Mesquite SWD, Inc.
NMOCD Case No. 16308
Mesa Verde SWD #3

July 12, 2018

STATE OF NEW MEXICO
DEPARTMENT OF ENERGY, MINERALS AND NATURAL RESOURCES
OIL CONSERVATION DIVISION

APPLICATION OF MESQUITE SWD, INC. TO AMEND ADMINISTRATIVE ORDER SWD-1696 FOR A SALT WATER DISPOSAL WELL IN EDDY COUNTY, NEW MEXICO.

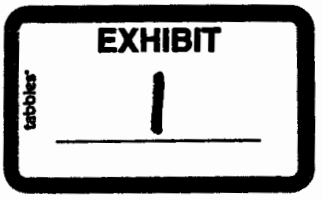
CASE NO. 16308

APPLICATION

Mesquite SWD, Inc. ("Mesquite"), OGRID No. 161968, through its undersigned attorneys, hereby makes this application to the Oil Conservation Division pursuant to the provisions of N.M. Stat. Ann. § 70-2-12, for an order amending the size of tubing approved by the Division in administrative order SWD-1696. An amendment is being requested to increase the diameter of the approved injection tubing to allow for the use of 7 inch tubing inside the surface and intermediate casings and 5 ½ inch tubing inside the liner. In support of this application, Mesquite states as follows:

1. Mesquite is the operator of the Mesa Verde SWD Well No. 3 Salt Water Disposal Well (API 30-015-44676). On October 20, 2017, the Oil Conservation Division authorized Mesquite through Administrative Order SWD-1696 to use the Mesa Verde SWD Well No. 3 for disposal of oil filed produced water through an open-hole interval within the Devonian and Silurian formations from 16620 feet to 17820 feet.

2. The order issued by the Division approving injection operations into the well states that injection will occur through "either an internally-coated, 5-1/2-inch or smaller tubing inside the surface and intermediate casings, and a 4-1/2-inch or smaller tubing inside the liner." SWD-1696, p. 1.



4. Mesquite seeks an amendment to this order, allowing it to use 7 inch tubing inside the surface and intermediate casings and 5 ½ inch tubing inside the liner.

5. Mesquite further seeks to increase injection rates to a maximum of 40,000 bbls per day.

6. The Mesa Verde SWD Well No. 3 well is located 1030 feet from the South line and 2635 feet from the West line, Unit N of Section 13, Township 24 South, Range 31 East, NMPM, Eddy County, New Mexico.

7. The granting of this application will avoid the drilling of unnecessary wells, will prevent waste, and will protect correlative rights.

WHEREFORE, Mesquite requests that this application be set for hearing before an Examiner of the Oil Conservation Division on July 12, 2018; and that after notice and hearing, the Division enter its order approving this application to amend Administrative Order SWD-1696 to increase the diameter of the injection tubing in the Mesa Verde SWD Well No. 3 to allow for the use of 7 inch tubing inside the surface and intermediate casings and 5 ½ inch tubing inside the liner and to increase the injection rates for the well.

Respectfully submitted,

MODRALL, SPERLING, ROEHL, HARRIS
& SISK, P.A.

By: _____

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Attorneys for Applicant

CASE NO. _____: Application of Mesquite SWD, Inc. to Amend Administrative Order SWD-1696 for a Salt Water Disposal Well in Eddy County, New Mexico. Applicant seeks an order from the Division amending Administrative Order SWD-1696 to permit an increase in the diameter of the injection tubing in its Mesa Verde SWD Well No. 3 to allow for the use of 7 inch tubing inside the surface and intermediate casings and 5 ½ inch tubing inside the liner and to increase the injection rates for the well. The subject well is located in Unit N of Section 13, Township 24 South, Range 31 East, NMPM, Eddy County, New Mexico. Said well is located approximately 30 miles east of Carlsbad, New Mexico.

State of New Mexico
Energy, Minerals and Natural Resources Department

Administrative Order SWD-1696
October 20, 2017

ADMINISTRATIVE ORDER
OF THE OIL CONSERVATION DIVISION

Pursuant to the provisions of Division Rule 19.15.26.8B. NMAC, Mesquite SWD, Inc. (the "operator") seeks an administrative order for its Mesa Verde SWD Well No. 3 ("proposed well") with a location of 1030 feet from the South line and 2635 from the West line, Unit N of Section 13, Township 24 South, Range 31 East, NMPM, Eddy County, New Mexico, for the purpose of commercial disposal of produced water.

THE DIVISION DIRECTOR FINDS THAT:

The application has been duly filed under the provisions of Division Rule 19.15.26.8B. NMAC and satisfactory information has been provided that affected parties as defined in said rule have been notified and no objections have been received within the prescribed waiting period. The applicant has presented satisfactory evidence that all requirements prescribed in Rule 19.15.26.8 NMAC have been met and the operator is in compliance with Rule 19.15.5.9 NMAC.

IT IS THEREFORE ORDERED THAT:

The applicant, Mesquite SWD, Inc. (OGRID 161968), is hereby authorized to utilize its Mesa Verde SWD Well No. 3 (API 30-015-pending) with a location of 1030 feet from the South line and 2635 from the West line, Unit N of Section 13, Township 24 South, Range 31 East, NMPM, Eddy County, for disposal of oil field produced water (UIC Class II only) through an open hole interval consisting of the Devonian and Silurian formations from 16620 feet to approximately 17820 feet.

Injection will occur through either an internally-coated, 5-1/2-inch or smaller tubing inside the surface and intermediate casings, and a 4-1/2-inch or small tubing inside the liner. Further, a packer shall be set within 100 feet of the uppermost perforation.

This permit does not allow disposal into the Ellenburger formation (lower Ordovician) or lost circulation intervals directly on top and obviously connected to this formation.

Prior to commencing disposal, the operator shall submit mudlog and geophysical logs information, to the Division's District geologist and Santa Fe Bureau Engineering office, showing evidence agreeable that only the permitted formation is open for disposal including a summary of

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depths (picks) for contacts of the formations which the Division shall use to amend this order for a final description of the depth for the injection interval.

IT IS FURTHER ORDERED THAT:

The operator shall take all steps necessary to ensure that the disposed water enters only the approved disposal interval and is not permitted to escape to other formations or onto the surface. This includes the completion and construction of the well as proposed in the application and, if necessary, as modified by the District Supervisor.

The operator shall circulate the cement behind the casing to surface for all surface and intermediate casings.

The operator shall run a CBL (or equivalent) across the 7-5/8-inch liner from 500 feet above the liner to the bottom of the liner to demonstrate a good cement across to demonstrate a good cement across the liner and good cement bond across the 9-5/8-inch casing.

If significant hydrocarbon shows occur while drilling, the operator shall notify the Division's District II and the operator shall be required to receive written permission prior to commencing disposal.

Within two years after commencing disposal, the operator shall conduct an injection survey, consisting of a temperature log or equivalent, over the entire injection interval using representative disposal rates. Copies of the survey results shall be provided to the Division's District II office and Santa Fe Engineering Bureau office.

After installing tubing, the casing-tubing annulus shall be loaded with an inert fluid and equipped with a pressure gauge or an approved leak detection device in order to determine leakage in the casing, tubing, or packer. The casing shall be pressure tested from the surface to the packer setting depth to assure casing integrity.

The well shall pass an initial mechanical integrity test ("MIT") prior to initially commencing disposal and prior to resuming disposal each time the disposal packer is unseated. All MIT procedures and schedules shall follow the requirements in Division Rule 19.15.26.11A. NMAC. The Division Director retains the right to require at any time wireline verification of completion and packer setting depths in this well.

The wellhead injection pressure on the well shall be limited to **no more than 3324 psi,** but may be modified by the Division Director following the completion of the initial Step-Rate Test. In addition, the disposal well or system shall be equipped with a pressure limiting device in workable condition which shall, at all times, limit surface tubing pressure to the maximum allowable pressure for this well.

The Director of the Division may authorize an increase in tubing pressure upon a proper showing by the operator of said well that such higher pressure will not result in migration of the disposed fluid from the target formations. Such proper showing shall be demonstrated by sufficient

evidence including but not limited to an acceptable Step-Rate Test.

The operator shall notify the supervisor of the Division's District II office of the date and time of the installation of disposal equipment and of any MIT so that the same may be inspected and witnessed. The operator shall provide written notice of the date of commencement of disposal to the Division's District II office. The operator shall submit monthly reports of the disposal operations on Division Form C-115, in accordance with Division Rules 19.15.26.13 and 19.15.7.24 NMAC.

The injection authority granted under this order is not transferable except upon Division approval. The Division may require the operator to demonstrate mechanical integrity of any injection well that will be transferred prior to approving transfer of authority to inject.

This proposed salt water disposal well's location was selected with collaboration from OXY USA, Inc, to not interfere with future development in the vicinity. As a result, the proposed salt water disposal well is within 10 feet of a Unit boundary.

The disposal authority granted herein shall terminate two (2) years after the effective date of this Order if the operator has not commenced injection operations into the subject well. One year after the last date of reported disposal into this well, the Division shall consider the well abandoned, and the authority to dispose will terminate *ipso facto*. The Division, upon written request mailed by the operator prior to the termination date, may grant an extension thereof for good cause.

Compliance with this Order does not relieve the operator of the obligation to comply with other applicable federal, state or local laws or rules, or to exercise due care for the protection of fresh water, public health and safety and the environment.

Jurisdiction is retained by the Division for the entry of such further orders as may be necessary for the prevention of waste and/or protection of correlative rights or upon failure of the operator to conduct operations (1) to protect fresh or protectable waters or (2) consistent with the requirements in this order, whereupon the Division may, after notice and hearing, terminate the disposal authority granted herein.

David R. Catanach

DAVID R. CATANACH
Director

DRC/mam

cc: Oil Conservation Division – Artesia District Office
Bureau of Land Management - Carlsbad
Administrative Application – pMAM1726254295

Mesquite SWD, Inc.
Mesa Verde SWD #3
API #30-015-44676
1030' FSL & 2635' FWL
Section 13, T24S, R31E, Eddy County, NM

Proposed Well Bore Diagram
Amended 06/01/2018

KB: 3623'
GL: 3597'

Surface Casing
Size: 20" 94# J-55 BTC
Set @: 857'
Sx Cmt: 1350
TOC: Surf (circulated)
Hole Size: 26"

1st Intermediate Casing
Size: 13 3/8" 54.5# NE80 BTC
Set @: 4521'
Sx Cmt: 2405
TOC: Surf (circulated)
Hole Size: 17 1/2"

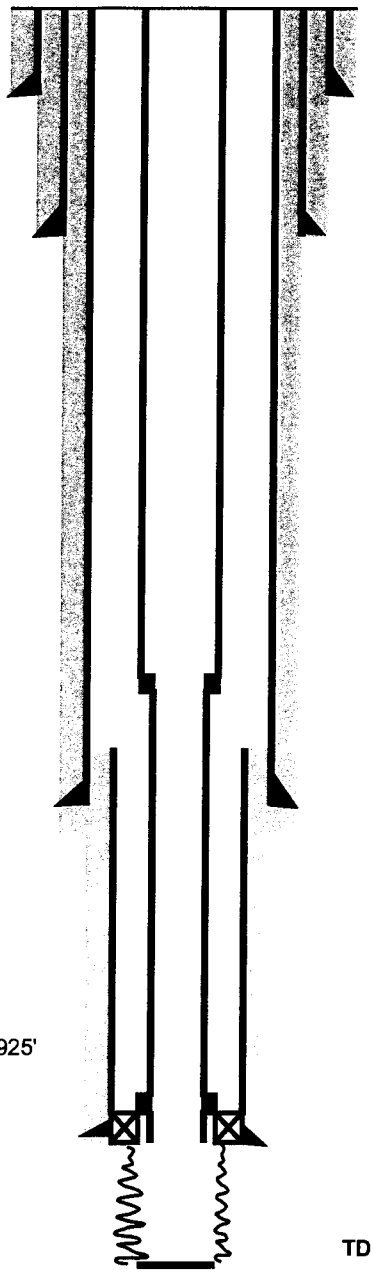
2nd Intermediate Casing
Size: 9 5/8" 53.5# P-110 BTC
Set @: 12030'
Sx Cmt: 2360
TOC: Surf
Hole Size: 12 1/4"

Liner
Size: 7 5/8" 39# ECP-110 J-2/STL FJ
Top: 11457'
Set @: 16927'
Sx Cmt: 350
TOC: 11457'
Hole Size: 8 1/2"

Open Hole
Interval: 16927' - 18032'
Hole Size: 6 1/2"

Tubing
7" 26# P-110 Tbg @ 11249"
7" x 5 1/2" X-Over @ 11250"
7 5/8" x 5 1/2" Dual Bore Permapak Packer @ 16925'
5 1/2" 20# JFE Bear Tbg @ 16960'

Open hole acid if required
Tubing annulus w/corrosion inhibitor
Complete surface head for disposal



857'
4521'
11250'
11457'
12030'
16927'
TD 18032'

Rustler est 720'
Top of Salt est 1060'
Base of Salt est 4370'
DVT @ 4570'
Delaware Mtn group 4646' (actual)
DVT @ 7021'
Bone Spring 8490' (actual)
Wolfcamp 11993'
Strawn 13935' (actual)
Atoka 14081' (actual)
Morrow15151' (actual)
Mississippi Lime 16397' (actual)
Devonian 16913' (actual)

Not to Scale

Notes: Casing and cement shown are existing in well bore
Tubing and packer is proposed
Tops from Delaware down are actual tops from mud log.

Amended 06/01/2018 Melanie Wilson

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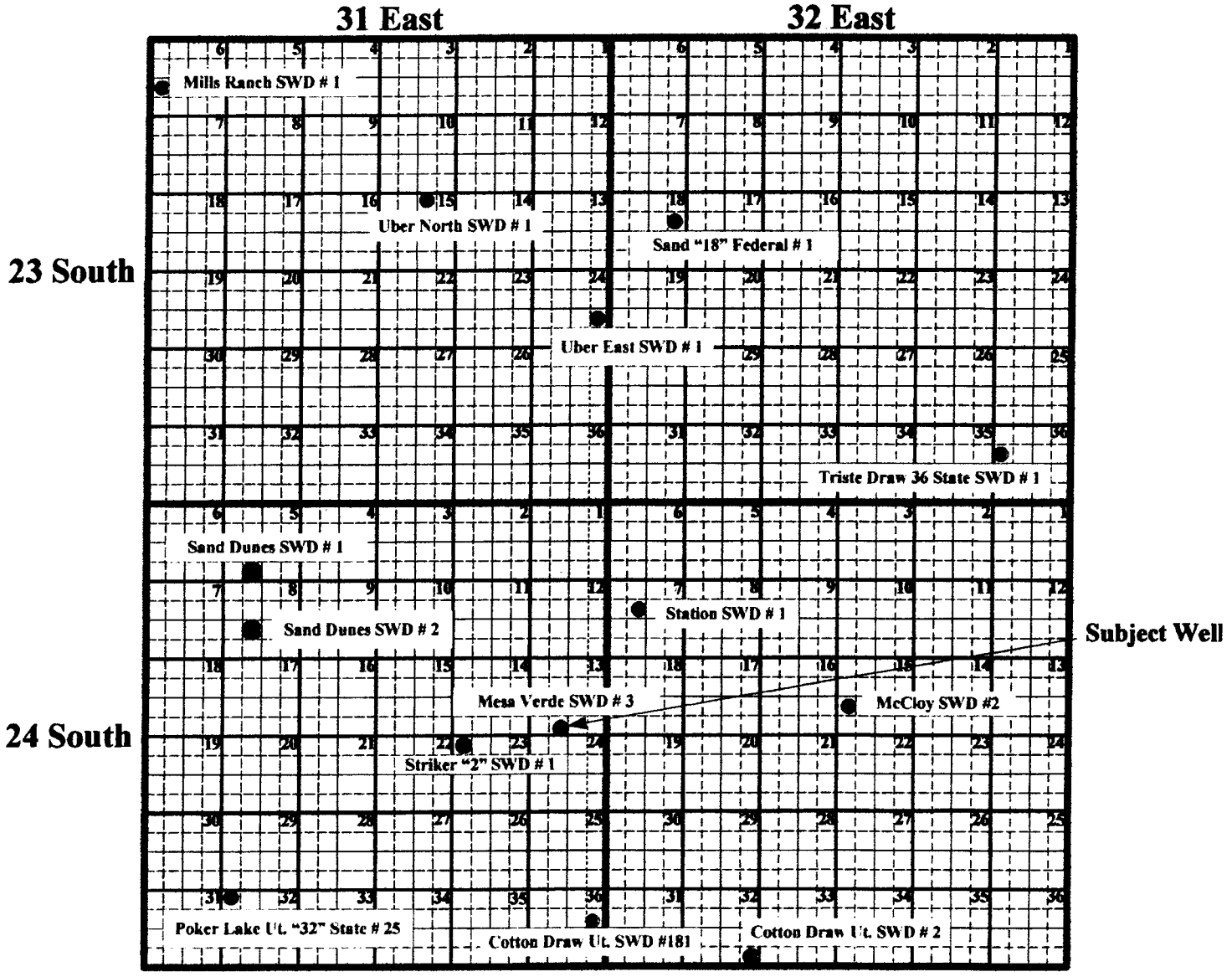

Mesquite SWD, Inc.
Map of Existing & Proposed Devonian SWD Wells
Townships 23-24 South, Ranges 31-32 East, NMPM
Eddy County, New Mexico

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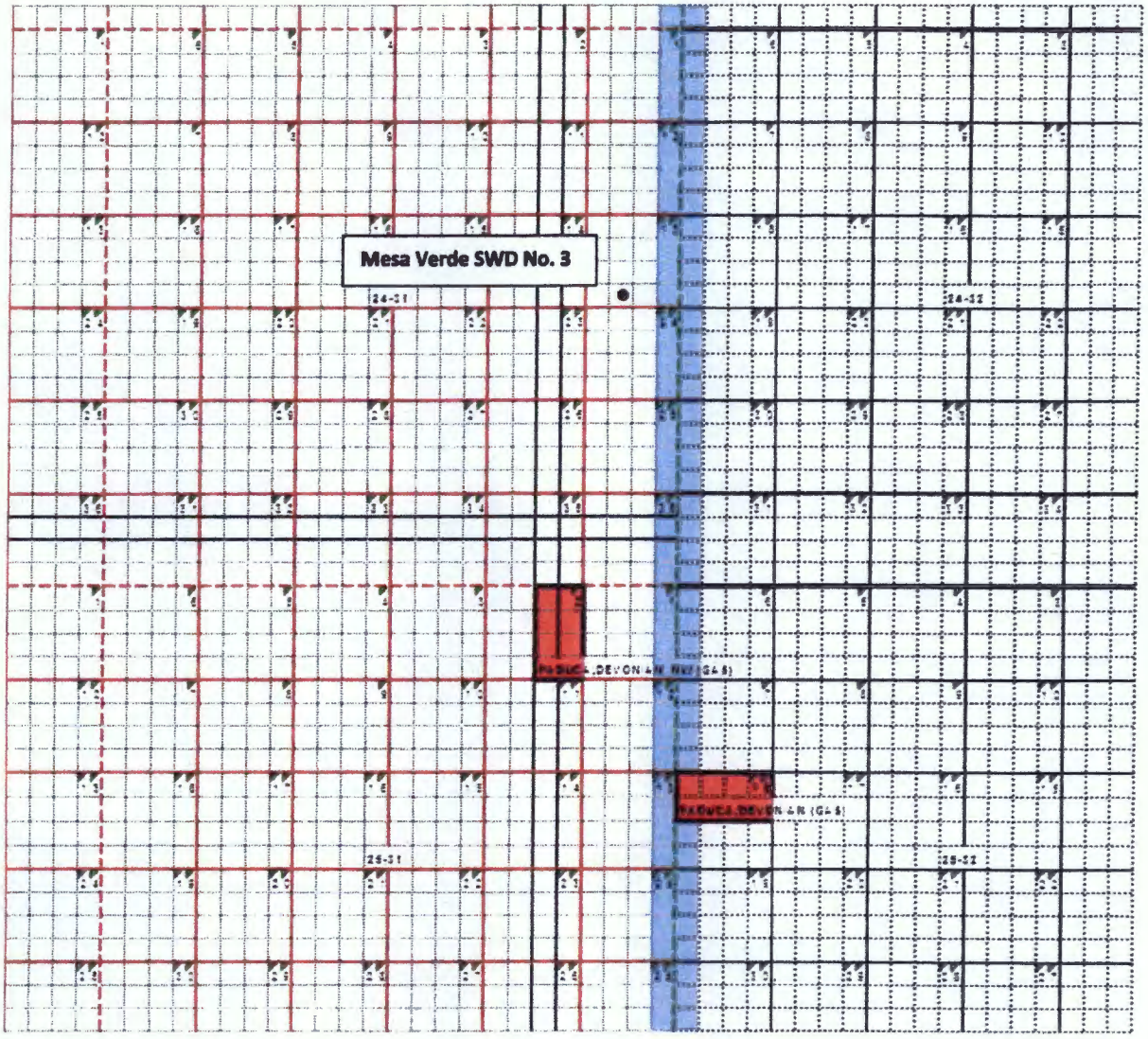
API No.	Well Name	Well Number	Type	Surface Owner	Status	Section	Township	Range	OCD Unit Letter	Formation	Current Injection	Cumulative Injection	Current Operator
30-015-43806	UBER EAST SWD	#001	SWD	Federal	New	24	23S	31E	I	Devonian	N/A	N/A	[161968] MESQUITE SWD, INC
30-015-43805	UBER NORTH SWD	#001	SWD	Federal	New	15	23S	31E	B	Devonian	N/A	N/A	[161968] MESQUITE SWD, INC
30-015-43316	MILLS RANCH SWD	#001	SWD		New	6	23S	31E	L	Devonian	N/A	N/A	[308339] OWL SWD OPERATING, LLC
30-025-31929	TRISTE DRAW 36 STATE	#001	SWD		Active	36	23S	32E	E	Devonian	929 BWPD	5,801,046 Bbls	[7377] EOG RESOURCES INC
30-025-25017	SAND 18 FEDERAL	#001	SWD		Active	18	23S	32E	H	Devonian	0 BWPD	0 Bbls	[5380] XTO ENERGY, INC
30-015-44570	Poker Lake Ut. 32 State	#025	SWD	State	New	32	24S	31E	D	Devonian	N/A	N/A	[260737] BOPCO, L.P.
30-015-41649	COTTON DRAW UNIT SWD	#181	SWD		Active	36	24S	31E	H	Devonian	15,327 BWPD	14,912,996 Bbls	[6137] DEVON ENERGY PRODUCTION COMPANY, LP
30-015-44676	MESA VERDE SWD	#003	SWD	Federal	New	13	24S	31E	N	Devonian	N/A	N/A	[161968] MESQUITE SWD, INC
30-015-44612	SAND DUNES SWD	#001	SWD	Federal	New	5	24S	31E	N	Devonian	N/A	N/A	[161968] MESQUITE SWD, INC
30-015-44131	SAND DUNES SWD	#002	SWD	Federal	Active	8	24S	31E	K	Devonian	23,589 BWPD	2,716,683 Bbls	[161968] MESQUITE SWD, INC
30-015-44416	STRIKER 2 SWD	#001	SWD	Private	New	23	24S	31E	D	Devonian	N/A	N/A	[372338] NGL WATER SOLUTIONS PERMIAN, LLC
30-025-41524	COTTON DRAW UT. SWD	#002	SWD	Federal	Active	32	24S	32E	P	Devonian	14,543 BWPD	3,707,746 Bbls	[6137] DEVON ENERGY PRODUCTION COMPANY, LP
30-025-43473	STATION SWD	#001	SWD		New	7	24S	32E	F	Devonian	N/A	N/A	[161968] MESQUITE SWD, INC
30-025-42947	MCCLOY SWD	#002	SWD	Private	Active	15	24S	32E	L	Devonian	11,741 BWPD	4,619,084 Bbls	[308339] OWL SWD OPERATING, LLC

(Note: Current & Cumulative Injection as of April or May, 2018)

Mesquite SWD, Inc.
Existing & Proposed Devonian SWD Wells
Townships 23-24 South, Ranges 31-32 East, NMPM
Eddy County, New Mexico



Mesquite SWD, Inc.
OCD Designated Devonian Pools Located Within the Area of the Mesa Verde SWD No. 3
Unit N, Section 13, Township 24 South, Range 31 East
Eddy County, New Mexico

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SERIES 150 OVERSHOTS

Instruction Manual 1150

Series 150 Releasing and Circulating Overshots

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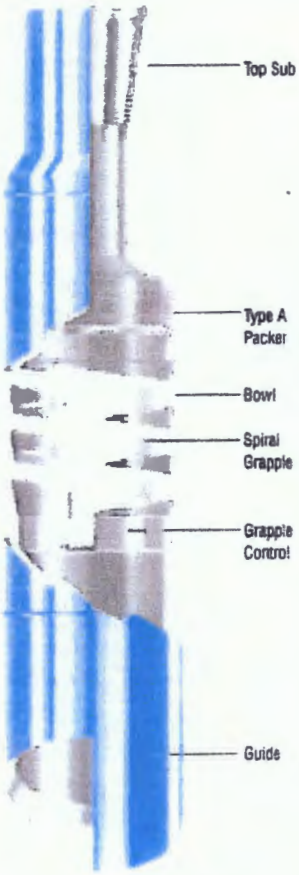
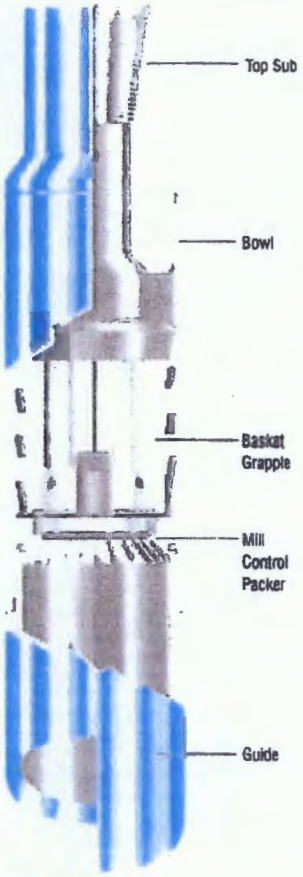


Series 150 Releasing and Circulating Overshot Dressed with Spiral Grapple and Parts



Series 150 Releasing and Circulating Overshot Dressed with Basket Grapple and Parts

General Description

The Bowen Series 150 Releasing and Circulating Overshot provides the strongest tool available to externally engage, pack-off, and pull a fish. The basic simplicity and rugged construction with which it is designed have made it the standard of all external catch fishing tools.

The **Bowen Series 150 Releasing and Circulating Overshot** has gained worldwide acceptance for fishing by means of external engagement of a fish. Each Overshot is a carefully engineered unit. In service, it takes a positive grip over a large area of fish and is therefore capable of withstanding extremely heavy pulling, torsional and jarring strains without damage or distortion to either the tool or the fish.

Bowen Overshots are continually developed to new standards of strength and efficiency and are expertly constructed of the highest quality material.

Each Bowen Series 150 Releasing and Circulating Overshot is a compact unit designed to engage, pack off and pull a specific size of tubing, pipe, coupling, tool joint, drill collar or smooth O.D. tool. Through the installation of proper undersize parts, they may be adapted to engage and pack off any smaller size.

Specifications

Maximum Catch Size *(Spiral)*		4-3/4	4-3/4	5	5	5-1/8	5-1/4	5-3/8	5-1/2	6-1/4	6-1/4	6-1/4
Maximum Catch Size *(Basket)*		4-1/4	4-1/4	4-1/2	4-3/8	4-5/8	4-5/8	4-3/4	4-7/8	5-5/8	5-9/16	5-1/2
Overshot O.D.		5-5/8	5-3/4	5-29/32	6-1/8	5-3/4	6-3/8	6-1/2	6-5/8	7-3/8	7-5/8	7-7/8
Standard Box Connection		Per Customer Order										
Type		SH	FS	SH	SFS	SH	SH	SH	SH	SH	SFS	FS
Complete Assembly	Part No.	C-5168	8975	C-5171	7787	C-11823	6655	4773	8625	9692	8741	C-2108
(Dressed with Spiral Parts)	Weight	133	136	140	157	160	176	182	185	216	241	261

Replacement Parts

Top Sub	Part No.	A-5169	8976	A-5172	7789	A-11824	6656	4774	8626	9693	8742	B-2106
	Weight	62	64	65	69	69	78	79	78	87	99	105
Bowl	Part No.	B-5170	8977	B-5173	7788	B-11825	4503	9205	8617	9694	1641	B-2109
	Weight	32	33	34	40	33	52	53	54	62	69	76
Packer	Part No.	B-2199	6114	L-5950	5950	B-11826	94505	9209	8618	9689	1642	L-1680
	Weight	3/4	3/4	3/4	3/4	3/4	33/4	7/8	3/4	1-1/8	1-1/8	1-1/8
Packer Seat Ring	Part No.	A-2200	6120	A-4368	5945	LA-11827	4510	9210	8622	9690	1643	A-2072
	Weight	1/8	1/8	1/8	1/4	1/8	3/8	3/8	3/8	1/4	3/8	3/8
Spiral Grapple	Part No.	B-2021	6112	B-4369	5942	B-11828	4498	9207	8619	9687	1644	B-2073
	Weight	2-1/2	2-3/4	2-1/2	2-1/2	2-1/2	33	3	4	5	5-1/4	5-3/4
Spiral Grapple Control	Part No.	B-2202	6113	B-4370	5944	A-11829	4499	9208	8620	9686	1645	A-2074
	Weight	2	2-1/4	2	2-1/4	2	2-1/2	2-1/2	2-1/2	3	3-1/4	3-1/2
Standard Guide	Part No.	B-2203	6121	B-4371	5946	A-11830	4504	4775	8621	9691	5525	A-2075
	Weight	33	34	34	42	33	39	43	45	58	63	69

Basket Parts

Basket Grapple	Part No.	B-2201	6112	B-4369	5942	B-11828	4498	9207	8619	9687	1644	B-2073
	Weight	12-1/2	13-1/2	12-1/2	14	12-1/2	15	16	20	25	27	28-3/4
Basket Grapple Control	Part No.	B-2202	6113	B-4370	5944	A-11829	4499	9208	8620	9686	1645	A-2074
	Weight	6	6-1/2	6	7	6	7-1/2	8	7-1/2	9	10	10-1/2
Mill Control Packer	Part No.	B-2199-R	6114-R	L-5950-R	5950-R	11826-R	4505-R	L9209-R	L-8618-R	9689-R	1642-R	L-1680-R
	Weight	8	8	8	9	18	10	10	10	12	13	14

How to Order

Specify:

(1) Name and number of assembly or part
(2) Size and type of fish to be caught
(3) Top connection
(4) O.D. if other than standard

SPECIAL NOTES:

FS (Full Strength) ..... *Engineered to withstand all pulling, torsional, and jarring strain*
XFS (Extra Full Strength) ..... *Engineered for extreme abuse.*
SFS (Semi Full Strength) ..... *Engineered for special hole conditions commensurate with maximum strength.*
SH (Slim Hole) ..... *Engineered to withstand heavy pulling strain only.*
XSH (Slim Hole) ..... *Engineered for pickup jobs only.*

RECOMMENDED SPARE PARTS:

Spiral:

- ***(1) 3 Packers***
- ***(2) 2 Grapples for each size***
- ***(3) 1 Control***

Basket:

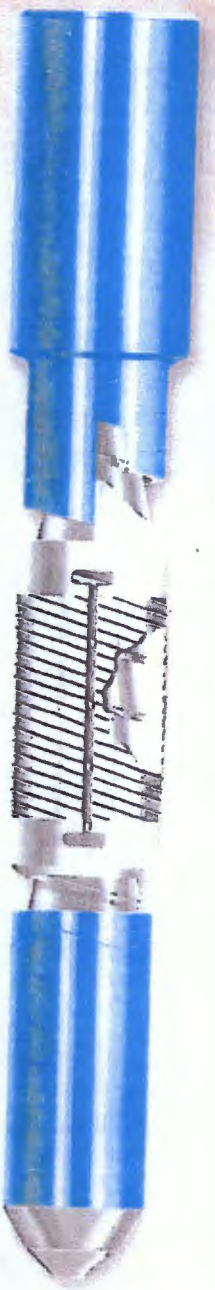
- ***(1) 2 Grapples***
- ***(2) Mill Control Packers for each size***

Mill Control Packer:

- ***(1) 3 Inner and 3 Outer Seals***

ITCO TYPE RELEASING SPEARS

Instruction Manual 2300



Itco Type Releasing Spears

General Description

The **Bowen Itco Type Releasing Spear** is a superior fishing spear which is designed to assure positive internal engagement with the fish. It is ruggedly built to withstand severe jarring and pulling strains. It engages the fish over a large area without damage to, or distortion of the fish. The simple design eliminates any small parts which could become lost or damaged in the hole. If the fish cannot be pulled, the spear may easily be released and disengaged.

Use

The Bowen Itco Type releasing Spear is used to internally engage and to retrieve all sizes of tubing, drill pipe and casing. It may be used in conjunction with cutters, spear pack-offs and other tools, where this is desirable.

Construction

The Bowen Itco Type Releasing Spear consists of a Mandrel, Grapple, Release Ring and Nut. The Mandrel may be ordered in ether a Flush Type or a Shoulder Type. Mandrel top connections are furnished to order.

The flexible one-piece Grapple has an internal helix matching the Mandrel helix. The tang of the Grapple rests against a stop on the Mandrel when the Spear is in the engaged position. The large engaging surface of the Grapple permits heavy jarring and pulling strains without distorting the fish.

The helix of the Mandrel ends at the point where the Release Ring is mounted. The cam of the Release Ring matches the cam on the face of the Nut. The matching cams of the Release Ring and the Nut are a safety device which resists locking, freezing or jamming of the Spear, assuring an easy release.

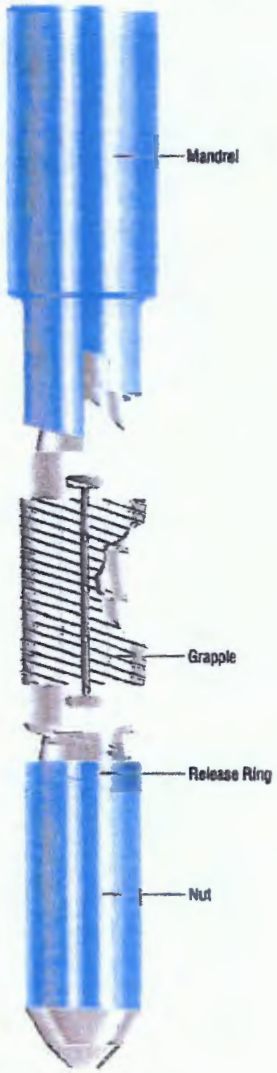
The standard plain bull-nose nut is furnished on the tool when ordered unless an alternate type is specified. Also available as accessory items at extra cost are Mill Type, Sub Type and Side-hill Type nuts.

Heavy Duty Itco Type Releasing Spears

Bowen Heavy Duty Itco Type Releasing Spears have a relatively longer Mandrel and Grapple than the Standard Spear resulting in twice as much supported wickered area in engagement with the fish. These assemblies are listed, along with the standard assemblies, in the specifications found below in this manual.

The Heavy Duty Itco Type Spear is intended for use in situations where swelling of the fish is a problem. This spear, which has a much longer mandrel and grapple, distributes the swelling forces over a greater area and thus substantially reduces these forces. While the tensile strength of the mandrel is the same as the standard spear, the Heavy Duty Spear is far less prone to damage from swelling of the fish and is actually much stronger in this sense.

Since the swelling forces being delivered to the fish vary with grapple size, type of lubrication used, straight pull or jarring, etc.; it is very difficult to provide meaningful strength data for each condition. While such calculations are possible, it would mean providing a different strength for each casing or tubing size, weight, and material grade for each spear size. Since it would require many pages of published data, many hours of calculations, many assumptions regarding coefficient of friction and condition of casing, we have never attempted to provide such data.



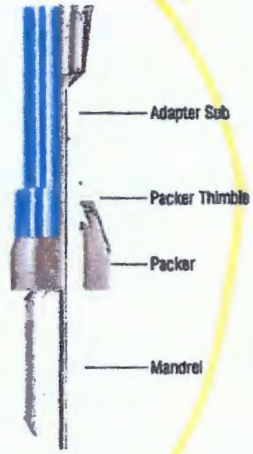
Shoulder Type in Engaging Position

Sidehill Type Nut

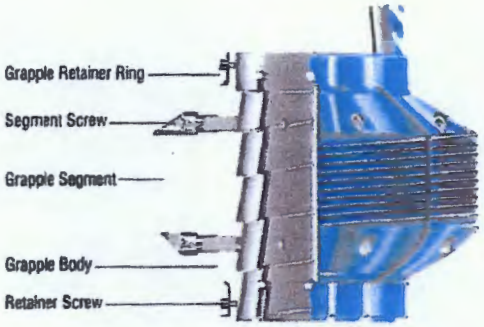
Sidehill Type Nut
The Sidehill Type Nut is used in place of the standard bullnose nut to align the Spear with a fish that is imbedded in the side wall of the hole.

Sub Type Nut

Sub Type Nut
The Sub Type Nut is used in place of the standard bullnose nut to provide the connection required to utilize other tools below the Spear, such as the Spear Pack-Off or Internal Cutters.



Spear Pack-Off Assembly



Segment-Type Spear Grapple Assembly for 8-5/8 Casing Spear, Part No. 9380

Segment-Type Spear Grapple Assembly
The Segment-Type Spear Grapple is used in place of the standard one-piece Grapple on the 8⁵/₈" and 9⁵/₈" size Spears to convert them to Spears capable of engaging up to 20" casing. The Segment Type Spear Grapple consists of a Grapple Body, eight grapple segments and 16 Grapple Segment Screws. The helix of the Grapple Body matches the helix of the Spear Mandrel making the action of the Spear the same as with the standard Grapple.

Spear Pack-Off Assembly
The Spear Pack-Off Assembly is attached to the Sub Type Nut below the Spear to pack off the fish in order to circulate through the fish. The Spear Pack-Off Assembly consists of an Adapter Sub, Packer Thimble, Packer and Mandrel. The Adapter Sub of the Spear Packoff will be furnished with a box connection to match the pin connection of the Sub Type Nut on which it is to be used, or as otherwise ordered. The Mandrel of the Spear Pack-Off may be ordered plain bullnose or with a pin connection for attachment of other tools, as specified.

Bowen Internal Cutters For Use in Cut and Pull Operations
Bowen Internal Cutters may be run below the Bowen Releasing Spear and are spaced as desired, depending upon the length of the fish and the length of the cut to be made. The Spear should be spaced far enough above the cutter so that the Spear is clear of the fish during cutting operations. After cutting is completed, the Spear can be lowered to retrieve the cut-off section. Bowen Internal Cutters are fully described in Instruction Manual No. 5600.

Operation
Examine and assure that the Bowen Releasing Spear is the correct size for the pipe to be caught and is properly assembled. Refer to the Specification Chart and to the Grapple Range Chart in this manual.

Connect the Spear to the fishing string. Set the Spear in released position by screwing the Grapple down the helix against the Release Ring as far as it will go by hand. In this position the Grapple is caused to contract inward and will not engage the pipe as it is run in.

Specifications

Nominal Catch Size		5 O.D. Casing	5 O.D. Casing	5 O.D. Casing	5 O.D. Casing	6 O.D. Casing	6 O.D. Casing	6 O.D. Casing	7 O.D. Casing	7 O.D. Casing	7 O.D. Casing
Additional Catch Size		5-1/2, 5-3/4, & 6 Casing	5-1/2, 5-3/4, & 6 Casing	5-1/2, 5-3/4, & 6 Casing	5-1/2, 5-3/4, & 6 Casing	6-5/8 & 7 Casing	6-5/8 & 7 Casing	6-5/8 & 7 Casing	7-5/8, 8, & 8-1/8 Casing	7-5/8, 8, & 8-1/8 Casing	7-5/8, 8, & 8-1/8 Casing
Spear O.D. (I)		4-1/32	4-1/32	4-1/32	4-1/32	5	5	5	5-11/16	5-11/16	5-11/16
Spear I.D.		7/8	1	1	7/8	1	1	1	2	2	2
Class		Light Duty	Std.	Std. L.H.	Light Duty, L.H	Light Duty	Std.	Std. L.H.	Std.	Std. L.H.	Heavy Duty
Complete Assembly	Part No.	1332	9680	18270	20115	9715	17234	58292	9266	20890	17237
	Weight	110	115	175	117	150	186	186	241	241	310

Replacement Parts

Mandrel – Flush Type	Part No.	1333	9681	18271	20116	9716	17235	58293	9267	20891	17238
	Weight	65	72	85	73	110	118	118	141	141	205
Mandrel – Shoulder Type (A)	Part No.	1333	9681	18271	20116	9716	17235	58293	9267	20891	17238
	Weight	67	77	91	80	115	123	123	146	146	214
Grapple	Part No.	1334	9682	18272	20117	9717	17236	58294	9268	20892	17239
(For weights and catch ranges, see Calculated Strength Chart.)											
Release Ring	Part No.	1336	1336	20119	20119	9718	9718	9718	9279	152677	9279
	Weight	1	1	1	1	2	2	2	3-1/2	3-1/2	3-1/2
Bullnose Nut	Part No.	1335	1335	20118	20118	9719	9719	58295	9269	20893	9269
	Weight	28	28	28	29	48	48	48	65	65	65

Accessories

Hill Type Nut	Part No.	1335-A	1335-A	1335-A	20118-A	9719-A	9719-A	58295-A	9269-A	20893-A	9269-A
	Weight	28	28	28	29	48	48	48	65	65	65
Sub Type Nut	Part No.	1335-B	1335-B	1335-B	20118-B	9719-B	9719-B	58295-B	9269-B	20893-B	9269-B
	Weight	28	28	28	29	48	48	48	65	65	65
Side Hill Type Nut	Part No.	1335-C	1335-C	1335-C	20118-C	9719-C	9719-C	58295-C	9269-C	20893-C	9269-C
	Weight	28	28	28	29	48	48	48	65	65	65

Stop Subs - Stop Rings

Stop Sub Body O.D.		4-1/32	4-1/32	4-1/32	4-1/32	5	5	5	5-11/16	5-11/16	5-11/16
Stop Sub Stop O.D.		5	5	5	5	6	6	6	7	7	7
Stop Ring O.D.		5-1/2	5-1/2	5-1/2	5-1/2	6-5/8	6-5/8	6-5/8	7-5/8	7-5/8	7-5/8
Stop Sub Type F	Part No.	19056	19056	19056	19056	19057	19057	19057	19058	19058	19058
Stop Ring Type S	Part No.	18804	18804	18804	18804	18805	18805	18805	18806	18806	18806

How to Order

Specify:

(1) Name and part number of assembly or part
(2) Size and type of top connection
(3) Size and weight or weights of pipe to be caught
(4) Flush or shoulder type
(specify O.D. of shoulder – A)
(5) Mandrel length desired (C)
(6) Thread size and type of nut, if wanted
See page 8 for dimensions

RECOMMENDED SPARES:
(1) 2 Grapples for Each Catch Size

How to Order Type F Stop

Specify:

(1) O.D of Stop Sub Body
(2) Length from Stop to thread connection
(3) Top and bottom connection desired
(4) Number of spear on which Stop Sub
will be used

How to Order Type S Stop Ring

Specify:

(1) O.D of Ring
(2) O.D on Spear shoulder or Stop Sub shoulder
with which Stop Ring is to be used

PRESSURE PIPE CUTTER

Instruction Manual 5680

Pressure Pipe Cutter

NATIONAL OILWELL VARCO

EXHIBIT

tabbies

8

General Description

The Bowen Pressure Pipe Cutter is designed to cut single and multiple strings of pipe from 4" O.D. to 36" O.D., using pump pressure to actuate three (3) Itcoloy coated Knives. Different lengths of Knives are used, depending on the size of pipe to be cut. The Cutter works on the principle of flow restriction across an orifice while cutting, and pressure drop when the pre-set diameter of the Knives is reached. This tells the operator that the pipe has been severed.

Operation

A drill bit is attached to the bottom of the Cutter for stabilizing purposes, if desired, and the Cutter is then attached to the Drill Pipe or Tubing. Use balling wire in the O.D. grooves provided on the Body to keep the Knives in a closed position while the Cutter is lowered to the desired depth. Begin rotation before mud pump is turned on.

The continued downward movement of the Piston reacting to the pump pressure forces the Knives to pivot about their pins. When the Knives reach their pre-set diameter, the Piston will separate from the Bit Jet Retainer Stem, causing an increase in mud flow through the tool. This, in turn will cause a decrease in pump pressure, indicating the Knives have severed the pipe.

Complete Disassembly

Refer to page 4 for proper location of parts.

National Oilwell recommends an assembly drawing of the size Pressure Pipe Cutter being serviced be available when disassembling and reassembling.

Secure the Bowen Pressure Pipe Cutter in an appropriate vise on the Body just above the Knives. Using a pipe wrench and V-Belt Pulley Assembly, break Top Sub connection and remove Top Sub. Using a screwdriver, remove Top Sub O-Ring.

After the Top Sub is removed, reach inside the Body and remove Valve Assembly. The Valve Assembly consists mainly of Bit Jet, Bit Jet Retainer, Bit Jet Retainer Stem and Stop Spider. Lay Valve Assembly on clean shop table. Using retainer ring pliers, remove retainer ring from Bit Jet Retainer. Insert drill rod or brass bar through Bit Jet Retainer Stem and remove Bit Jet by tapping it out. Remove I.D. O-Ring from Bit Jet Retainer.

Remove three (3) set screws from Stop Spider. Remove Bit Jet Retainer Stem from Bit Jet Retainer. Remove Bit Jet Retainer from Stop Spider. Next, remove the three (3) Knives from Body by first, removing the three (3) retaining screws at the head of each knife pin. Using a screwdriver or metal punch, remove the three (3) Knife Pins. Remove Knives from Body.

Insert pipe or brass bar into one of the Knife grooves on Body and tap out Piston. Remove Piston Spring from Body also. Lay Piston on clean shop table and remove Piston I.D. Retainer Ring with retainer ring pliers. Remove Piston Bushing with a screwdriver and also the I.D. O-Ring inside Piston Bushing bore. Secure Piston in a bench vise on small diameter using soft jaws (brass or copper).

NOTE: Do not score or mark any O.D. surface on piston.

With a screwdriver, remove O.D. seal Retainer Ring, Plate and O.D. seal (on 3⅝" O.D. and 5 9/16" O.D. tools, Piston O.D. seal consists of an O-Ring only). The Bowen Pressure Pipe Cutter is now completely disassembled.

Carefully clean and inspect all parts for wear and damage. Replace all worn and damaged parts with new parts.

Complete Reassembly and Knife Cutting Diameter Adjustment

Refer to page 4 for proper location of parts.

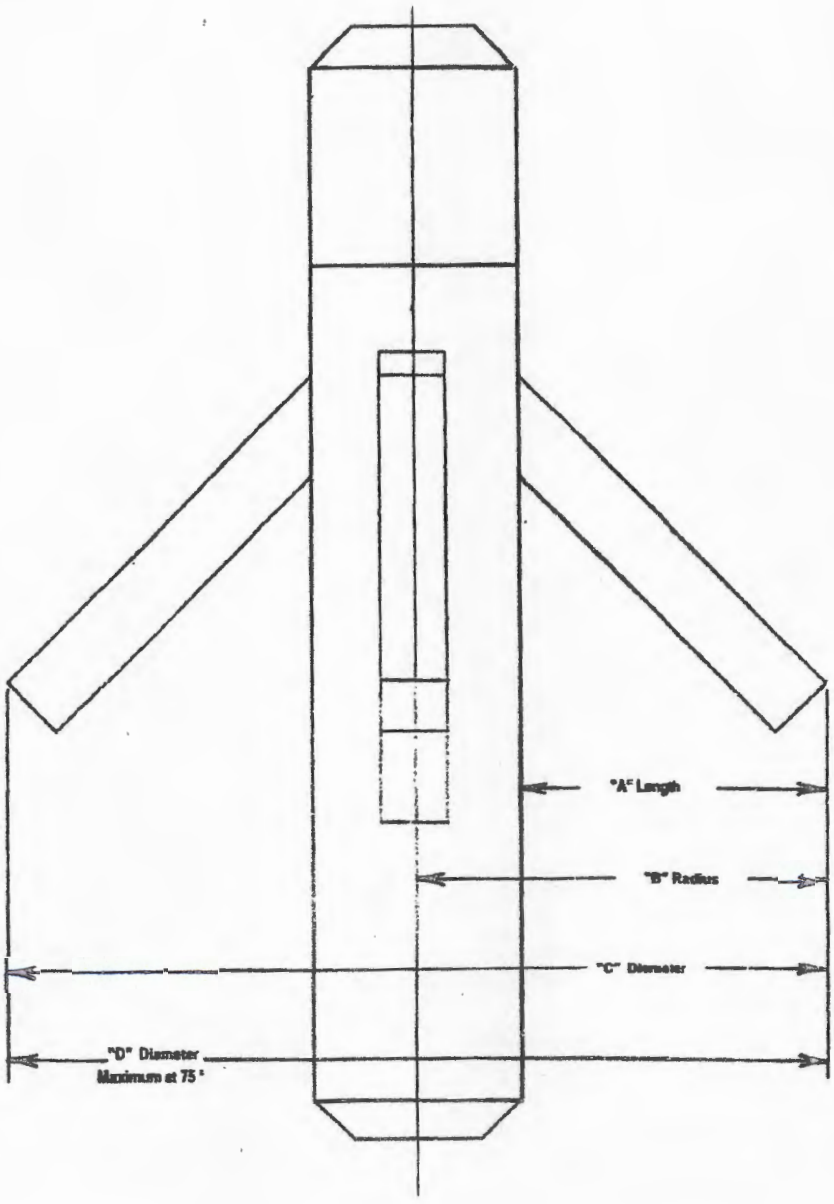
National Oilwell recommends an assembly drawing of the size Pressure Pipe Cutter being serviced be available when disassembling and reassembling.

The Bowen Pressure Pipe Cutter is easy to reassemble. The Body is dressed with the appropriate length of Knives, Knife Pins and set screws. The Knives are inserted into the three (3) Knife slots with the Itcoloy surfaces facing outward and holes in Knives and Body aligned. The Knife Pins are inserted into each of the through drilled holes on the Body. With the head of the Knife Pin inserted into the slot on the Body, the three (3) retaining screws are then installed to hold the Knife Pin in place. The Knives are then checked, assuring they hinge freely.

The Piston O.D. Seal is fitted, then Plate and Retainer Ring installed, (install appropriate Piston O.D. O-Ring on 3⅝" and 5 9/16" O.D. tools). Install Piston I.D. O-Ring inside Piston bore and insert Piston Bushing until it rests on the shoulder of the Piston. The Retainer Ring is inserted in the groove, locking the Piston Bushing into the I.D. of the Piston. The Piston Assembly is inserted into the Body until it touches the Knives.

NOTE: Piston spring is not installed at this time.

The Bit Jet Retainer Stem is screwed and tightened securely to the Bit Jet Retainer. Next, install I.D. O-Ring inside the Bit Jet Retainer, followed by the Bit Jet and Retainer Ring in that order. The Stop Spider is then threaded onto the Bit Jet Retainer.


"A" Length
"B" Radius
"C" Diameter
"D" Diameter
Maximum at 75°

Single Cut Operation Running Chart

3-1/4" (83 mm) O.D. Pressure Pipe Cutter

Casing or Pipe Size	Knife					Rotary Speed	Orifice Pressure Differential	Orifice I.D. Std.
	Part No.	"A" Length	"B" Radius	"C" Diameter	"D" Max. Diameter @ 75°*			
4 O.D. Pipe	150446	.625 (16 mm)	2-1/4 (57 mm)	4-1/2 (114 mm)	5-3/8 (136 mm)	80	180 psi (13 Kg/cm²)	1/4

3-5/8" (92 mm) O.D. Pressure Pipe Cutter

Casing or Pipe Size	Knife					Rotary Speed	Orifice Pressure Differential	Orifice I.D. Std.
	Part No.	"A" Length*	"B" Radius*	"C" Diameter*	"D" Max. Diameter @ 75°*			
4-1/2 (114 mm)	80357	9/16 (14 mm)	2-3/8 (60 mm)	4-3/4 (121 mm)	6-1/2 (165 mm)	80	180 psi (13 kg/cm²)	
5 (127 mm)	80357	13/16 (21 mm)	2-5/8 (67 mm)	5-1/2 (133 mm)	6-1/2 (165 mm)	80	180 psi (13 kg/cm²)	
5-1/2 (140 mm)	80357	11/16 (27 mm)	2-7/8 (73 mm)	5-3/4 (146 mm)	6-1/2 (165 mm)	80	240 psi (17 kg/cm²)	1/4
6 (152 mm)	80357	15/16 (33 mm)	3-1/8 (79 mm)	6-1/4 (159 mm)	6-1/2 (165 mm)	80	240 psi (17 kg/cm²)	

5-9/16" (141 mm) O.D. Pressure Pipe Cutter

Casing or Pipe Size	Knife					Rotary Speed	Orifice Pressure Differential	Orifice I.D. Std.
	Part No.	"A" Length*	"B" Radius*	"C" Diameter*	"D" Max. Diameter @ 75°*			
6-5/8 (168 mm)	80717	5/8 (17 mm)	3-7/16 (87 mm)	6-7/8 (175 mm)	8-3/4 (222 mm)	80	750 psi (53 kg/cm²)	
7 (178 mm)	80717	13/16 (21 mm)	3-5/8 (92 mm)	7-1/4 (184 mm)	8-3/4 (222 mm)	80	750 psi (53 kg/cm²)	
7-5/8 (194 mm)	81896	1-1/8 (29 mm)	3-15/16 (100 mm)	7-7/8 (200 mm)	10-1/2 (267 mm)	70	800 psi (56 kg/cm²)	1/4
8-5/8 (219 mm)	81896	1-5/8 (42 mm)	4-7/16 (113 mm)	8-7/8 (225 mm)	10-1/2 (267 mm)	60	900 psi (63 kg/cm²)	
9-5/8 (244 mm)	81896	2-1/8 (55 mm)	4-15/16 (125 mm)	9-7/8 (251 mm)	10-1/2 (267 mm)	60	900 psi (63 kg/cm²)	

7-3/8" (187 mm) O.D. Pressure Pipe Cutter

Casing or Pipe Size	Knife					Rotary Speed	Orifice Pressure Differential	Orifice I.D. Std.
	Part No.	"A" Length	"B" Radius	"C" Diameter	"D" Max. Diameter @ 75°*			
8-5/8 (219 mm)	151023	7/8 (22 mm)	4-9/16 (115 mm)	9-1/8 (231 mm)	10-9/16 (268 mm)	70	450 psi (32 kg/cm²)	
9-5/8 (244 mm)	151023	1-3/8 (34 mm)	5-9/16 (128 mm)	10-1/8 (257 mm)	10-9/16 (268 mm)	70	450 psi (32 kg/cm²)	
10-3/4 (273 mm)	151029	1-15/16 (49mm)	5-5/8 (142 mm)	11-1/4 (285 mm)	19-1/2 (495 mm)	60	450 psi (32 kg/cm²)	3/8
11-3/4 (298 mm)	151029	2-7/16 (61 mm)	61/8 (155 mm)	12-1/4 (311 mm)	19-1/2 (495 mm)	60	500 psi (35 kg/cm²)	
13-3/8 (340 mm)	151029	3-1/4 (82 mm)	6-15/16 (176 mm)	13-1/8 (333 mm)	19-1/2 (495 mm)	60	600 psi (42 kg/cm²)	

* See drawing on page 8.

OD (inches)	Weight (lb/ft)	ID (inches)	Capacity (bbl/ft)	Displ. (bbl/ft)	Capacity (gal/ft)
4 1/2	9.50	4.090	0.01625	0.00346	0.01971
4 1/2	10.50	4.052	0.01595	0.00382	0.01977
4 1/2	11.60	4.000	0.01554	0.00422	0.01976
4 1/2	13.50	3.920	0.01493	0.00491	0.01984
4 1/2	15.10	3.826	0.01422	0.00549	0.01971
5	11.50	4.560	0.02020	0.00418	0.02438
5	13.00	4.494	0.01962	0.00473	0.02435
5	15.00	4.408	0.01888	0.00546	0.02434
5	18.00	4.276	0.01776	0.00655	0.02431
5 1/2	14.00	5.012	0.02440	0.00509	0.02949
5 1/2	15.50	4.950	0.02380	0.00564	0.02944
5 1/2	17.00	4.892	0.02325	0.00619	0.02944
5 1/2	20.00	4.778	0.02218	0.00728	0.02945
5 1/2	23.00	4.670	0.02119	0.00837	0.02956
6	18.00	5.424	0.02858	0.00655	0.03513
6 5/8	24.00	5.921	0.03406	0.00873	0.04279
6 5/8	28.00	5.791	0.03258	0.01019	0.04277
6 5/8	32.00	5.675	0.03129	0.01164	0.04293
7	17.00	6.538	0.04152	0.00619	0.04771
7	20.00	6.456	0.04049	0.00728	0.04777
7	23.00	6.366	0.03937	0.00837	0.04774
7	26.00	6.276	0.03826	0.00946	0.04772
7	29.00	6.184	0.03715	0.01055	0.04770
7	32.00	6.094	0.03608	0.01164	0.04772
7	35.00	6.004	0.03502	0.01273	0.04775
7	38.00	5.920	0.03405	0.01383	0.04788
7 5/8	24.00	7.025	0.04794	0.00873	0.05667
7 5/8	26.40	6.969	0.04718	0.00960	0.05678
7 5/8	29.70	6.875	0.04592	0.01081	0.05673
7 5/8	33.70	6.765	0.04446	0.01226	0.05672
7 5/8	39.00	6.624	0.04262	0.01419	0.05681
8	26.00	7.386	0.05299	0.00946	0.06245
8 1/8	35.00	7.285	0.05156	0.01273	0.06429
8 5/8	28.00	8.017	0.06244	0.01018	0.07263

OD (inches)	Weight (lb/ft)	ID (inches)	Capacity (bbl/ft)	Displ. (bbl/ft)	Capacity (gal/ft)
8 5/8	32.00	7.921	0.06095	0.01164	0.07259
8 5/8	36.00	7.825	0.05948	0.01310	0.07258
8 5/8	40.00	7.725	0.05797	0.01455	0.07252
8 5/8	44.00	7.625	0.05648	0.01601	0.07249
8 5/8	49.00	7.511	0.05480	0.01783	0.07263
9	40.00	8.150	0.06453	0.01455	0.07908
9 5/8	32.30	9.001	0.07870	0.01175	0.09045
9 5/8	36.00	8.921	0.07731	0.01310	0.09041
9 5/8	40.00	8.835	0.07583	0.01455	0.09038
9 5/8	43.50	8.755	0.07446	0.01583	0.09029
9 5/8	47.00	8.681	0.07321	0.01710	0.09031
9 5/8	53.50	8.535	0.07077	0.01946	0.09023
10	33.00	9.384	0.08554	0.01201	0.09755
10 3/4	32.75	10.192	0.10091	0.01192	0.11283
10 3/4	40.50	10.050	0.09812	0.01473	0.11285
10 3/4	45.50	9.950	0.09617	0.01655	0.11272
10 3/4	51.00	9.850	0.09425	0.01856	0.11281
10 3/4	55.50	9.760	0.09254	0.02019	0.11273
11 3/4	42.00	11.084	0.11835	0.01528	0.13463
11 3/4	47.00	11.000	0.11754	0.01710	0.13464
11 3/4	54.00	10.880	0.11499	0.01965	0.13464
11 3/4	60.00	10.772	0.11272	0.02183	0.13455
12	40.00	11.384	0.12589	0.01455	0.14044
13	45.00	12.380	0.14841	0.01637	0.18478
13 3/8	48.00	12.715	0.15705	0.01746	0.17451
13 3/8	54.50	12.615	0.15459	0.01983	0.17442
13 3/8	61.00	12.515	0.15215	0.02219	0.17434
13 3/8	68.00	12.415	0.14973	0.02474	0.17447
13 3/8	72.00	12.347	0.14809	0.02620	0.17429
16	65.00	15.250	0.22592	0.02365	0.24957
16	75.00	15.124	0.22220	0.02729	0.24949
16	84.00	15.010	0.21887	0.03056	0.24943
20	94.00	19.124	0.35528	0.03420	0.38948
20	106.50	19.000	0.35069	0.03875	0.38944
20	133.00	18.730	0.34078	0.04839	0.38918

STATE OF NEW MEXICO
DEPARTMENT OF ENERGY, MINERALS AND NATURAL RESOURCES
OIL CONSERVATION DIVISION

APPLICATION OF MESQUITE SWD, INC. TO AMEND ADMINISTRATIVE ORDER SWD-1696 FOR A SALT WATER DISPOSAL WELL IN EDDY COUNTY, NEW MEXICO.

CASE NO. 16308

AFFIDAVIT

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

Jennifer L. Bradfute, attorney in fact and authorized representative of Mesquite SWD, Inc., the Applicant herein, being first duly sworn, upon oath, states that the above-referenced Application was provided under the notice letter and that proof of receipt is attached hereto.

Jennifer L. Bradfute

SUBSCRIBED AND SWORN to before me this 11th day of July, 2018 by Jennifer L. Bradfute.

Notary Public

My commission expires: 12-07-19

OFFICIAL SEAL
Zina Crum
NOTARY PUBLIC
STATE OF NEW MEXICO
My Commission Expires: 12-07-19

EXHIBIT
tabbies
9

Zina Crum
Modrall Sperling
500 4th Street NW
Suite 1000
Albuquerque NM 87102

PS Form 3877

Type of Mailing: CERTIFIED
06/19/2018

Firm Mailing Book ID: 145605

Line	Article Number	Name, Street & P.O. Address	Postage	Fee	R.R.Fee	Reference	Rest.Del.Fee Contents
1	9314 8699 0430 0047 8440 74	BLM 620 E Greene St Carlsbad NM 88220	$1.21	$3.45	$1.50	87366-0001	$0.00 Notice
2	9314 8699 0430 0047 8440 81	Chevron USA, Inc. 6301 Deauville Blvd Midland TX 79706	$1.21	$3.45	$1.50	87366-0001	$0.00 Notice
3	9314 8699 0430 0047 8440 98	COG Operating LLC 600 W Illinois Ave Midland TX 79701	$1.21	$3.45	$1.50	87366-0001	$0.00 Notice
4	9314 8699 0430 0047 8441 04	Devon Energy Production Company LP 333 W Sheridan Ave Oklahoma City OK 73102	$1.21	$3.45	$1.50	87366-0001	$0.00 Notice
5	9314 8699 0430 0047 8441 11	EOG Resources, Inc. 104 S. Fourth St. Artesia NM 88210	$1.21	$3.45	$1.50	87366-0001	$0.00 Notice
6	9314 8699 0430 0047 8441 28	EOG-Y Resources, Inc. 105 South 4th St Artesia NM 88210	$1.21	$3.45	$1.50	87366-0001	$0.00 Notice
7	9314 8699 0430 0047 8441 35	OXY USA, Inc. 5 Greenway Plaza Houston TX 77046	$1.21	$3.45	$1.50	87366-0001	$0.00 Notice
8	9314 8699 0430 0047 8441 42	Tap Rock Operating, LLC 602 Park Point Drive, Suite 200 Golden CO 80401	$1.21	$3.45	$1.50	87366-0001	$0.00 Notice
		Totals:	**$9.68**	**$27.60**	**$12.00**		**$0.00**
						Grand Total:	**$49.28**

List Number of Pieces Listed by Sender	Total Number of Pieces Received at Post Office	Postmaster: Name of receiving employee	Dated:
8			

Transaction Report Details - CertifiedPro.net
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Certified Mail Article Number	Return Receipt Article Number	Date Created	Name 1	Address	City	State	Zip	Postage	Fees	Certified Mailing Status	Service Options	Mail Delivery Date
9314869904300047844142	Not Applicable	2018-06-19 10:53 AM	Tap Rock Operating, LLC	602 Park Point Drive, Suite 200	Golden	CO	80401	1.21	4.95	Delivered	Return Receipt - Electronic	06-21-2018
9314869904300047844135	Not Applicable	2018-06-19 10:53 AM	OXY USA, Inc.	5 Greenway Plaza	Houston	TX	77046	1.21	4.95	Delivered	Return Receipt - Electronic	06-25-2018
9314869904300047844128	Not Applicable	2018-06-19 10:53 AM	EOG-Y Resources, Inc.	105 South 4th St	Artesia	NM	88210	1.21	4.95	Delivered	Return Receipt - Electronic	06-25-2018
9314869904300047844111	Not Applicable	2018-06-19 10:53 AM	EOG Resources, Inc.	104 S. Fourth St.	Artesia	NM	88210	1.21	4.95	Delivered	Return Receipt - Electronic	06-25-2018
9314869904300047844104	Not Applicable	2018-06-19 10:53 AM	Devon Energy Production Company LP	333 W Sheridan Ave	Oklahoma City	OK	73102	1.21	4.95	Delivered	Return Receipt - Electronic	06-22-2018
9314869904300047844098	Not Applicable	2018-06-19 10:53 AM	COG Operating LLC	600 W Illinois Ave	Midland	TX	79701	1.21	4.95	Delivered	Return Receipt - Electronic	06-22-2018
9314869904300047844081	Not Applicable	2018-06-19 10:53 AM	Chevron USA, Inc.	6301 Deauville Blvd	Midland	TX	79706	1.21	4.95	Delivered	Return Receipt - Electronic	06-22-2018
9314869904300047844074	Not Applicable	2018-06-19 10:53 AM	BLM	620 E Greene St	Carlsbad	NM	88220	1.21	4.95	Delivered	Return Receipt - Electronic	06-22-2018

CARLSBAD
CURRENT-ARGUS

AFFIDAVIT OF PUBLICATION

Ad No.
0001251849

MODRALL SPERLING
PO BOX 2168

ALBUQUERQUE NM 87103

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:

06/22/18

Legal Clerk

Subscribed and sworn before me this
22nd of June 2018.

State of WI, County of Brown
NOTARY PUBLIC

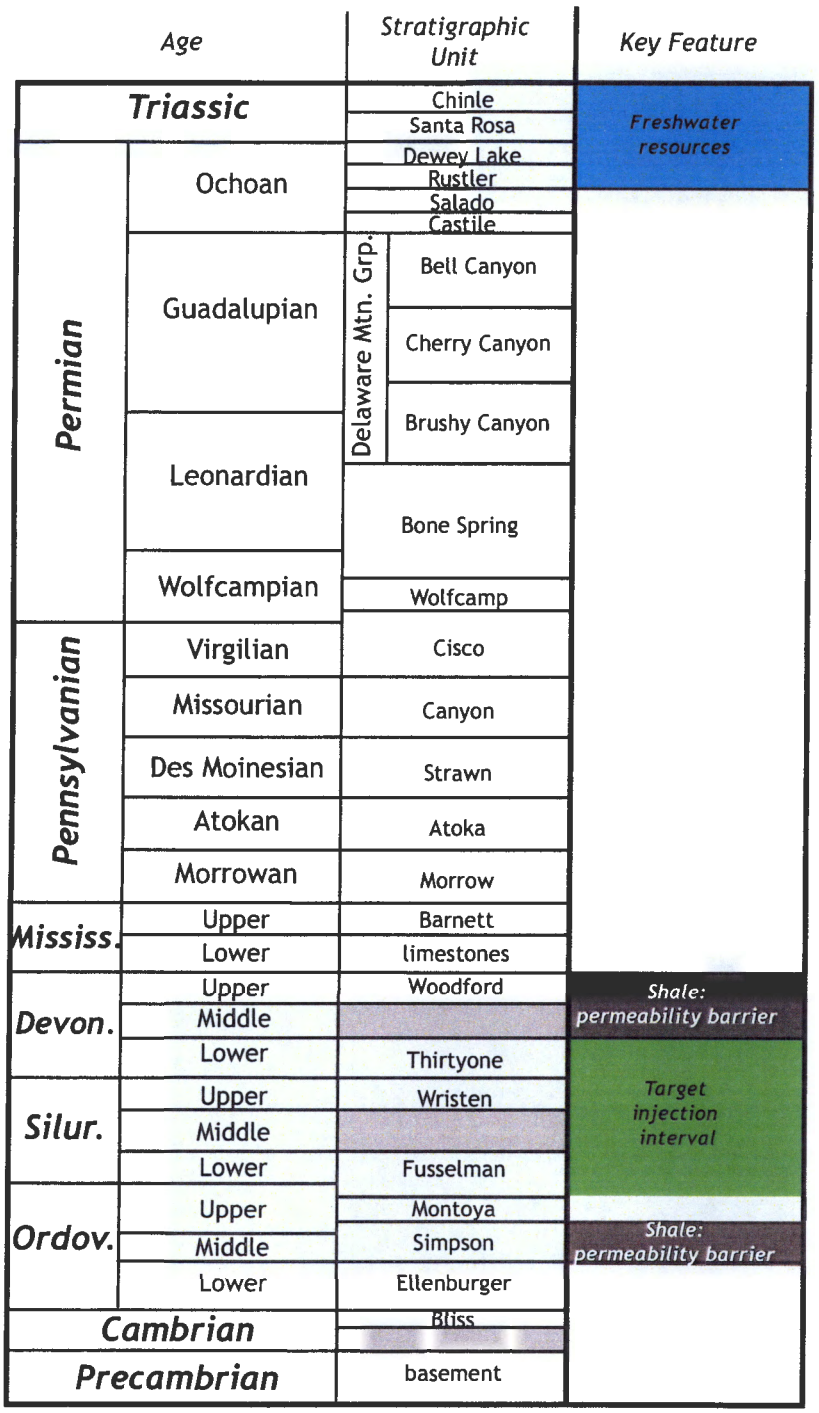
My Commission Expires

Ad#:0001251849
P O : 16308
# of Affidavits :0.00

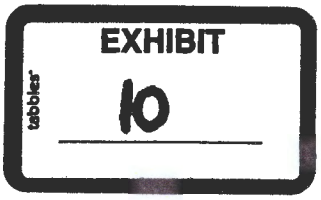
TARA MONDLOCH
Notary Public
State of Wisconsin

CASE No. 16308: Notice to all affected parties, including EOG-Y Resources, Inc.; EOG Resources, Inc.; Devon Energy Production Company LP; COG Operating LLC; Chevron USA, Inc.; OXY USA, Inc.; Tap Rock Operating, LLC; and the Bureau of Land Management of Mesquite SWD, Inc.'s application to Amend Administrative Order SWD-1696 for a Salt Water Disposal Well in Eddy County, New Mexico. The State of New Mexico, through its Oil Conservation Division, hereby gives notice that the Division will conduct a public hearing at 8:15 a.m. on July 12, 2018, to consider this application. Applicant seeks an order from the Division amending Administrative Order SWD-1696 to permit an increase in the diameter of the injection tubing in its Mesa Verde SWD Well No. 3 to allow for the use of 7 inch tubing inside the surface and intermediate casings and 5 ½ inch tubing inside the liner and to increase injection rates. The subject well is located in Unit N of Section 13, Township 24 South, Range 31 East, NMPM, Eddy County, New Mexico. Said well is located approximately 30 miles east of Carlsbad, New Mexico.

Published June 22, 2018



Stratigraphic chart for the Delaware Basin from Broadhead (2017).



Delaware Basin Stratigraphic Unit Descriptions

Lower Paleozoic

Woodford Shale (Upper Devonian)

The Woodford Shale is dominated by organic-rich mudstone interbedded with carbonate (limestone and/or dolostone) beds, chert beds and radiolarian laminae. This unit has been interpreted to include sedimentary gravity-flow deposits. Dominantly shale means lower porosity and permeability than the limestone/dolostone units above and below. The Woodford Shale is unconformable on the units below it. Locally this contact includes solution cavities and fissures down into the underlying carbonate unit(s), creating a complex boundary. It is up to 150' thick locally.

Thirtyone Formation (Lower Devonian)

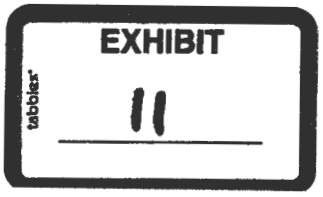
The Thirtyone Formation is part of a wedge of sedimentary rocks that thins to the north and the west where the wedge ends up truncated beneath the base of the overlying Woodford Shale. The Thirtyone Formation is only present in southeastern Lea County and consists of an upper coarsely crystalline dolostone unit and lower chert unit. This unit is not present in the area of concern.

Wristen Group (Middle-Upper Silurian)

The Wristen Group consists of interbedded limestone and dolostone that has a maximum thickness in Lea County, then thins to the north and the west. Thicknesses range from 0 to 1,400' thick. In the Delaware Basin, it occurs up to 19,000' below land surface, then rises to 10,000' to 12,000' subsurface to the north and west. It represents deposition in a shelf-margin environment and includes buildups of coral reefs, stromatoporoids and other invertebrate colonialists. The carbonate beds include boundstones, rudstones and oolitic grainstones with significant primary porosity. To the north, reservoirs targeted for production are dolomitic with vugular and fracture-related porosity.

Fusselman Formation (Late Ordovician-Lower Silurian)

The Fusselman Formation is almost entirely dolostone and can be up to 1,500' thick. As with the overlying Thirtyone Formation and Wristen Group, the Fusselman Formation thinks to the north and west where it is truncated beneath the Woodford Shale to the north of where the Wristen Group pinches out. In Lea County, the Fusselman Formation can be 18,000' or more below land surface. It is primarily coarsely crystalline dolostone that is vugular, fractured and/or brecciated, with significant secondary porosity due to the fracturing and brecciation.



Montoya Group (Middle-Upper Ordovician)

The Montoya Formation includes three dolostone members overlying a sandstone unit. The three upper carbonate units include the Upham, Aleman and Cutter Members and the lower sandstone unit is the Cable Canyon Sandstone. The entire package can be up to 600' thick and depth to the top of the unit ranges from 5,500' near the northern pinchout in Chaves County to as much as 20,000' in southern Lea County. The Montoya Group was stripped from the higher parts of the Central Basin Platform by erosion in the Late Pennsylvanian and Early Permian.

Simpson Group (Middle-Upper Ordovician)

The Simpson Group in a heterogeneous unit with limestone, dolostone, sandstone and green shale horizons. Up to 1000' thick, it is dominated by the shale beds (55% of total thickness), followed by the dolostone and limestone beds (40%) and finally sandstone (5%). The shale horizons can serve as a permeability barrier between the underlying Precambrian basement rocks and overlying reservoirs where the Simpson Group is present and has sufficient thickness. Depths to the Simpson Group range from 6,700' on parts of the Central Basin Platform to up to 21,000' in the Delaware Basin.

Ellenburger Formation (Lower Ordovician)

The Ellenburger Formation is up to 1000' thick and composed of limestone and dolostone that represent cyclic deposition in waters of the inner platform with restricted circulation. Porosity in the Ellenburger Formation includes porosity in the matrix, vugs, major karst dissolution features, collapse karst breccias and fractures. Depths to the top of the unit range from 7,500' on the Central Basin Platform to up to 22,000' in the Delaware Basin.

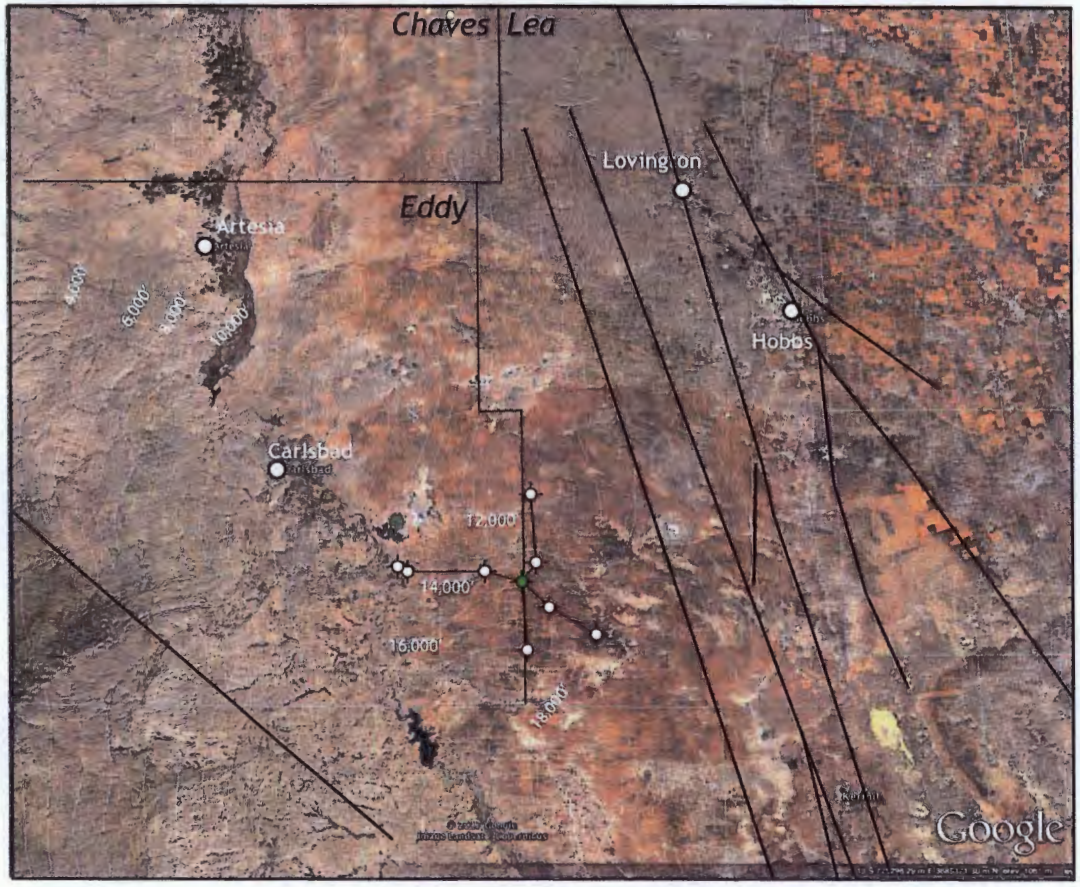
References

Broadhead, R.F., 2017, Petroleum Geology: *in* V.T. McLemore, S. Timmons and M. Wilks (eds.), Energy and Mineral Resources of New Mexico, New Mexico Bureau of Geology and Mineral Resources Memoir 50, vol. A, 90 p.

Comer, J.B., 1991, Stratigraphic analysis of the Upper Devonian Woodford Formation, Permian Basin, West Texas and southeastern New Mexico: Bureau of Economic Geology, University of Texas at Austin, Report of Investigations no. 201, 63 p.

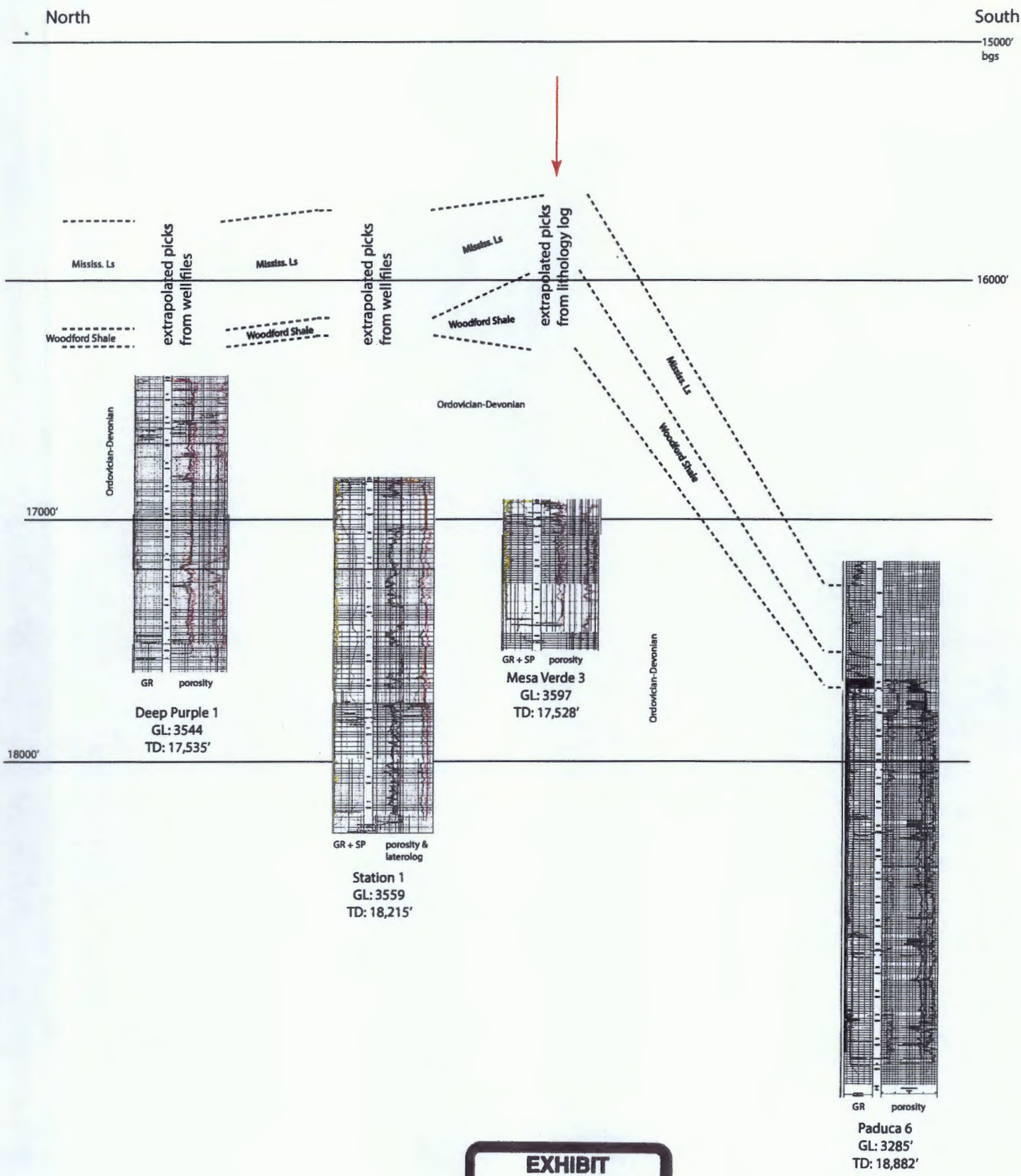
Hemmesch, N.T., Harris, N.B., Mnich, C.A. and Selby, D., 2014, A sequence-stratigraphic framework for the Upper Devonian Woodford Shale, Permian Basin, west Texas: American Association of Petroleum Geologists Bulletin, v. 98, no. 1, p. 23-47, doi:10.1306/05221312077

Texas Bureau of Economic Geology, 2009, Integrated Synthesis of the Permian Basin: Data and Models for Recovering Existing and Undiscovered Oil Resources from the Largest Oil-Bearing Basin in the U.S.: Department of Energy Final Technical Report, Award No: DE-FC26-04NT15509, 964 p.



Structure map on the top of the Precambrian (white lines) in feet below sea level. Black lines are fault zones. From the Texas Bureau of Economic Geology 2009 Integrated Synthesis of the Permian Basin.

tabbies
EXHIBIT
12



EXHIBIT
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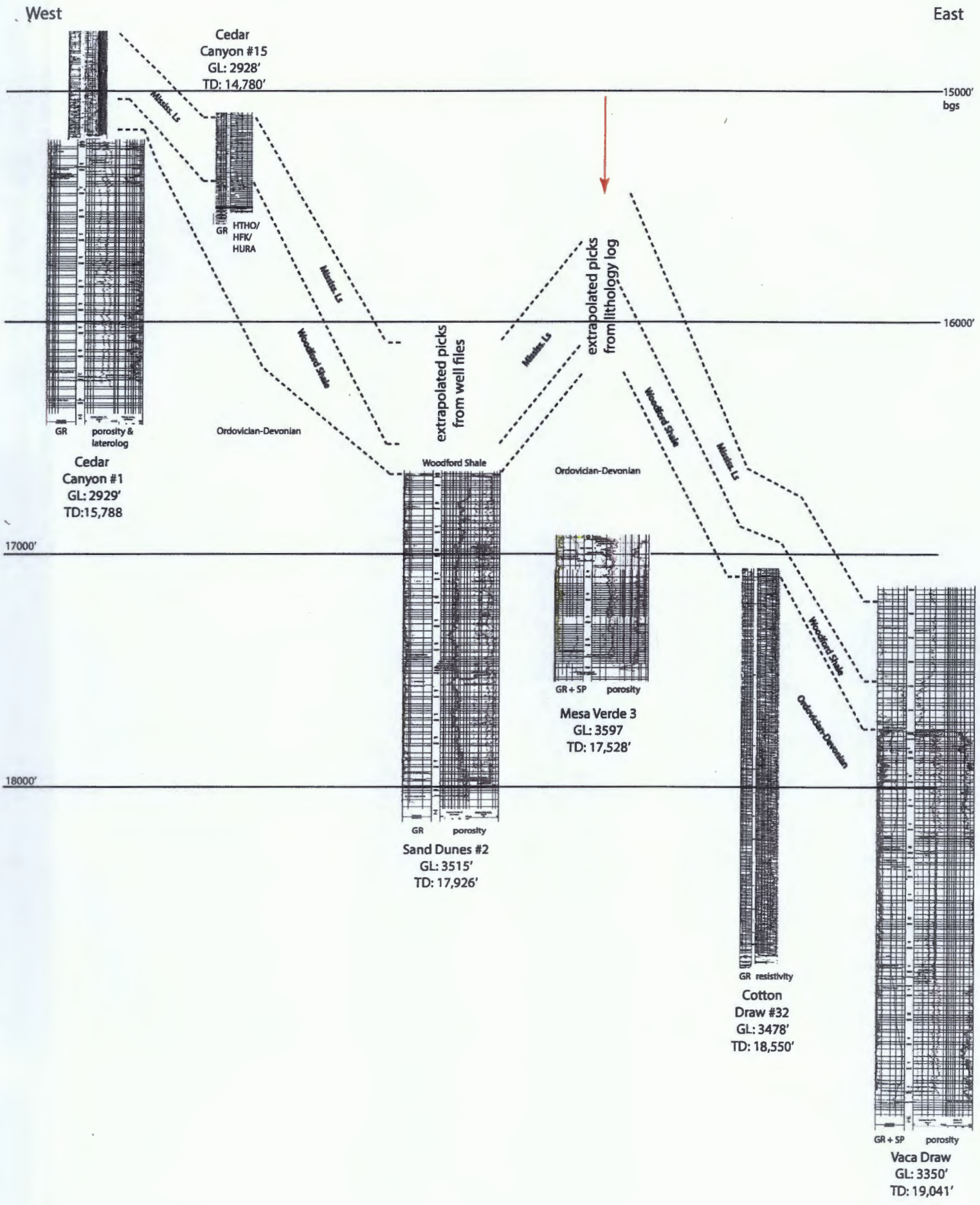
13


West
East
Cedar
Canyon #15
GL: 2928'
TD: 14,780'
15000'
bgs
16000'
17000'
18000'
Mississ. Ls
Woodford Shale
Ordovician-Devonian
GR
HTHO/
HFK/
HURA
GR
porosity &
laterolog
Cedar
Canyon #1
GL: 2929'
TD:15,788
extrapolated picks
from well files
extrapolated picks
from lithology log
Woodford Shale
GR
porosity
Sand Dunes #2
GL: 3515'
TD: 17,926'
Ordovician-Devonian
GR + SP
porosity
Mesa Verde 3
GL: 3597
TD: 17,528'
GR
resistivity
Cotton
Draw #32
GL: 3478'
TD: 18,550'
GR + SP
porosity
Vaca Draw
GL: 3350'
TD: 19,041'

Mesquite SWD : Nodal Analysis Match
Sand Dunes #2 SWD Step-Rate Test.

Measured bottomhole pressure data was matched against a nodal analysis model

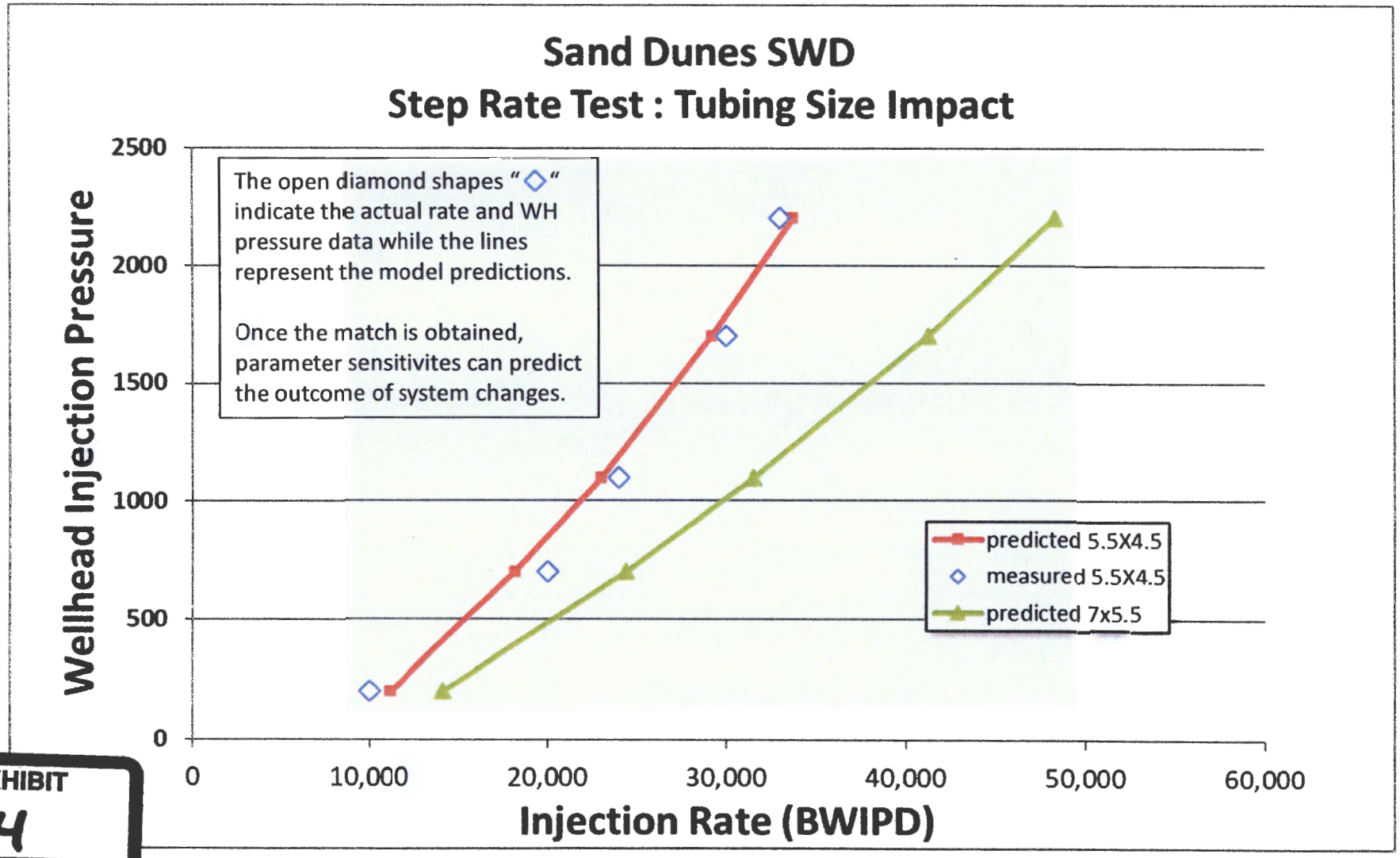


EXHIBIT
14

Wellbore Hydraulics Models predict a 33% increase in maximum injection rate between 5.5x4.5 tubing and 7x5.5 tubing.

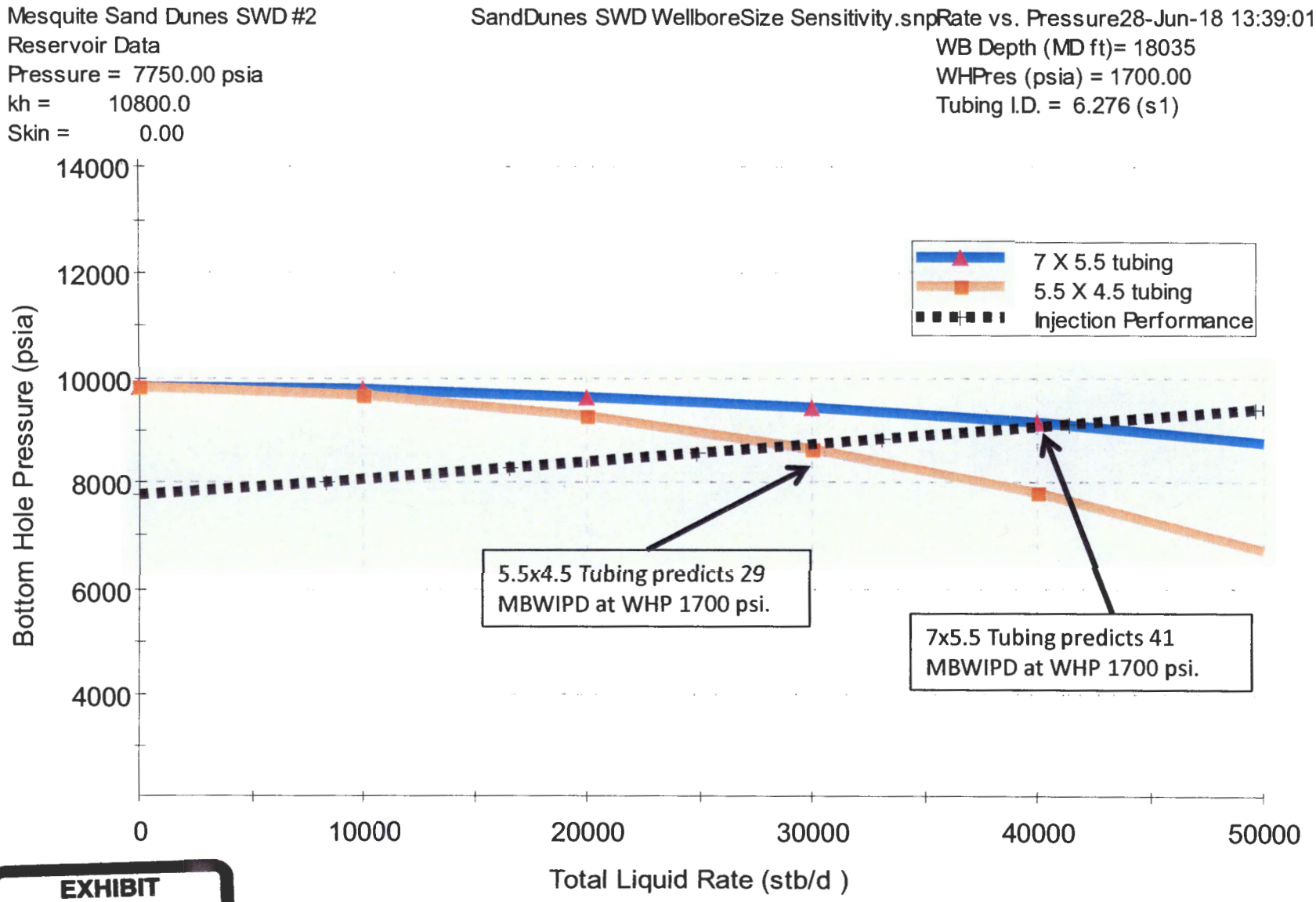
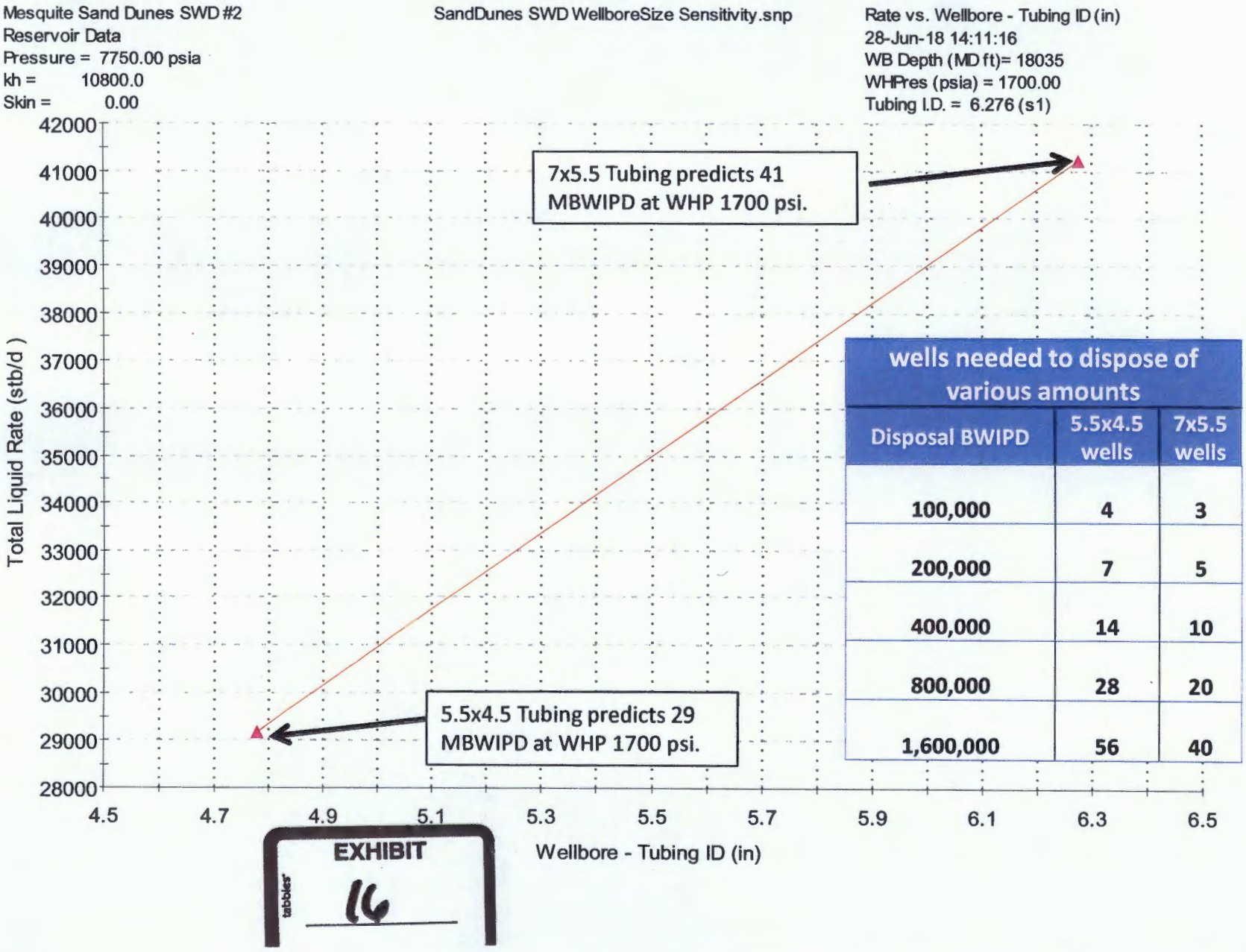


EXHIBIT
15

Mesquite SWD

Increased injection rate per well equates to fewer injectors.



wells needed to dispose of various amounts		
Disposal BWIPD	5.5x4.5 wells	7x5.5 wells
100,000	4	3
200,000	7	5
400,000	14	10
800,000	28	20
1,600,000	56	40

EXHIBIT

16

Increasing tubing size will decrease friction losses and conserve horsepower

3 example tubing sizes and their impact on friction losses

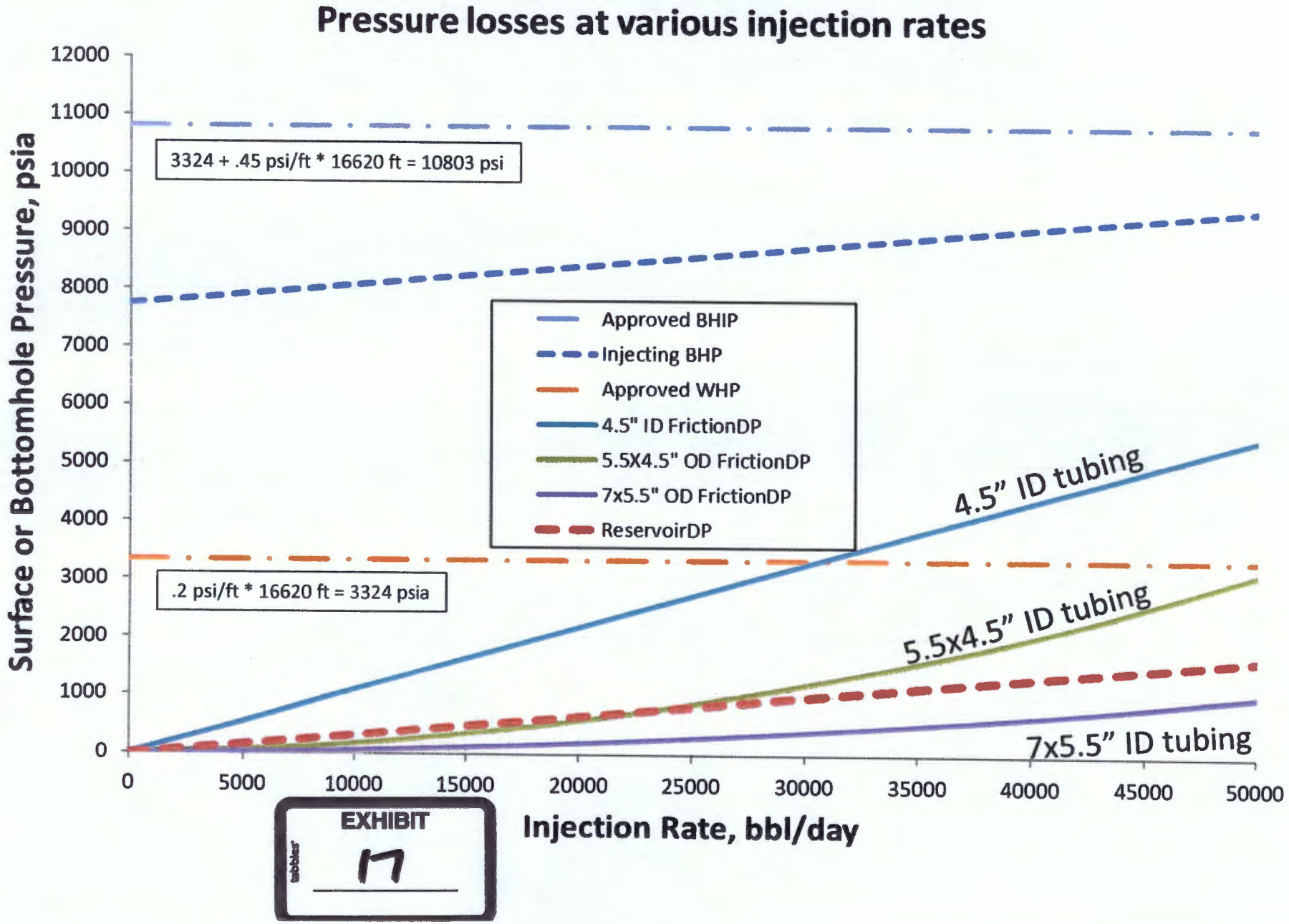
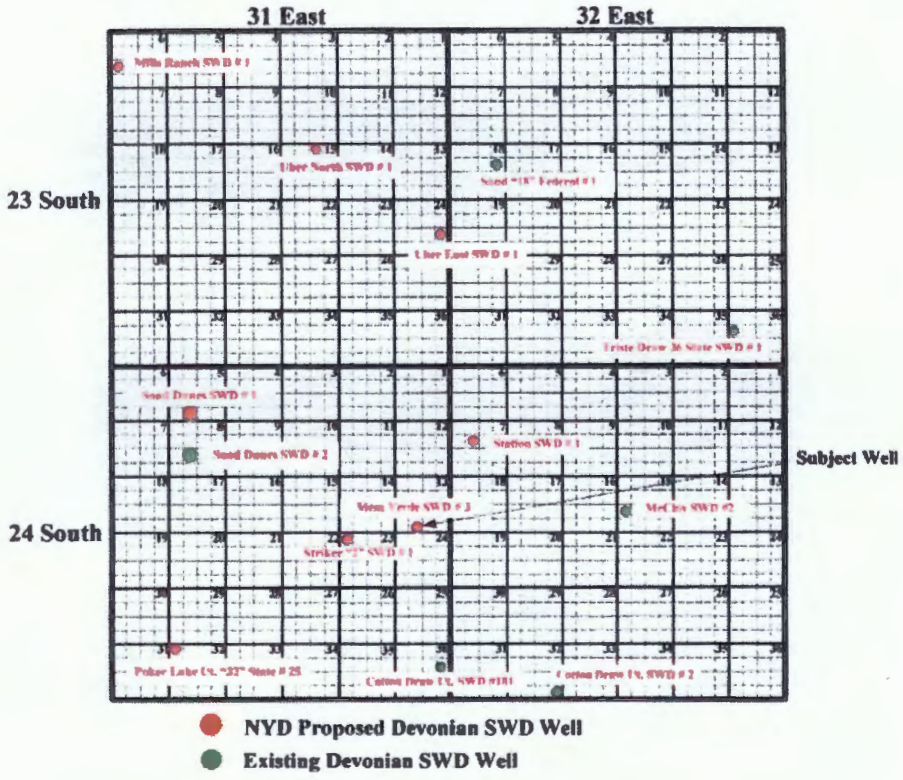


EXHIBIT 17

Reservoir Simulation grid represents existing and proposed wells in a 4 township area.



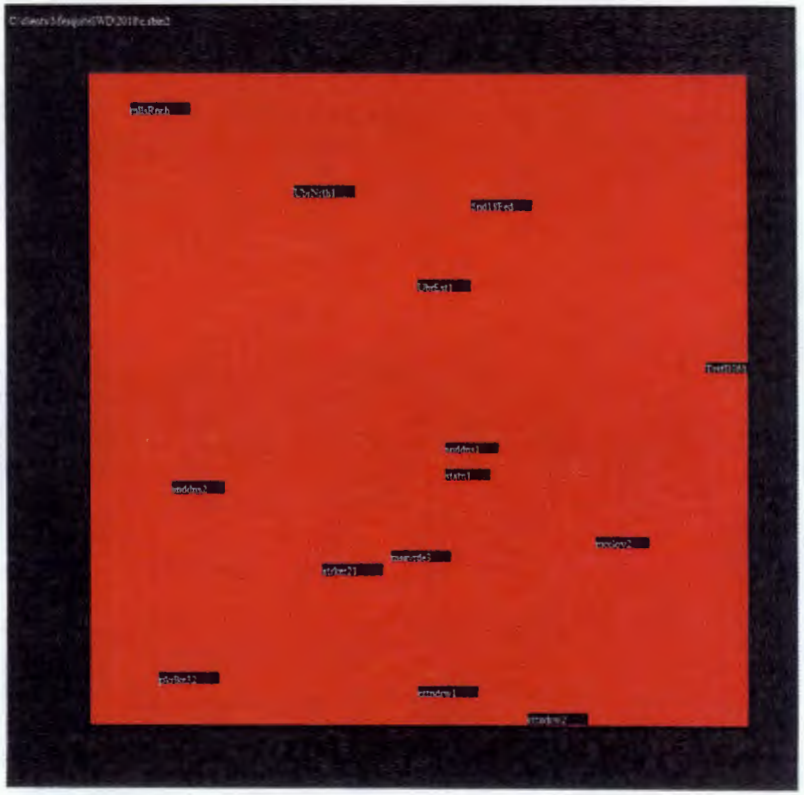
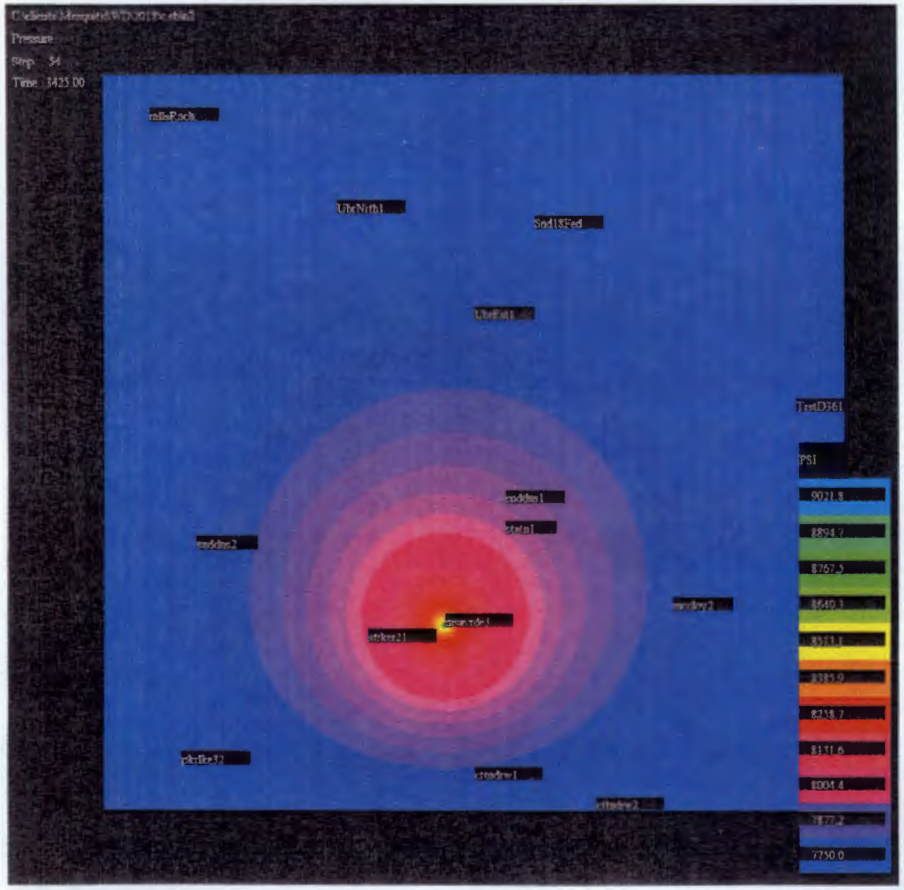
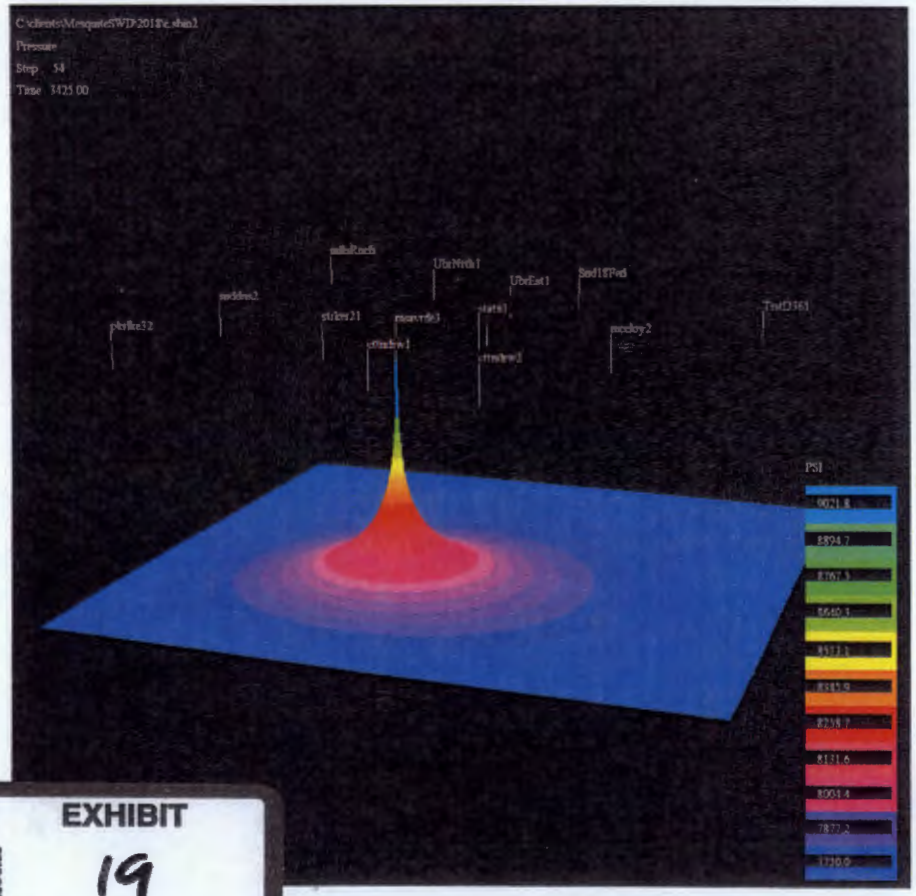


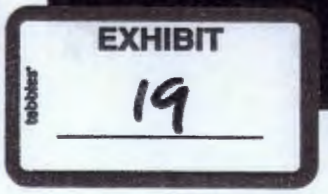
EXHIBIT
tabbies
18

Pore Pressure Impact over 10 years

High permeability-thickness disperses injected fluids

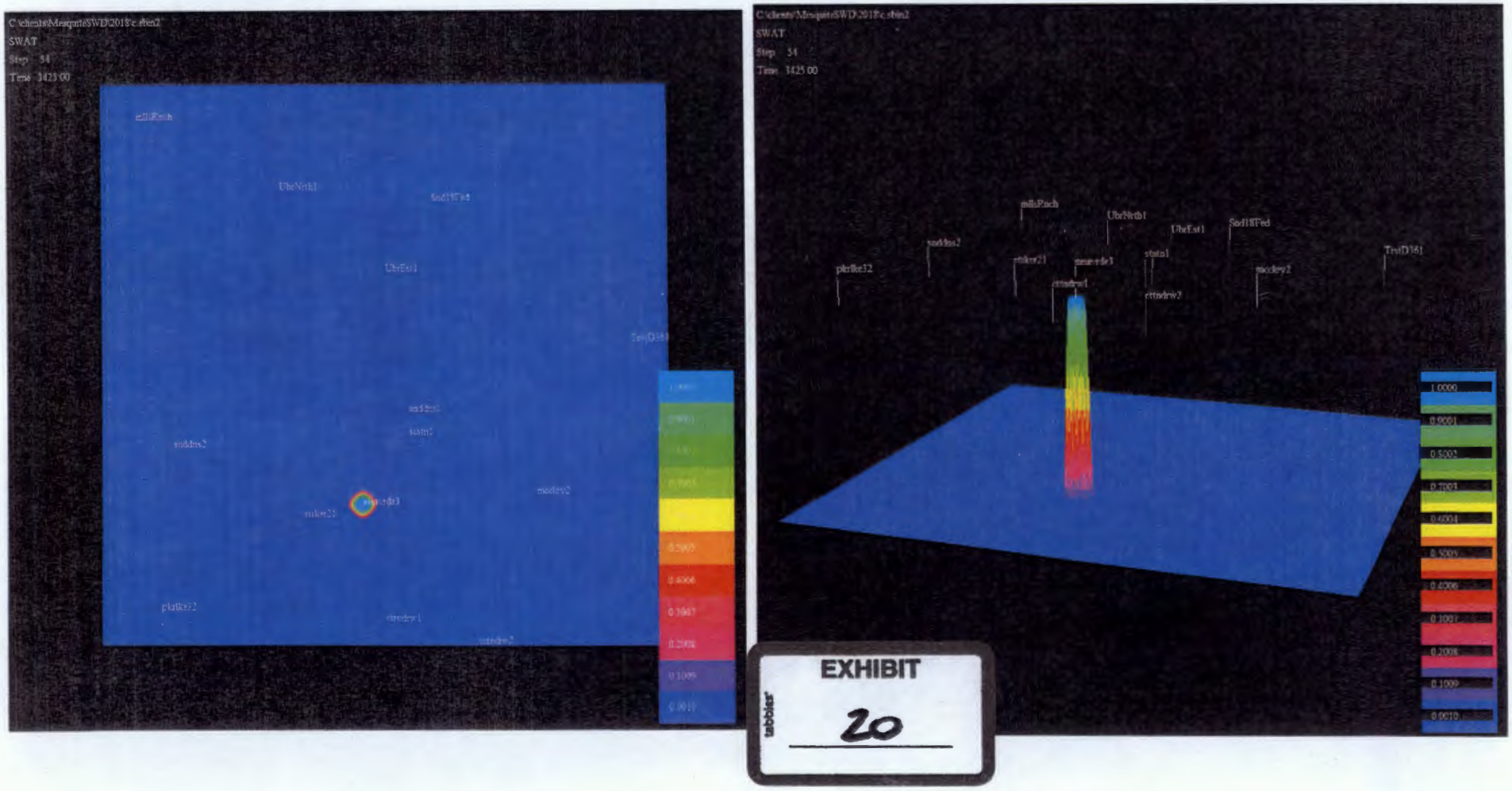






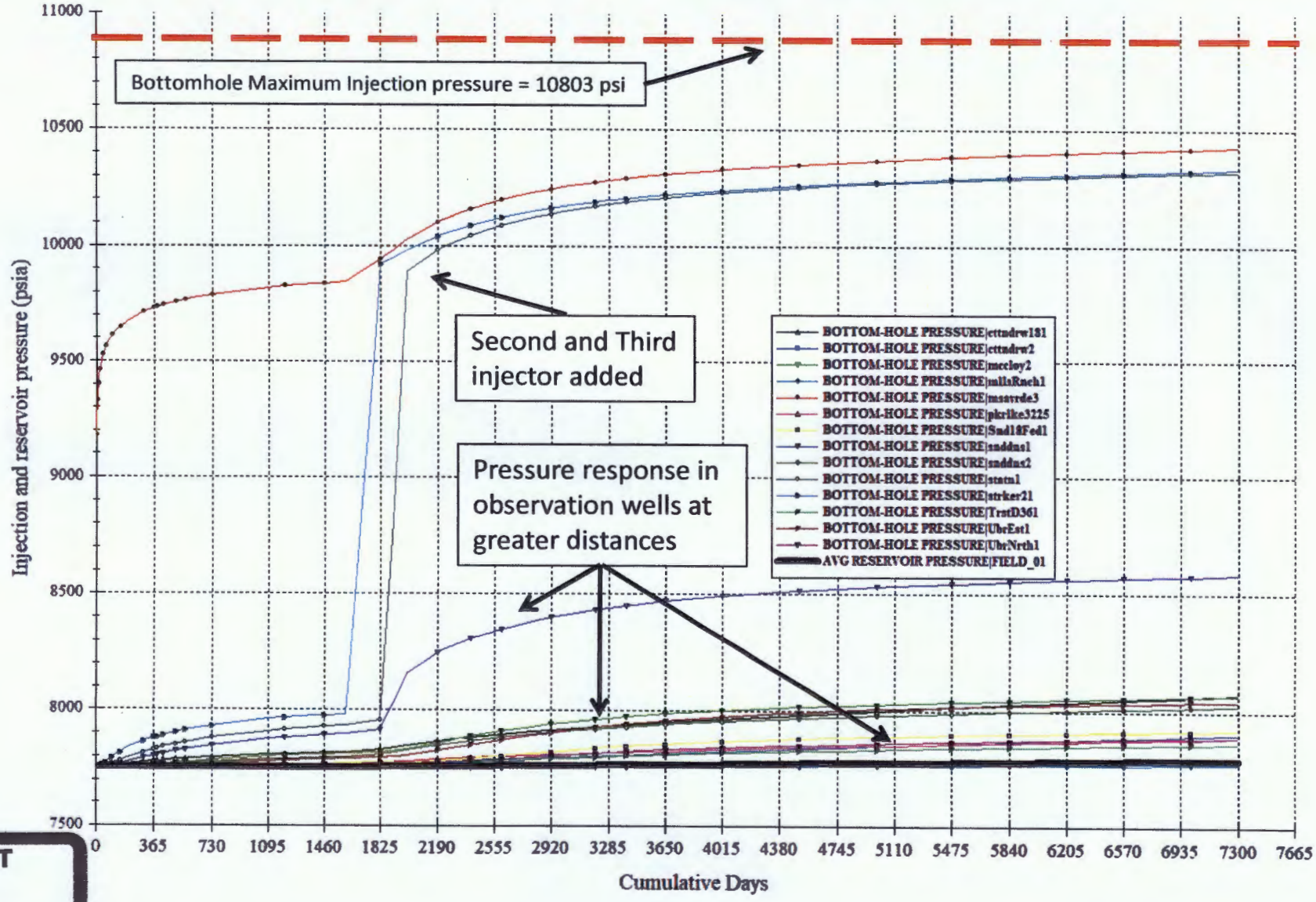
Injected Fluid Saturation over 10 years

Saturation profile is step-wise, with descrete boundaries, while pressure profile is “conical and smooth” since injected fluids transmit pressure through fluids that are already in the injection zone.



Pore Pressure Impact over 20 years with more wells

Adding additional injectors does not materially affect pressures in the large scale area.



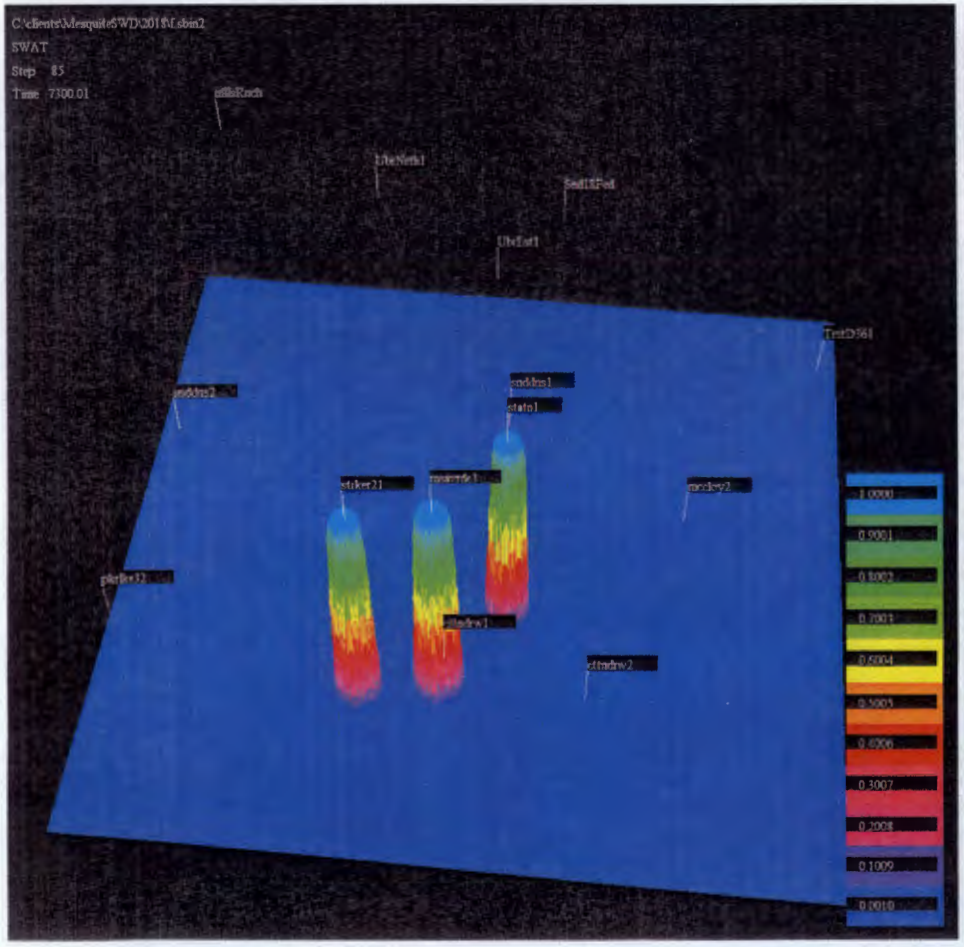
EXHIBIT

21

Pore Pressure Impact over 20 years with more wells

Adding additional injectors does not materially affect pressures in the large scale area.

Injected fluids remain near injectors	Pressure changes more uniformly



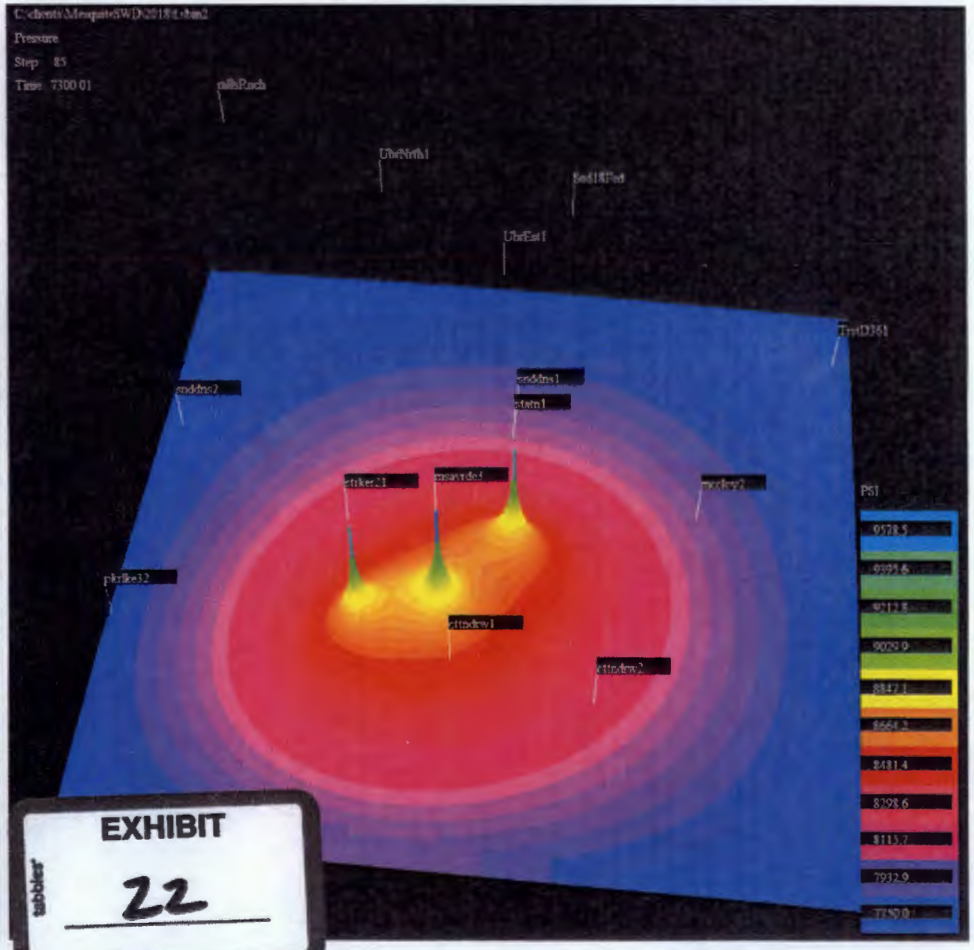
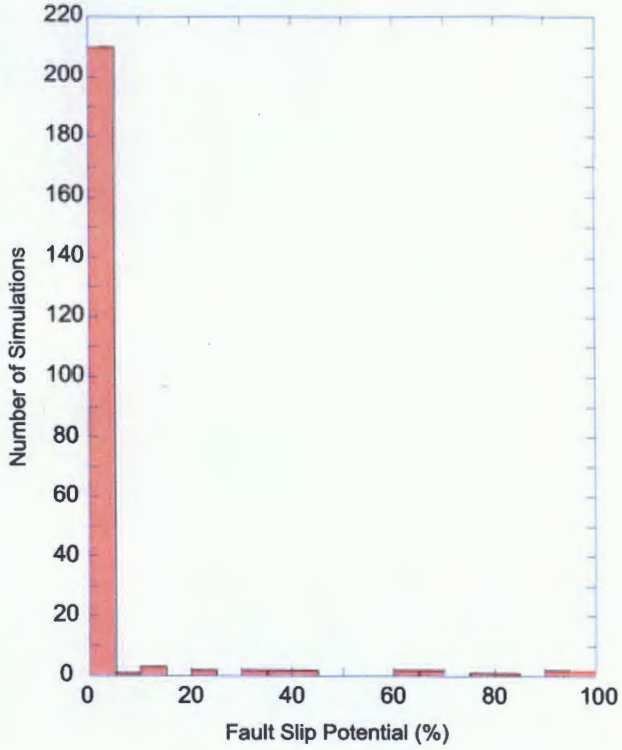


EXHIBIT
22

Analysis of Fault Slip Potential, using FSP 1.0 software from Stanford Center for Induced and Triggered Seismicity: Mesquite Mesa Verde Well #3

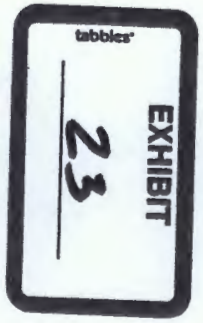
Key Parameters	Range Tested	
SH_max	60,70,80,90	based on ranges from World Stress Map in SE NM, west TX
APhi	0.2,0.5.0.7	based on data from Hurd and Zoback, 2012
Injection thickness	1500 ft	
%porosity	**10**	
permeability (mD)	**15**,50	
fault dip	40,50,60,70,80	
fault friction	0.4,0.5	0.4-0.6 commonly used for rocks expected in region of interest

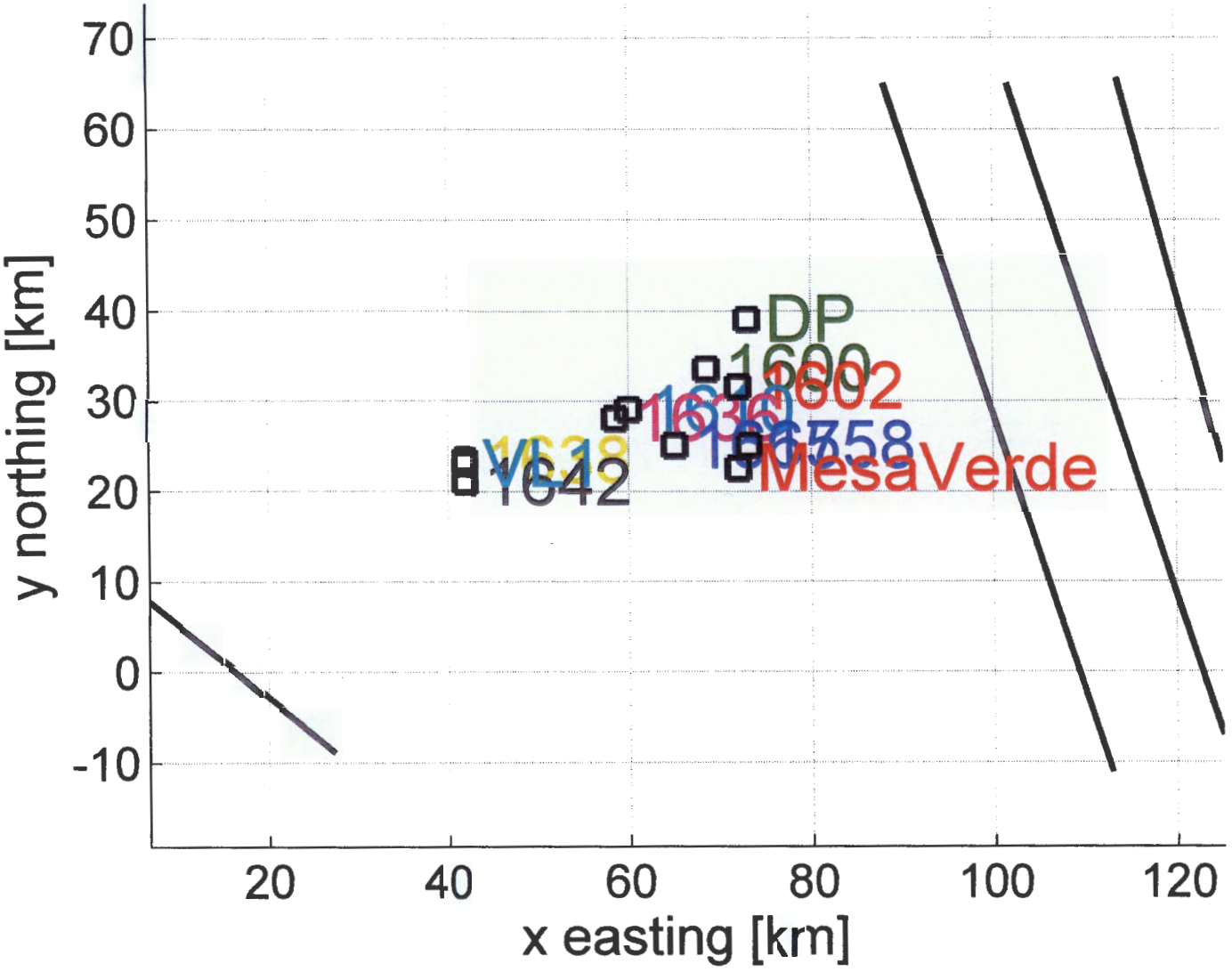


Majority of models tested led to 0% fault slip potential (FSP) on the mapped faults included in model

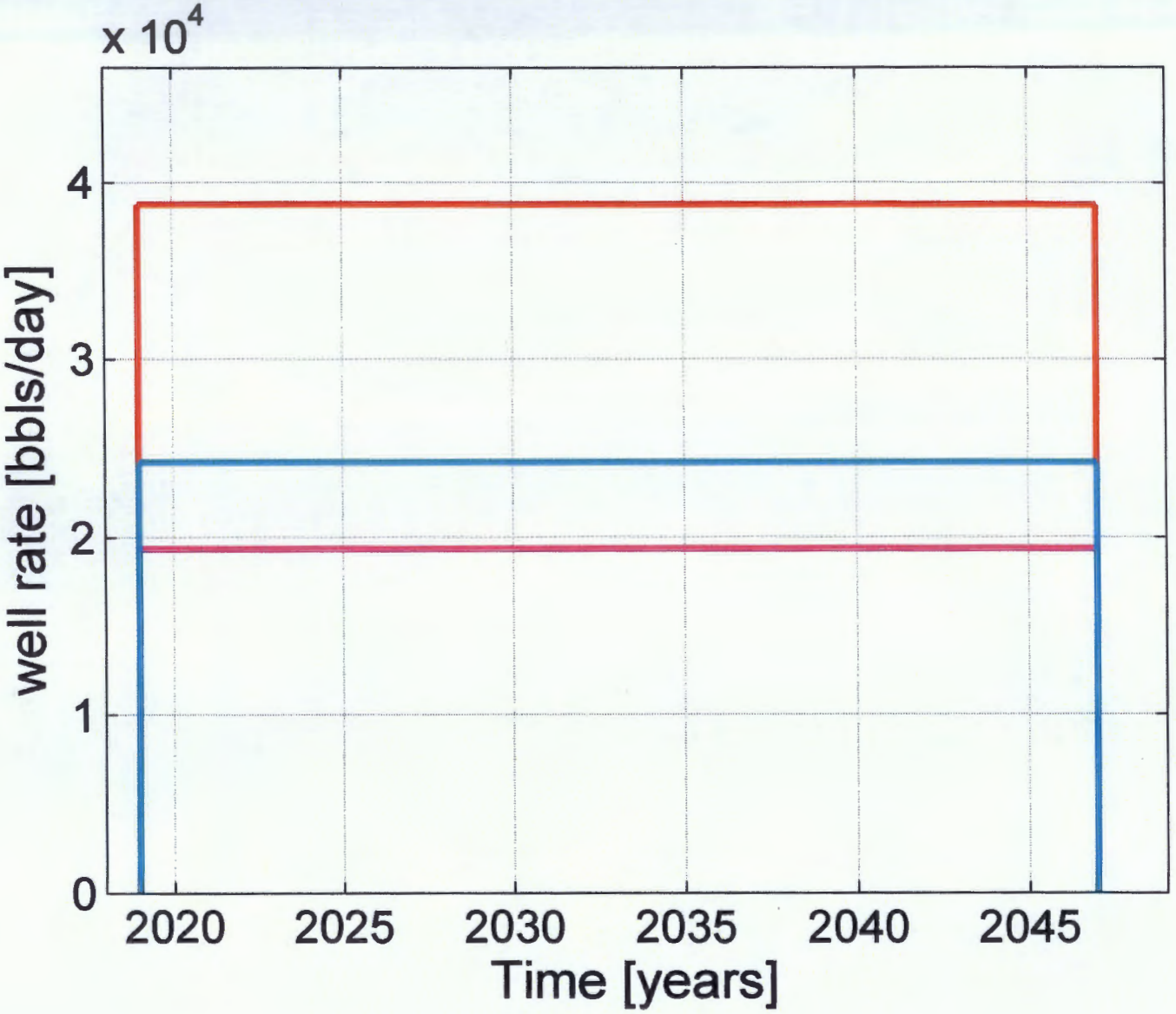
Results show range of fault slip potential from 0-100%, using parameters consistent with regional geology, stress conditions, and hydrologic conditions. The highest values of FSP occurred on the western-most fault in model, solely due to particularly combinations of fault orientation and stress field with lowest fault friction. Reducing fault friction to very low values could increase FSP, depending on fault and stress geometry

- Other tests of permeability and porosity ranges increased the pressure change on fault, but did not significantly change FSP.

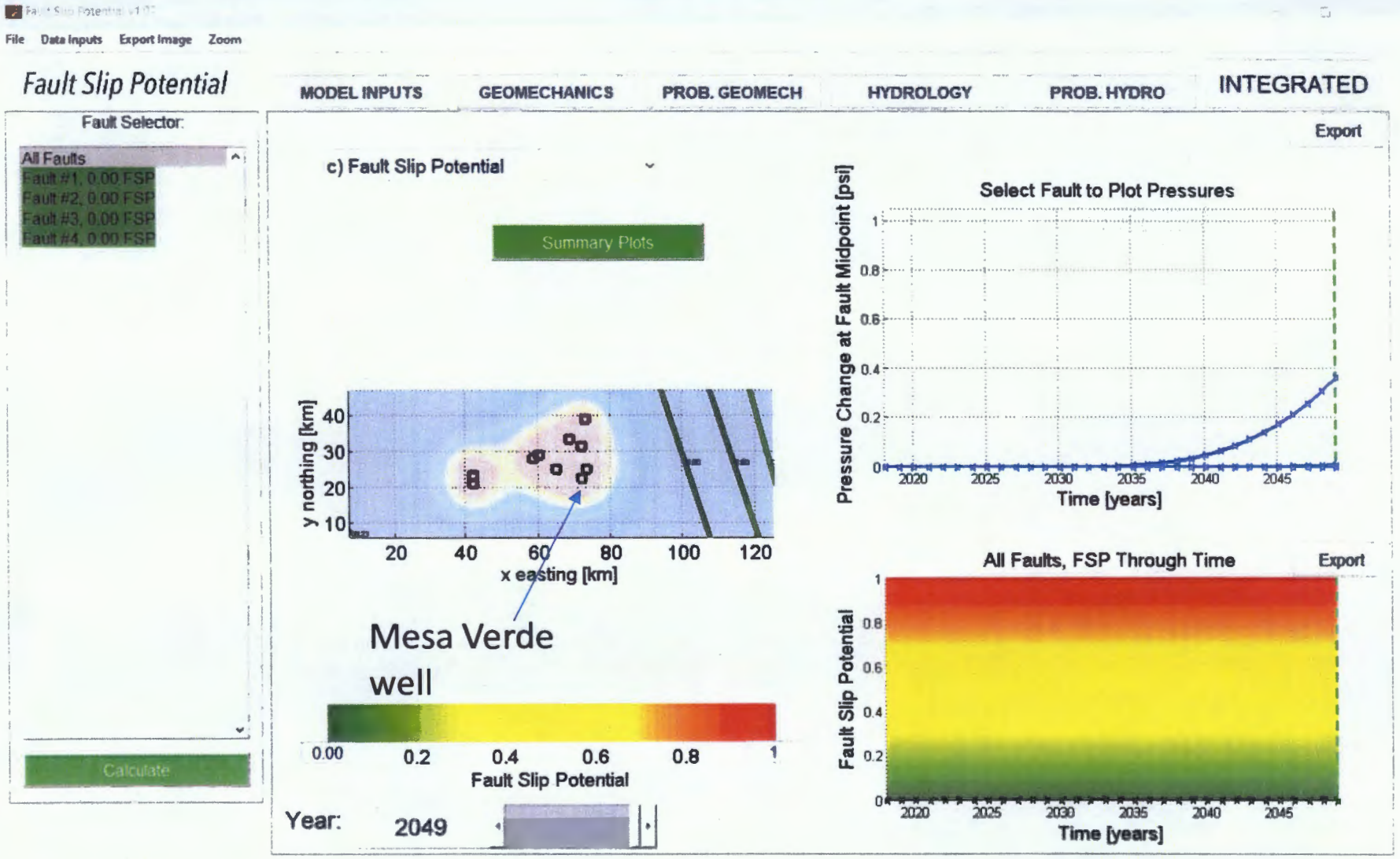




Model domain containing faults (black lines) and well locations. Mesa Verde (square) is the well of application, the other wells (squares) are previously approved Mesquite wells.

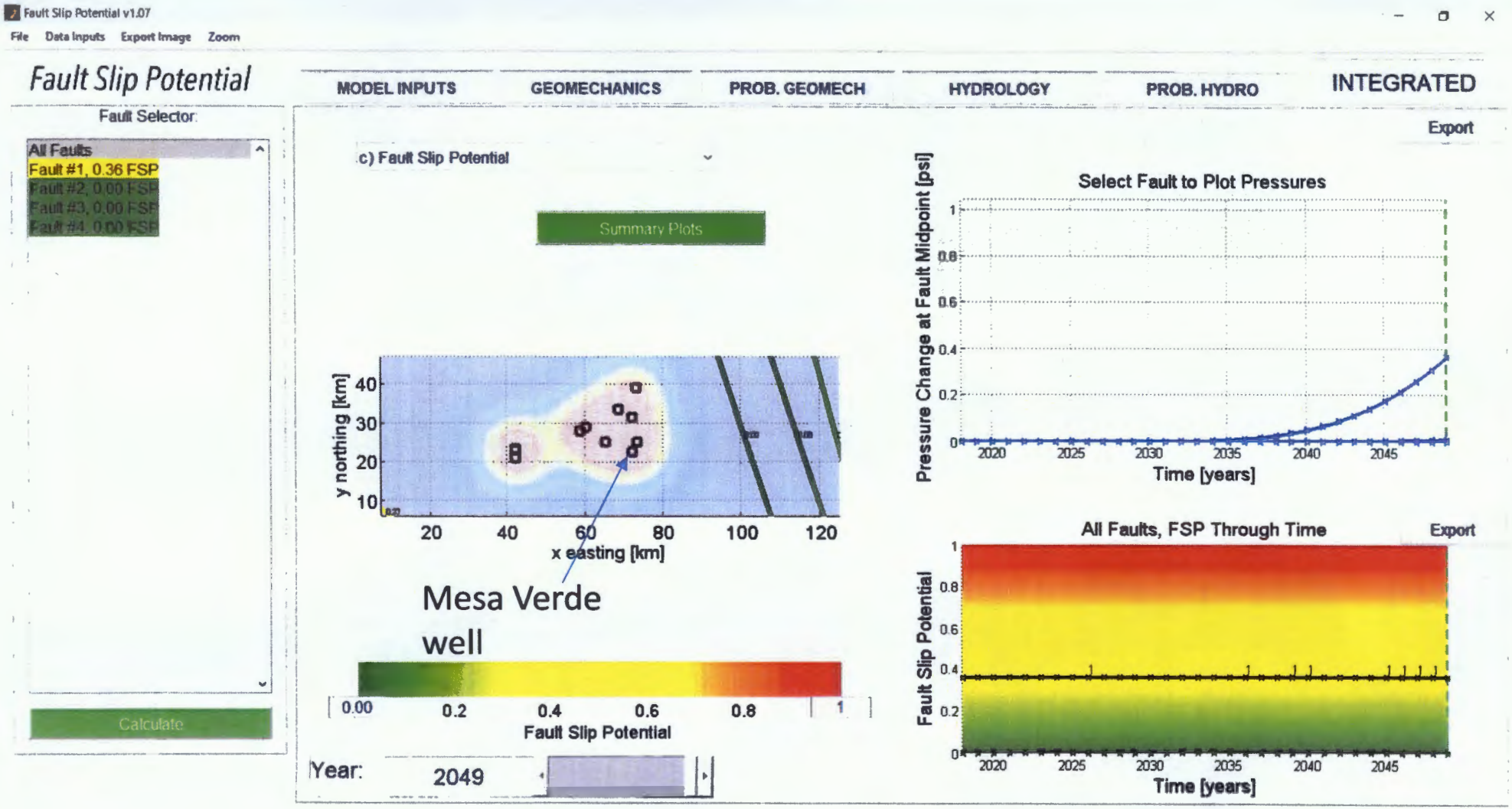


Injection rates for each of the wells shown in well map (previous page). This includes Mesa Verde #3 injection rates from application (red line), as well as previously approved Mesquite SWD wells in the region.



Sample Results - This case using parameters:
SH_max: 80°
APhi: 0.5
Fault dip: 70°
Fault friction: 0.4 (results at 0.5 are same)

Fault slip potential (FSP) on all 4 mapped faults is 0. This results is similar to most other parameter sets, except those with lower friction and/or specific fault and stress orientations.



Sample Results - This case using parameters:
SH_max: 80°
APhi: 0.2
Fault dip: 40°
Fault friction: 0.4 (results at 0.5 are same)

Fault slip potential (FSP) on westernmost mapped fault (#1) is 36%, because of geometry and stress orientation. FSP is 0 on the eastern faults.

Seismic Catalog Analysis within 25 km of **Mesa Verde #3**:

Analysis based on NMT seismicity analysis using US Geological Survey earthquake catalog and data from seismic network stations within the SE New Mexico region. Published NMT catalogs span 1962-2009 (Sanford et al., 2002, Sanford et al., 2006, Stankova-Pursley et al., 2013) and unpublished catalogs from 2009 – September 2017, February-March 2018.

Total of 7 events within 25 km of this well (between 1962-March 2018)

Catalog from 1962-2004: 1 event magnitude 3.2
Closest event to well location: 23.7 km (magnitude 3.2 event)

Catalog from 2005-2018(March): minimum magnitude 1.0, maximum magnitude 2.4
Closest event to well location: 9.8 km (1.0 magnitude event)

Yearly summary of earthquakes within 25 km of Mesa Verde #3 well:
1962_1998: 1 (1 earthquake with magnitude greater than 2)
1998_2004:0
2005-2014: 2 (1 earthquake with magnitude greater than 2)
2015: 0
2016: 0
2017: 4 (0 > M2)
2018(through March): 0

YYYYMMDD	HH:MM:SS	LATITUDE	LONGITUDE	MAGNITUDE
19971019	11:12:09	32.33	-103.94	3.2
20111227	23:10:37	32.37	-103.95	1.6
20120318	10:57:22	32.30	-103.87	2.4
20170211	14:34:27	32.29	-103.92	1.5
20170302	11:38:53	32.37	-103.88	1.7
20170325	22:46:01	32.13	-103.77	1.0
20170814	01:09:56	32.39	-103.56	1.2

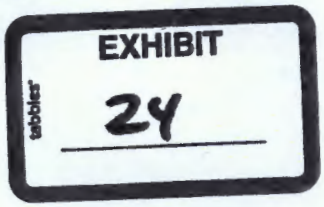
Earthquake depths are unconstrained.

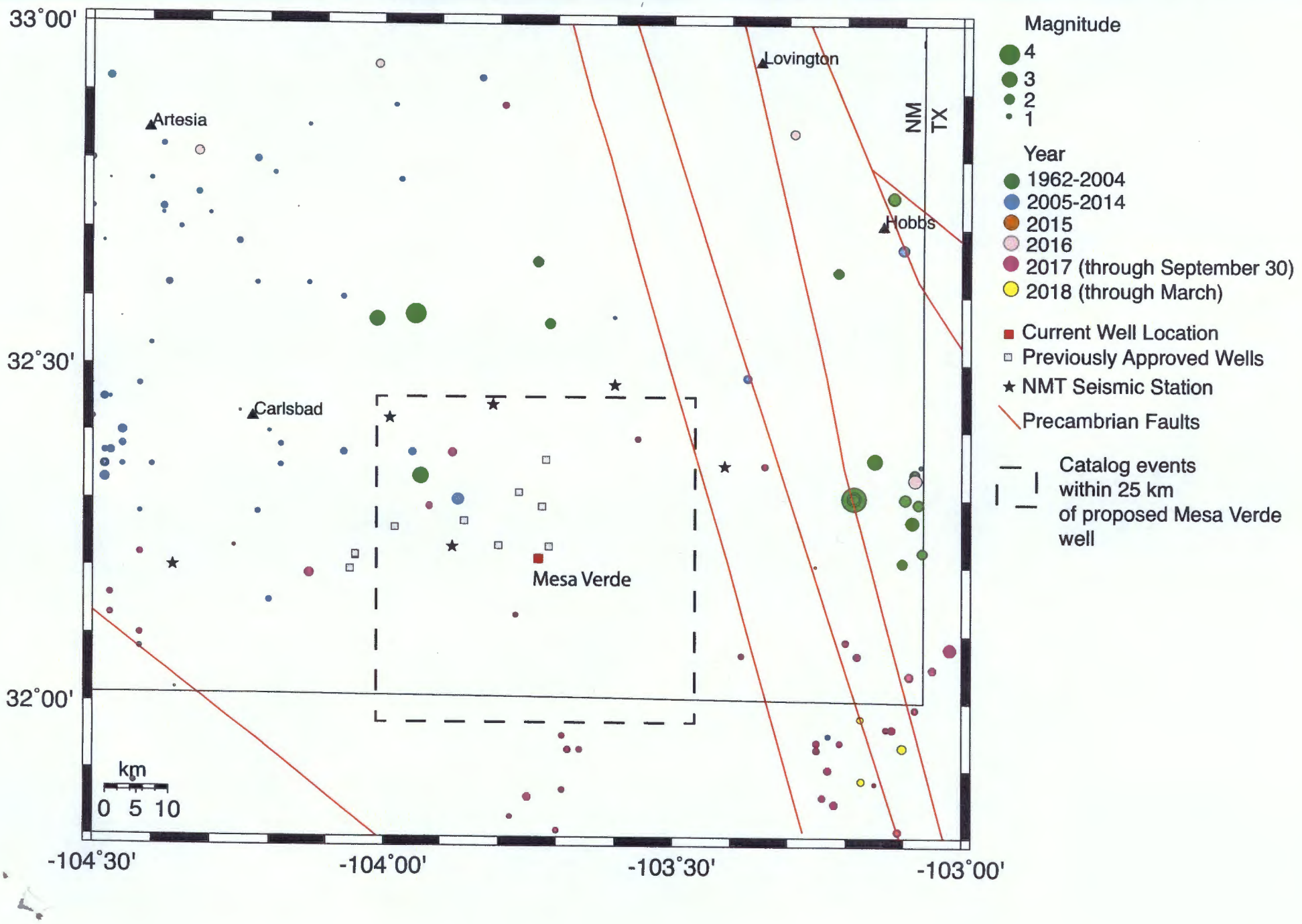
References:

Sanford, A. R., Lin, K-w., Tsai, I., and Jaksha, L. H., 2002, Earthquake catalogs for New Mexico and bordering areas: 1869–1998: New Mexico Bureau of Geology and Mineral Resources, Circular 210, 104 pp.

Sanford, A. R., Mayeau, T. M., Schlue, J. W., Aster, R. C., and Jaksha, L. H., 2006, Earthquake catalogs for New Mexico and bordering areas II: 1999–2004: New Mexico Geology, v. 28, no. 4, pp. 99–109.

Pursley, J., Bilek, S.L., and Ruhl, C.J., 2013, Earthquake catalogs for New Mexico and bordering areas: 2005–2009, New Mexico Geology, v. 35, no. 1, pp. 3–12.




33°00'
32°30'
32°00'
-104°30'
-104°00'
-103°30'
-103°00'
Artesia
Carlsbad
Lovington
Hobbs
Mesa Verde
NM
TX
km
0 5 10
Magnitude
4
3
2
1
Year
1962-2004
2005-2014
2015
2016
2017 (through September 30)
2018 (through March)
Current Well Location
Previously Approved Wells
NMT Seismic Station
Precambrian Faults
Catalog events within 25 km of proposed Mesa Verde well

Tubing specifications for the 5.5" tubing:

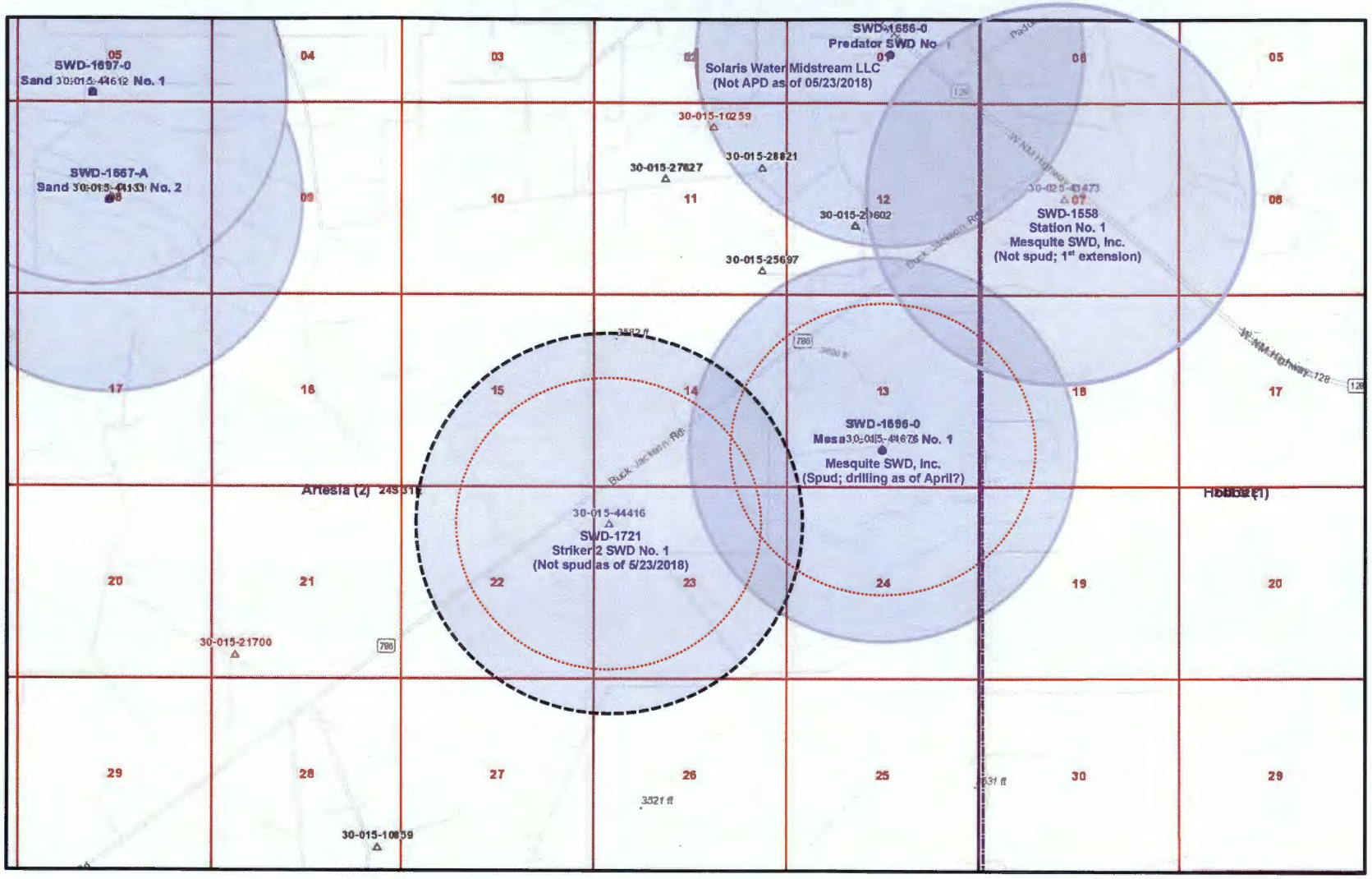
- 5.5" 20 # p-110
- Body OD- 5.5"
- Coupling OD 6.05"
- ID- 4,778"
- Burst- 12,640#'s
- Collapse- 11,100#'s

Approved wells with 7" x 5.5" tubing:

- VL SWD #1
- Station SWD #1
- West Gramma Ridge SWD #1
- Cypress SWD #1

Ex 25

Pending Application for High-Volume Devonian Disposal Well
C-108 Application for Striker 2 SWD No. 1 – NGL Water Solution Permian – Updated 05/23/2018



Striker 2 SWD No. 1; NGL Water Solutions Permian; SWD-1721

API 30-015-44416; Application No. pMAM1723357567

Approved interval: 16,300' to 17,850'

Protested by XTO and EOG; both protests retracted.

RBDM Suspn: 8.30.2017; processing application with current design.

Closet Devonian Well with Large-Volume Potential: Mesa Verde SWD No. 3 (30-015-44676) spud 2.25.2018; approved current tubing: 5-in tapering to 4.5-in; pending application for tubing size modification.