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

APPLICATION OF SPUR ENERGY PARTNERS LLC FOR APPROVAL OF A PRESSURE MAINTENANCE PROJECT, EDDY COUNTY, NEW MEXICO.

CASE NO. 24042

NOTICE OF SUPPLEMENTAL AND REVISED EXHIBITS

Spur Energy Partners LLC ("Spur") (OGRID No. 328947), the applicant in the above-referenced case, submits this notice of filing of supplemental and revised exhibits.

The self-affirmed statement from Goerge A. Waters explains the supplemental and revised exhibits. Spur Supplemental Exhibit I contains the findings from a reservoir simulation conducted by W.D. Von Gonten Engineering LLC ("Von Gonten") for the Burch Keely Unit #566. Spur Revised Exhibit H is a revised copy of the requested monitoring plan.

Spur respectfully requests that the attached supplemental and revised exhibits be accepted for filing and made part of the record of this case.

Respectfully submitted,

HOLLAND & HART LLP

By:_____

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ATTORNEYS FOR SPUR ENERGY PARTNERS LLC

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APPLICATION OF SPUR ENERGY PARTNERS LLC FOR APPROVAL OF A PRESSURE MAINTENANCE PROJECT, EDDY COUNTY, NEW MEXICO.

CASE NO. 24042

SELF-AFFIRMED SUPPLEMENTAL STATEMENT OF GEORGE A. WATERS

1. My name is George Armstrong Waters. I work for Spur Energy Partners LLC ("Spur") as an Operations Manager.

2. I have testified before the New Mexico Oil Conservation Division as an expert witness in petroleum engineering in this matter and my credentials as an expert have been accepted by the Division and made a matter of record.

3. I am submitting this supplemental statement in response to a request by the Division Technical Examiner at the hearing to submit a reservoir simulation showing that Spur's proposed injection will remain within the Project Area.

4. Spur hired W.D. Von Gonten Engineering LLC ("Von Gonten") to run a reservoir simulation to estimate the impact radius of gas injection for the Burch Keely Unit #566.

5. **Spur Exhibit I** is an overview of the analysis and reservoir simulation conducted. The second page of the exhibit outlines the scope of the simulation project, the workflow, and assumptions. As noted, it was assumed that the Burch Keely Unit #566 was not connected to offset wells through hydraulic fractures. Based on my experience and knowledge of the production in this area, I believe that is a valid assumption.

6. As explained in the workflow description on page 2 of the exhibit, Von Gonten used the Burch Keely Unit #416 and Tex-Mack 1 Federal Com #1 logs to calibrate petrophysics

and a Mechanical Earth Model to run the simulation. They performed an assessment of stimulated area for the Burch Kelly Unit #566 and performed a history match to calibrate historical deliverability and permeability. Lastly, they ran various gas injection scenarios.

7. Pages 3-8 of the exhibit review and explain how the reservoir simulation was constructed, including a review of the well's production history, the nodal analysis used to estimate bottomhole injection pressures based on the proposed maximum surface pressure of 1,077 psi, the methodology used to calibrate the applicable petrophysics for the injection interval and to create the model grid, the methodology to estimate the well's fracture geometry, and demonstration that the model achieved a good history match on the well's production.

8. Page 9 of the exhibit depicts one of the injection scenarios run with the model simulation. In this scenario, Von Gonten modelled the gas injection pressure at a constant 1,350 psi bottomhole pressure, which corresponds to the proposed maximum surface injection pressure of 1,077 psi at an injection rate of 1 MMCF/day, as determined through the nodal analysis calculations. This scenario shows that Spur would be able to inject 76 MMCF over five years while injecting at or below the maximum proposed surface injection pressure. The model estimates that Spur would be able to achieve an initial injection rate of about 400 MCF/day and that the injection rate would drop to about 100 MCF/day.

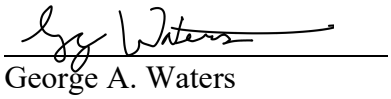
9. In addition, Spur ran another simulation scenario to confirm that gas injection will be confined to the ½-mile radius within the proposed Project Area. Von Gonten ran this second case at 5 MMCF/day.

10. Pages 10-15 of the exhibit show that the injected gas is expected to remain contained within the ½-mile radius and within the Project Area boundaries.

11. After reviewing multiple reservoir simulations, it is my opinion that injected gas is expected to stay within the proposed Project Area. It remains my opinion that granting this application will help conserve resources, and will avoid waste and protect correlative rights.

12. Also attached is **Revised Spur Exhibit H**. Spur revised its proposed monitoring program for this pressure maintenance project based on the results from the model simulation to include all wells expected to show a response from injection under the model simulation in the six-month monitoring plan. Accordingly, Spur adjusted the monitoring plan to include six additional wells in under its six-month monitoring plan. The adjusted plan and a complete list of wells under each monitoring program are included in the revised exhibit.

13. I affirm under penalty of perjury under the laws of the State of New Mexico that the foregoing statements are true and correct. I understand that this self-affirmed statement will be used as written testimony in this case. This statement is made on the date next to my signature.



George A. Waters

2/22/2024

Date

REVISED SPUR EXHIBIT H

BKU 566 PRESSURE MAINTENANCE PROJECT – REVISED PROPOSED MONITORING PROGRAM

11-Well Program

Below is the proposed monitoring program for the 11 project wells that are expected to be within the gas injection front at the end of five years of injection, based on the reservoir simulation. This data will be gathered once every six months for each well (see Table 2)

- Well Test – one every six months
- Fluid Level – one every six months
- Runtime – one every six months

23-Well Program

Below is the proposed monitoring program for the 23 project wells that are expected to be outside the gas injection front at the end of five years of injection, based on the reservoir simulation. This data will be gathered once annually for each well (see Table 2).

- Well Test – one every year
- Fluid Level – one every year
- Runtime – one every year

Battery Monitoring

Additionally, the production at the affected batteries (**Table 1**) is measured daily, and will be continuously monitored for trend changes. This data can be furnished at any time, or once annually.

Table 1. List of affected batteries.

Battery Name	Count of Wells in the Monitoring Program
BURCH KEELY UNIT 18A TB	13
BURCH KEELY UNIT 18B EAST TB	8
BURCH KEELY UNIT 13A NORTH TB	8
BURCH KEELY UNIT 13B SOUTH TB	3
MERAK 7 FEDERAL 8 TB	2

Specifics of some Key Performance Indicators

Well Test – The 24-hour Oil, Water, and Gas rates of a producing well, measured through a test separator. These tests should be a minimum of three days, or a maximum of five days, consecutively. The 24-hour rates are the averages over the time of the test (cumulative volume divided by total hours).

Fluid Level – The fluid level in the tubing-casing annulus, measured in feet from surface with an acoustic fluid level gun. If a fluid level is rising in a producing well, it indicates that the well is under-producing.

Runtime – The previous 60 day run data can be accessed from a well's Rod Pump Controller (Menu 3-1-3 in a Lufkin model). The average of the 60 days is the Average Runtime. If the average is increasing, it

BEFORE THE OIL CONSERVATION DIVISION
Santa Fe, New Mexico
Revised Exhibit No. H
Submitted by: Spur Energy Partners, LLC
Hearing Date: December 7, 2023
Case No. 24042

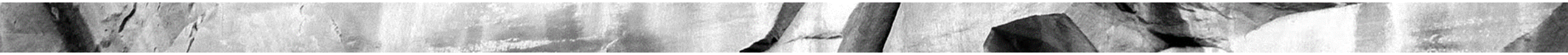
W.D. Von Gonten Engineering LLC

SPUR

Burch Keely Unit #566 Gas Injection

January 2024

BEFORE THE OIL CONSERVATION DIVISION
Santa Fe, New Mexico
Exhibit No. I
Submitted by: Spur Energy Partners, LLC
Hearing Date: December 7, 2023
Case No. 24042



Burch Keely 566 Gas Injection Modeling

Scope:

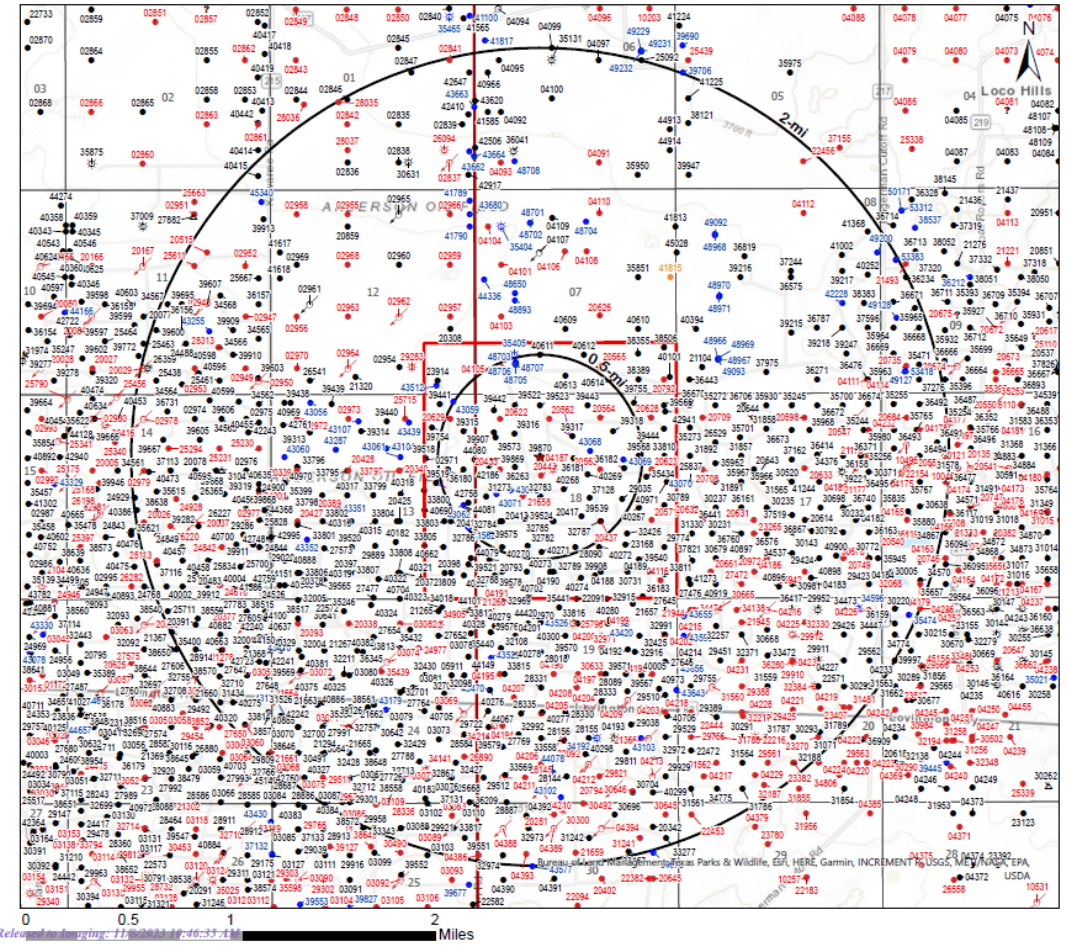
- Use modeling to estimate impact radius of gas injection for the Burch Keely #566.

Workflow:

- Use #416 log and offset Texmack (previous study) to calibrate petrophysics and MEM.
- Perform assessment of stimulated area for the Burch Keely 566.
- Perform history match of Burch Keely 566 to calibrate historical deliverability and permeability.
- Run gas injection scenarios.

Key Assumption:

- Burch Keely 566 not connected to offset wells.



Legend

- Well Location
- Affected Wells Laterals (5)
- Project Area
- Miscellaneous (3)
- Gas, Active (19)
- Gas, New (5)
- Gas, Plugged (23)
- Injection, Active (5)
- Injection, Plugged (69)
- Oil, Active (906)
- Oil, New (93)
- Oil, Plugged (326)
- Oil, Temporary Abandonment (1)
- Salt Water Disposal, Active (3)
- Salt Water Disposal, Plugged (1)
- undefined (7)

Source Info: NMOCD O&G Wells updated 10/25/2023 (https://www.emnrd.nm.gov/ocd/ocd-data/ftp-server/)

O&G Wells AOR Map

BURCH KEELY UNIT #566
Eddy County, New Mexico

Proj Mgr: Oliver Seekins	October 25, 2023	Mapped by: Ben Bockelmann

Prepared for: SPUR ENERGY PARTNERS
Prepared by: ALL CONSULTING

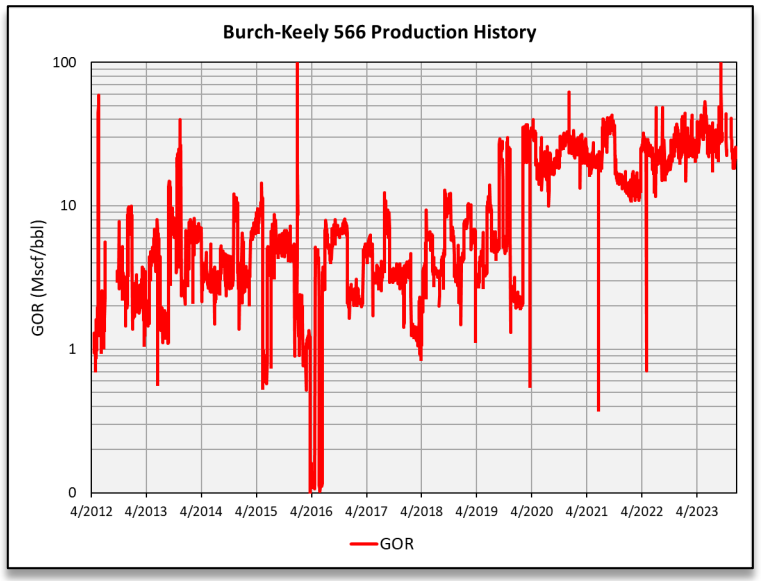
VII – Proposed Operation

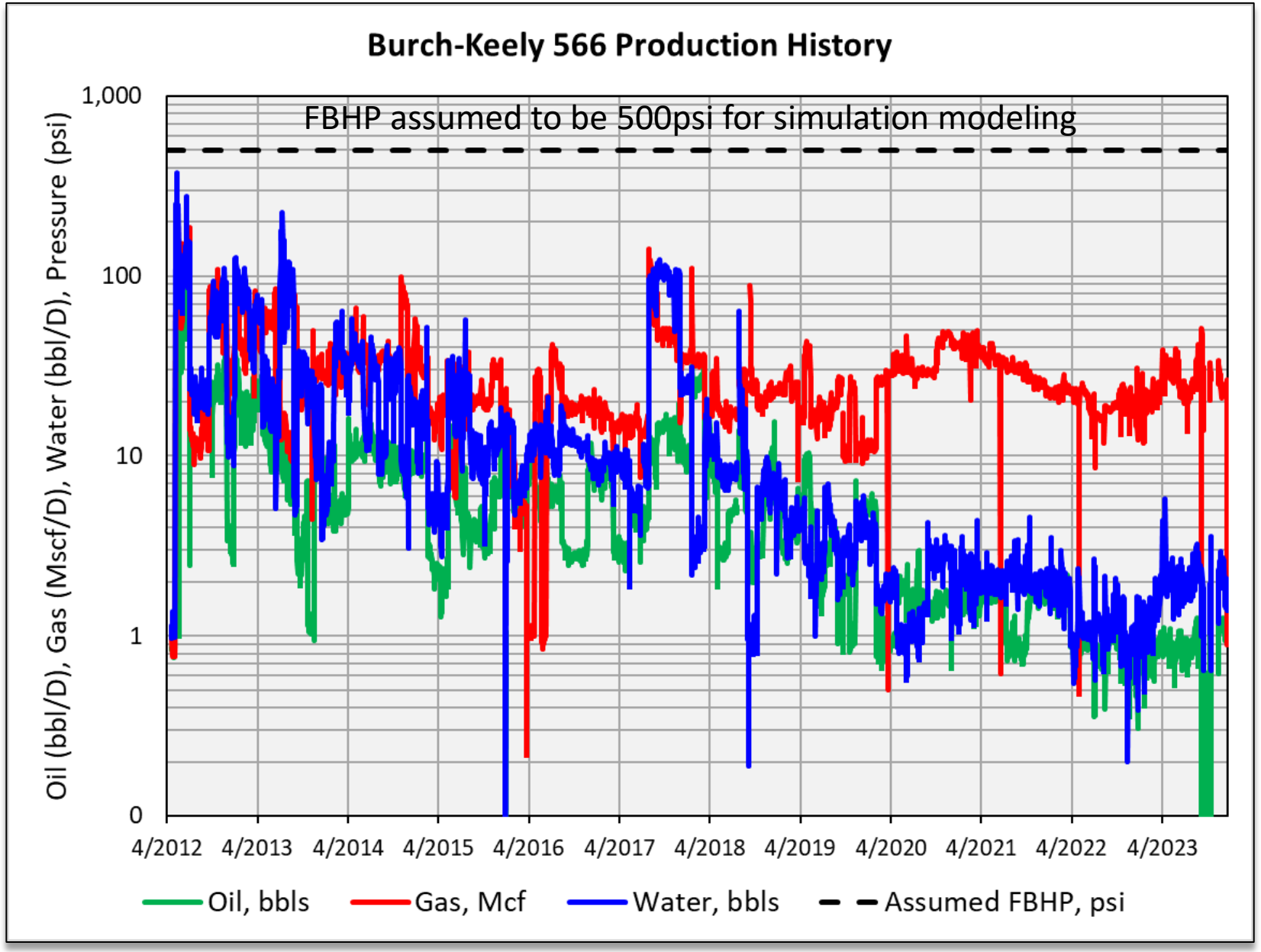
(1) **Proposed Maximum Injection Rate:** 10 MMCF/day
Proposed Average Injection Rate: 5 MMCF/day
(2) A closed system will be used.
(3) **Proposed Maximum Injection Pressure:** 1,077 psi (surface)
Proposed Average Injection Pressure: approximately 700 psi (surface)
(4) **Source Injectate Analysis:** The injectate is expected to consist of gas produced from the Glorieta-Upper Yeso Pool and re-injected into the same formations for pressure maintenance

Burch Keely 566 Production History for Modeling

- No pressure information available. FBHP profile assumed to be constant at 500 psi for modeling.

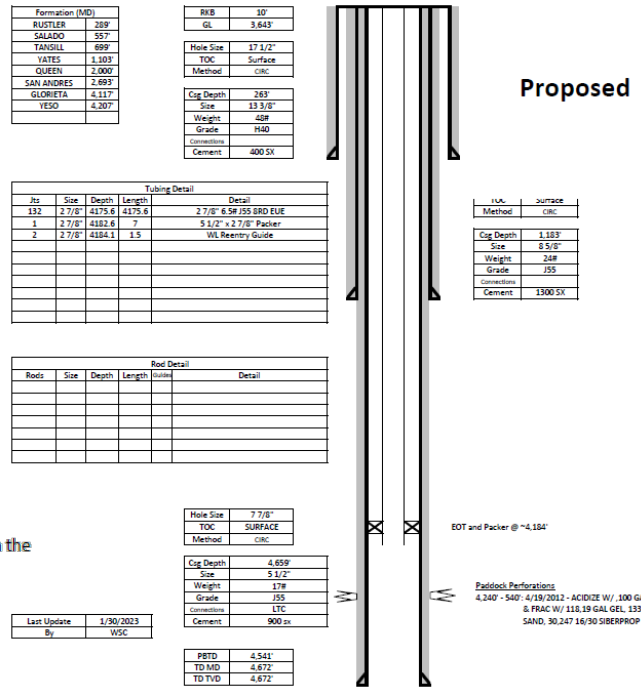
- Cum oil ~27,576 bbls
- Cum gas ~ 121,020 Mscf
- Cum water ~ 72,699 bbls





Nodal Analysis for Gas Injection Pressures

- Nodal analysis used to estimate BH injection pressures with surface constraints.
- Assumptions from application:
  - Injecting down tubing (2 7/8")
  - Max surface press – 1,077psi
  - Relative gas density ~0.915



Formation (MD)	
RUSTLER	289'
SALADO	557'
TANSILL	699'
YATES	1,103'
QUEEN	2,000'
SAN ANDRES	2,693'
GLORIETA	4,117'
YESO	4,207'

RKB	10'
GL	3,643'
Hole Size	17 1/2"
TOC	Surface
Method	CIRC
Csg Depth	263'
Size	13 3/8"
Weight	48#
Grade	H40
Connections	
Cement	400 SX

Tubing Detail				
Jts	Size	Depth	Length	Detail
132	2.7/8"	4175.6	4175.6	2.7/8" 6.5# J55 8RD EUE
1	2.7/8"	4182.6	7	5 1/2" x 2.7/8" Packer
2	2.7/8"	4184.1	1.5	WL Reentry Guide

TOC	Surface
Method	CIRC
Csg Depth	1,183'
Size	8 5/8"
Weight	24#
Grade	J55
Connections	
Cement	1300 SX

Rod Detail					
Rods	Size	Depth	Length	Guides	Detail

Hole Size	7 7/8"
TOC	SURFACE
Method	CIRC
Csg Depth	4,659'
Size	5 1/2"
Weight	17#
Grade	J55
Connections	LTC
Cement	900 sx

Last Update	1/30/2023
By	WSC

PBTD	4,541'
TD MD	4,672'
TD TVD	4,672'

VII – Proposed Operation

(1) **Proposed Maximum Injection Rate:** 10 MMCF/day
Proposed Average Injection Rate: 5 MMCF/day
(2) **A closed system will be used.**
(3) **Proposed Maximum Injection Pressure:** 1,077 psi (surface)
Proposed Average Injection Pressure: approximately 700 psi (surface)
(4) **Source Injectate Analysis:** The injectate is expected to consist of gas produced from the Glorieta-Upper Yeso Pool and re-injected into the same formations for pressure maintenance.

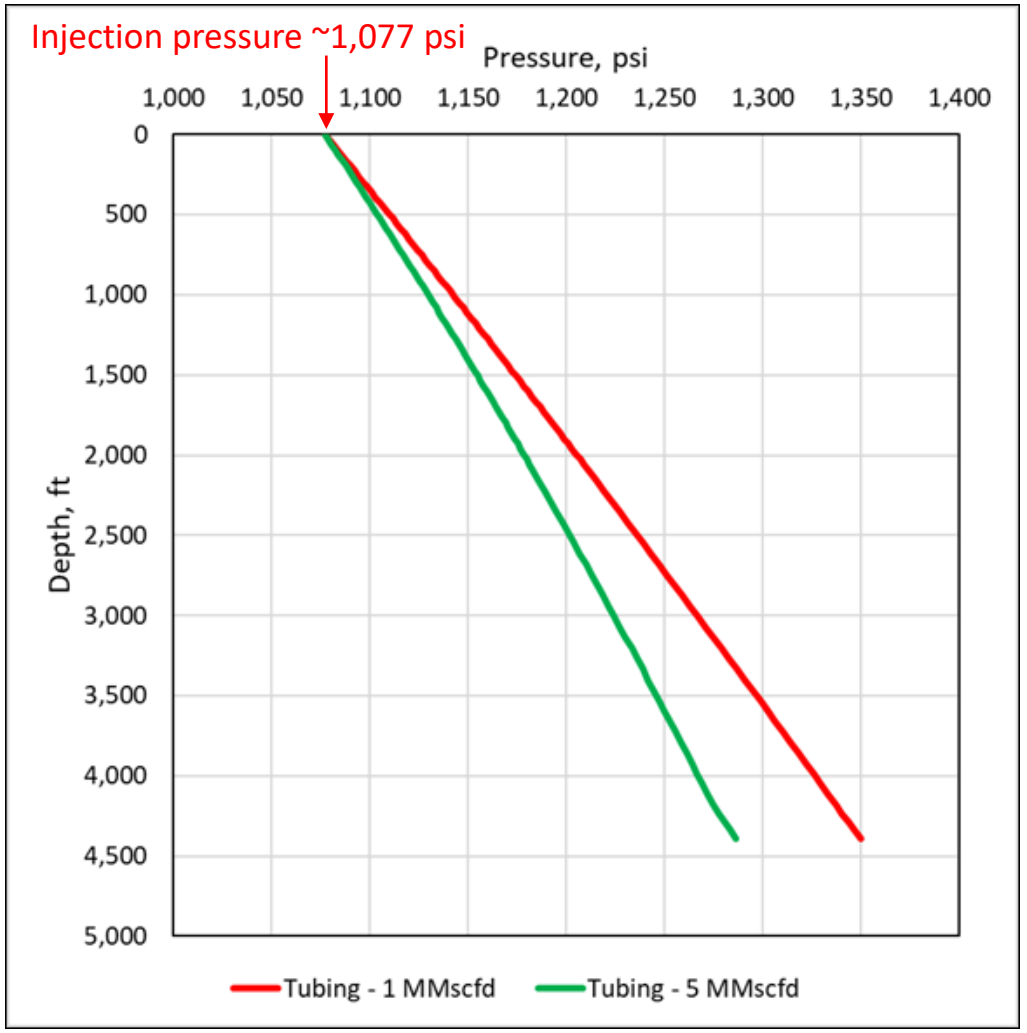
Pressure Base:	14.730 psia	Meter Status:	Active
Temperature Base:	60.00 °F	Contract Hr.:	7 AM
Atmos Pressure:	12.770 psi	Full Wellstream:	
Calc Method:	AGA3-2013	WV Technique:	
Z Method:	AGA-8 Detail (1992)	WV Method:	
Tube I.D.:	2.0670 in	HV Cond:	
Tap Location:	Upstream	Meter Type:	EFM
Tap Type:	Flange	Interval:	1 Hour

CO2	N2	C1	C2	C3	IC4	NC4	IC5
2.332	2.721	58.959	17.649	10.804	1.396	3.326	0.797

NC5	neo	C6	C7	C8	C9	C10
0.763		1.254	0.000	0.000	0.000	0.000

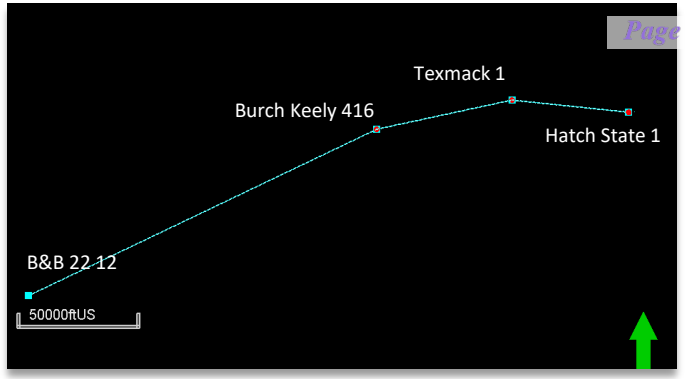
Ar	CO	H2	O2	He	H2O	H2S	H2S ppm
0.000	0.000	0.000	0.000	0.000	0.000	0.000	

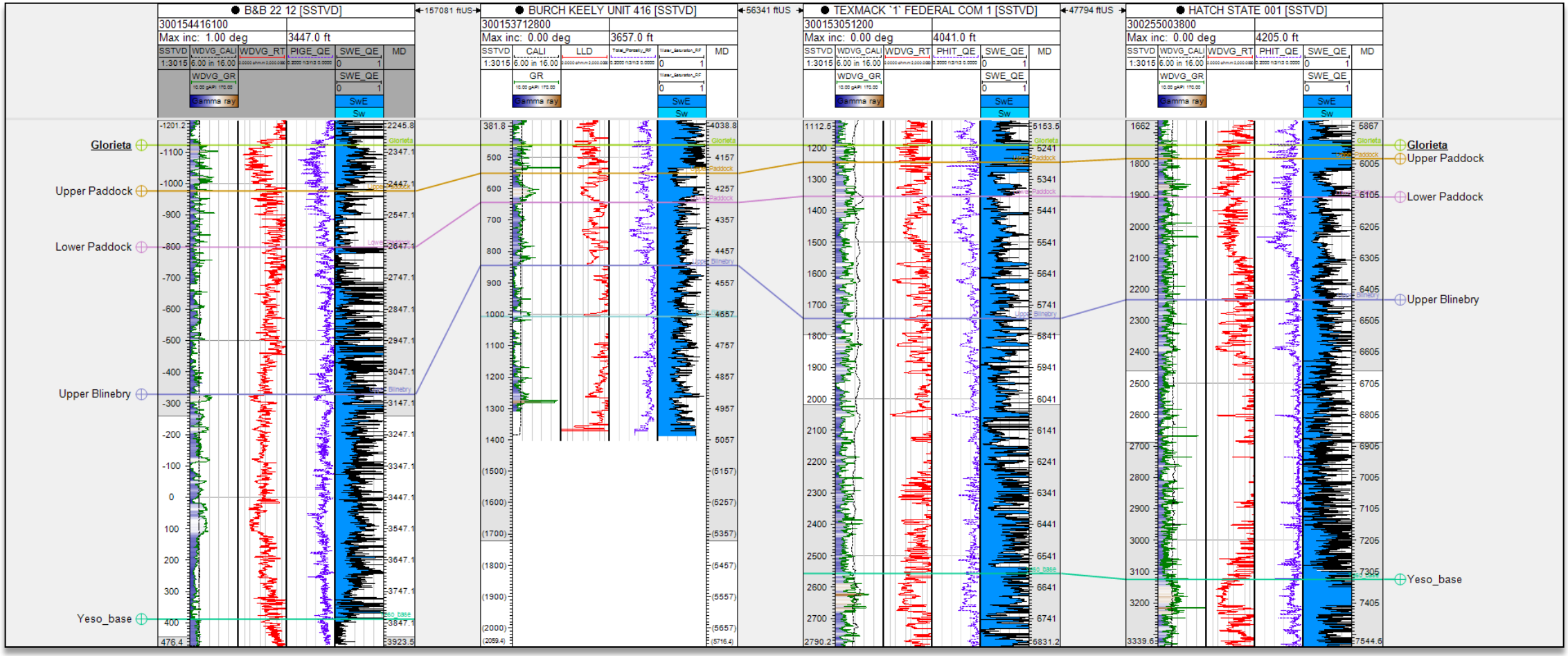
Day	Differential (In. H2O)	Pressure (psia)	Temp. (°F)	Flow Time (hrs)	Relative Density	Plate (inches)	Volume (Mcf)	Heating Value (Btu/scf)	Energy (MMBtu)	Edited
1	0.00	15.17	42.45	0.00	0.9148	1.2500	0.00	1471.96	0.00	Yes



Well Cross-Section

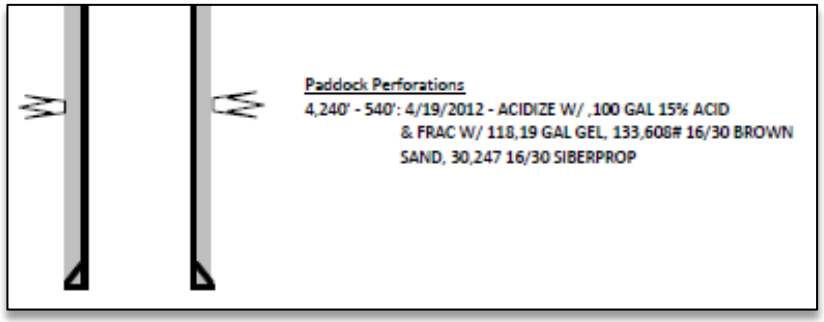
- The Texmack 1 was the closest well that had previously calibrated petrophysics and a 1D MEM.
- Used the Texmack log to stitch on the bottom of the #416 log for coverage below the Upper Blinebry.

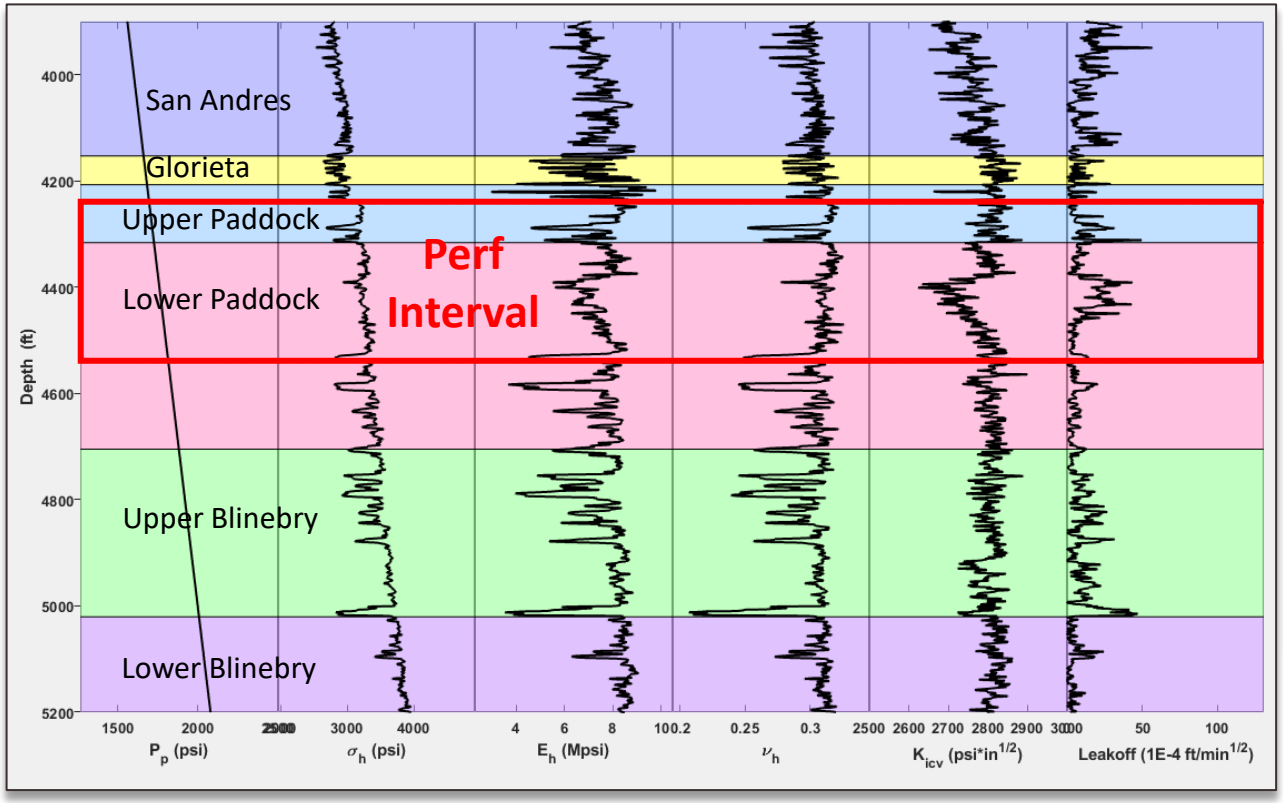


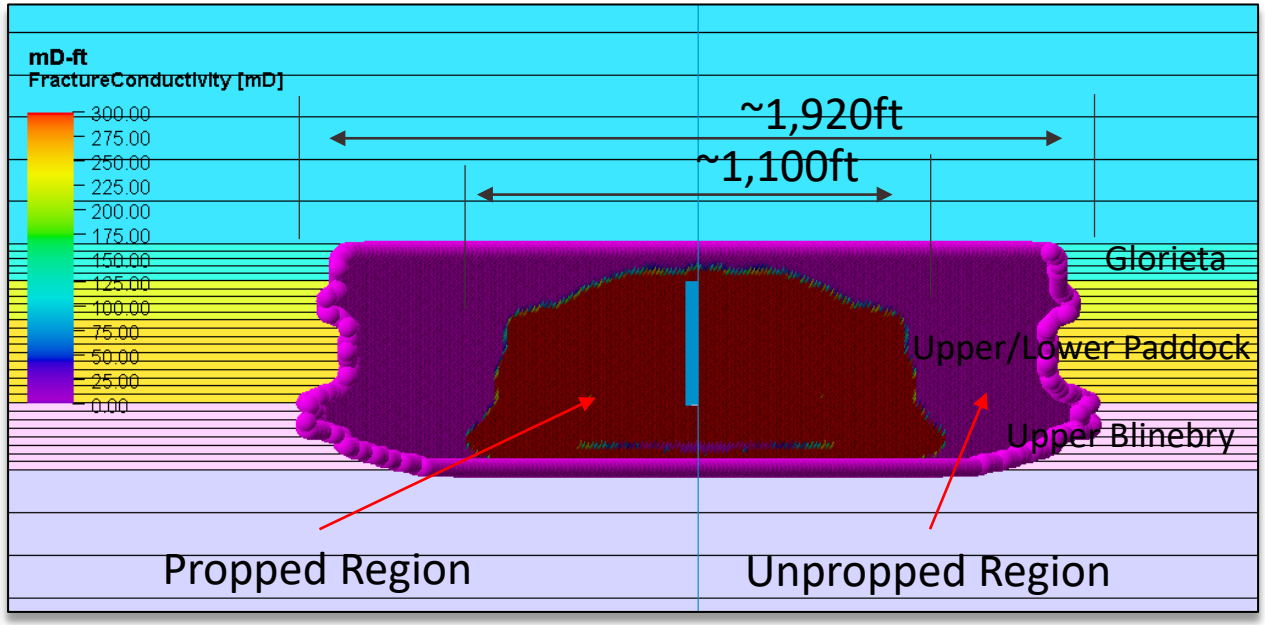


Hydraulic Fracture Geometries for Reservoir Simulation

- Utilized the Texmack MEM (shifted to the 566 depths) to perform ballpark frac geometry evaluation.
- Generated synthetic pump schedule that matched total stimulation volumes.
- Provides a good base framework for gas injection modeling.

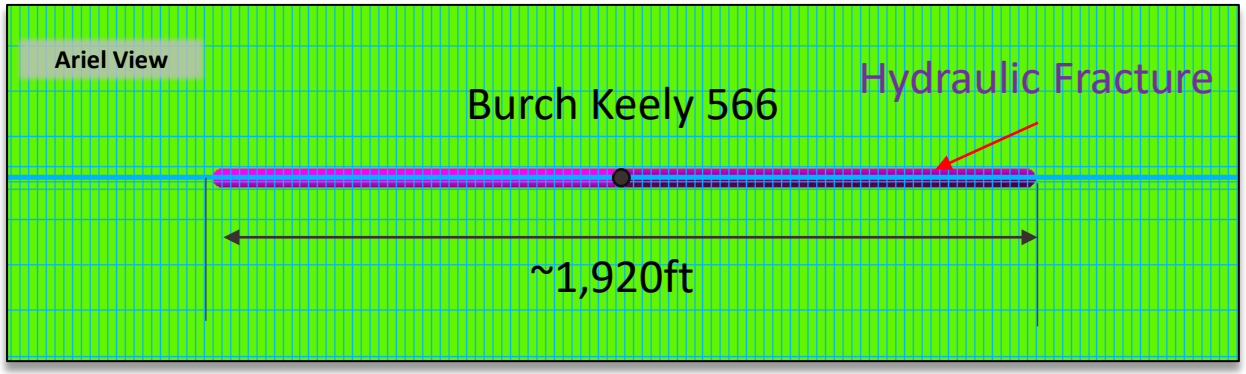


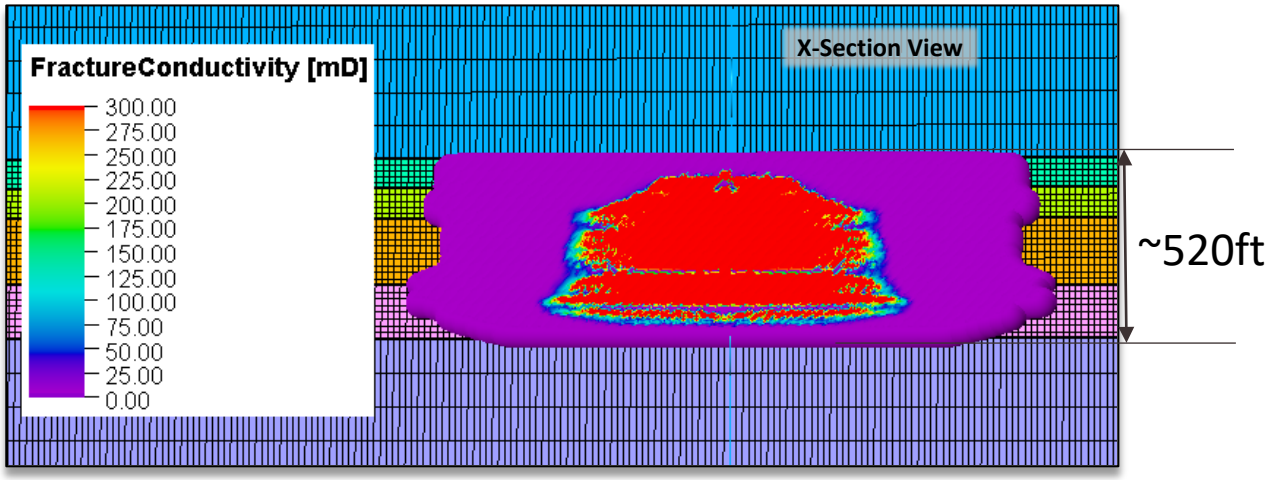




Reservoir Simulation Grid Construction

- Constructed reservoir simulation grid with single vertical well to represent the #566.
  - Single fracture plane to represent hydraulic fracture.
- Increased baseline permeabilities to obtain history match.

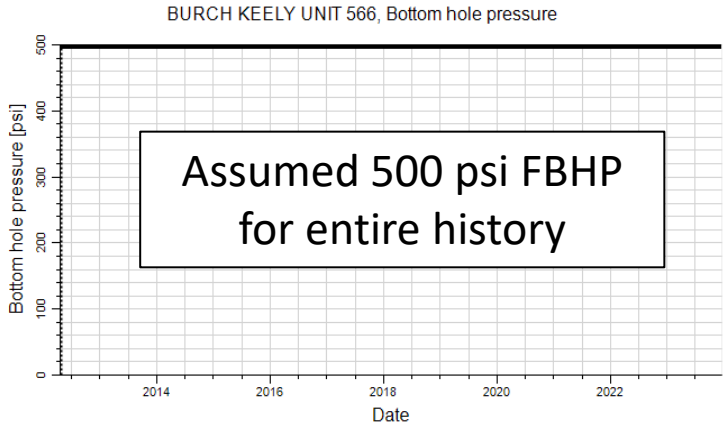


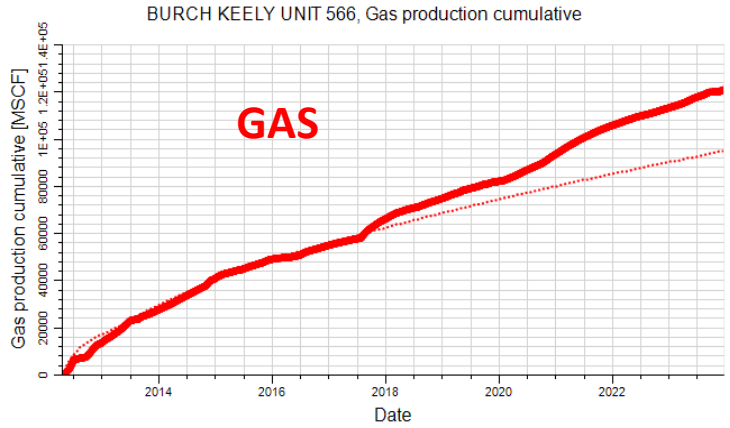


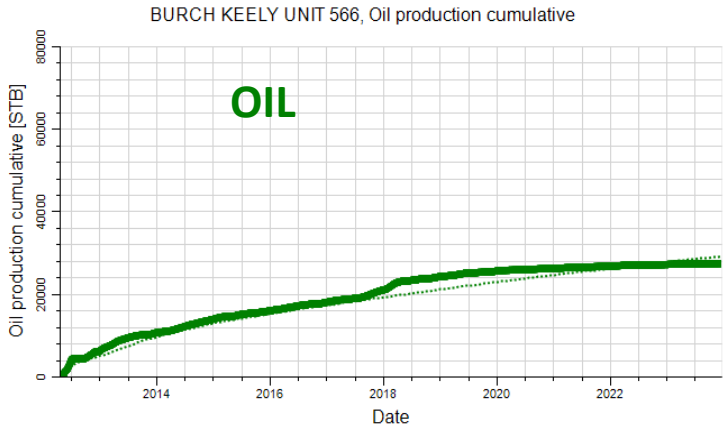
TVD	Thickness	Layer	Zones(hierarchy)	PHI	SW	HCPV	PERM
ft	ft			%	%	%	nD
4048.3	101.7	14	San Andres	4.7%	60%	1.9%	616
4150.0	18.0	15	Glorieta	5.3%	74%	1.4%	510
4168.0	18.0	16	Glorieta	3.8%	74%	1.0%	413
4186.0	18.0	17	Glorieta	3.8%	68%	1.2%	338
4204.0	18.0	18	Glorieta	3.9%	75%	1.0%	352
4222.0	18.0	19	Glorieta	5.8%	37%	3.7%	374
4240.0	18.6	20	Upper Paddock	4.7%	41%	2.8%	270
4258.6	18.6	21	Upper Paddock	5.9%	35%	3.8%	415
4277.2	18.6	22	Upper Paddock	5.8%	60%	2.3%	552
4295.8	18.6	23	Upper Paddock	6.0%	69%	1.8%	587
4314.4	18.6	24	Upper Paddock	4.3%	51%	2.1%	397
4333.0	20.1	25	Lower Paddock	2.8%	45%	1.6%	148
4353.1	20.1	26	Lower Paddock	3.6%	50%	1.8%	200
4373.2	20.1	27	Lower Paddock	5.6%	44%	3.2%	550
4393.3	20.1	28	Lower Paddock	6.8%	39%	4.1%	579
4413.4	20.1	29	Lower Paddock	6.4%	52%	3.1%	753
4433.5	20.1	30	Lower Paddock	7.7%	48%	4.0%	818
4453.5	20.1	31	Lower Paddock	3.1%	49%	1.6%	249
4473.6	20.1	32	Lower Paddock	4.2%	44%	2.3%	361
4493.7	20.1	33	Lower Paddock	5.0%	46%	2.7%	436
4513.8	20.1	34	Lower Paddock	5.0%	51%	2.4%	520
4533.9	20.4	35	Upper Blinebry	1.9%	52%	0.9%	85
4554.3	20.4	36	Upper Blinebry	1.4%	63%	0.5%	66
4574.7	20.4	37	Upper Blinebry	2.2%	54%	1.0%	132
4595.1	20.4	38	Upper Blinebry	2.0%	41%	1.2%	73
4615.5	20.4	39	Upper Blinebry	1.7%	53%	0.8%	69
4635.8	20.4	40	Upper Blinebry	2.0%	37%	1.3%	84
4656.2	20.4	41	Upper Blinebry	1.7%	43%	1.0%	57
4676.6	20.4	42	Upper Blinebry	3.3%	59%	1.3%	247

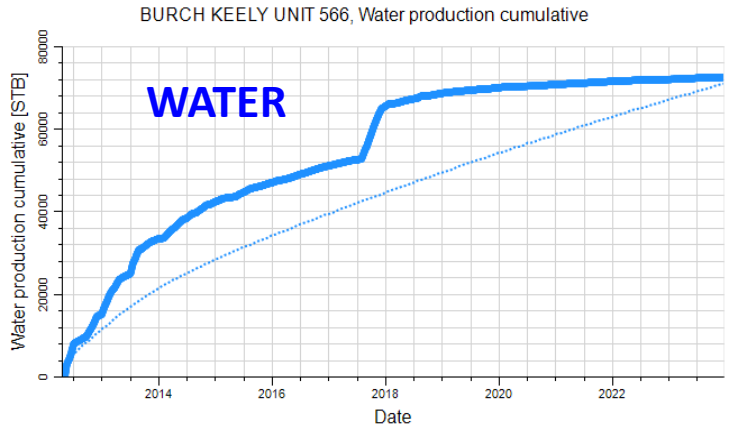
Burch Keely 566 Production Calibration

- A good volumetric calibration for the Burch Keely 566 was achieved.
- Provides the baseline model for gas injection modeling.

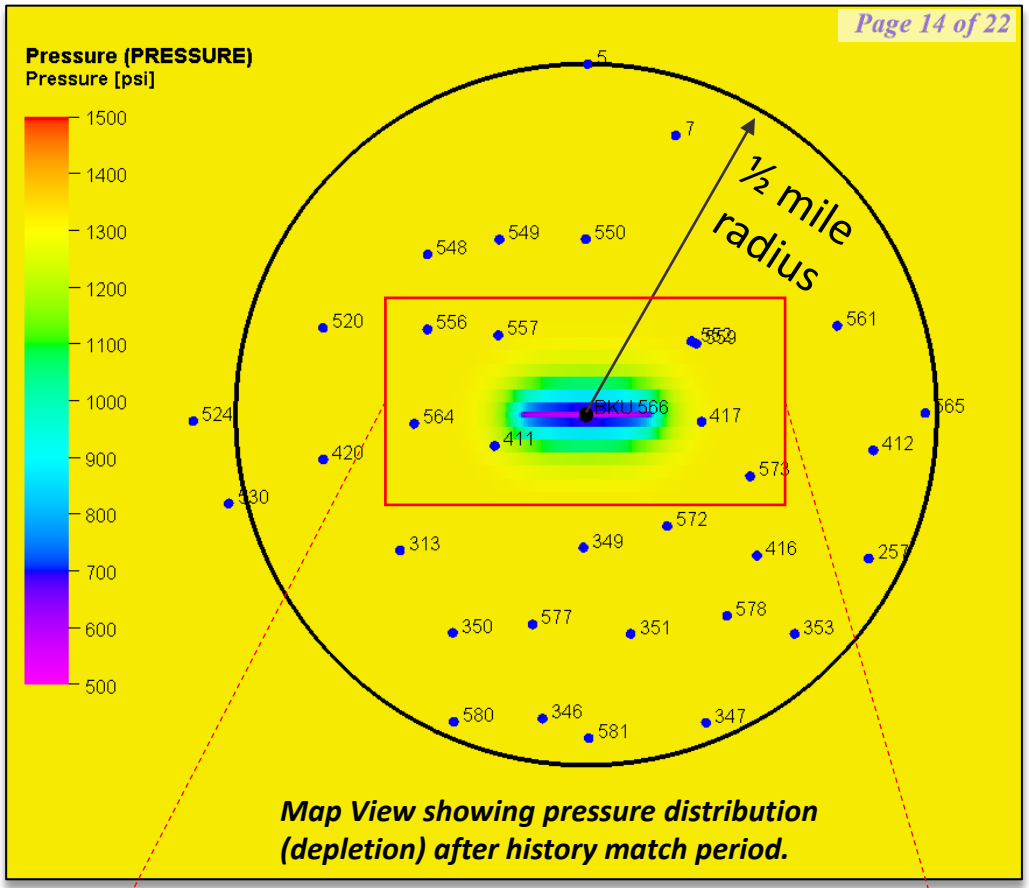




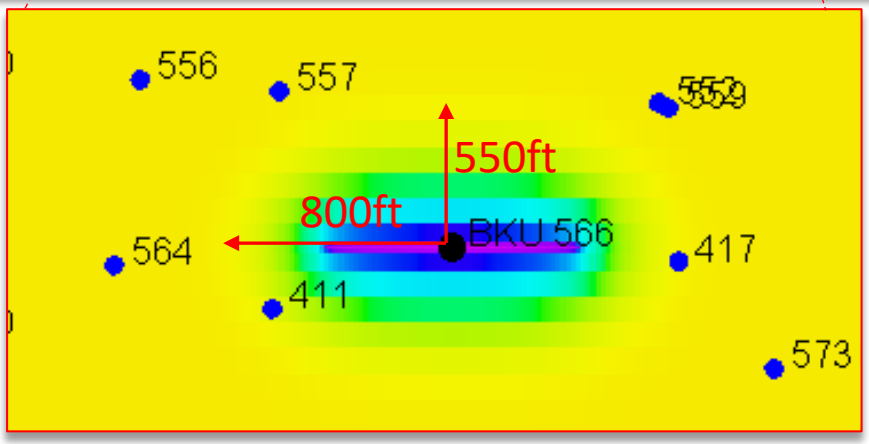




Thick line = Historical Thin line = Simulation



Map View showing pressure distribution (depletion) after history match period.

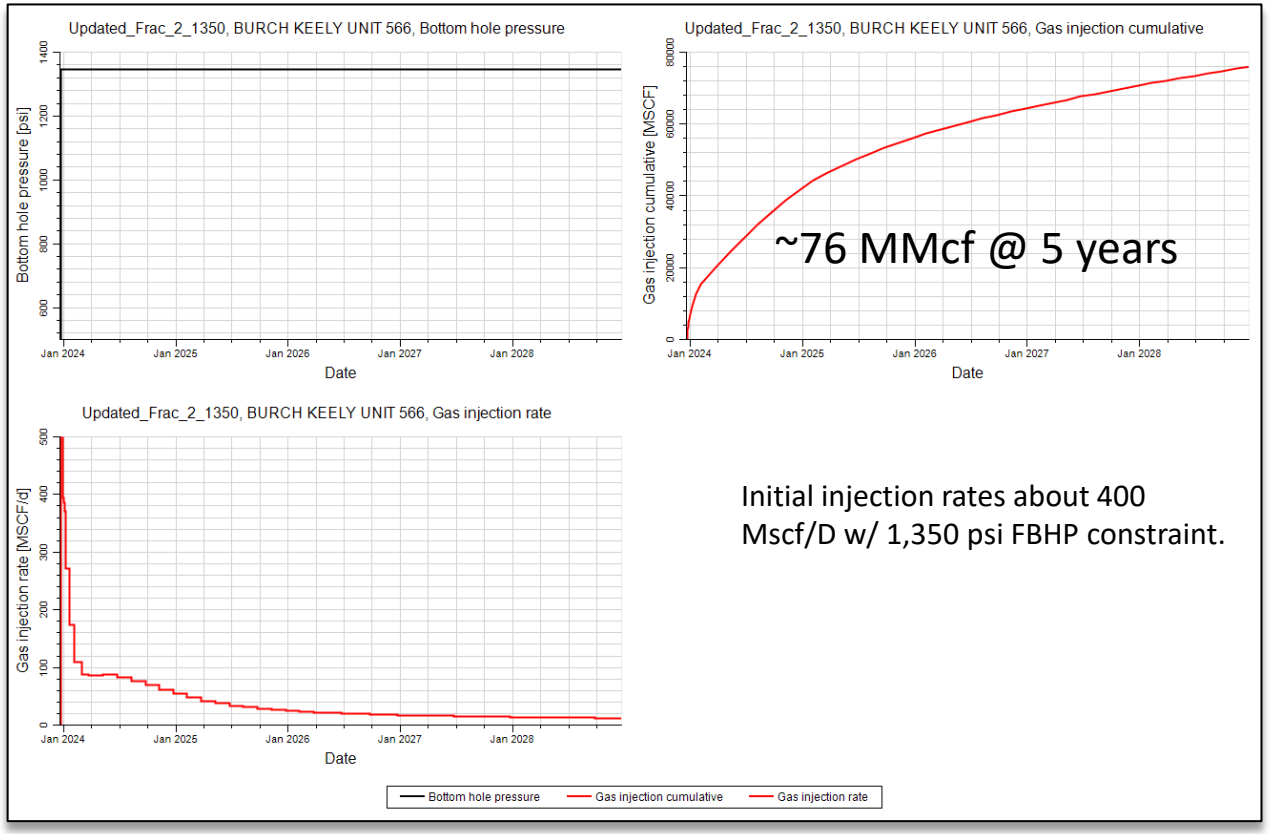


Burch Keely 566 Gas Injection Scenarios

After a base case depletion calibration was obtained, several gas injection scenarios were modeled:

1. Gas injection pressure at 1,350 psi Bottomhole Pressure (1,077 Surface Injection Pressure)
2. Gas injection rate at 5 MMscf/D

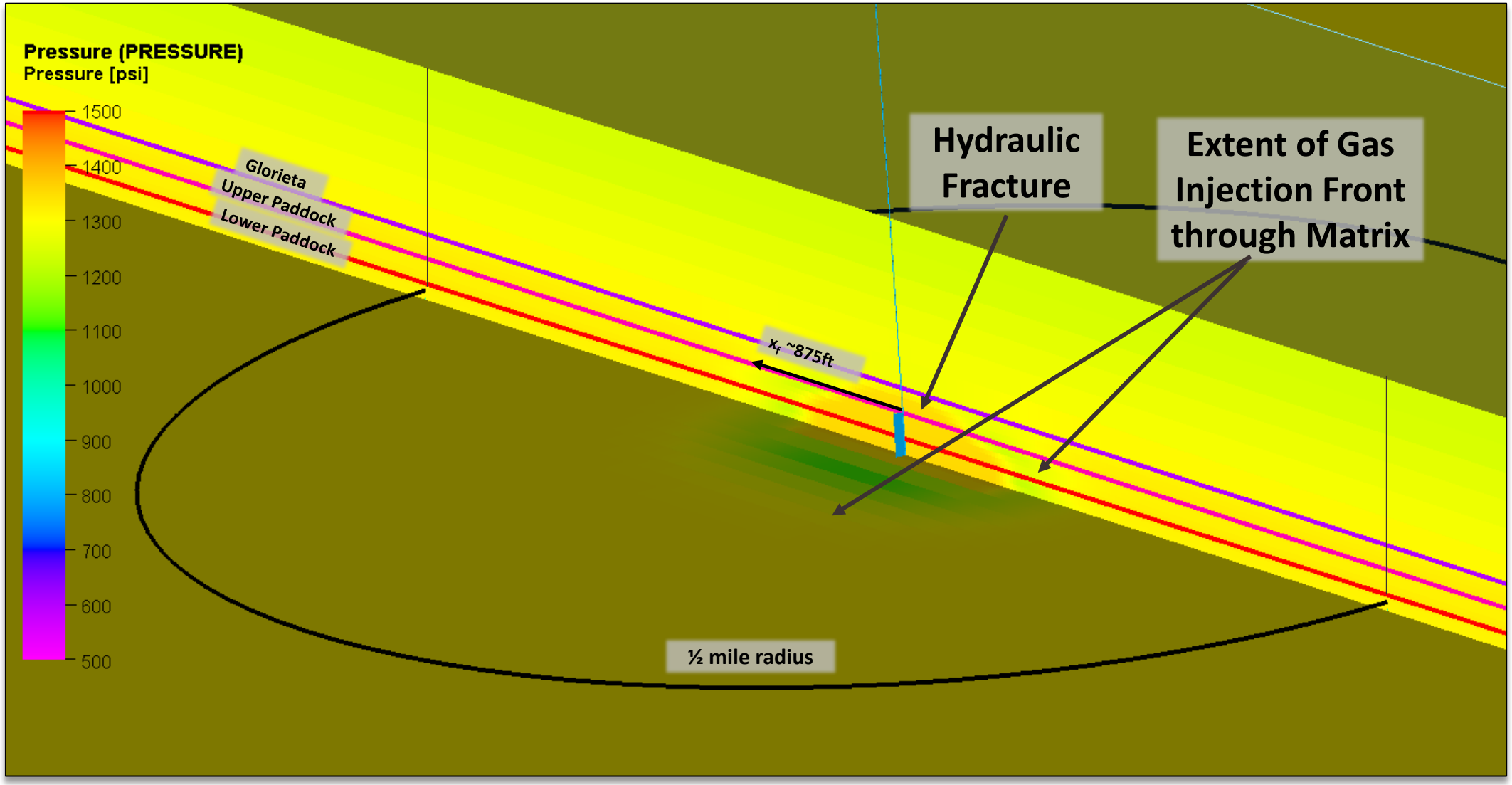
Gas Injection Pressure @ 1,350 FBHP



Initial injection rates about 400 Mscf/D w/ 1,350 psi FBHP constraint.

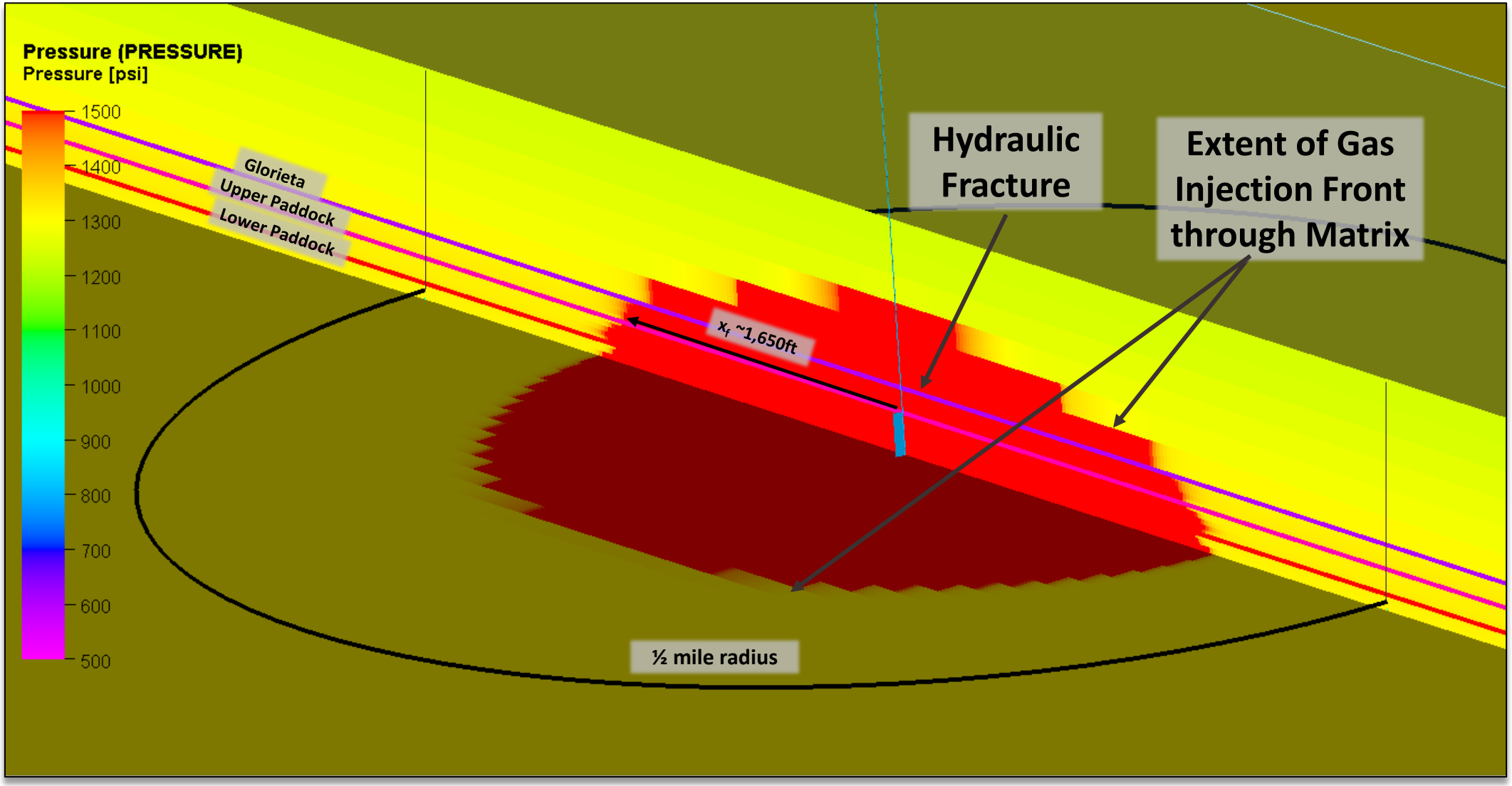
Burch Keely 566 Pressure at End of Gas Injection (5 years)

Gas Injection Pressure @ 1,350 FBHP



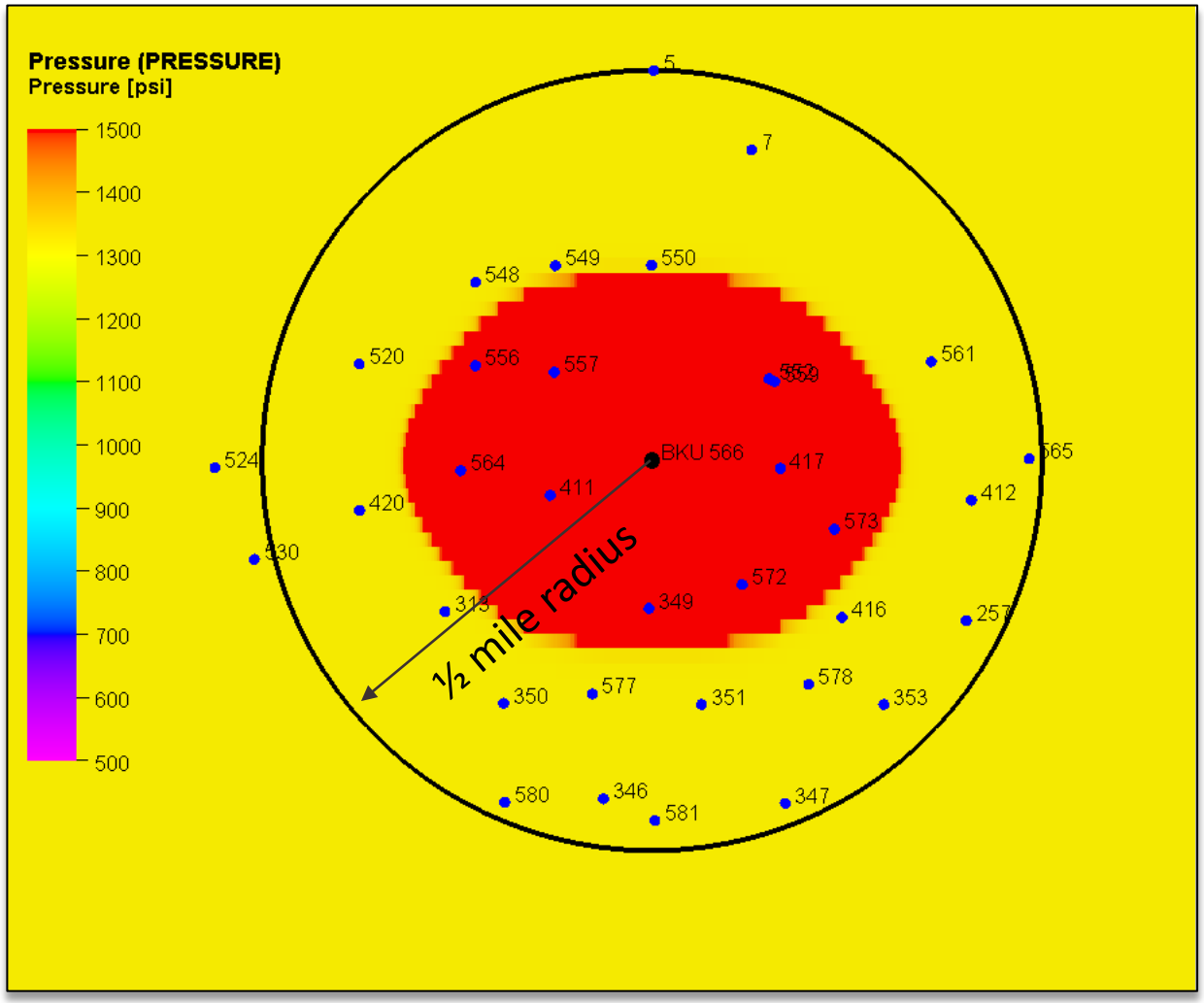
Burch Keely 566 Pressure at End of Gas Injection (5 years)

Gas Injection @ 5 MMscf/D

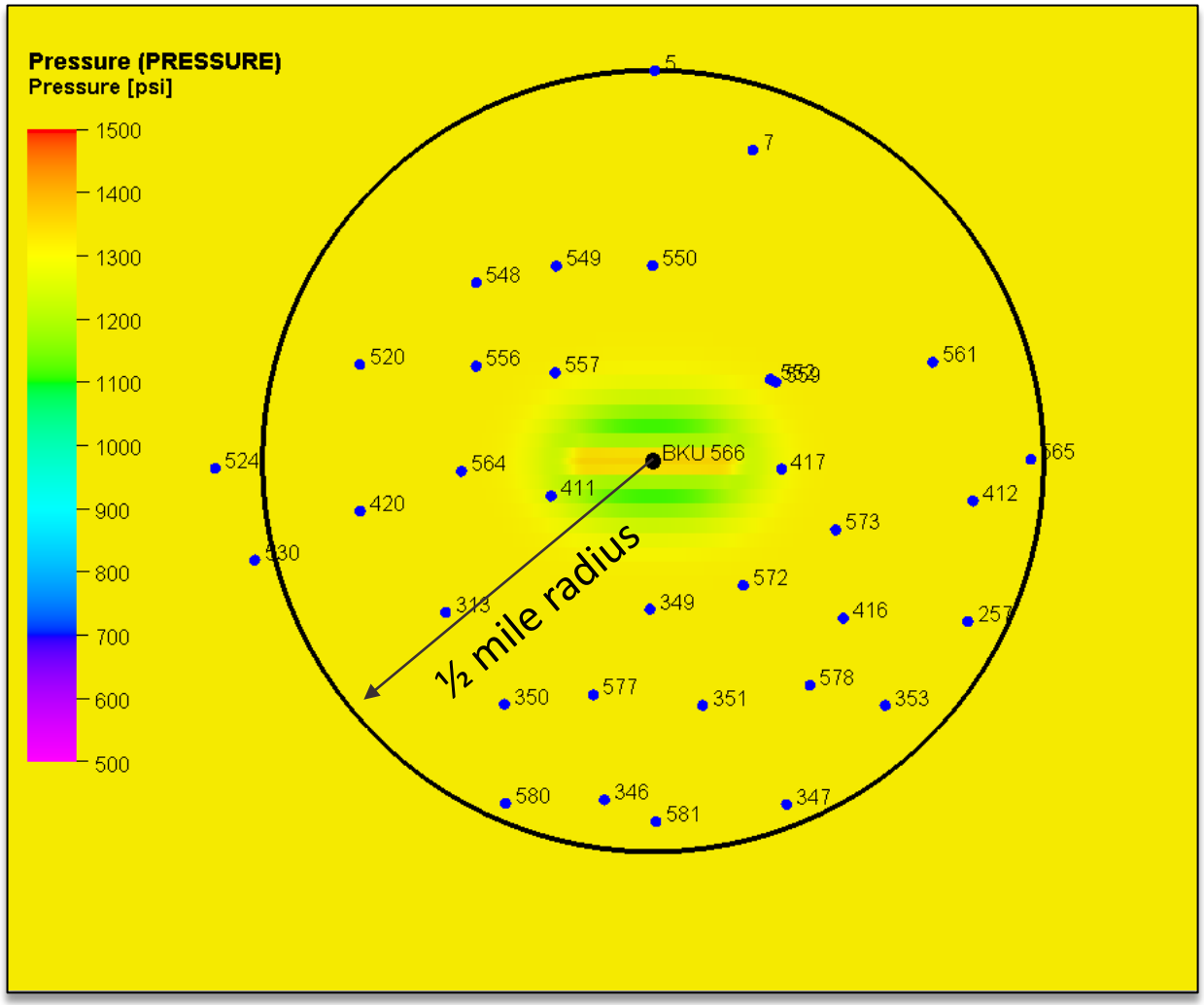


Burch Keely 566 Pressure at End of Gas Injection (5 years)

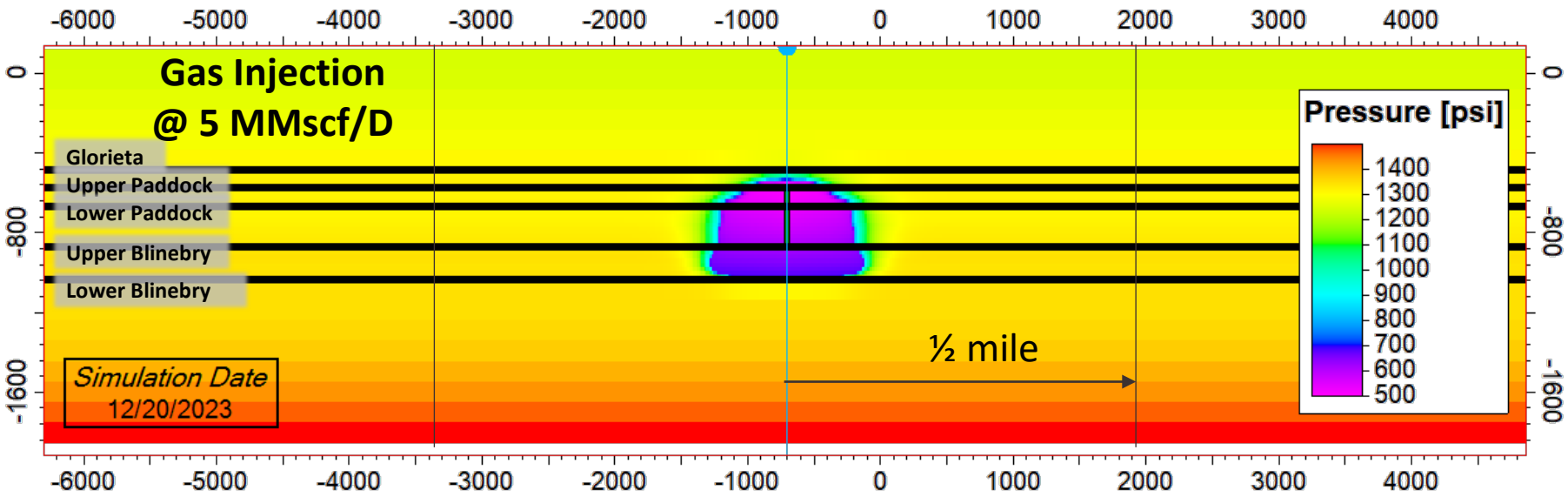
Gas Injection rate @ 5 MMscf/D

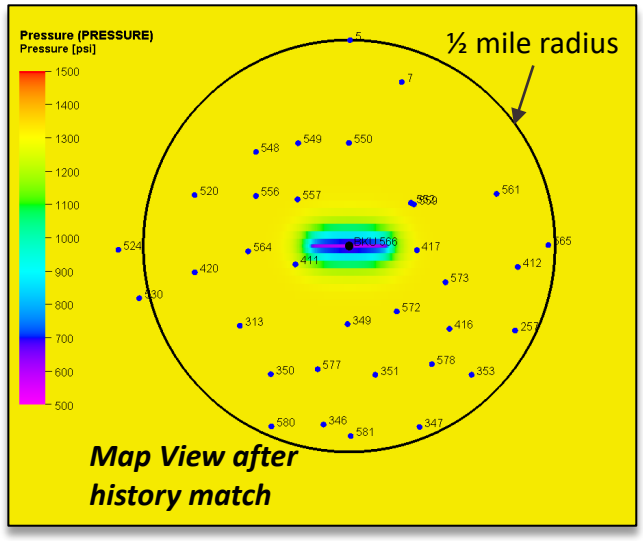


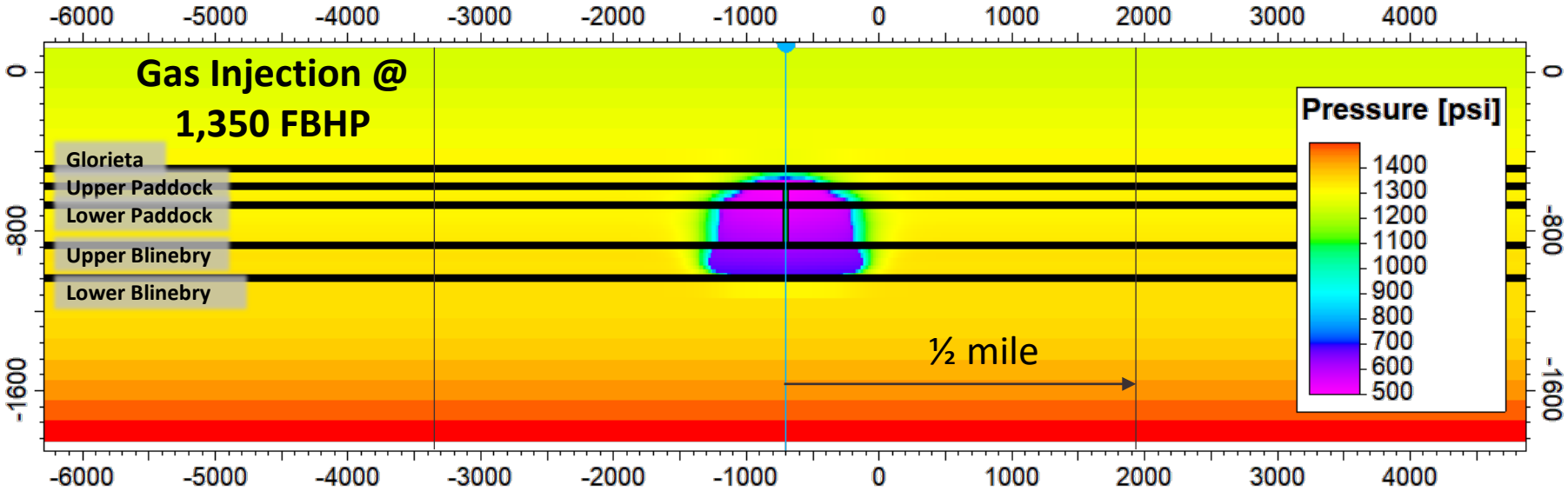
Gas Injection Pressure @ 1,350 FBHP

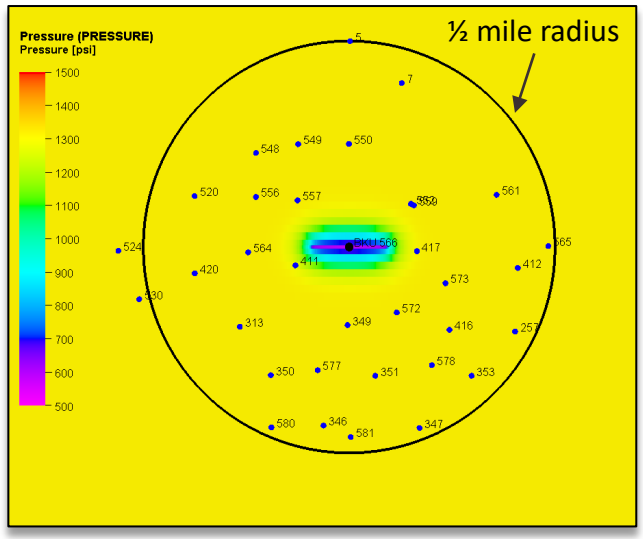


Burch Keely 566 Pressure at End of Production History

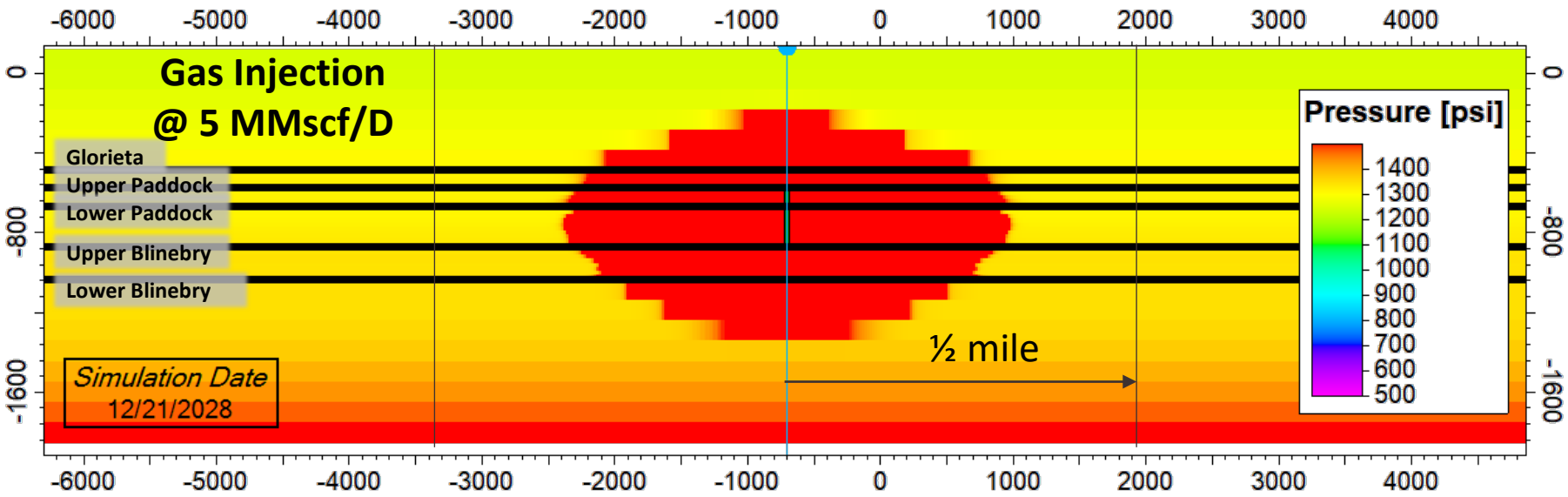


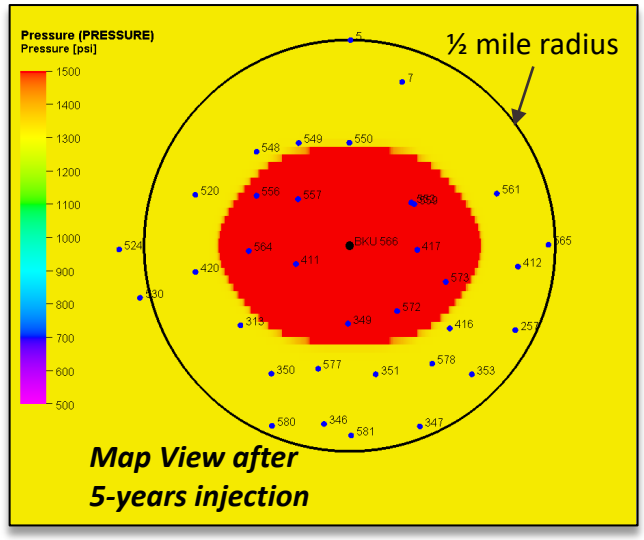


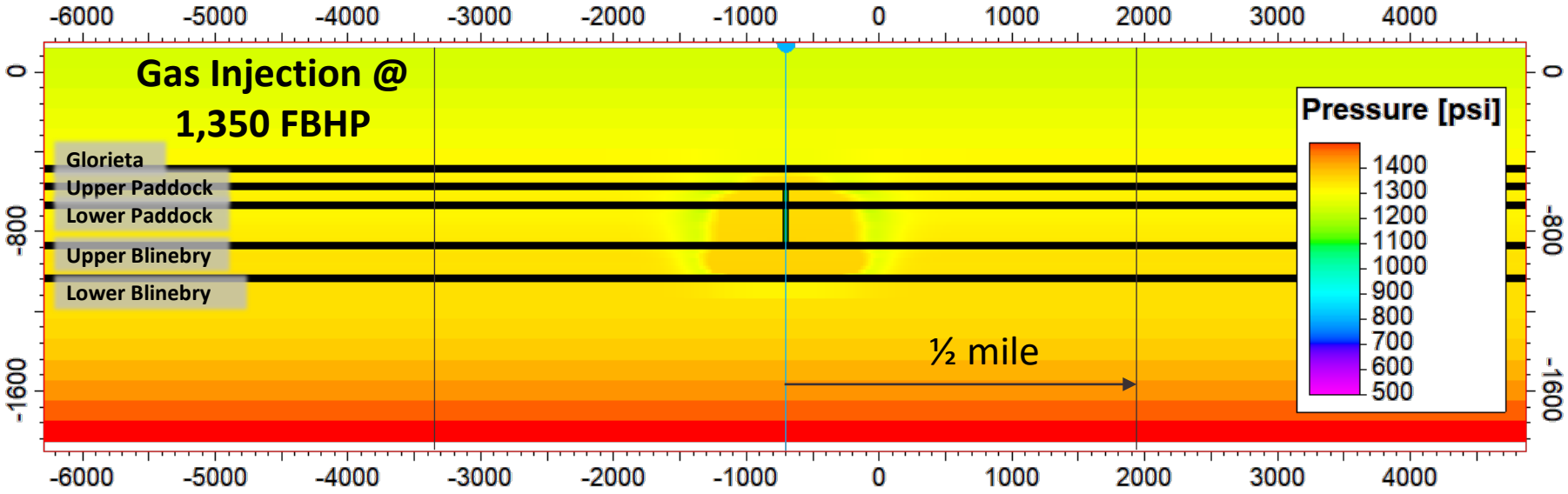


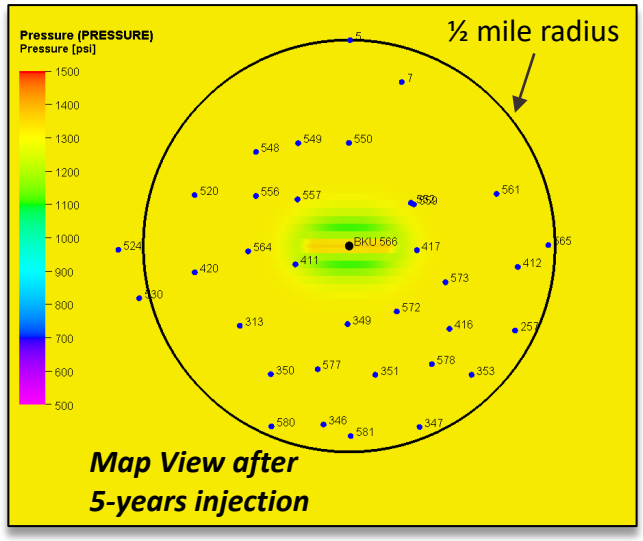


Burch Keely 566 Pressure at End of Gas Injection (5 years)

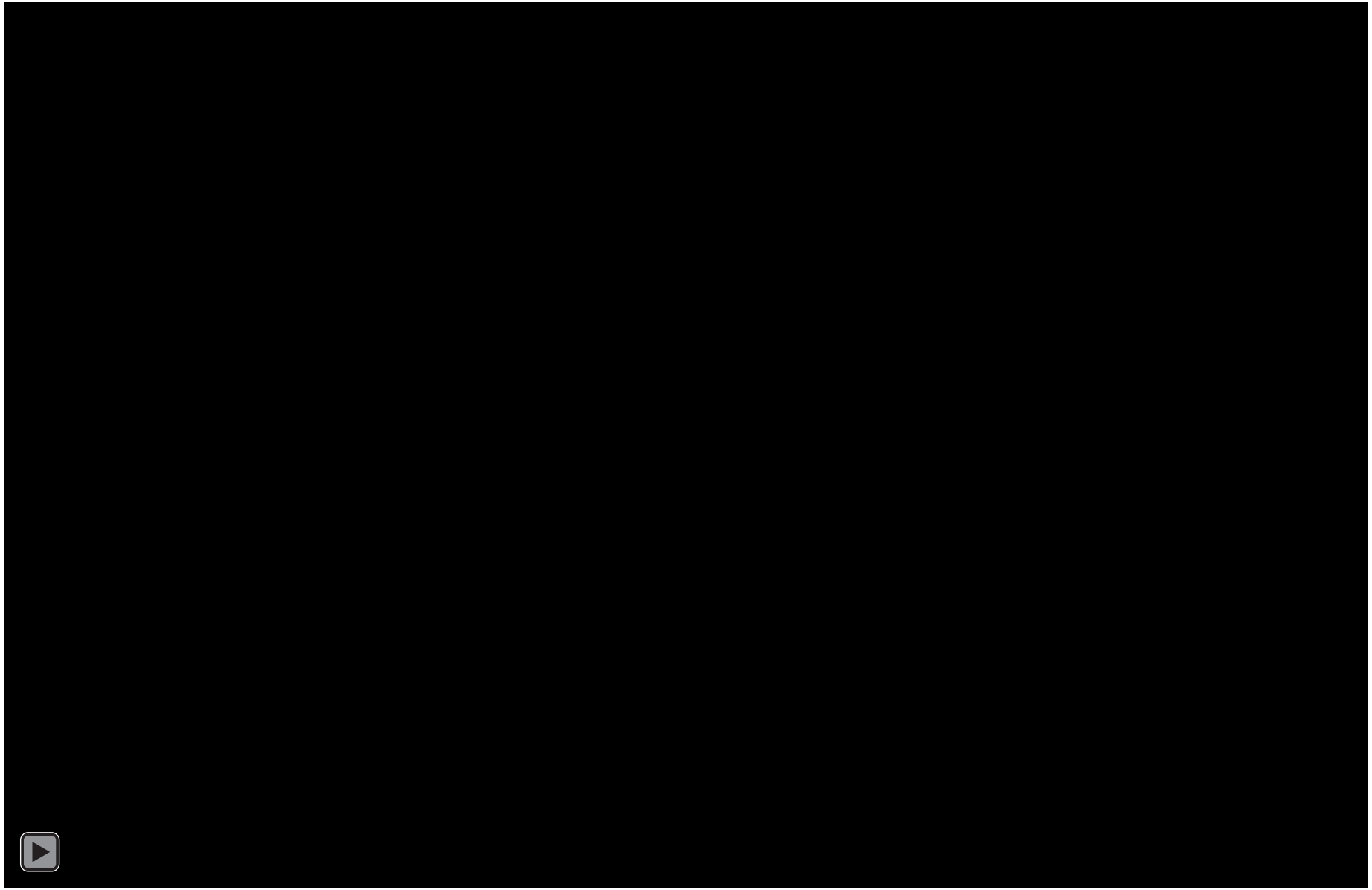


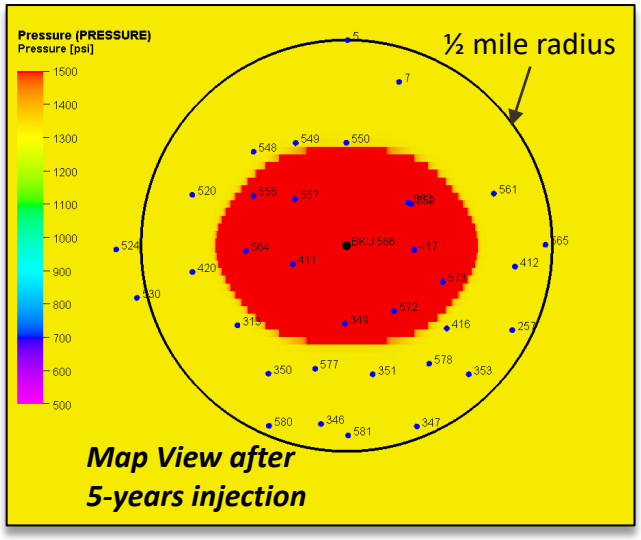


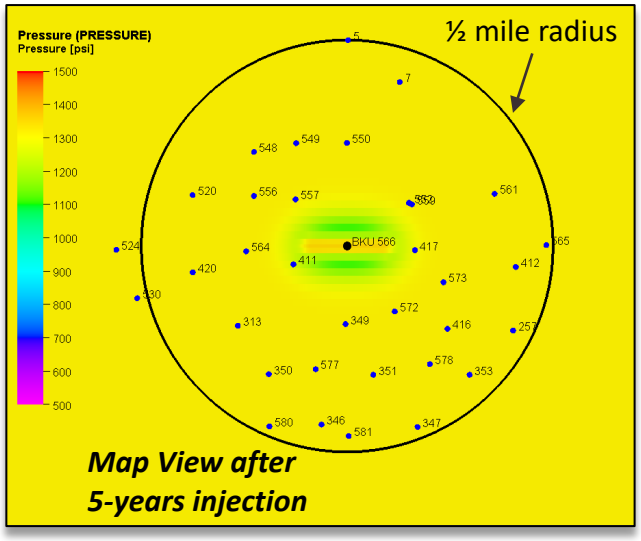




Burch Keely 566 Pressure w/ Injection (Movie)







REVISED SPUR EXHIBIT H

indicates that the well is getting more fluid inflow from the reservoir. If the well is ran on a Timer, the Timer will indicate the percent runtime.

Table 2. List of project wells in the proposed monitoring program.

Well Name	Well Number	API	Distance From BKU 566 (ft)	Facility Name	Every 6 Months	Every 12 Months
BURCH KEELY UNIT	411	30-015-36263	729	BURCH KEELY UNIT 18A TB	X	
BURCH KEELY UNIT	417	30-015-36181	869	BURCH KEELY UNIT 18A TB	X	
BURCH KEELY UNIT	557	30-015-39316	891	BURCH KEELY UNIT 18A TB	X	
BURCH KEELY UNIT	559	30-015-39317	931	BURCH KEELY UNIT 18A TB	X	
BURCH KEELY UNIT	552	30-015-39443	965	BURCH KEELY UNIT 18A TB	X	
BURCH KEELY UNIT	349	30-015-32783	1001	BURCH KEELY UNIT 13A NORTH TB	X	
BURCH KEELY UNIT	572	30-015-40268	1037	BURCH KEELY UNIT 18B EAST TB	X	
BURCH KEELY UNIT	564	30-015-39869	1297	BURCH KEELY UNIT 18A TB	X	
BURCH KEELY UNIT	573	30-015-40269	1319	BURCH KEELY UNIT 18B EAST TB	X	
BURCH KEELY UNIT	550	30-015-39523	1320	BURCH KEELY UNIT 18A TB	X	
BURCH KEELY UNIT	556	30-015-39907	1356	BURCH KEELY UNIT 18A TB	X	
BURCH KEELY UNIT	549	30-015-39522	1471	BURCH KEELY UNIT 18A TB		X
BURCH KEELY UNIT	577	30-015-39524	1630	BURCH KEELY UNIT 13B SOUTH TB		X
BURCH KEELY UNIT	416	30-015-37128	1668	BURCH KEELY UNIT 18B EAST TB		X
BURCH KEELY UNIT	351	30-015-32785	1684	BURCH KEELY UNIT 18B EAST TB		X
BURCH KEELY UNIT	548	30-015-39442	1696	BURCH KEELY UNIT 18A TB		X
BURCH KEELY UNIT	313	30-015-31273	1735	BURCH KEELY UNIT 13A NORTH TB		X
BURCH KEELY UNIT	578	30-015-39539	1848	BURCH KEELY UNIT 18B EAST TB		X
BURCH KEELY UNIT	350	30-015-32784	1925	BURCH KEELY UNIT 13A NORTH TB		X
BURCH KEELY UNIT	561	30-015-39318	2005	BURCH KEELY UNIT 18A TB		X
BURCH KEELY UNIT	420	30-015-36180	2008	BURCH KEELY UNIT 13A NORTH TB		X
BURCH KEELY UNIT	520	30-015-39315	2087	BURCH KEELY UNIT 13A NORTH TB		X
BURCH KEELY UNIT	412	30-015-36182	2178	BURCH KEELY UNIT 18A TB		X
MERAK 7 FEDERAL	7	30-015-40613	2208	MERAK 7 FEDERAL 8 TB		X
BURCH KEELY UNIT	353	30-015-32787	2277	BURCH KEELY UNIT 18B EAST TB		X
BURCH KEELY UNIT	346	30-015-32782	2312	BURCH KEELY UNIT 13A NORTH TB		X
BURCH KEELY UNIT	581	30-015-40271	2325	BURCH KEELY UNIT 13B SOUTH TB		X
BURCH KEELY UNIT	257	30-015-29035	2387	BURCH KEELY UNIT 18B EAST TB		X
BURCH KEELY UNIT	347	30-015-28090	2488	BURCH KEELY UNIT 18B EAST TB		X
BURCH KEELY UNIT	580	30-015-40270	2518	BURCH KEELY UNIT 13B SOUTH TB		X
BURCH KEELY UNIT	530	30-015-39519	2529	BURCH KEELY UNIT 13A NORTH TB		X
BURCH KEELY UNIT	565	30-015-39568	2553	BURCH KEELY UNIT 18A TB		X
BURCH KEELY UNIT	524	30-015-39518	2625	BURCH KEELY UNIT 13A NORTH TB		X
MERAK 7 FEDERAL	5	30-015-40611	2641	MERAK 7 FEDERAL 8 TB		X

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