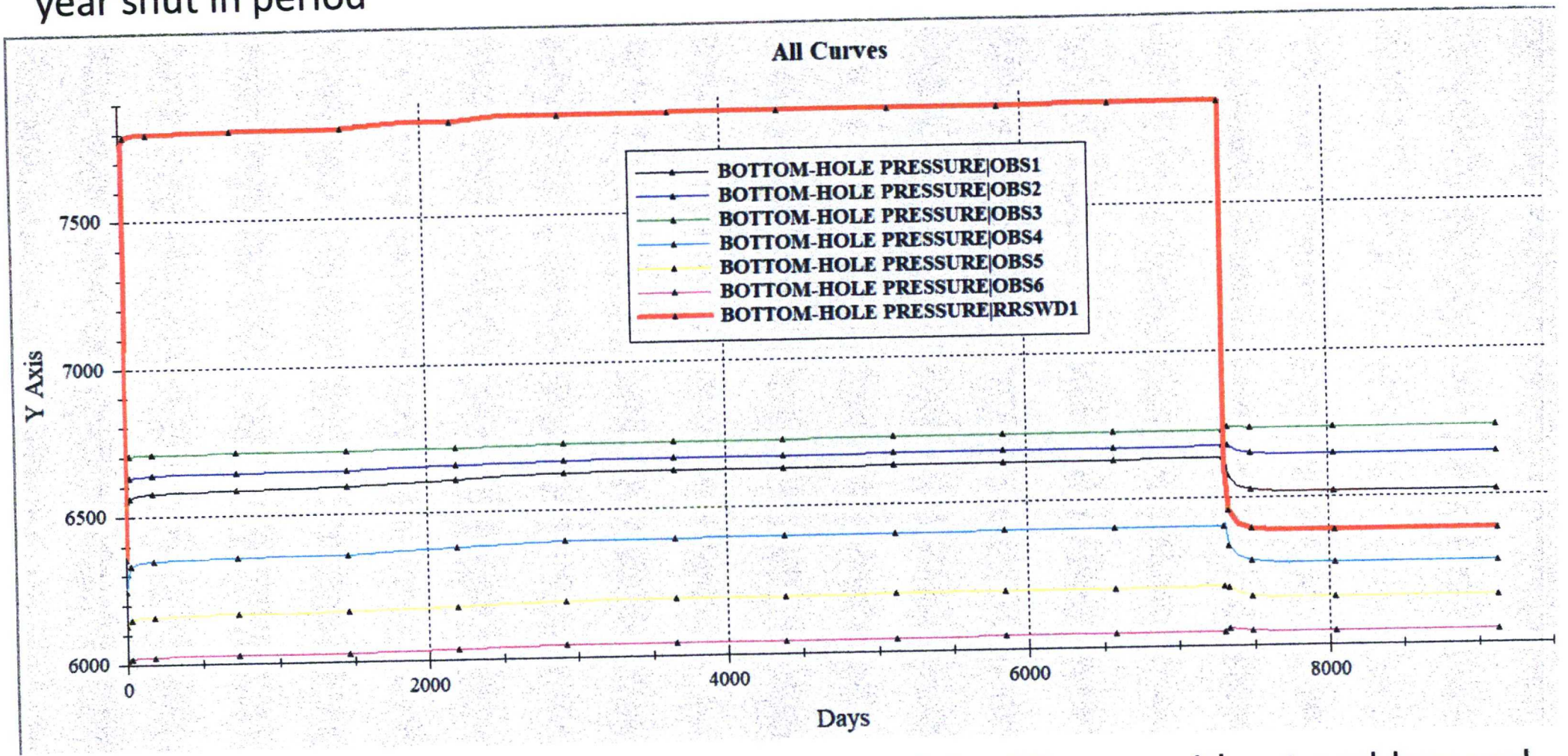
Scenario 1: Pressures after 20 years



Scenario 1: Pressures after 21 years

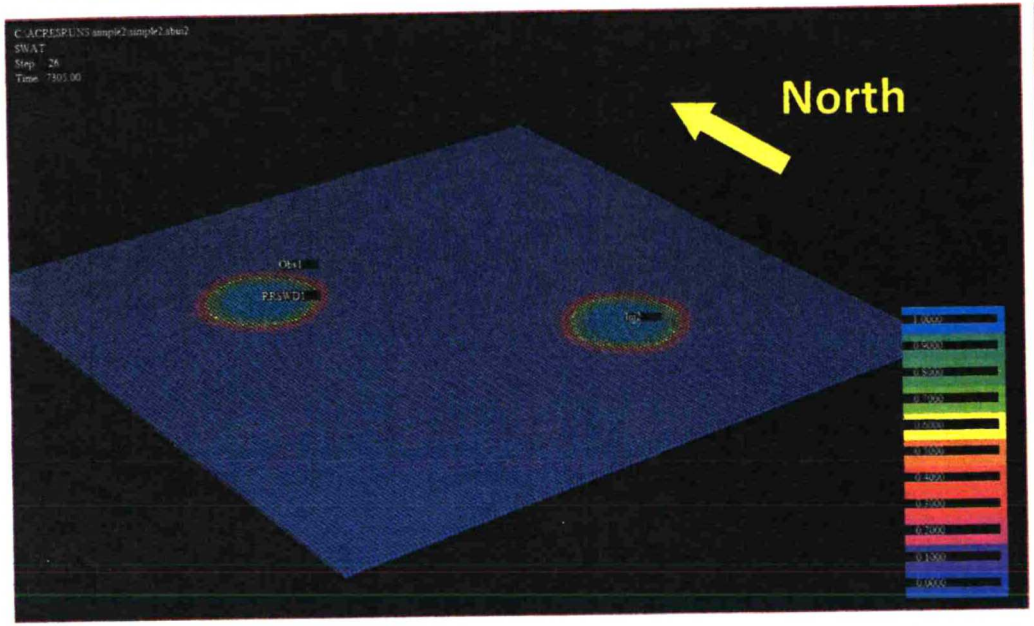


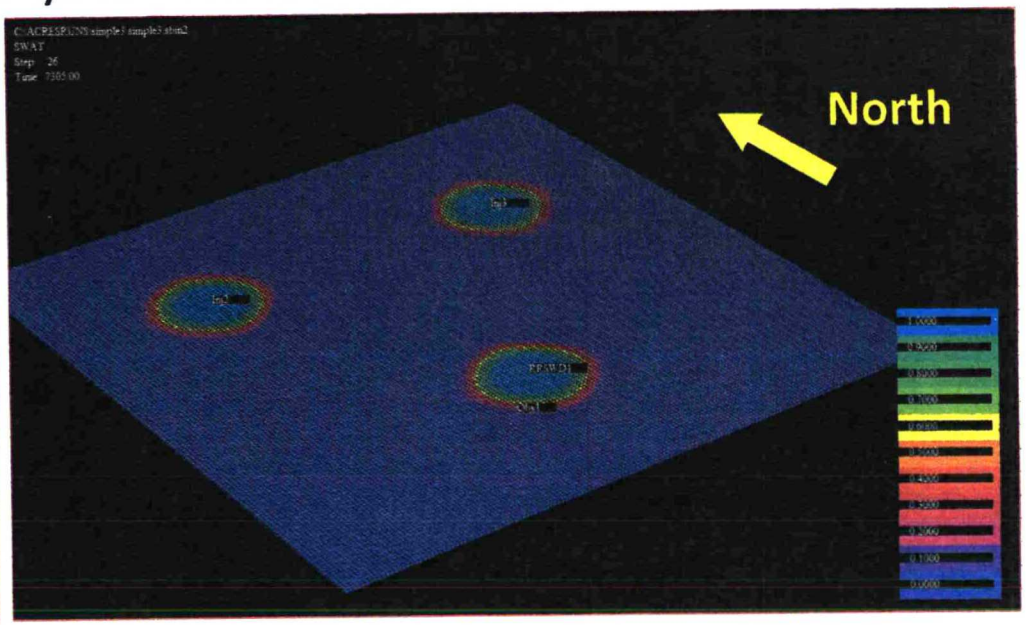
Scenario 1: Bottom hole pressures (psi, Y axis) over the 20 year injection period and 5 year shut in period

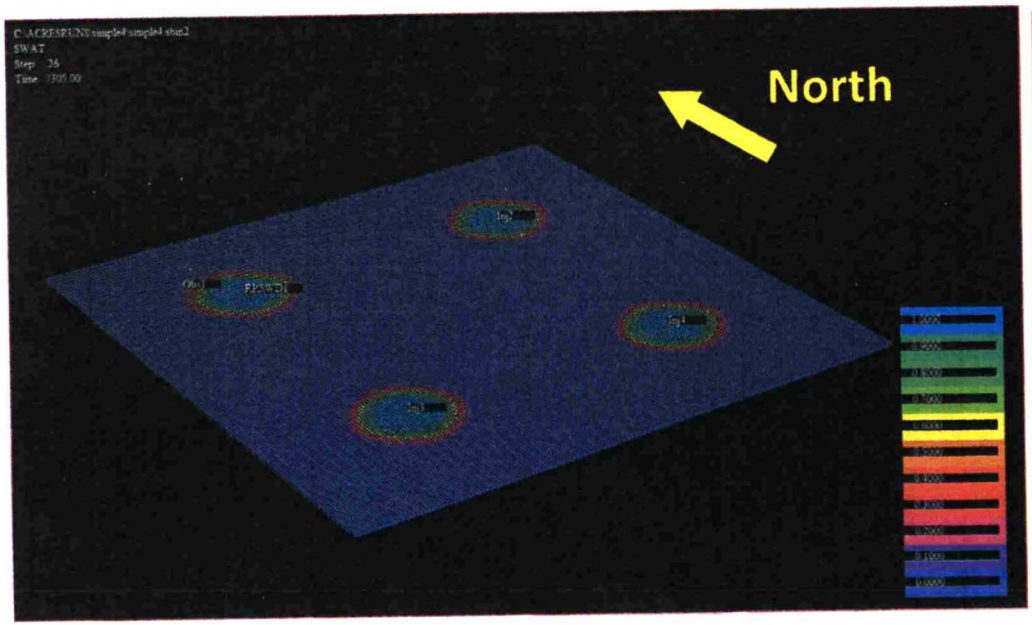


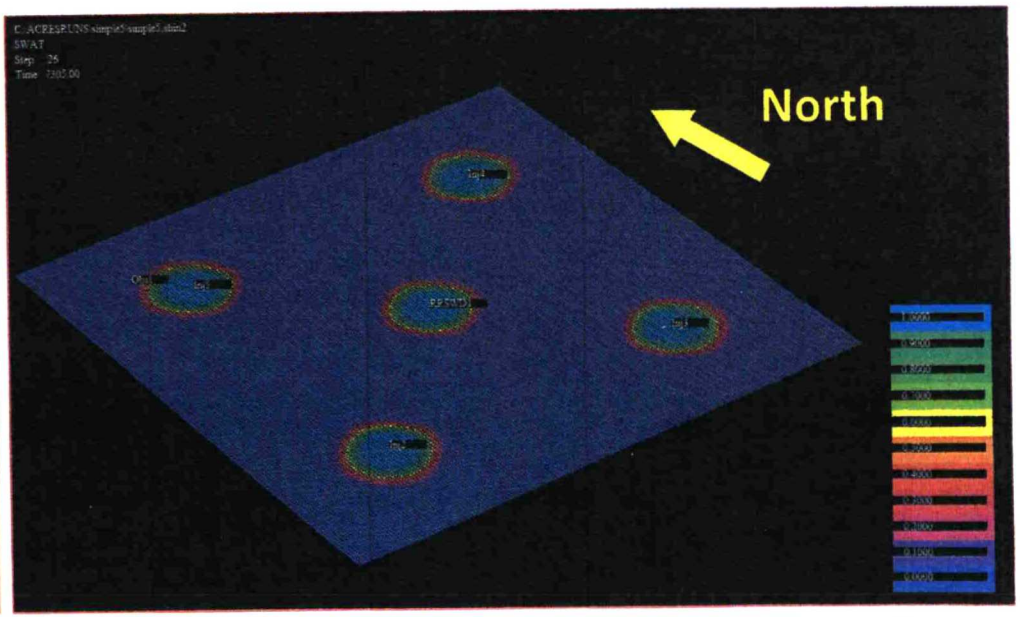
Scenario 1 Summary: The well injects 30,000 BWPD for 20 years without problem and the observation wells do not see much affect. After 20 years, the area returns to near initial conditions quickly. Also the structure is fairly flat so including it only serves to unnecessarily complicate the pressure map.

Scenario 2: Make the structure flat and place 2-5 identical wells inside the 10 mile x 10 mile grid as far away from each other as possible and analyze the injection interference. Volume displacement after 20 years are shown below.

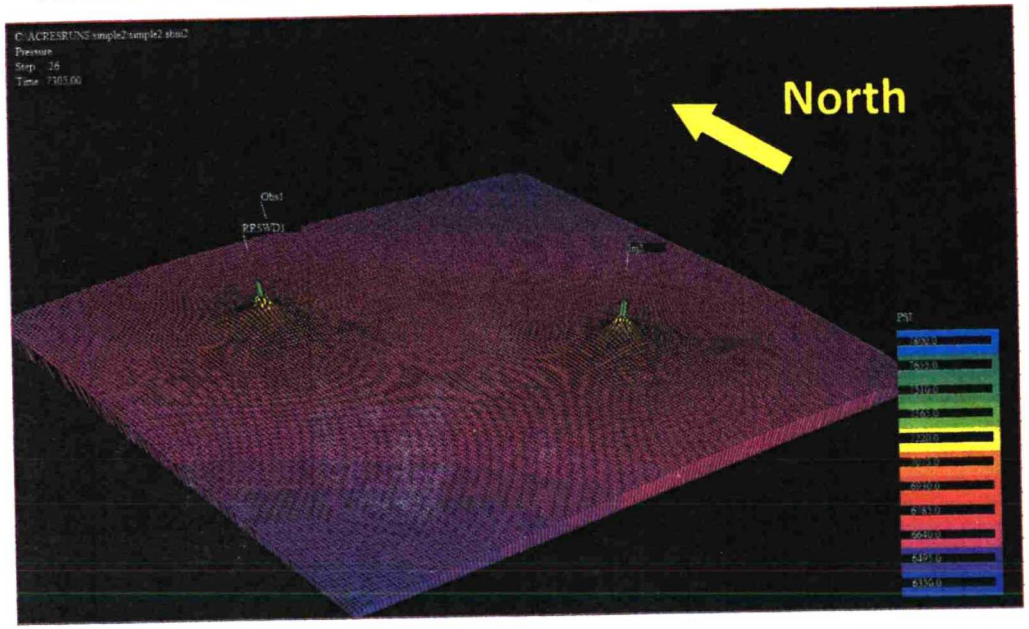


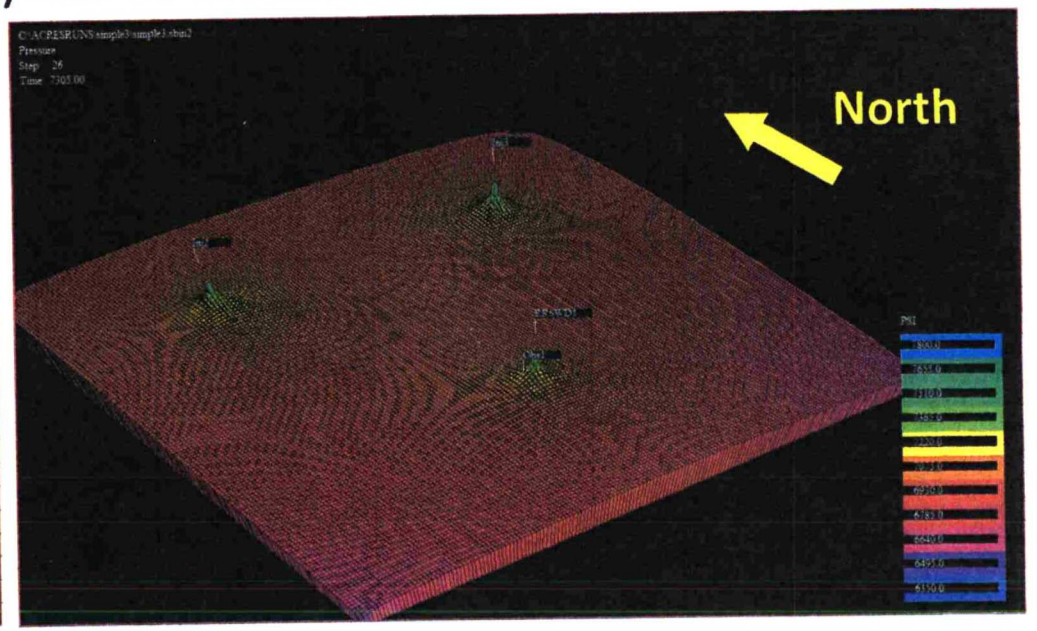


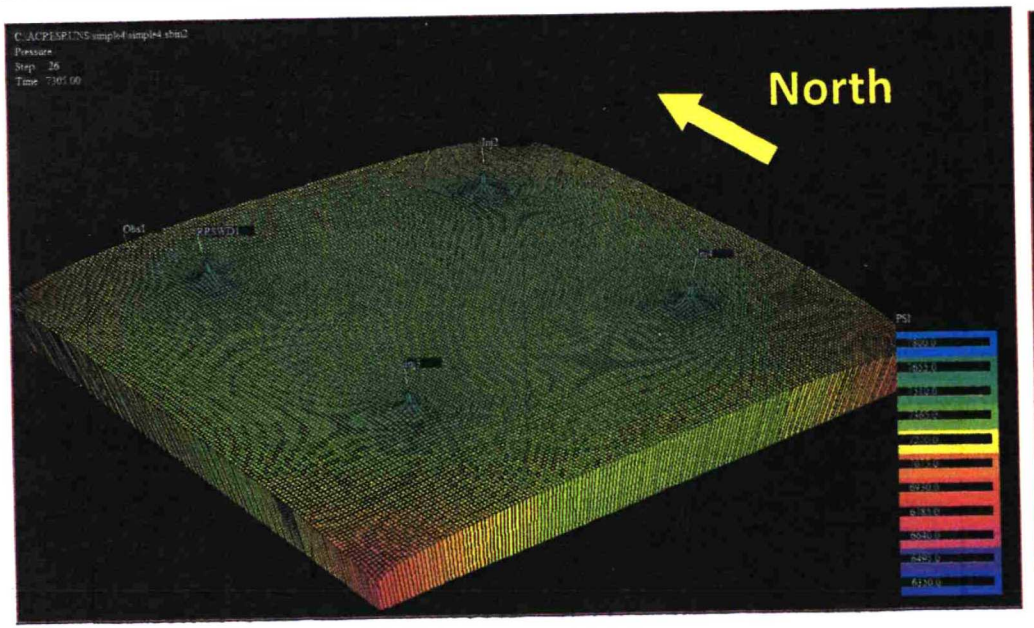


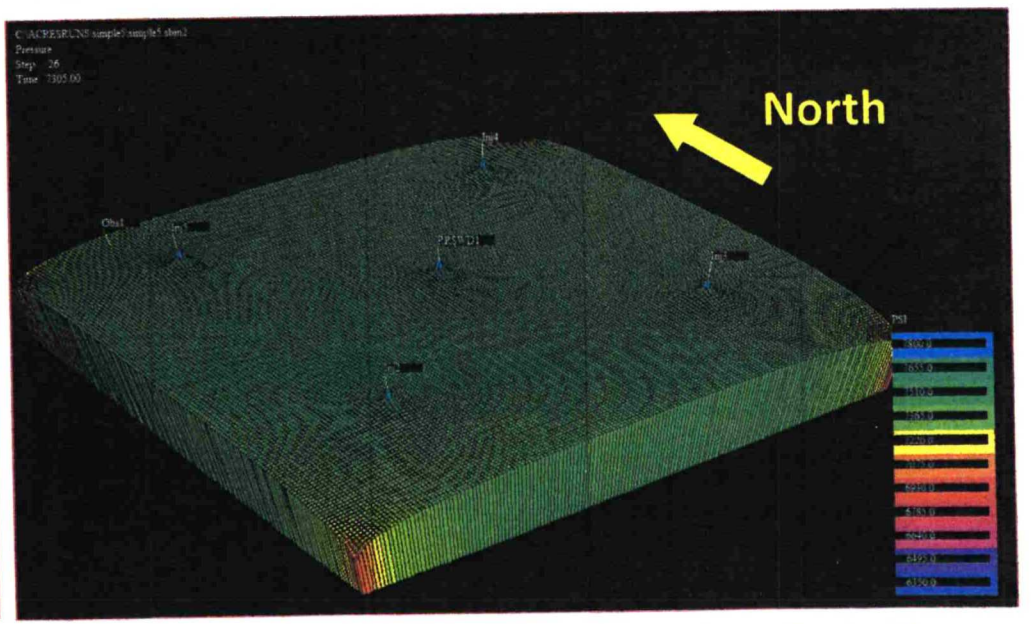


Scenario 2: Make the structure flat and place 2-5 identical wells inside the 10 mile x 10 mile grid as far away from each other as possible and analyze the injection interference. Reservoir pressures after 20 years are shown below.

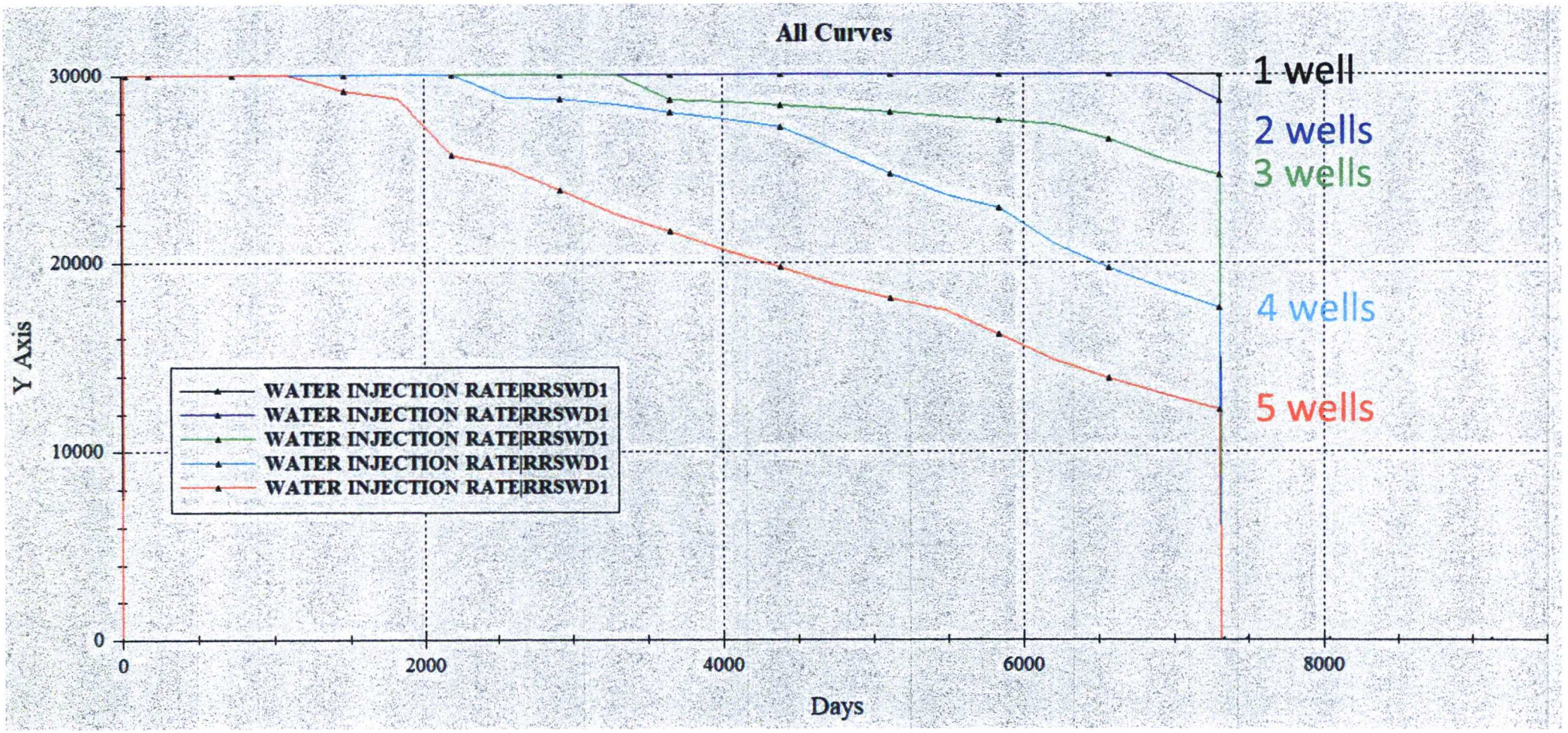






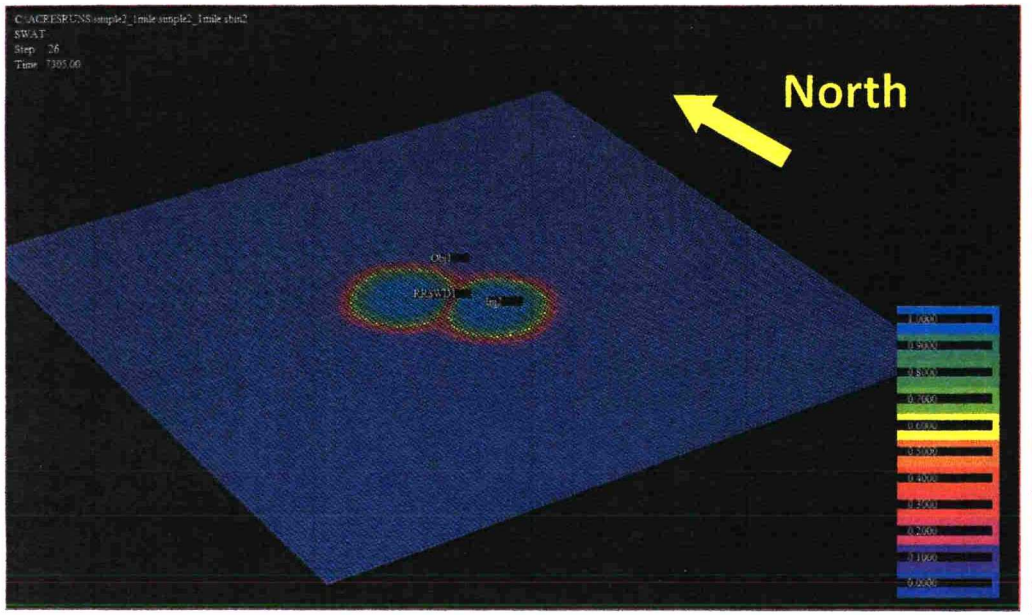


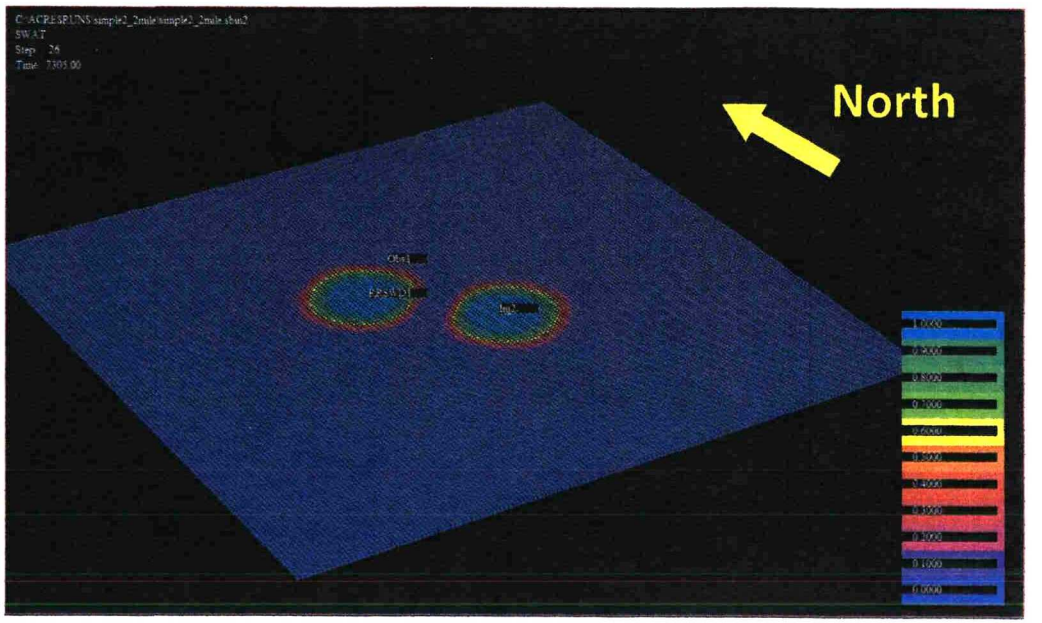
Scenario 2: Injection well rates (BWPD, Y axis) over 20 year injection period for the 1 to 5 well cases. Well is controlled with a maximum WHP of 2661 psi.

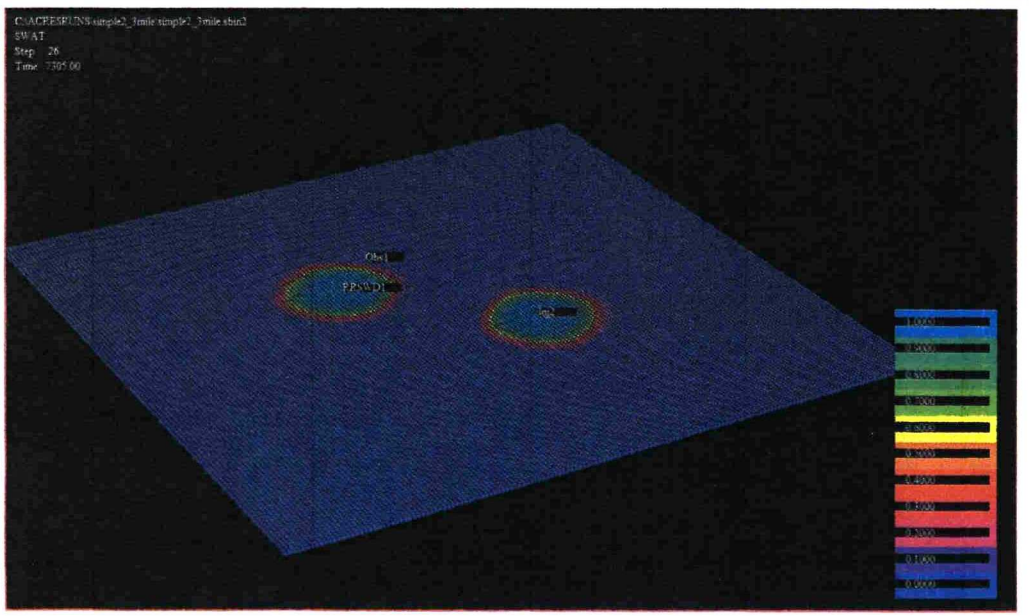


Scenario 2 Summary: With the given WHP restriction, wells can interfere with each other even though they are 4-5 miles apart. The amount of interference varies but cumulative injection per well can drop by as much as 27% when 5 wells compete in this scenario.

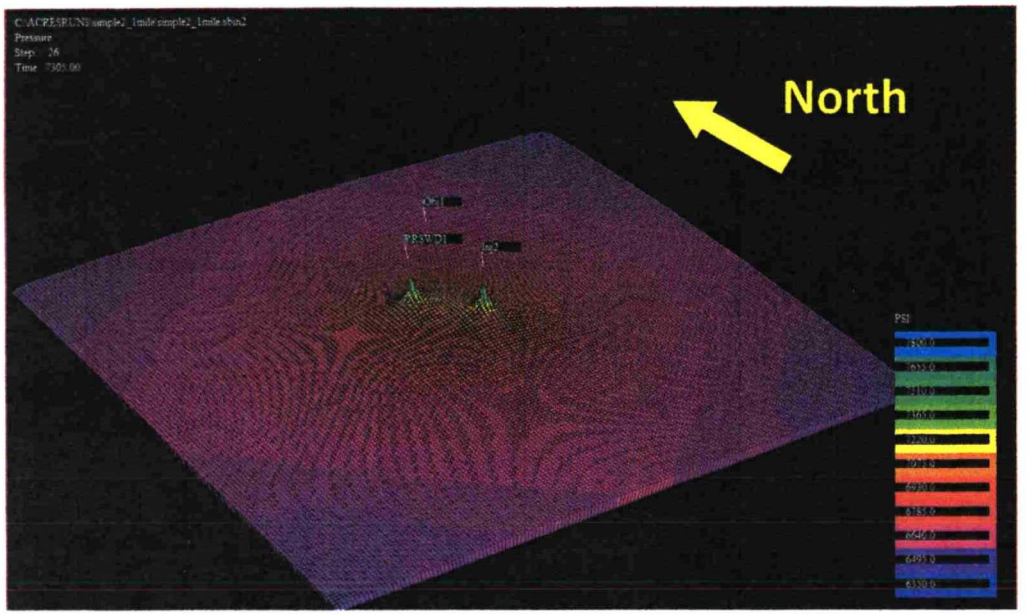
Scenario 3: Similar to scenario 2 but two wells only that vary 1, 2, and 3 miles apart. Volume displacement after 20 years are shown below.

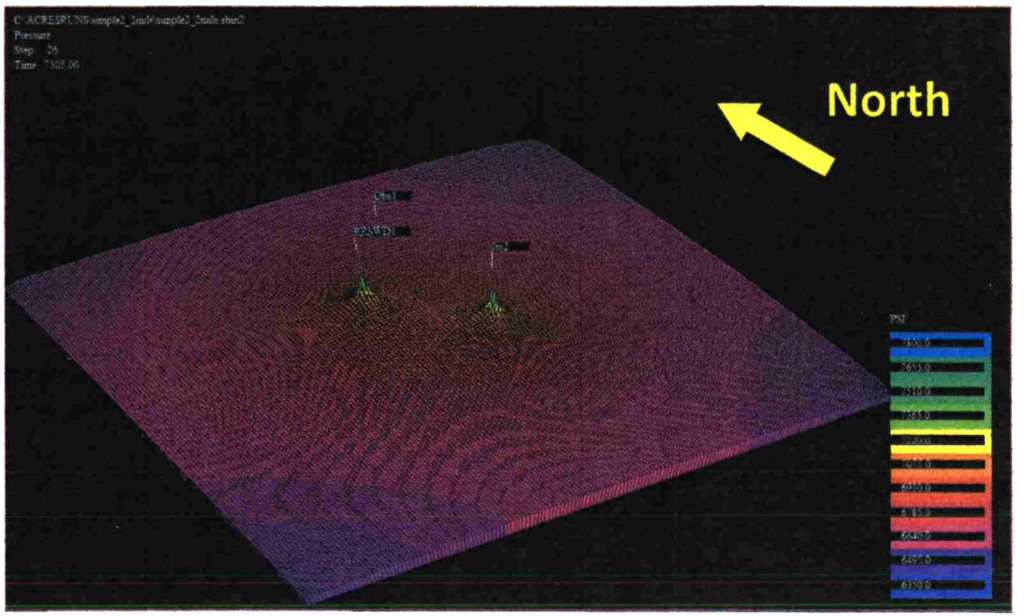


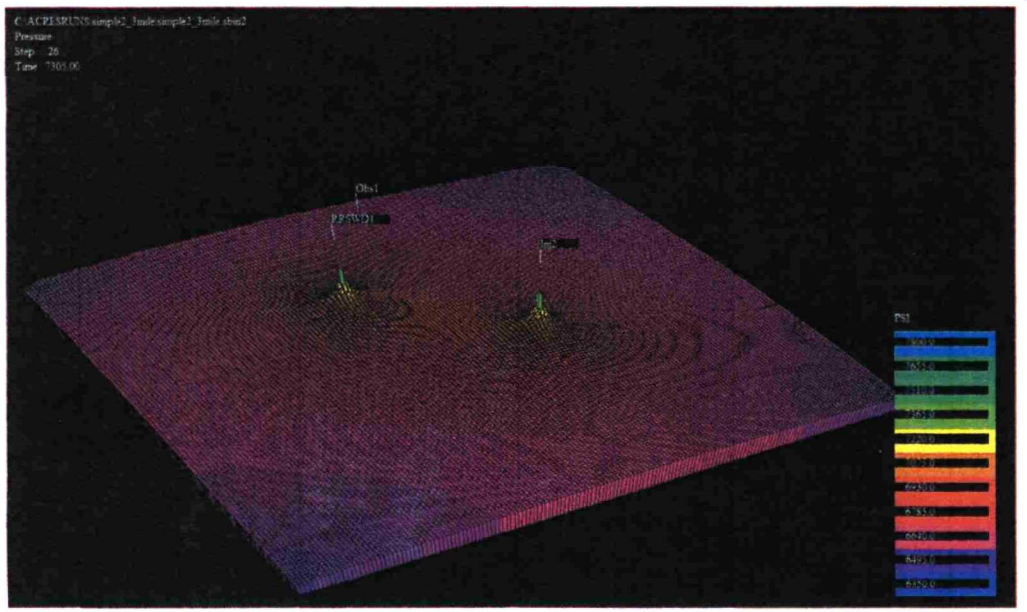




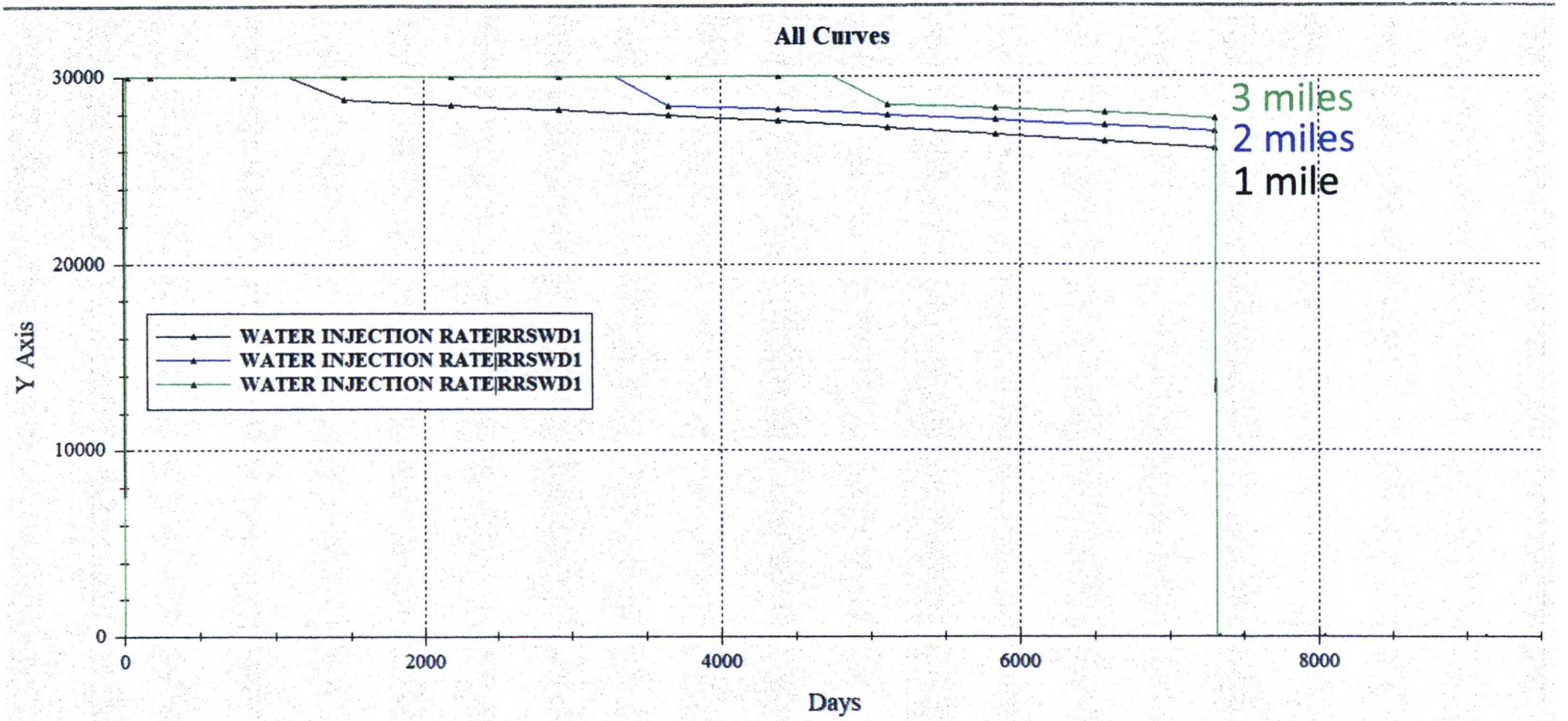
Scenario 3: Similar to scenario 2 but two wells only that vary 1, 2, and 3 miles apart. Reservoir pressures after 20 years are shown below.







Scenario 3: Injection well rates (BWPD, Y axis) over 20 year injection period for 2 wells, 1, 2, and 3 miles apart. Well is controlled with a maximum WHP of 2661 psi.



Scenario 3 Summary: Spacing between injectors also matters, with as much as a 7% reduction in cumulative injection in the 1 mile distance case.

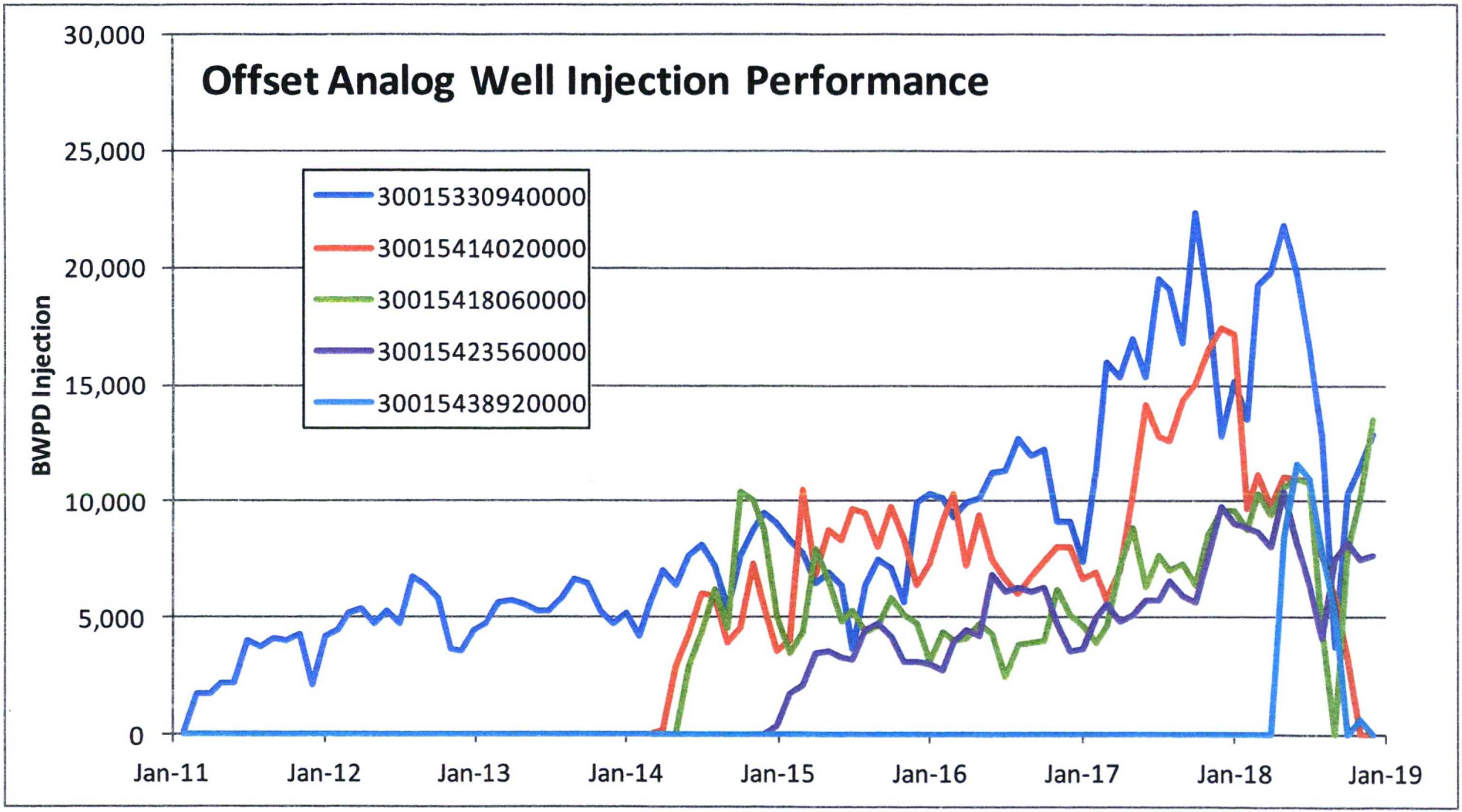
Overall Conclusions:

The simulation shown here illustrates how one well by itself injects with no problem and the resulting increase in pressure dissipates quickly. It also shows wells can compete with each other in a variety of scenarios in varying degrees, all of which are not too severe.

Note the reservoir description used in this study is very idealized and in reality is much more complicated by fractures and faults. So the behavior of any given well and it's nearby competitors will be affected by variable fracturing and local geology that is difficult to predict.

Restricting the well head injection pressure essentially regulates the competition, but new wells drilled far away from existing injectors are less likely to experience interference. Wells drilled close to each other may also not experience much interference depending on unknown connectivity and how much the overall nearby reservoir is utilized over time. Offset analogs (appendix, from Todd Reynolds) suggest 30,000 BWPD injection is optimistic.

Appendix: Offset analog injection performance



Application No. pMAM1819258846

Case No. 20405

Road Runner SWD No. 1

Solaris Water Midstream, LLC

Portion of Original Application Retained Following Amended Surface Location

(including original notification)

07/17/2018

DATE IN 7/10/2018	SUSPENSE	ENGINEER MAM	LOGGED IN 7/11/2018	TYPE SWD	APP NO. pMAM1815258496

ABOVE THIS LINE FOR DIVISION USE ONLY

NEW MEXICO OIL CONSERVATION DIVISION
- Engineering Bureau -
1220 South St. Francis Drive, Santa Fe, NM 87505

ADMINISTRATIVE APPLICATION CHECKLIST

THIS CHECKLIST IS MANDATORY FOR ALL ADMINISTRATIVE APPLICATIONS FOR EXCEPTIONS TO DIVISION RULES AND REGULATIONS WHICH REQUIRE PROCESSING AT THE DIVISION LEVEL IN SANTA FE

Application Acronyms:

[NSL-Non-Standard Location] [NSP-Non-Standard Proration Unit] [SD-Simultaneous Dedication]
[DHC-Downhole Commingling] [CTB-Lease Commingling] [PLC-Pool/Lease Commingling]
[PC-Pool Commingling] [OLS - Off-Lease Storage] [OLM-Off-Lease Measurement]
[WFX-Waterflood Expansion] [PMX-Pressure Maintenance Expansion]
[SWD-Salt Water Disposal] [IPI-Injection Pressure Increase]
[EOR-Qualified Enhanced Oil Recovery Certification] [PPR-Positive Production Response]

[1] **TYPE OF APPLICATION** - Check Those Which Apply for [A]

SWD
- SOLonis cotton midstream
371643

[A] Location - Spacing Unit - Simultaneous Dedication
☐ NSL ☐ NSP ☐ SD

Check One Only for [B] or [C]

[B] Commingling - Storage - Measurement
☐ DHC ☐ CTB ☐ PLC ☐ PC ☐ OLS ☐ OLM

ROADRUNNER SWD #1
30-015-45095

[C] Injection - Disposal - Pressure Increase - Enhanced Oil Recovery
☐ WFX ☐ PMX ☒ SWD ☐ IPI ☐ EOR ☐ PPR

[D] Other: Specify _____

[2] **NOTIFICATION REQUIRED TO:** - Check Those Which Apply, or Does Not Apply

SWD, Devonian-Silurian
97869

[A] ☐ Working, Royalty or Overriding Royalty Interest Owners

[B] ☒ Offset Operators, Leaseholders or Surface Owner

[C] ☒ Application is One Which Requires Published Legal Notice

[D] ☐ Notification and/or Concurrent Approval by BLM or SLO
U.S. Bureau of Land Management - Commissioner of Public Lands, State Land Office

[E] ☒ For all of the above, Proof of Notification or Publication is Attached, and/or,

[F] ☐ Waivers are Attached

[3] **SUBMIT ACCURATE AND COMPLETE INFORMATION REQUIRED TO PROCESS THE TYPE OF APPLICATION INDICATED ABOVE.**

[4] **CERTIFICATION:** I hereby certify that the information submitted with this application for administrative approval is **accurate** and **complete** to the best of my knowledge. I also understand that **no action** will be taken on this application until the required information and notifications are submitted to the Division.

Note: Statement must be completed by an individual with managerial and/or supervisory capacity.

J. Daniel Arthur, P.E., SPEC		Consulting Engineer - ALL Consulting	07/17/2018
Print or Type Name	Signature	Title	Date

darthur@all-llc.com
e-mail Address

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL
RESOURCES DEPARTMENT

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, New Mexico 87505

FORM C-108
Revised June 10, 2003

APPLICATION FOR AUTHORIZATION TO INJECT

I. PURPOSE: ____ Secondary Recovery ____ Pressure Maintenance _X_ Disposal ____ Storage
Application qualifies for administrative approval? _X_ Yes ____ No

II. OPERATOR: Solaris Water Midstream, LLC

ADDRESS: 9811 Katy Freeway, Suite 900, Houston, TX 77024

CONTACT PARTY: Bonnie Atwater PHONE: 432-203-9020

III. WELL DATA: Complete the data required on the reverse side of this form for each well proposed for injection. Additional sheets may be attached if necessary.

IV. Is this an expansion of an existing project? ____ Yes _X_ No
If yes, give the Division order number authorizing the project: ____

V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.

VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.

VII. Attach data on the proposed operation, including:

1. Proposed average and maximum daily rate and volume of fluids to be injected;
2. Whether the system is open or closed;
3. Proposed average and maximum injection pressure;
4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and,
5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).

*VIII. Attach appropriate geologic data on the injection zone including appropriate lithologic detail, geologic name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such sources known to be immediately underlying the injection interval.

IX. Describe the proposed stimulation program, if any.

*X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division, they need not be resubmitted).

*XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.

XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground sources of drinking water.

XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.

XIV. Certification: I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

NAME: Katy Welch TITLE: Land Manager

SIGNATURE: Katy Welch DATE: 7/3/2018

E-MAIL ADDRESS: Katy.Welch@solarismidstream.com

* If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be resubmitted. Please show the date and circumstances of the earlier submittal: ____

DISTRIBUTION: Original and one copy to Santa Fe with one copy to the appropriate District Office

III. WELL DATA

A. The following well data must be submitted for each injection well covered by this application. The data must be both in tabular and schematic form and shall include:

(1) Lease name; Well No.; Location by Section, Township and Range; and footage location within the section.

(2) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.

(3) A description of the tubing to be used including its size, lining material, and setting depth.

(4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

Division District Offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well.

B. The following must be submitted for each injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.

(1) The name of the injection formation and, if applicable, the field or pool name.

(2) The injection interval and whether it is perforated or open-hole.

(3) State if the well was drilled for injection or, if not, the original purpose of the well.

(4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.

(5) Give the depth to and the name of the next higher and next lower oil or gas zone in the area of the well, if any.

XIV. PROOF OF NOTICE

All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the owner of the surface of the land on which the well is to be located and to each leasehold operator within one-half mile of the well location.

Where an application is subject to administrative approval, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is located. The contents of such advertisement must include:

(1) The name, address, phone number, and contact party for the applicant;

(2) The intended purpose of the injection well; with the exact location of single wells or the Section, Township, and Range location of multiple wells;

(3) The formation name and depth with expected maximum injection rates and pressures; and,

(4) A notation that interested parties must file objections or requests for hearing with the Oil Conservation Division, 1220 South St. Francis Dr., Santa Fe, New Mexico 87505, within 15 days.

NO ACTION WILL BE TAKEN ON THE APPLICATION UNTIL PROPER PROOF OF NOTICE HAS BEEN SUBMITTED.

NOTICE: Surface owners or offset operators must file any objections or requests for hearing of administrative applications within 15 days from the date this application was mailed to them.

A-3 and AL-2 LOK-SET Retrievable Casing Packers

Product Family No. H64630 and H64628

APPLICATION

The A-3™ LOK-SET™ packer combines advantages of a retrievable packer with the features of a permanent packer. An ability to lock down tubing forces makes the A-3 suitable for a broad range of applications, including production, injection, zone isolation, and remedial operations. The AL-2™ LOK-SET packer is similar to the A-3, and has a larger bore.

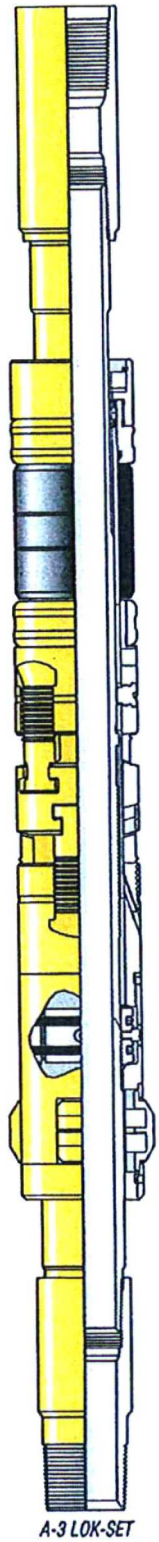
Advantages

- Holds pressure from above and below, without relying on set-down weight, tubing tension, or hydraulic hold down
- Provides tubing anchoring with tension applied, suitable for pumping wells or injection, controlling tubing forces related to change fluid temperatures
- Opposed, non-transferring, dovetail slips prevent packer movement associated with changing differential pressures, while allowing the landing of the tubing in tension, neutral or compression
- Right-hand tubing rotation controls setting and releasing
- Packing element compression locks in by ratcheting action of lock segments, which restricts rotation to one direction

Accessories

To provide a simple and reliable injection system for retrieving an injection string without having to unseat the packer:

L-10 or L-316 on-off sealing connectors, Product Family Nos. H68420 and H68422. Baker Hughes blanking plug can be used in the seating nipple profile of the on-off sealing connector to provide a means of plugging the lower zone while the tubing is being pulled.



A-3 LOK-SET Retrievable Casing Packer Product Family No. H64630

SPECIFICATION GUIDES

A-3™ LOK-SET Retrievable Casing Packer, Product Family No. H64630

Casing			Packer				
OD		Weight •	Size	Nom ID		Max Gage Ring OD	
In.	mm	lb/ft		In.	mm	In.	mm
4	101.6	9.5–12.9	41A2	1.500	38.1	3.244	82.4
4-1/2	144.3	21.6–23.6	41A2	1.500	38.1	3.244	82.4
4	101.6	9.5	41A4	1.500	38.1	3.423	112.4
4-1/2	114.3	18.8	41A4	1.500	38.1	3.423	112.4
		13.5–17.7	41B			3.578	90.9
		11.6–13.5	43A2	1.978	50.2	3.786	96.2
		9.5–10.5	43A4			3.786	96.2
5	127.0	15–18	43B	1.978	50.2	4.140	105.2
		11.5–15	43C			4.265	108.3
5-1/2	139.7	26	43C	1.978	50.2	4.265	108.3
		20–23	45A2			4.515	114.7
		15.5–20	45A4			4.656	118.3
		13–15.5	45B			4.796	121.8
6	152.4	26	45B	1.978	50.2	4.796	121.8
		20–23	45C			5.078	129.0
		15–18	45D			5.171	131.3
6-5/8	168.3	34	45E	1.978	50.2	5.421	137.7
		24–32	45F			5.499	139.7
		24	47A2	2.441	62.0	5.671	144.0
		17–24	45G	1.978	50.2	5.796	147.2
		17–20	47A4	2.441	62.0	5.827	148.0
7	177.8	38	47A2	2.441	62.0	5.671	144.0
		32–35	47A4			5.827	148.0
		26–29	47B2			5.983	152.0
		23–26	47B4			6.093	154.8
		17–20	47C2			6.281	159.5
7-5/8	193.7	33.7–39	47C4	2.441	62.0	6.468	164.3
		24–29.7	47D2			6.687	169.9
		20–24	47D4			6.827	173.4
8-5/8	219.1	44–49	49A2	3.500	88.9	7.327	186.1
		32–40	49A4			7.546	191.7
		20–28	49B			7.796	198.0
9-5/8	244.5	47–53.5	51A2	3.500	88.9	8.234	209.1
		40–47	51A4			8.452	214.7
		29.3–36	51B			8.608	218.6

AL-2™ Large Bore LOK-SET Retrievable Casing Packer Product Family No. H64628

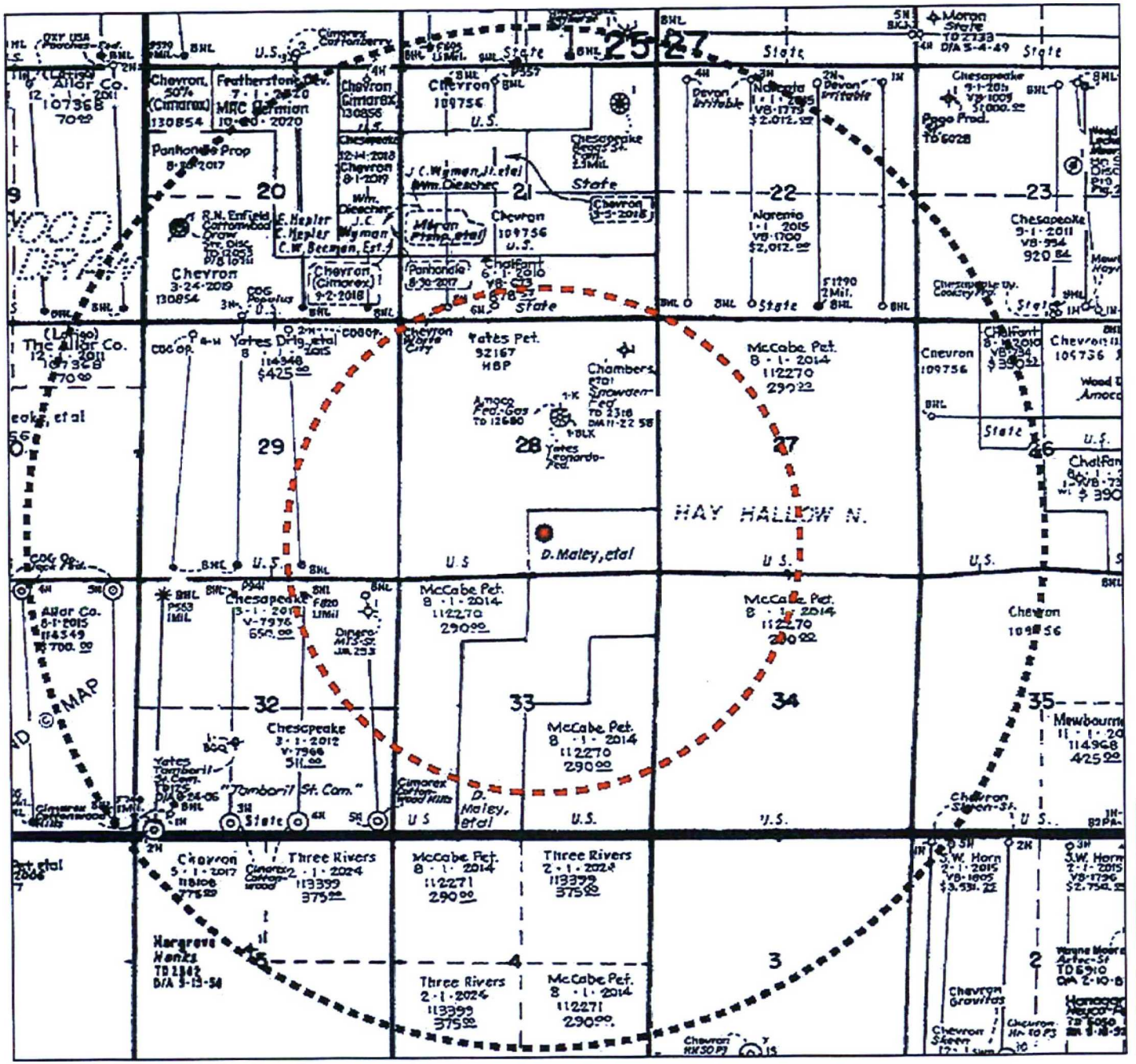
Casing		Packer							
OD		Weight •	Size	Nom ID		Max Gage Ring OD		Max Diameter of Compressed Drag Block	
In.	mm	lb/ft		In.	mm	In.	mm	In.	mm
5-1/2	139.7	20	45A2 x 2-3/8	2.375	60.3	4.562	115.9	4.592	116.6
		15.5–17	45A4 x 2-3/8			4.656	118.3	4.750	120.7
		13	45B x 2-3/8			4.796	121.8	4.902	124.5
6	152.4	26	45B x 2-3/8	2.375	60.3	4.796	121.8	4.902	124.5

• *When selecting a packer for a casing weight common to two weight ranges (same OD), choose the packer size shown for the lighter of the two weight ranges. Example: for 7-in. (177.8 mm) OD 26 lb/ft casing use packer size 47B4. Under certain circumstances the other packer size may be run, such as when running in mixed casing strings.*

Repair kits, including such items as packing elements, seal rings, etc., are available for redressing Baker Retrievable Packers. Contact your Baker Hughes representative. Use only Baker Hughes repair parts.

Attachment 2

Area of Review Well Map, Lease Map, and Well Details


Prepared for:
SOLARIS WATER MIDSTREAM
N
Legend
Proposed SWD
1- mile Radius
2 - mile Radius
Road Runner SWD #1
Offset Leases
Eddy County, NM
Proj Mgr: JDA
July 02, 2018
Mapped by: BJB
Prepared by:
ALL CONSULTING

One Mile AOR Tabulation for Road Runner SWD #1 (Top of Injection Interval: 13,305')								
Well Name	API#	Well Type	Operator	Spud Date	Location (Sec., Tn., Rng.)	Footage Location	Total Depth	Penetrate Inj. Int.?
LEONARDO BKL FEDERAL COM #001	30-015-22763	G	EOG Y RESOURCES, INC.	1/17/1979	G-28-25S-27E	1980 FNL 1980 FEL	12712	No
WHITE CITY 21 25 27 FEDERAL COM #005H	30-015-42975	O	CHEVRON U S A INC	5/19/2015	Sec 21 T25S R27E Mer NMP	330 FSL 990 FWL	7451	No
WHITE CITY 21 25 27 FEDERAL COM #006H	30-015-42976	O	CHEVRON U S A INC	4/23/2015	Sec 21 T25S R27E Mer NMP	330 FSL 1923 FWL	12276	No
Snowden-Federal	30-015-01146	O	Chambers & Kennedy & J.M.C. Ritchie	10/15/1958	Sec 26 T25S R27E	660 FNL 660 FEL	2318	No
M.T.S. State	30-015-23971	O	Dinero Operating Company	11/28/1981	Sec 32 T25S R27E	660 FNL 660 FEL	293	No

No wells within the 1-mile AOR penetrate the injection interval.

Attachment 3

Source Water Analyses

Wolfcamp

BAKER HUGHES

Water Analysis

Date: 23-Aug-11

2708 West County Road, Hobbs NM 88240
Phone (575) 392-5556 Fax (575) 392-7307

Analyzed For Brushy Draw 1 #1

Company	Well Name	County	State
	BD	~~Lea~~ Eddy	New Mexico 1-26S-29E

Sample Source Swab Sample **Sample #** 1

Formation **Depth**

Specific Gravity	1.170	SG @ 60 °F	1.172
pH	6.30	Sulfides	Absent
Temperature (°F)	70	Reducing Agents	

Cations

Sodium (Calc)	in Mg/L	77,982	in PPM	66,520
Calcium	in Mg/L	4,000	in PPM	3,413
Magnesium	in Mg/L	1,200	in PPM	1,024
Soluable Iron (FE2)	in Mg/L	10.0	in PPM	9

Anions

Chlorides	in Mg/L	130,000	in PPM	110,922
Sulfates	in Mg/L	250	in PPM	213
Bicarbonates	in Mg/L	127	in PPM	108
Total Hardness (as CaCO3)	in Mg/L	15,000	in PPM	12,799
Total Dissolved Solids (Calc)	in Mg/L	213,549	in PPM	182,209
Equivalent NaCl Concentration	in Mg/L	182,668	in PPM	156,031

Scaling Tendencies

*Calcium Carbonate Index 507,520

Below 500,000 Remote / 500,000 - 1,000,000 Possible / Above 1,000,000 Probable

*Calcium Sulfate (Gyp) Index 1,000,000

Below 500,000 Remote / 500,000 - 10,000,00 Possible / Above 10,000,000 Probable

*This Calculation is only an approximation and is only valid before treatment of a well or several weeks after treatment.

Remarks RW=.048@70F

Report # 3188

Sec 22, T25S, R28E

North Permian Basin Region
P.O. Box 740
Sundown, TX 79372-0740
(806) 229-8121
Lab Team Leader - Sheila Hernandez
(432) 495-7240

Bone Spring

Water Analysis Report by Baker Petrolite

Company:		Sales RDT:	33514.1
Region:	PERMIAN BASIN	Account Manager:	TONY HERNANDEZ (575) 910-7135
Area:	ARTESIA, NM	Sample #:	534665
Lease/Platform:	PINOCHLE 'BPN' STATE COM	Analysis ID #:	106795
Entity (or well #):	2 H	Analysis Cost:	$90.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	03/10/11
Analysis Date:	03/18/11
Analyst:	SANDRA GOMEZ
TDS (mg/l or g/m3):	184911.1
Density (g/cm3, tonne/m3):	1.113
Anion/Cation Ratio:	1
Carbon Dioxide:	0 50 PPM
Oxygen:	
Comments:	

Analysis of Sample 534665 @ 75 °F

Anions	mg/l	meq/l	Cations	mg/l	meq/l
Chloride:	109618.0	3091.92	Sodium:	70275.7	3056.82
Bicarbonate:	2135.0	34.99	Magnesium:	195.0	16.04
Carbonate:	0.0	0.	Calcium:	844.0	42.12
Sulfate:	747.0	15.55	Strontium:	220.0	5.02
Phosphate:			Barium:	0.8	0.01
Borate:			Iron:	6.5	0.23
Silicate:			Potassium:	869.0	22.22
			Aluminum:		
Hydrogen Sulfide:		0 PPM	Chromium:		
pH at time of sampling:		7	Copper:		
pH at time of analysis:			Lead:		
pH used in Calculation:		7	Manganese:	0.100	0.
			Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite $CaCO_3$		Gypsum $CaSO_4 \cdot 2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$		CO_2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	1.08	188.52	-1.20	0.00	-1.18	0.00	-0.11	0.00	0.58	0.29	1.72
100	0	1.10	206.05	-1.29	0.00	-1.20	0.00	-0.15	0.00	0.35	0.29	2.35
120	0	1.12	224.17	-1.38	0.00	-1.19	0.00	-0.17	0.00	0.16	0.00	3.17
140	0	1.13	243.17	-1.42	0.00	-1.18	0.00	-0.18	0.00	0.00	0.00	4.21

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the five scales.

Note 3: The reported CO2 pressure is actually the calculated CO2 fugacity. It is usually nearly the same as the CO2 partial pressure.

Attachment 4

Injection Formation Water Analyses

wellname	api	section	township	range	county	state	formation	sampledate	ph	specificgravity	specificgravity_temp_F	tds_mgL	resistivity_ohm_cm	resistivity_ohm_cm_temp_F	conductivity	conductivity_temp_F	sodium_mgL	calcium_mgL	magnesium_mgL	chloride_mgL	bicarbonate_mgL	sulfate_mgL
JURNEGAN POINT #001	3001510280	5	24S	25E	EDDY	NM	DEVONIAN	12/14/1964 0:00	7			203100								121100	175	2220
WHITE CITY PENN GAS COM UNIT 1 #001	3001500408	29	24S	26E	EDDY	NM	DEVONIAN	3/1/1960 0:00	7	1.012	60		0.36	75	25596	64	6072	1002	132	10120	653	1336

Source: Go-Tech (http://gotech.nmt.edu/gotech/Water/producedwater.aspx)

Attachment 5

Water Well Map

Proposed SWD & Water Wells within 1 mile

Prepared for: SOLARIS WATER MIDSTREAM

Legend

- Proposed SWD
- Water Well (iWATERS)
- Proposed SWD 1-mi Buffer

Road Runner SWD #1		
County: Eddy, NM	Date: 7/2/2018	
Lat: 32.096231	PM: J Daniel Arthur	
Long: -104.194050	Map: Ben Bockelmann	1:22,000

0 1,250 2,500 5,000 Feet

Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Prepared by: ALL CONSULTING

Attachment 6

Induced Seismicity Assessment Letter

ALL CONSULTING
GOVERNMENT RELATIONS · ENERGY · PLANNING · TECHNOLOGY
ENGINEERING · ENVIRONMENTAL

July 2, 2018

Mr. Phillip Goetze, P.G.
NM EMNRD – Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, NM 87505

Subject: Induced Seismicity Potential Statement for the Road Runner SWD #1

Dear Mr. Goetze,

This letter provides information regarding the seismic potential associated with injection operations associated with Solaris Water Midstream, LLC's (Solaris), proposed Road Runner SWD #1, hereinafter referred to as the "Subject Well".

As outlined herein, based on my experience as an expert on the issue of induced seismicity, it is my opinion that the potential for the proposed injection well to cause injection-induced seismicity is expected to be minimal, at best. This conclusion is based on (1) the lack of historic seismic activity and faulting in the area, (2) the low fault slip potential (FSP) of Precambrian faults in the area, (3) the presence of confining layers, and (4) the overall vertical distance between the proposed injection zone and basement rock.

The Subject Well, is located 902' FSL & 2,404' FEL of Section 28, in T25-S and R27-E of Eddy County, New Mexico. Historically, the Eddy County area has experienced very limited recorded seismic activity (per the U.S. Geological Survey [USGS] earthquake catalog database). There have been two known seismic events located within a 25-mile radius of the proposed subject well. The closest recorded seismic event was a M3.9 that occurred on April 11, 1974, and was located approximately 15.1 miles north of the subject well (See Exhibit 1). The second closest recorded seismic event was a M3.1 that occurred on March 18, 2012, and was located approximately 21.8 miles northeast of the Subject Well. The closest Class IID well injecting into the same formations (Devonian-Silurian) of the Subject Well is approximately 2.63 miles to the southeast (See Exhibit 1).

Solaris does not own either 2D or 3D seismic reflection data in the area of the Subject Well. Fault data from USGS indicates that the closest known fault is approximately 10.85 miles northwest of the Subject Well and a second small inferred fault segment is approximately 11.82 miles to the northeast (See Exhibit 1).

In a recent paper written by Snee and Zoback (2018) entitled "State of Stress in the Permian Basin, Texas and New Mexico: Implications for Induced Seismicity,", the authors found that large groups of mostly north-south striking Precambrian basement faults, predominantly located along the

Central Basin Platform, the western Delaware Basin, and large parts of the Northwest Shelf (which includes Eddy and Lea counties, New Mexico) have low FSP at the modeled fluid-pressure perturbation. The map in Exhibit 2 depicts the low probability risk of FSP for the Delaware Basin and Northwest Shelf areas (Snee and Zoback 2018).

Geologic analysis indicates that the proposed Devonian-Silurian injection zone is overlain by approximately 200 to 400 feet of Woodford Shale, which is the upper confining zone and will serve as a barrier for upward injection fluid migration. Additionally, the Simpson Group that lies directly below the Montoya Formation will act as a lower confining zone to prohibit fluids from migrating downward into the underlying Ellenberger Formation and Precambrian basement rock. See the stratigraphic column for the Delaware Basin included in Exhibit 3.

In the Eddy and Lea Counties area of New Mexico, the Simpson Group is comprised of a series of Middle to Upper Ordovician carbonates, several sandstones, and sandy shales that range from approximately 350 to 650 feet thick (Jones 2008). This group of rocks is capped by the limestones of the Bromide Formation, which is approximately 200 feet thick in this area (Jones 2008). The closest deep well drilled into the Precambrian basement was completed by the Skelly Oil Company in 1975. This well is located in Section 17, Range 36E, Township 25S of Lea County (API No.30-025-25046) and encountered 602 feet of Ellenburger Formation before reaching the top of the Precambrian granite at a depth of 18,920 feet. Based on the estimated thickness of the Simpson Group and Ellenburger Formation in this area, the Precambrian basement should be approximately 1,000 to 1,200 feet below the bottom of the proposed injection zones in the Subject Well.

Conclusion

As an expert on the issue of induced seismicity, it is my opinion that the potential for the proposed injection well to cause injection-induced seismicity is expected to be minimal, at best. This conclusion is based on (1) the lack of historic seismic activity and faulting in the area, (2) the low FSP of Precambrian faults in the area, (3) the presence of confining layers, and (4) the overall vertical distance between the proposed injection zone and basement rock.

Sincerely,
ALL Consulting

J. Daniel Arthur, P.E., SPEC
President and Chief Engineer

Enclosures
References
Exhibits

References

Ball, Mahlon M. 1995. "Permian Basin Province (044)." In *National Assessment of United States Oil and Gas Resources—Results, Methodology, and Supporting Data.* U.S. Geological Survey. https://certmapper.cr.usgs.gov/data/noga95/prov44/text/prov44.pdf (accessed June 18, 2018).

Green, G.N., and G.E. Jones. 1997. "The Digital Geologic Map of New Mexico in ARC/INFO Format." U.S. Geological Survey Open-File Report 97-0052. https://mrdata.usgs.gov/geology/state/state.php?state=NM (accessed June 14, 2018).

Jones, Rebecca H. 2008. "The Middle-Upper Ordovician Simpson Group of the Permian Basin: Deposition, Diagenesis, and Reservoir Development." http://www.beg.utexas.edu/resprog/permianbasin/PBGSP_members/writ_synth/Simpson.pdf (accessed June 19, 2018).

Snee, Jens-Erik Lund, and Mark D. Zoback. 2018. "State of Stress in the Permian Basin, Texas and New Mexico: Implications for Induced Seismicity." *The Leading Edge* 37, no. 2 (February 2018): 127-34.

U.S. Geological Survey (USGS). No date. Earthquakes Hazard Program: Earthquake Catalog. https://earthquake.usgs.gov/earthquakes/search/ (accessed June 14, 2018).

Exhibits

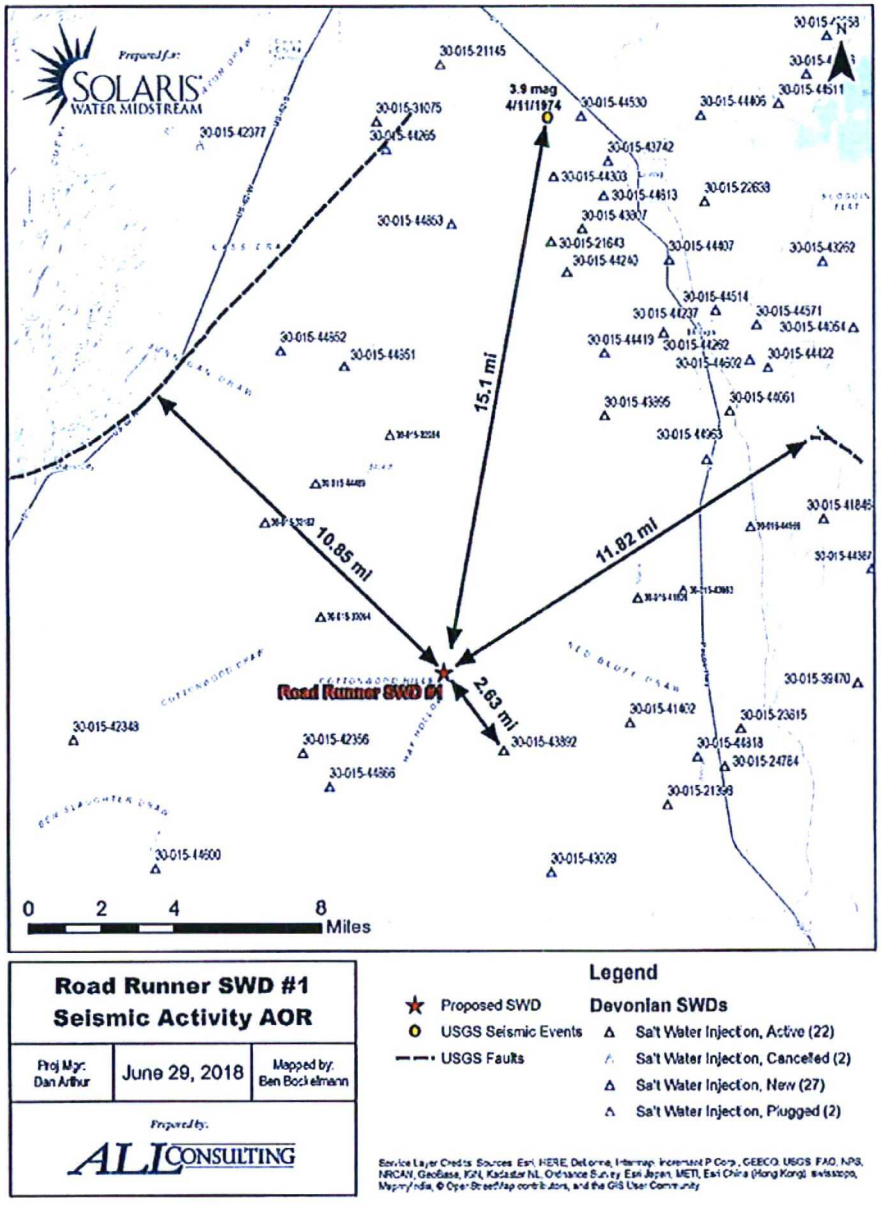


Exhibit 1. Map Showing the Distances from Known and Inferred Faults, Seismic Event, and Closest Deep Injection Well

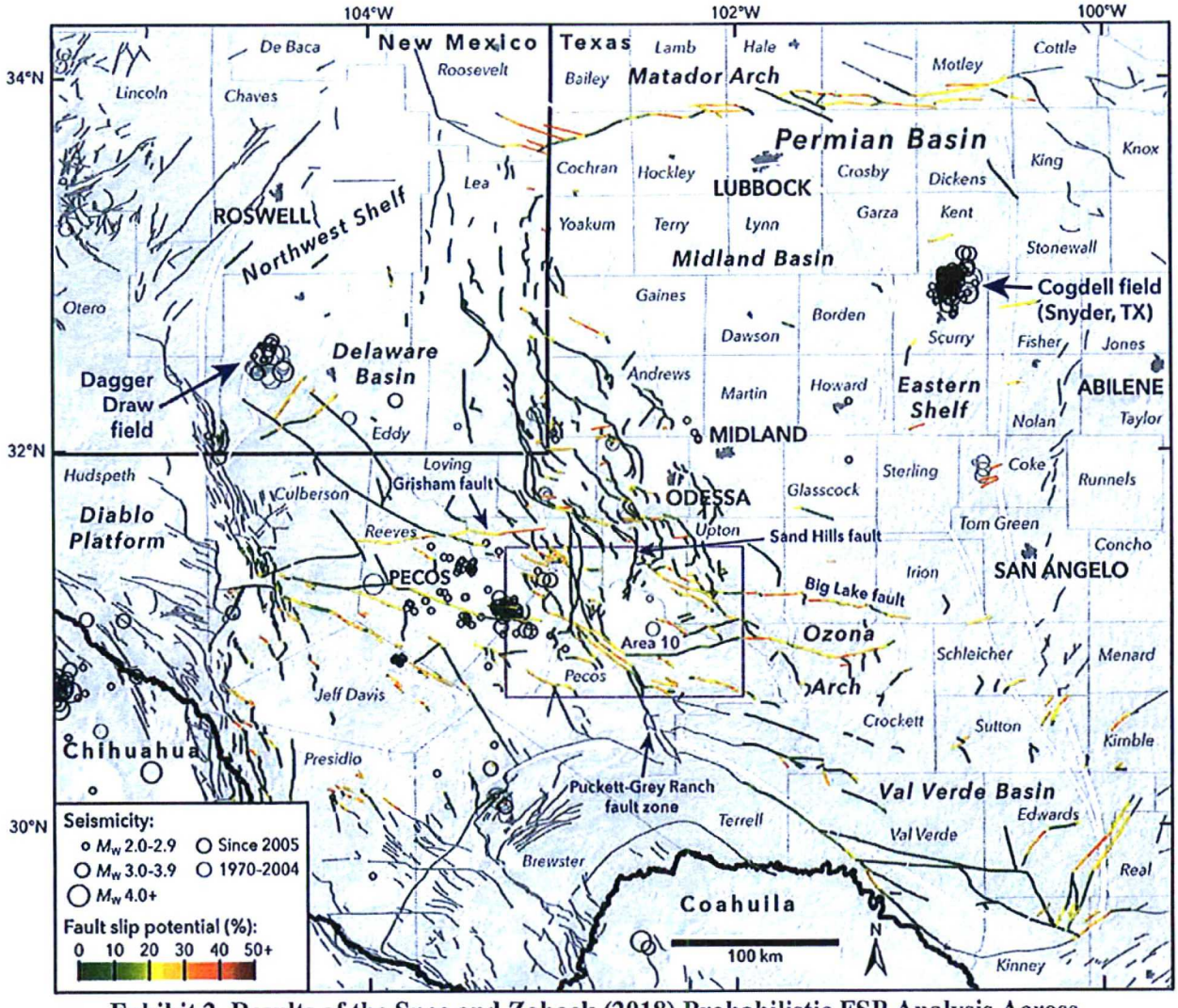


Exhibit 2. Results of the Snee and Zoback (2018) Probabilistic FSP Analysis Across the Permian Basin

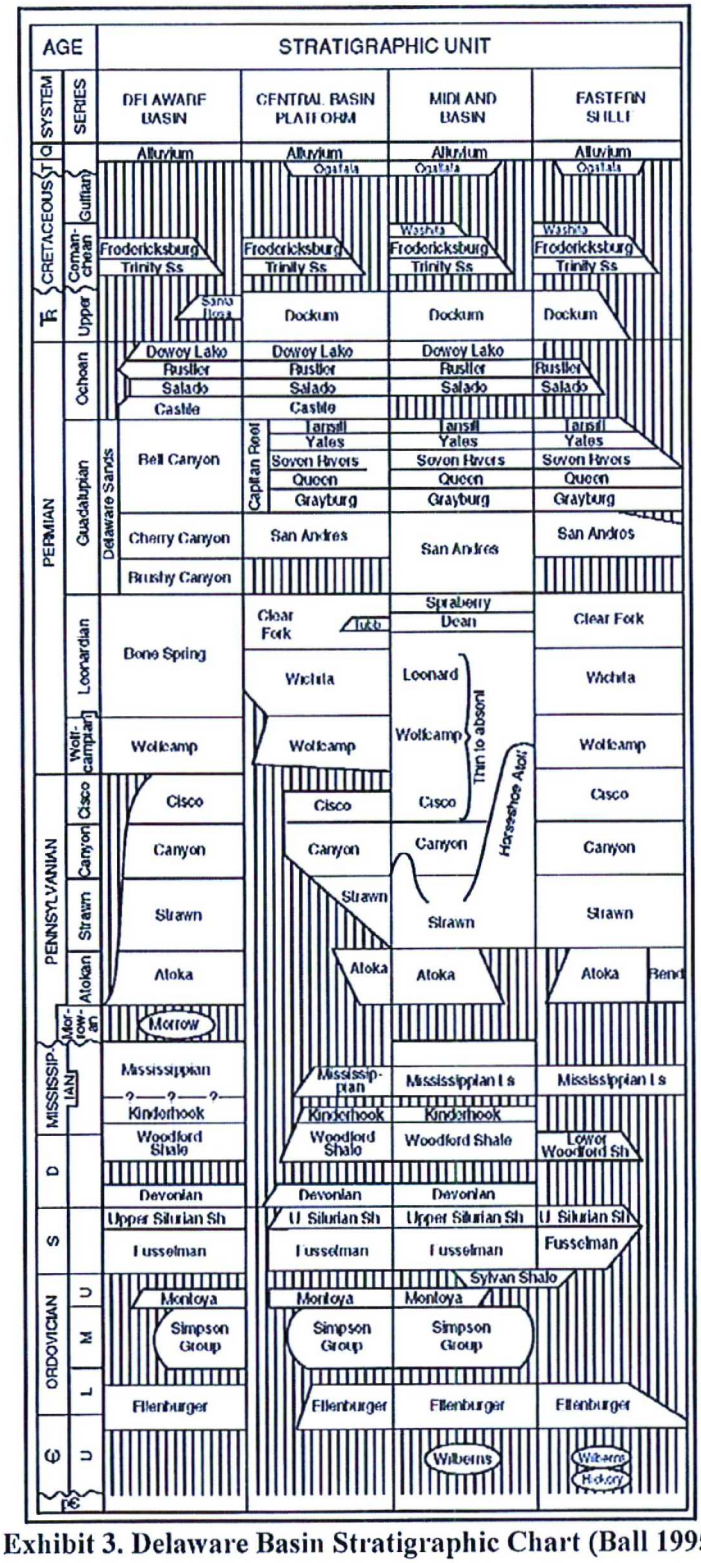


Exhibit 3. Delaware Basin Stratigraphic Chart (Ball 1995)

Attachment 7

Public Notice Affidavit and Notice of Application Confirmations

CARLSBAD
CURRENT-ARGUS

AFFIDAVIT OF PUBLICATION

Ad No.
0001252814

ALL CONSULTING
1718 SOUTH CHEYENNE AVE

TULSA OK 74119

I, a legal clerk of the **Carlsbad Current-Argus**, a newspaper published daily at the City of Carlsbad, in said county of Eddy, state of New Mexico and of general paid circulation in said county; that the same is a duly qualified newspaper under the laws of the State wherein legal notices and advertisements may be published; that the printed notice attached hereto was published in the regular and entire edition of said newspaper and not in supplement thereof on the date as follows, to wit:

06/28/18

Sara Kanitz
Legal Clerk

Subscribed and sworn before me this
28th of June 2018.

Tara Mondloch
State of WI, County of Brown
NOTARY PUBLIC

Aug. 6. 2021
My Commission Expires

TARA MONDLOCH
Notary Public
State of Wisconsin

Ad#:0001252814
P O : 0001252814
# of Affidavits :0.00

APPLICATION FOR AUTHORIZATION TO INJECT

NOTICE IS HEREBY GIVEN: That Solaris Water Midstream, LLC, 9811 Katy Freeway, Suite 900, Houston, TX 77024, is requesting that the New Mexico Oil Conservation Division administratively approve the APPLICATION FOR AUTHORIZATION TO INJECT as follows:
PURPOSE: The intended purpose of the injection well is to dispose of salt water produced from permitted oil and gas wells.
WELL NAME AND LOCATION: Maley Road Runner SWD #1
SW ¼ SE ¼, Section 28, Township 25S, Range 27E
902' FSL & 2,404' FEL
Eddy County, NM
NAME AND DEPTH OF DISPOSAL ZONE: Devonian-Silurian (13,305' - 14,400')
EXPECTED MAXIMUM INJECTION RATE:30,000 Bbls/day
EXPECTED MAXIMUM INJECTION PRESSURE: 2,661 psi (surface)
Objections or requests for hearing must be filed with the New Mexico Oil Conservation Division within fifteen (15) days. Any objection or request for hearing should be mailed to the Oil Conservation Division, 1220 South St. Francis Dr., Santa Fe, New Mexico 87505.
Additional information may be obtained by contacting Bonnie Atwater (Solaris - Regulatory Technician) at 432-203-9020.
Pub: June 28, 2018 #1252814

Road Runner SWD # 1 Notice of Application Recipients				
Entity	**Address**	**City**	**State**	**Zip Code**
Landowner				
David and Lavern Maley	P.O. Box 2459	Carlsbad	NM	88220
OCD District				
OCD District 2	811 S. First St.	Artesia	NM	88210
Leasehold Operators				
Amoco Production Company	1017 Stanolind Rd	Hobbs	NM	88240
Chalfant Properties, Inc.	P. O. Box 3123	Midland	TX	79702
Chesapeake Operating, Inc.	P. O. Box 18496	Oklahoma City	OK	73154
Chevron USA Inc.	6301 Deauville Blvd.	Midland	TX	79706
Cimarex Energy Company	202 S. Cheyenne Ave.	Tulsa	OK	74103
COG Production, LLC	600 W. Illinois Ave.	Midland	TX	79701
EOG Resources	5509 Champions Dr.	Midland	TX	79706
McCabe Petroleum Corporation	P. O. Box 11188	Midland	TX	79701
Yates Petroleum Inc.	P.O. Box 1933	Roswell	NM	88201

McMillan, Michael, EMNRD

From: Nathan Alleman <nalleman@all-llc.com>
Sent: Tuesday, July 17, 2018 6:31 AM
To: McMillan, Michael, EMNRD
Subject: Solaris - Requested Application Information
Attachments: John Wayne 26 SWD 1 - NMOCD Injection Application Checklist.pdf; Road Runner SWD #1 - NMOCD Injection Application Checklist.pdf; John Wayne 26 SWD 1 - Mailing Certifications.pdf; Road Runner SWD #1 - Mailing Certifications.pdf

Michael,

Attached are the requested mailing confirmations (green sheets) and checklists for the Road Runner SWD #1 and John Wayne 26 SWD 1 Injection Permit Applications.

Please let me know if you need any further information for these applications.

Thank You!

Nate Alleman
Energy & Environmental Consultant
ALL Consulting
1718 South Cheyenne Avenue
Tulsa, OK 74119
Office: 918-382-7581
Cell: 918-237-0559

Certified Mail™ Labels Top of the page Print postage using Stamps.com Template **SDC-3610**

ALL Consulting
1718 S. Cheyenne Ave.
Tulsa, OK 74119

$5.420
US POSTAGE
FIRST-CLASS
FROM 74119
JUL 05 2018
stamps.com

0625000866399 1

Place label at top of the center of the envelope and fold at dotted line.

CERTIFIED MAIL™

CERTIFIED MAIL™

9414 8118 9956 0373 7514 85

Chevron USA Inc.
6301 Deauville
Midland TX 79706-2964

ALL Consulting
1718 S. Cheyenne Ave.
Tulsa, OK 74119

$5.420
US POSTAGE
FIRST-CLASS
FROM 74119
JUL 05 2018
stamps.com

0625000866399 1

Place label at top of the center of the envelope and fold at dotted line.

CERTIFIED MAIL™

CERTIFIED MAIL™

9414 8118 9956 0373 7514 78

Chalfant Properties, Inc.
P.O. Box 3123
Midland TX 79702-3123

ALL Consulting
1718 S. Cheyenne Ave.
Tulsa, OK 74119

$5.420
US POSTAGE
FIRST-CLASS
FROM 74119
JUL 05 2018
stamps.com

0625000866399 1

Place label at top of the center of the envelope and fold at dotted line.

CERTIFIED MAIL™

CERTIFIED MAIL™

9414 8118 9956 0373 7515 53

NMOCD District Office #2
811 S. First St.
Artesia NM 88210-2834

ALL Consulting
1718 S. Cheyenne Ave.
Tulsa, OK 74119

$5.420
US POSTAGE
FIRST-CLASS
FROM 74119
JUL 05 2018
stamps.com

0625000866399 1

Place label at top of the center of the envelope and fold at dotted line.

CERTIFIED MAIL™

CERTIFIED MAIL™

9414 8118 9956 0373 7515 22

David and Lavern Maley
P.O. Box 2459
Carlsbad NM 88221-2459

For best results, feed this sheet through your printer as few times as possible.
To purchase or for printing instructions go to **www.stamps.com/3610.**

stamps.com

Certified Mail™ Labels Top of the page Print postage using Stamps.com Template **SDC-3610**

ALL Consulting
1718 S. Cheyenne Ave.
Tulsa, OK 74119

$5.420
US POSTAGE
FIRST-CLASS
FROM 74119
JUL 05 2018
stamps.com
0625000866399 1

Place label at top of the center of the envelope and fold at dotted line.

CERTIFIED MAIL™
CERTIFIED MAIL™

9414 8118 9956 0373 7510 27

EOG Resources
5509 Champions Dr.
Midland TX 79706-2843

ALL Consulting
1718 S. Cheyenne Ave.
Tulsa, OK 74119

$5.420
US POSTAGE
FIRST-CLASS
FROM 74119
JUL 05 2018
stamps.com
0625000866399 1

Place label at top of the center of the envelope and fold at dotted line.

CERTIFIED MAIL™
CERTIFIED MAIL™

9414 8118 9956 0373 7510 89

Yates Petroleum Inc.
P.O. Box 1933
Roswell NM 88202-1933

ALL Consulting
1718 S. Cheyenne Ave.
Tulsa, OK 74119

$5.420
US POSTAGE
FIRST-CLASS
FROM 74119
JUL 05 2018
stamps.com
0625000866399 1

Place label at top of the center of the envelope and fold at dotted line.

CERTIFIED MAIL™
CERTIFIED MAIL™

9414 8118 9956 0373 7510 72

McCabe Petroleum Corporation
P.O. Box 11188
Midland TX 79702-8188

ALL Consulting
1718 S. Cheyenne Ave.
Tulsa, OK 74119

$5.420
US POSTAGE
FIRST-CLASS
FROM 74119
JUL 05 2018
stamps.com
0625000866399 1

Place label at top of the center of the envelope and fold at dotted line.

CERTIFIED MAIL™
CERTIFIED MAIL™

9414 8118 9956 0373 7514 34

COG Production, LLC
600 W Illinois Ave.
Midland TX 79701-4882

For best results, feed this sheet through your printer as few times as possible.
To purchase or for printing instructions go to **www.stamps.com/3610.**

stamps.com

Certified Mail™ Labels Top of the page Print postage using Stamps.com Template **SDC-3610**

ALL Consulting
1718 S. Cheyenne Ave.
Tulsa, OK 74119

$5.420
US POSTAGE
FIRST-CLASS
FROM 74119
JUL 05 2018
stamps.com
062S0008663991

Place label at top of the center of the envelope and fold at dotted line.

CERTIFIED MAIL™

CERTIFIED MAIL™

Place label at top of the center of the envelope and fold at dotted line.

CERTIFIED MAIL™

CERTIFIED MAIL™

9414 8118 9956 0373 7513 48

Amoco Production Company
1017 W Stanolind Rd.
Hobbs NM 88240-7675

ALL Consulting
1718 S. Cheyenne Ave.
Tulsa, OK 74119

$5.420
US POSTAGE
FIRST-CLASS
FROM 74119
JUL 05 2018
stamps.com
062S0008663991

Place label at top of the center of the envelope and fold at dotted line.

CERTIFIED MAIL™

CERTIFIED MAIL™

ALL Consulting
1718 S. Cheyenne Ave.
Tulsa, OK 74119

$5.420
US POSTAGE
FIRST-CLASS
FROM 74119
JUL 05 2018
stamps.com
062S0008663991

Place label at top of the center of the envelope and fold at dotted line.

CERTIFIED MAIL™

CERTIFIED MAIL™

9414 8118 9956 0373 7513 31

Chesapeake Operating Inc.
P.O. Box 18496
Oklahoma City OK 73154-0496

9414 8118 9956 0373 7510 58

Cimarex Energy Company
202 S. Cheyenne Ave. Ste 1000
Tulsa OK 74103-3001

For best results, feed this sheet through your printer as few times as possible.
To purchase or for printing instructions go to **www.stamps.com/3610.**

stamps.com

Goetze, Phillip, EMNRD

From: Earl E. DeBrine <edebrine@modrall.com>
Sent: Friday, March 29, 2019 4:33 PM
To: Jones, William V, EMNRD; Goetze, Phillip, EMNRD; McMillan, Michael, EMNRD; Murphy, Kathleen A, EMNRD
Cc: 'pdomenici@domenicilaw.com'; 'lhollingsworth@domenicilaw.com'; Cusimano, Frank (IFCU)
Subject: [EXT] RE: CASE NO. 20405 / CHEVRON / Pre-Hearing Statement

Please be advised that Chevron is withdrawing its protest to Solaris Case No 20405.
--Earl

MODRALL SPERLING

Earl E. DeBrine, Jr.
Modrall Sperling | www.modrall.com
P.O. Box 2168 | Albuquerque, NM 87103-2168
500 4th St. NW, Ste. 1000 | Albuquerque, NM 87102
D: 505.848.1810 | O: 505.848.1800 | F: 505.848.9710

From: Kathleen Allen <KATA@modrall.com>
Sent: Thursday, 28 March, 2019 5:01 PM
To: 'florene.davidson@state.nm.us' <florene.davidson@state.nm.us>
Cc: 'Jones, William V, EMNRD' <WilliamV.Jones@state.nm.us>; 'Phillip.Goetze@state.nm.us' <Phillip.Goetze@state.nm.us>; 'Murphy, Kathleen A, EMNRD' <KathleenA.Murphy@state.nm.us>; Earl E. DeBrine <edebrine@modrall.com>; Lance D. Hough <ldh@modrall.com>; Zina Crum <zinac@modrall.com>; 'pdomenici@domenicilaw.com' <pdomenici@domenicilaw.com>; 'lhollingsworth@domenicilaw.com' <lhollingsworth@domenicilaw.com>
Subject: CASE NO. 20405 / CHEVRON / Pre-Hearing Statement

Dear Florene: Attached for filing is Chevron's Pre-Hearing Statement in the above-referenced case.

Chevron U.S.A., Inc.
Case No. 20405
Pre-Hearing Statement

Thank you for your assistance. Please contact me if you have any questions or trouble opening the attachment.

Kat

MODRALL SPERLING

Kathleen Allen
Legal Assistant to Earl E. DeBrine, Jr., Chris Killion & Nicole T. Russell
Modrall Sperling | www.modrall.com

P.O. Box 2168 | Albuquerque, NM 87103-2168
500 4th St. NW, Ste. 1000 | Albuquerque, NM 87102
O: 505.848.1800 Ext. 1671 | F: 505.848.9710

McMillan, Michael, EMNRD

From: Goetze, Phillip, EMNRD
Sent: Thursday, July 19, 2018 2:50 PM
To: McMillan, Michael, EMNRD
Subject: FW: Chevron U.S.A. Inc. Protest of Application for Authorization to Inject
Attachments: Scanned from a Xerox multifunction device.pdf

For the protest file. PRG

Phillip Goetze, PG
Engineering Bureau, Oil Conservation Division, NM EMNRD
1220 South St. Francis Drive, Santa Fe, NM 87505
Direct: 505.476.3466
E-mail: phillip.goetze@state.nm.us

From: Cusimano, Frank (IFCU) <FCusimano@chevron.com>
Sent: Thursday, July 19, 2018 2:16 PM
To: Goetze, Phillip, EMNRD <Phillip.Goetze@state.nm.us>; Jones, William V, EMNRD <WilliamV.Jones@state.nm.us>
Cc: Davidson, Florene, EMNRD <florene.davidson@state.nm.us>; Rouse, Leonor [Lynn) <Lynn.Rouse@chevron.com>; Schwed, Martin <MSchwed@chevron.com>; Verner, Frederick C <fredverner@chevron.com>
Subject: Chevron U.S.A. Inc. Protest of Application for Authorization to Inject

Ladies and Gentlemen:

Chevron U.S.A. Inc. (Chevron) hereby protests the Application for Authorization to Inject signed July 3, 2018 by Solaris Water Midstream, LLC for the Road Runner SWD 1 well in Section 28, T25S, R27E, Eddy County, NM. Chevron received notice of this application on July 9, 2018 (copy attached). The basis of Chevron's protest includes, but is not limited to, the proximity of the injection site to a mapped fault.

Please let me know if you have any questions. My contact information appears below.

Regards,

Frank Cusimano, III

Frank Cusimano, III
Senior Counsel – Mid-Continent Business Unit
FCusimano@chevron.com

Chevron North America Exploration and Production Company
(a Chevron U.S.A. Inc. division)
1400 Smith, Room 6084, Houston, TX 77002
Tel 713 372 9034
Mobile 281 615 4902

ALL CONSULTING
GOVERNMENT RELATIONS · ENERGY · PLANNING · TECHNOLOGY
ENGINEERING · ENVIRONMENTAL

RECEIVED
7-9-18

July 5, 2018

Chevron USA Inc.
6301 Deauville
Midland, TX 79706

Subject: Solaris Water Midstream – Notice of Application for Authorization to Inject

To Whom It May Concern:

The purpose of this letter is to provide notice that Solaris Water Midstream, LLC (Solaris) of Houston, Texas is applying for administrative approval of the Road Runner SWD #1 Class IID injection well in Eddy County, New Mexico for the purpose of disposing of produced fluid from oil and natural gas wells into the Devonian-Silurian formations. Please see the attached Application for Authorization to Inject for detailed information regarding the proposed well and associated injection operations.

Any interested party may file an objection to the application or may request a public hearing. Any objection or request for hearing must be filled with the Oil Conservation Division, 1220 South St. Francis Dr., Santa Fe, New Mexico 87505 within 15 days from the date this letter is received.

Sincerely,
ALL Consulting

Dan Arthur, P.E., SPEC
President/Chief Engineer

Attachment

FORM C-108 Technical Review Summary [Prepared by reviewer and included with application; V17]

DATE RECORD: First Rec: 7/17/18 **Admin Complete:** 7/17/18 **or Suspended:** 7/19/18 Protested Add. Request/Reply: *

ORDER TYPE: WFX / PMX / SWD Number: 1816 Order Date: 4/12/19 Legacy Permits/Orders: [R-20450]

Well No. 1 Well Name(s): Road Runner SWD *amended C-108; Case No. 20405

API : 30-025-45099 Spud Date: TBD New or Old (EPA): New (*UIC Class II Primacy 03/07/1982*)

Footages 830' FNL / 200' FEL Lot — or Unit A Sec 33 Tsp 25S Rge 27E County Eddy

General Location: ~11 mi SW of Malaga; 6.8 mi W of US 285 Pool: SWD; Devonian-Silurian Pool No.: 97869

BLM 100K Map: Carlsbad Operator: Solaris Water Midstream, LLC OGRID: 371643 Contact: L. Hollingsworth / Domenici / whitney Mckee / Solaris

COMPLIANCE RULE 5.9: Total Wells: 21 Inactive: 0 **Fincl Assur:** Yes Compl. Order? NO **IS 5.9 OK?** ✓ **Date:** 4/12/19

WELL FILE REVIEWED ✓ Current Status: APD (of amended location) on file

WELL DIAGRAMS: NEW: Proposed ✓ or **RE-ENTER:** Before Conv. ◯ After Conv. ◯ Logs in Imaging: _____

Planned Rehab Work to Well: _____

Well Construction Details	Sizes (in) Borehole / Pipe	Setting Depths (ft)		Cement Sx or Cf	Cement Top and Determination Method
Planned ✓ or Existing — **Surface**	24 / 20	0 to 500	Stage Tool	700	Cir. to surface
Planned ✓ or Existing — **Interm/Prod**	17½ / 13⅜	0 to 2700	None	1600	Cir. to surface
Planned ✓ or Existing — **Interm/Prod**	12¼ / 9⅝	0 to 10150	?	2700	Cir. to surface
Planned ✓ or Existing — **Prod/Liner**	8½ / 7⅝	9950 to 13305	None	230	CBL
Planned — or Existing — **Liner**	—	—	—	—	—
Planned ✓ or Existing — **OH / PERF**	— / 16½	13305 - 14325	Inj Length 1020		

Injection Lithostratigraphic Units:	Depths (ft)	Injection or Confining Units ✓Granites	Tops ✓
Adjacent Unit: Litho. Struc. Por.		Mississippian	[10300]
Confining Unit: Litho. Struc. Por.	Base of Woodford	Woodford	[10688]
Proposed Inj Interval TOP:	13305	Devonian	[10738]
Proposed Inj Interval BOTTOM:	14325	Silurian	[11143]
Confining Unit: Litho. Struc. Por.	14325 (est)	Ordovician / Montoya	14325 (est)
Adjacent Unit: Litho. Struc. Por.		Ellenburger	

Completion/Operation Details:

Drilled TD — PBTD —

NEW TD 14325 NEW PBTD —

NEW Open Hole ✓ or NEW Perfs ◯

Tubing Size 5.5x5 in. Inter Coated? Yes

Proposed Packer Depth 13285 ft

Min. Packer Depth 13285 (100-ft limit)

Proposed Max. Surface Press. 2661 psi

Admin. Inj. Press. 2deel (0.2 psi per ft)

AOR: Hydrologic and Geologic Information

POTASH: R-111-P NA Noticed? NA BLM Sec Ord NA WIPP NA Noticed? — Salt/Salado T: 1300 B: 1890 **NW:** Cliff House fm —

USDW: Aquifer(s) Alluvial / Rustler Fm Max Depth <500' **HYDRO AFFIRM STATEMENT By Qualified Person** ✓

NMOSE Basin: Carlsbad **CAPITAN REEF:** thru — adj — NA ✓ **No. GW Wells in 1-Mile Radius?** 0 FW Analysis? NA

Disposal Fluid: Formation Source(s) BS / WC / DMG Analysis? Yes On Lease ◯ Operator Only ◯ or Commercial ✓

Disposal Interval: Inject Rate (Avg/Max BWPD): 20000 / 30000 Protectable Waters? NO Source: Rev. Water Samples from Devonian System: **Closed or Open**

HC Potential: Producing Interval? No Formerly Producing? No Method: Logs/DST/P&A/Other Mudlog 2-Mi Radius Pool Map ✓

AOR Wells: 1/2-M — or ONE-M ✓ **RADIUS MAP/WELL LIST: Total Penetrating Wells:** 0 [AOR Hor: 0 AOR SWDs: 0]

Penetrating Wells: No. Active Wells 0 Num Repairs? — on which well(s)? — Diagrams? —

Penetrating Wells: No. P&A Wells 0 Num Repairs? — on which well(s)? — Diagrams? —

① **Induced-Seismicity Risk Assess:** analysis submitted Provided after initial review ✓ historical/catalog review — fault-slip model ✓ **probability** low

NOTICE:* 1/2-M — or ONE-M ✓ : Newspaper Date — **Mineral Owner*** BLM Surface Owner* BLM N. Date 02/08/19

* Two notice efforts - old location and Case No. 20405

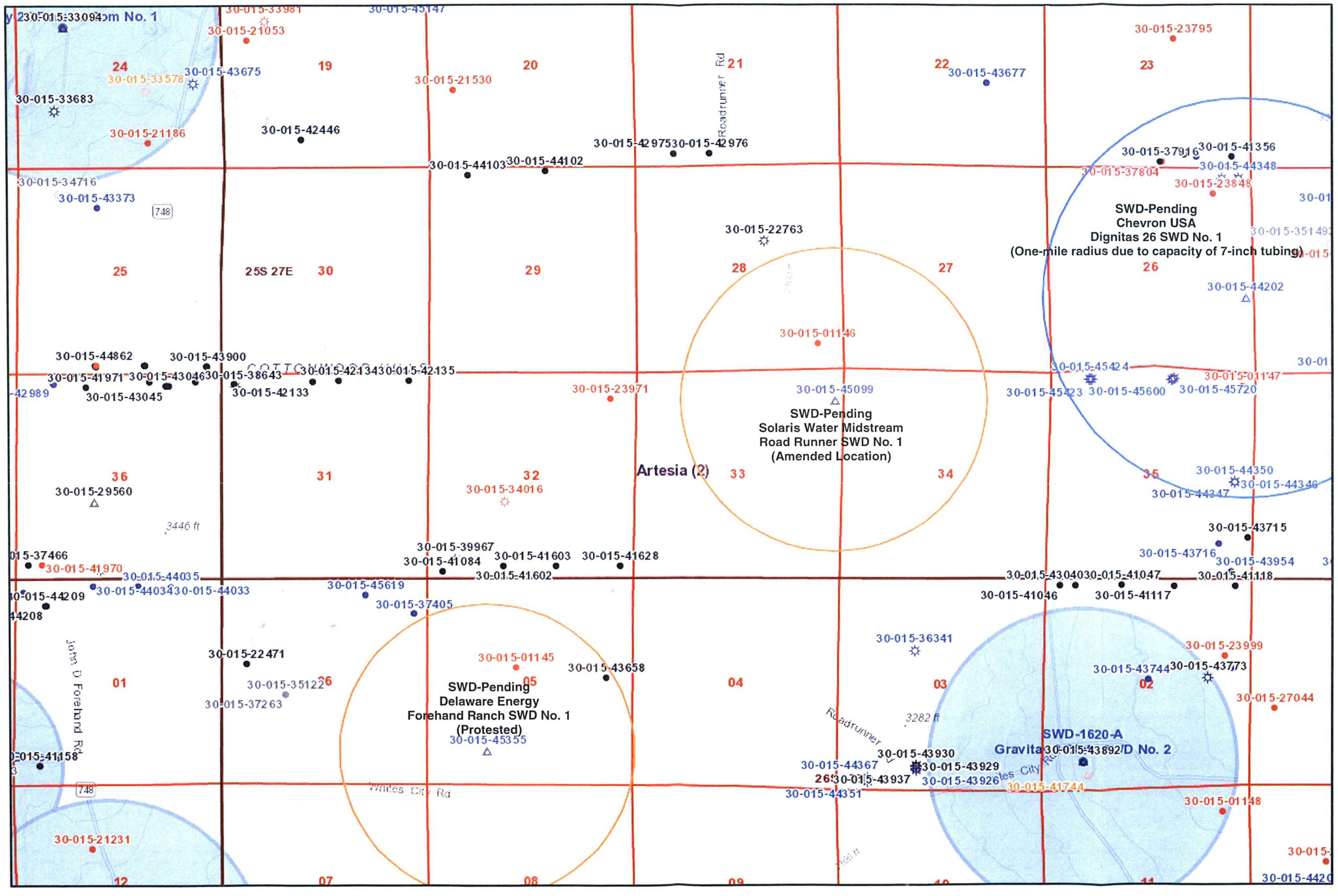
RULE 26.7(A): Identified Tracts? Yes **Affected Persons*:** NMSLO; COG; Chevron (both); EOG (call); ABO Empire * Lessee also noticed N. Date 02/06/19

*** new definition as of 12/28/2018** [any the mineral estate of United States or state of New Mexico; SWD operators within the notice radius]

Order Conditions: Issues: ① [IS potential], cementing issues, CBL proposed for liner;

Additional COAs: Mudlog with Picks / Standard notice for uncirculated cmt / CBL for ① liner / BH pressure measurement [IS assess. provided]

Pending Application for High-Volume Devonian Disposal Well
Amended C-108 Application for Road Runner SWD No. 1 – Solaris Water Midstream



Pending Application for High-Volume Devonian Disposal Well
Amended C-108 Application for Road Runner SWD No. 1 – Solaris Water Midstream