# Additional Information

1st Extension Request 11/9/21

PERMIAN OILFIELD PARTNERS

PO Box 3329 • Hobbs, NM 88241 • (817) 606-7630

November 9, 2021

Via E-mail

Oil Conservation Division
Energy, Minerals and Natural Resources Department
1220 South Saint Francis Drive
Santa Fe, New Mexico 87505
OCD.Engineer@state.nm.us

**Re: Permian Oilfield Partners, LLC Request for Extension of Time to Commence Injection Operations Under Order SWD-2103**

Dear Oil Conservation Division:

Permian Oilfield Partners, LLC ("Permian") respectfully requests an additional one (1) year extension to commence injection operations in the Straight Shooter State SWD #1, under Order SWD-2103. This extension is being requested because there have been changes in Permian's drilling schedule due to COVID-19 and current market conditions.

In Permian's opinion, good cause exists for an extension of time. Due to the delays occasioned by COVID-19, Permian cannot commence injection operations before the Order's current expiration date, which is December 10, 2021. Permian intends to drill and operate the Well.

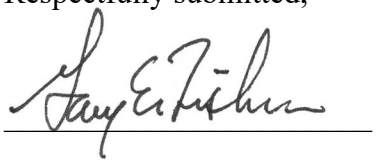
Permian understands that the NMOCD has adopted a new UIC form of order and, if NMOCD grants the extension of time, Permian agrees either that the terms of the new UIC form of order related to seismicity can be incorporated into the Order or, alternatively, Permian agrees that the Order can be replaced with the revised UIC form of order to conform the Order to the new UIC form of order.

Permian has reviewed the 1-mile Area of Review (AOR) associated with this well and no new affected parties were identified and no additional wells penetrating the approved injection interval have been drilled.

Permian prepared an updated Statement Regarding Seismicity and it is included with this request. As evidenced by the updated analysis, the likelihood of fault slip is extremely low, even over time. The distances from the Well to the nearest known fault is approximate 6.4 miles. The probability of an induced seismic event is calculated to be 0% after 5, 10, 20, and 30 years.

For these reasons, Permian respectfully requests that Order SWD-2103 be amended to allow Permian an additional one-year extension of time to commence injection into the Well, through December 10, 2022.

Respectfully submitted,



Gary E. Fisher
President

**Attachment to C-108**
**Permian Oilfield Partners, LLC**
**Straight Shooter State SWD #1**
**Sec. 30, Twp. 24S, Rge. 33E**
**1745' FSL, 319' FWL**
**Lea County, NM**

November 5, 2021

STATEMENT REGARDING SEISMICITY-**REVISED**

Examination of the USGS and TexNet seismic activity databases has shown minimal historic seismic activity in the AOI (< 5.64 miles) of our proposed above referenced SWD well as follows:

1. M2.9, 1984-12-09, 6.65 miles away @ 33.48 deg heading

However, there have been recent seismic events located approximately 9.5 miles to the southwest, in and around Sect. 6, Twp. 26S, Rge. 32E. These recent seismic events were used to estimate potential fault lines for FSP analysis, in addition to previously known faults as described below.

Permian Oilfield Partners does not own any 2D or 3D seismic data in the area of this proposed SWD well. Our fault interpretations are based on well to well correlations and publicly available data and software as follows:

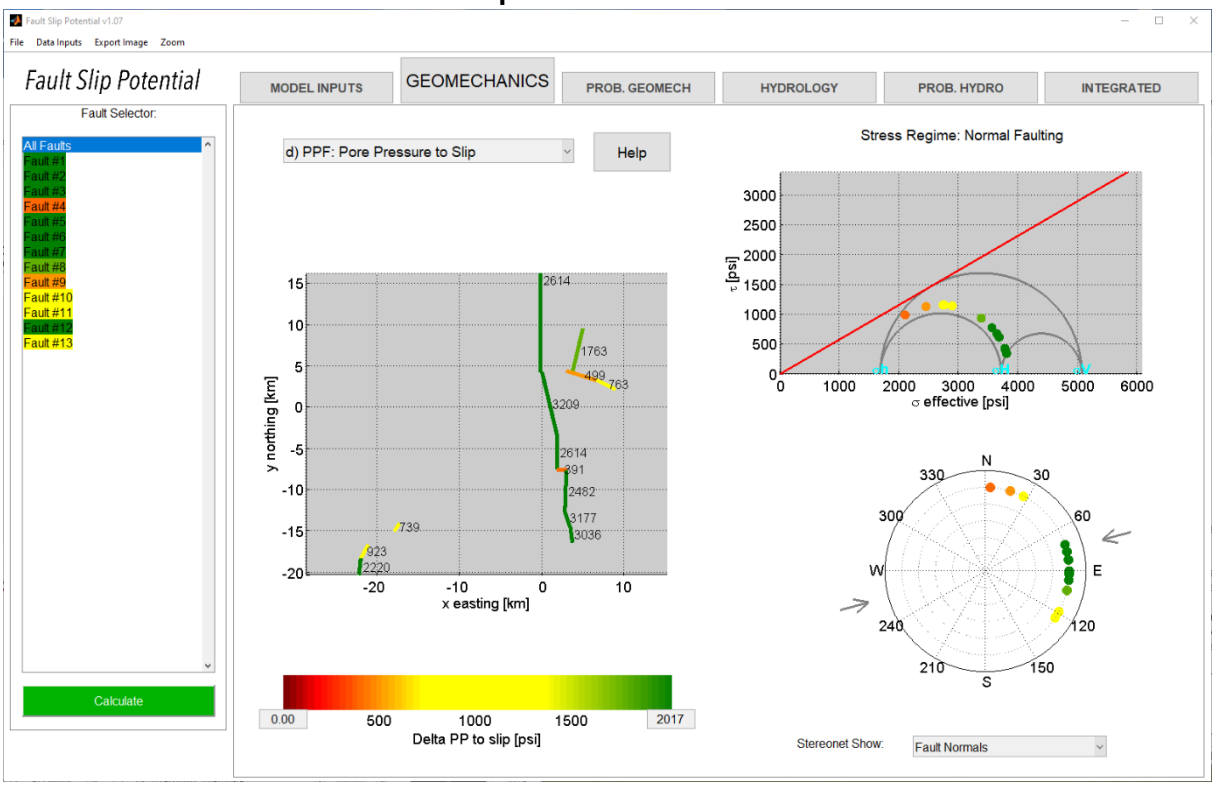
1. USGS Quaternary Fault & Fold database shows no quaternary faults in the nearby area.
2. Based on offset well log data, we have not interpreted any faults in the immediate area.
3. Basement faults are documented in the Snee & Zoback paper, "State of stress in the Permian Basin, Texas and New Mexico: Implications for induced seismicity", published in the February 2018 issue of the SEG journal, The Leading Edge, along with a method for determining the probability of fault slip in the area.
4. Fault data was also correlated to the publicly available USGS GIS geologic units & structural features database, the NMOCD SWD Applications & Fault Map dated 6/22/2020, and to fault maps as published in the New Mexico Geological Society Special Publication 13A, "Energy and Mineral Resources of New Mexico: Petroleum Geology," by R. F. Broadhead, 2017.

5. Permian Oilfield Partners ran modeling to check for fault slip assuming that any known faults penetrate the Devonian-Silurian injection zone. Software as discussed in #3 from the Stanford Center for Induced and Triggered Seismicity, “FSP 1.0: A program for probabilistic estimation of fault slip potential resulting from fluid injection”, was used to calculate the probability of the fault being stressed so as to create an induced seismic event.
6. The distance from the proposed injection well to the nearest known fault is approximately 6.4 mi (10.3 km). The probability of an induced seismic event is calculated to be 0% after 5, 10, 20, & 30 years as per the FSP results screenshots below.

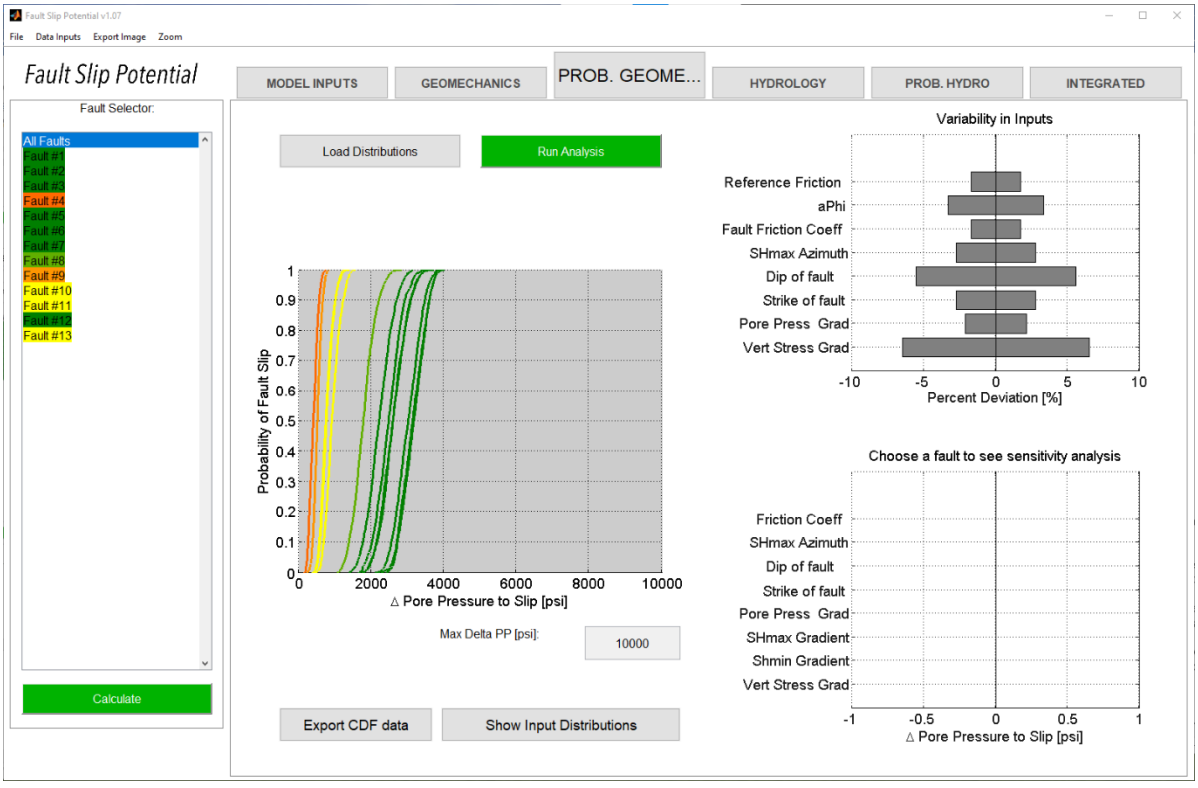
**Input assumptions:**

| | |
|---|---|
| Rate (BBL/day) | 50000 |
| Interval height (ft) | 1639 |
| Average Porosity (%) | 4.3 |
| Vert stress gradient (psi/ft) | 0.77 |
| Hor stress direction (deg N) | 75 |
| Fault dip (deg) | 75 |
| Ref depth (ft) | 16888 |
| Initial res press gradient (psi/ft) | 0.47 |
| A phi | 0.6 |
| Friction coefficient | 0.58 |
| Weighted Average perm (mD) | 25 |
| Fluid density (kg/m3) | 1100 |
| Dynamic viscosity (Pa-s) | 0.0003 |
| Fluid compressibility (/Pa) | 4 e-10 |
| Rock compressibility (/Pa) | 1.08 e-09 |

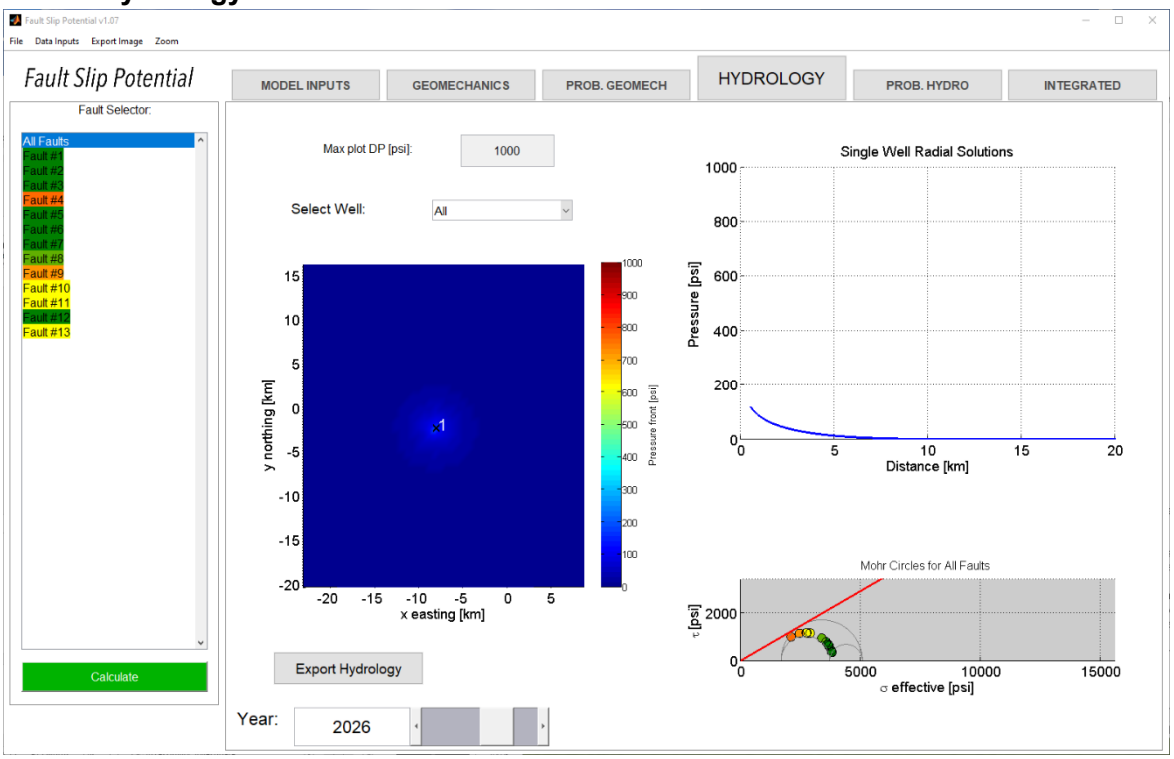
## Geomechanics Pore Pressure to Slip



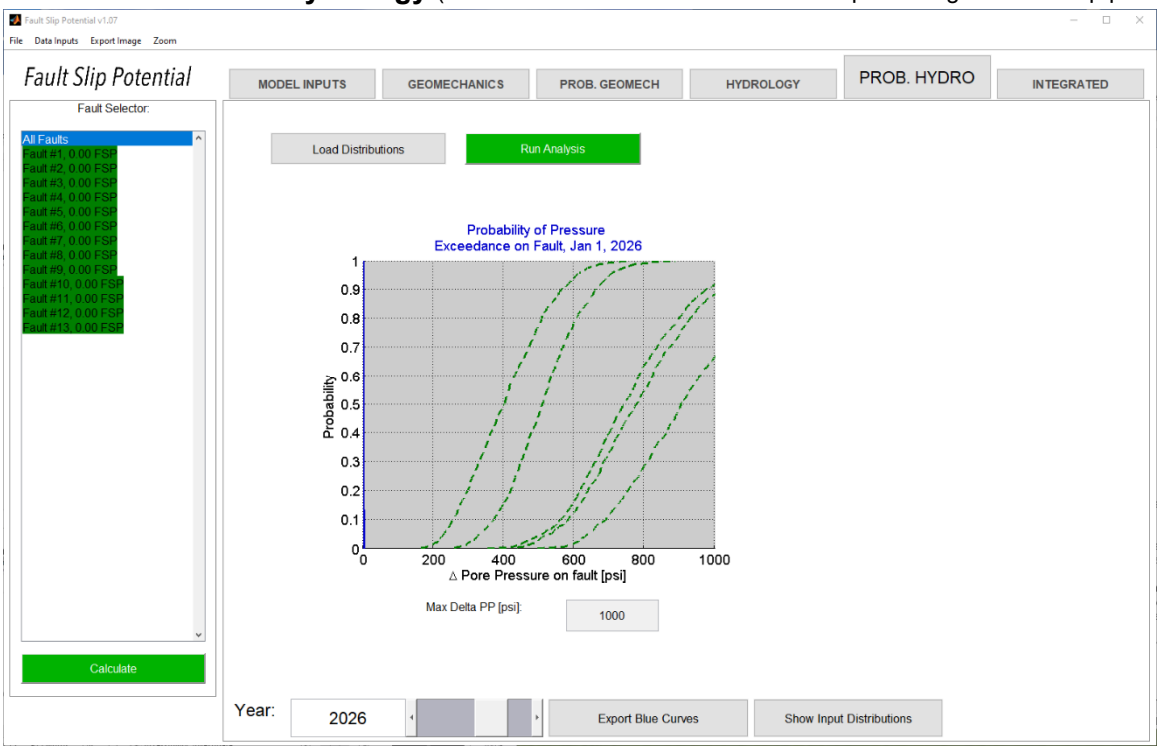

## GeoMechanics Variability



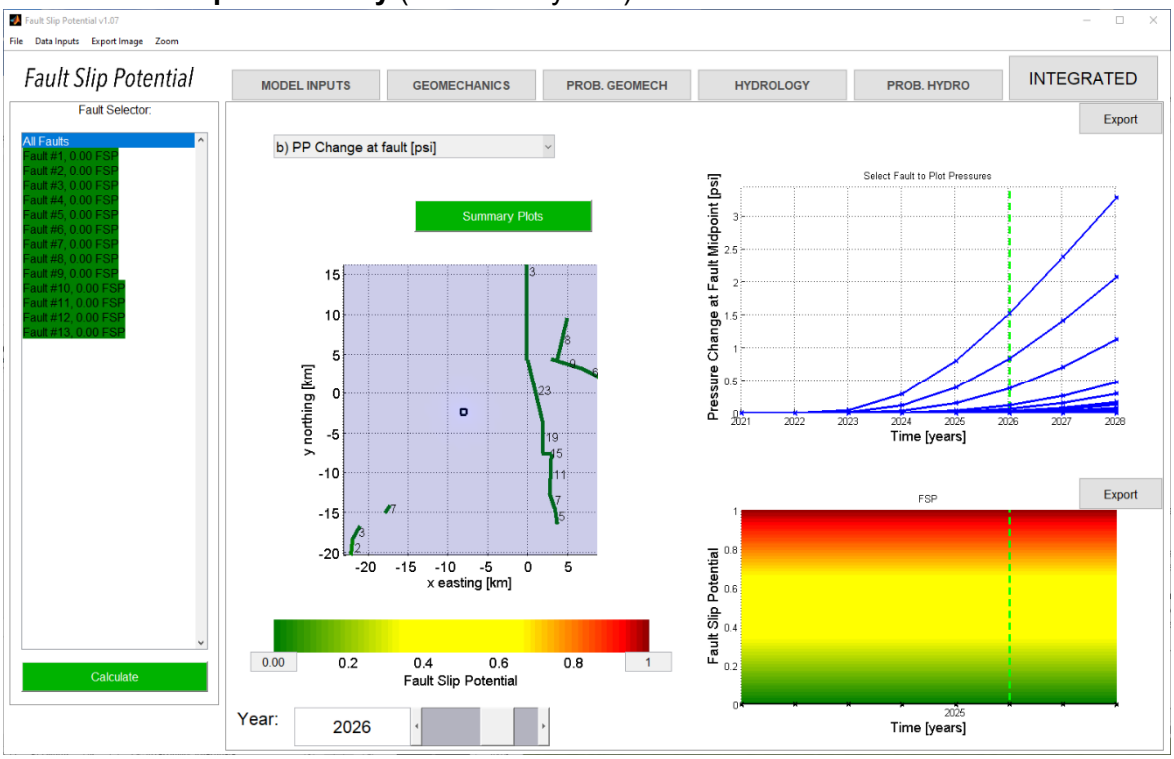
## Year 5 Hydrology



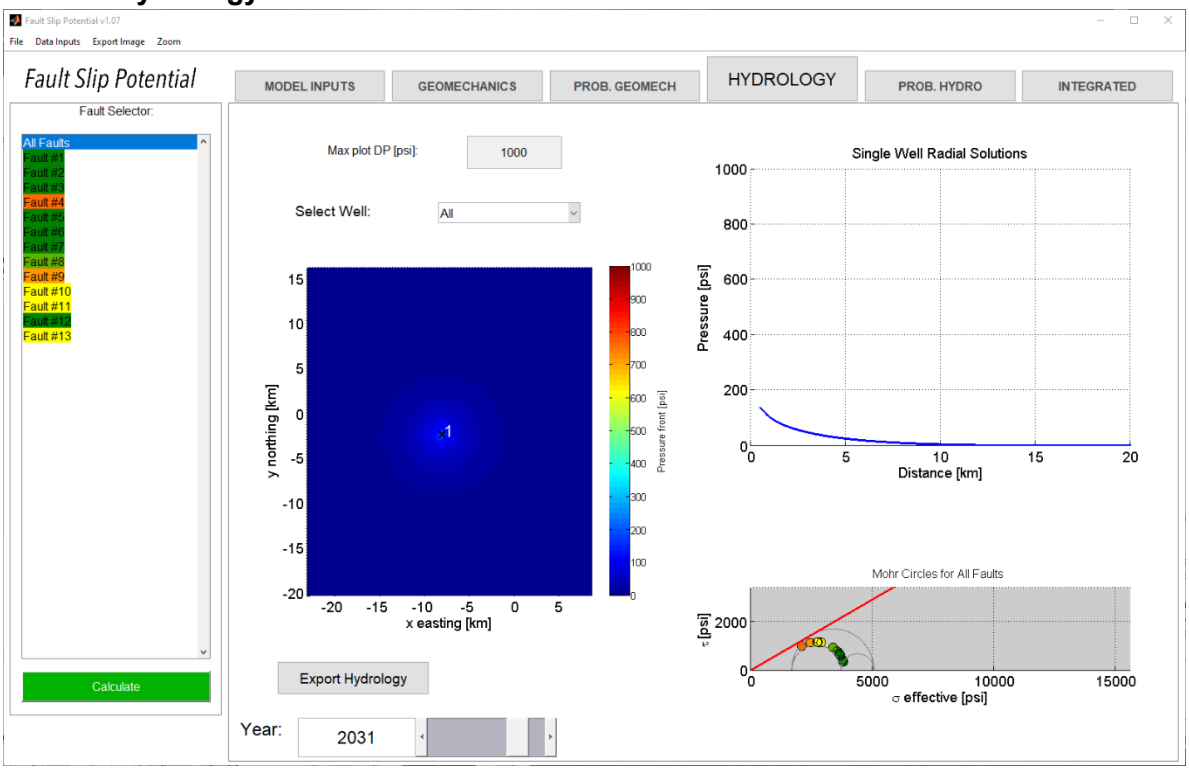

## Year 5 Probabilistic Hydrology (note no crossover between blue delta-press. & green fault slip press.)



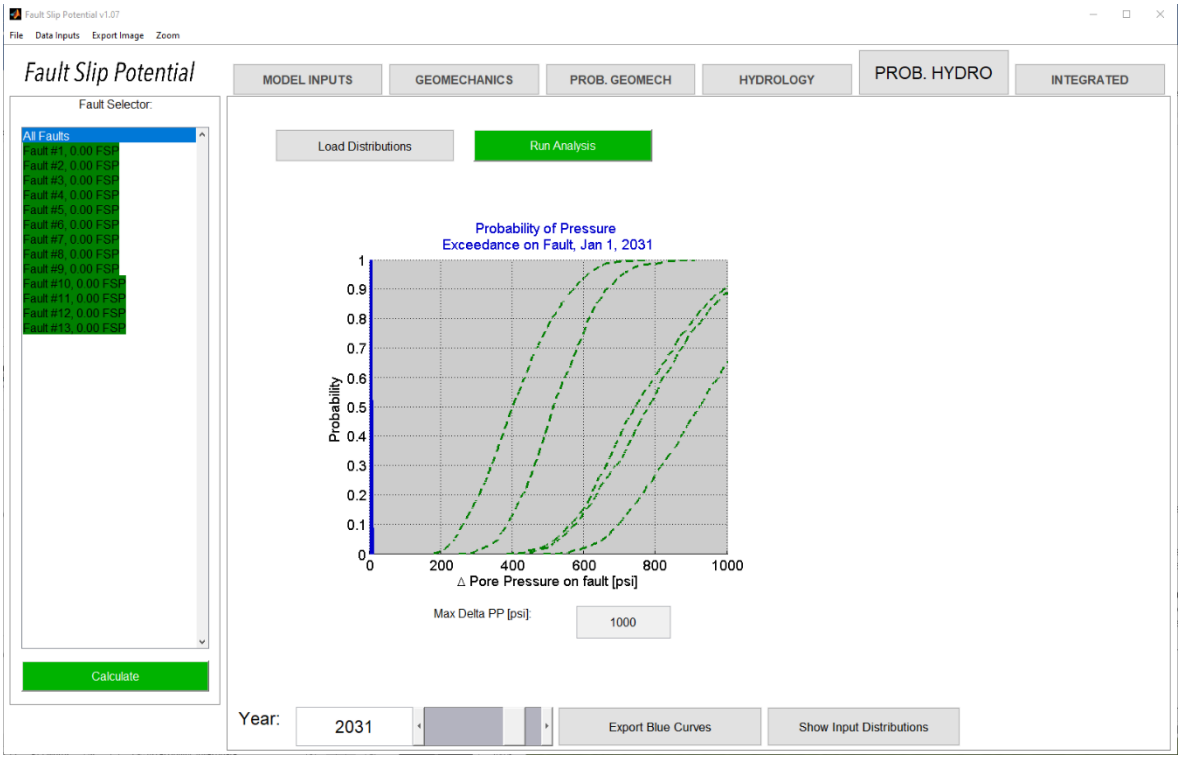
**Year 5 Fault Slip Probability** (0% after 5 years)



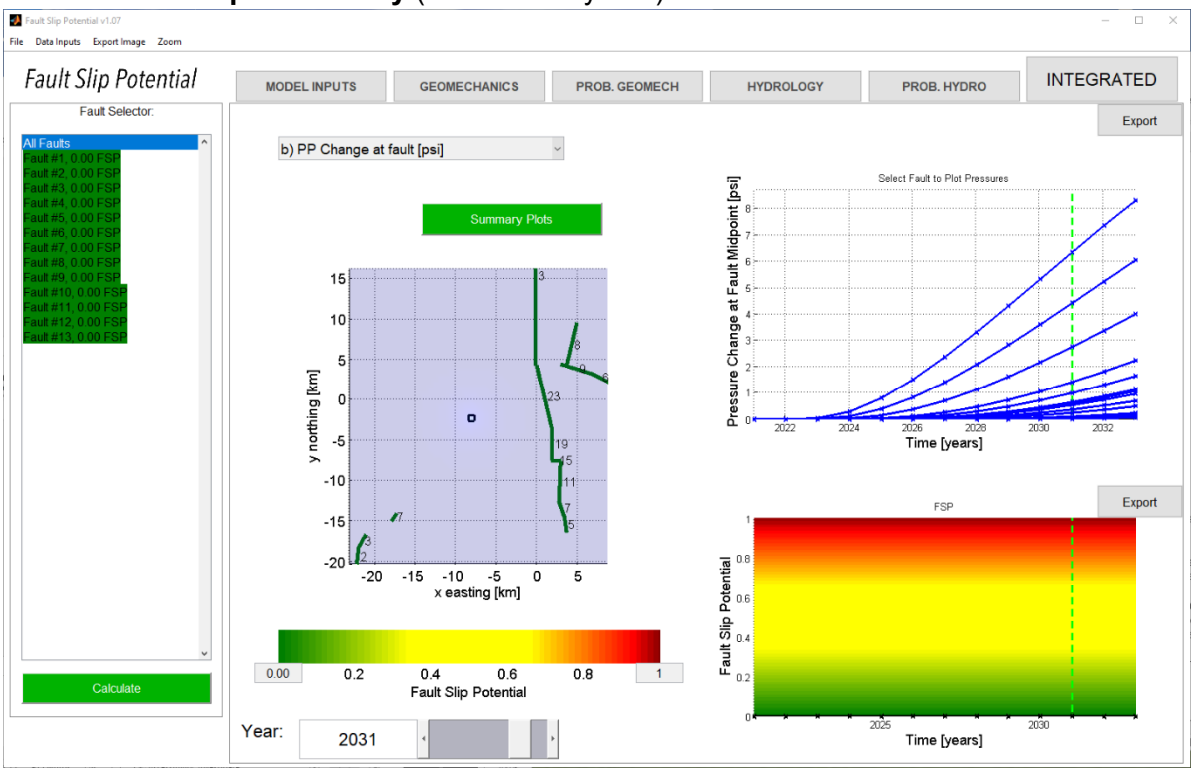
## Year 10 Hydrology



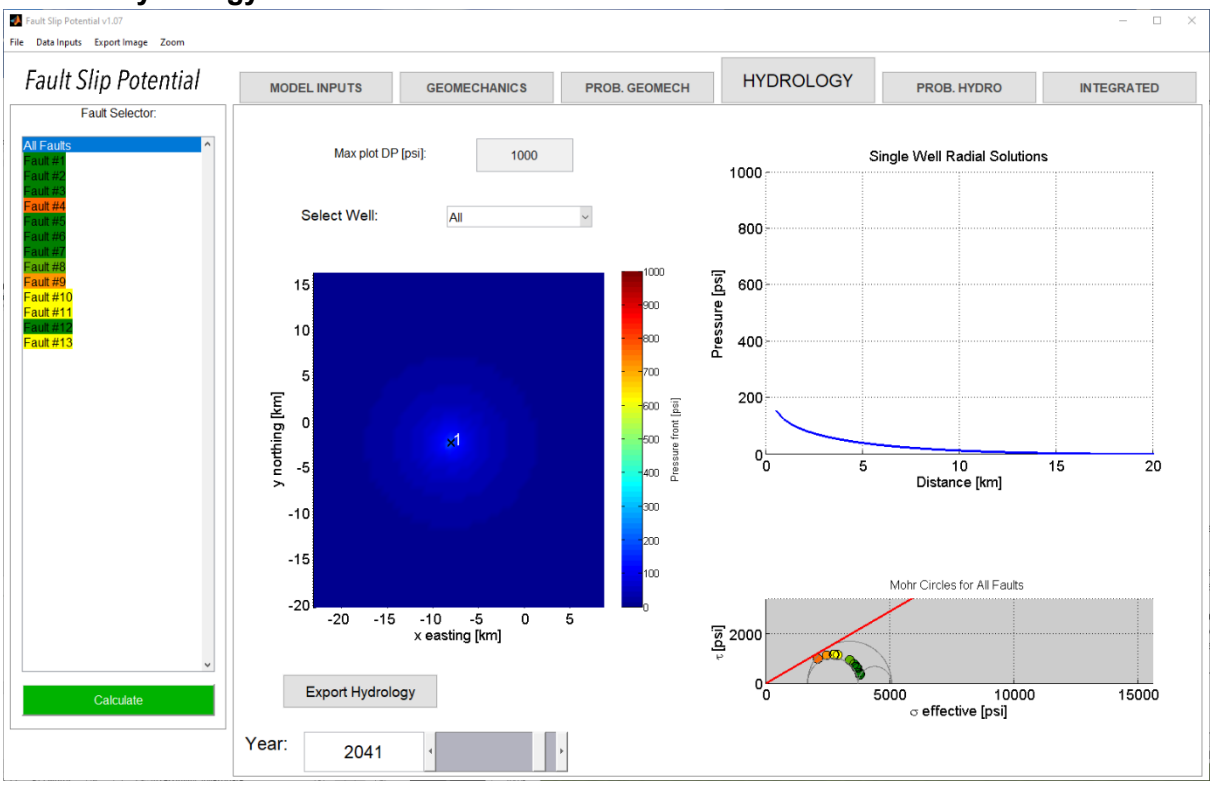

## Year 10 Probabilistic Hydrology (note no crossover between blue delta-press. & green fault slip press.)



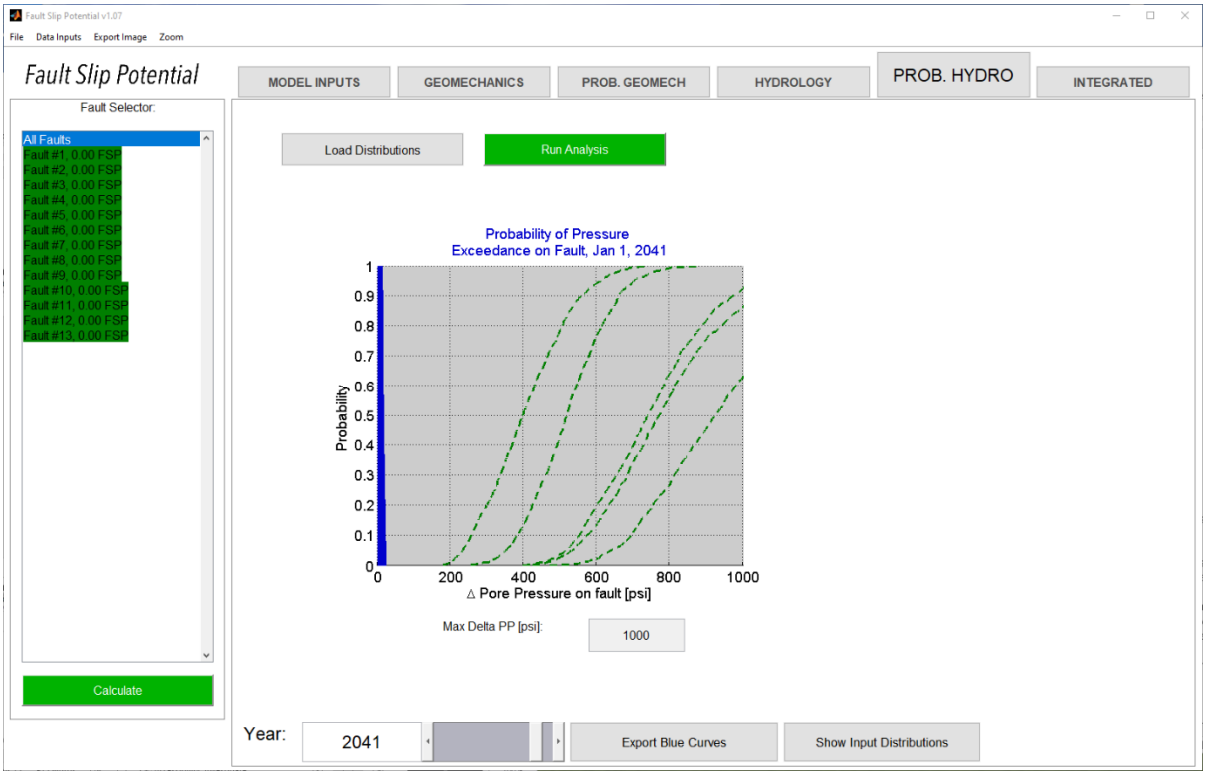
**Year 10 Fault Slip Probability** (0% after 10 years)



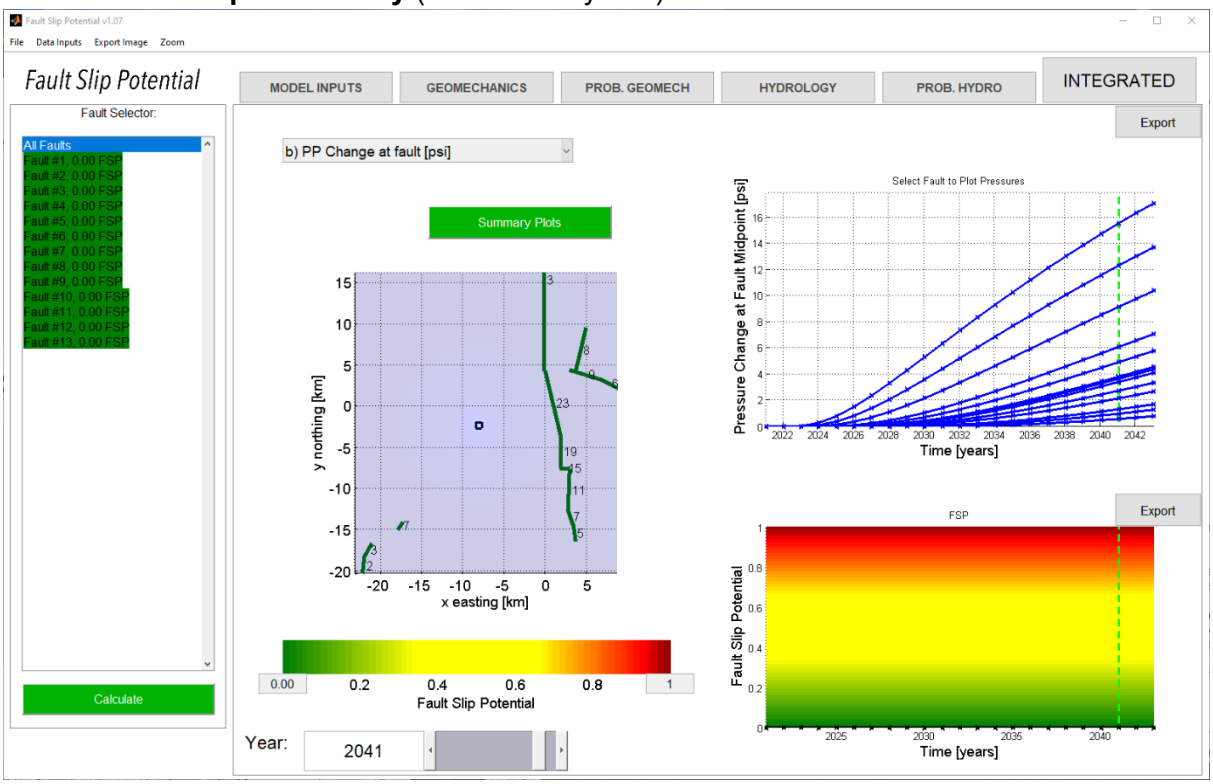
## Year 20 Hydrology



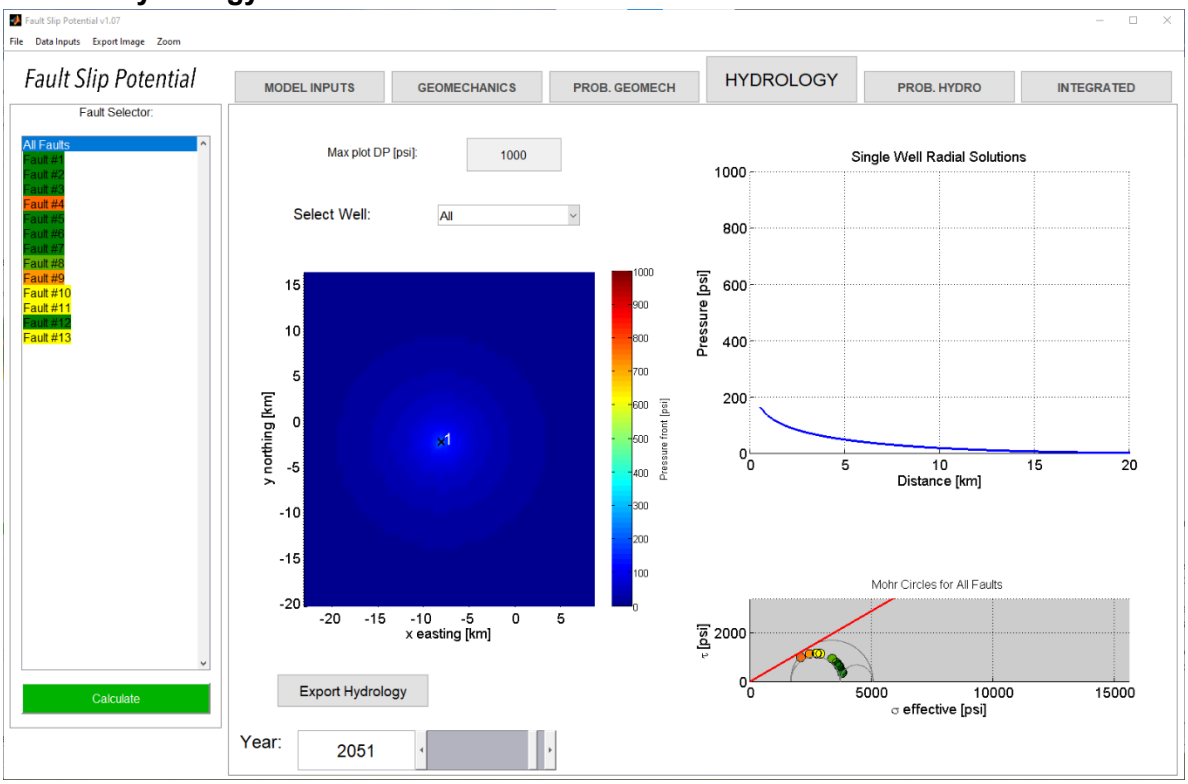

## Year 20 Probabilistic Hydrology (note no crossover between blue delta-press. & green fault slip press.)



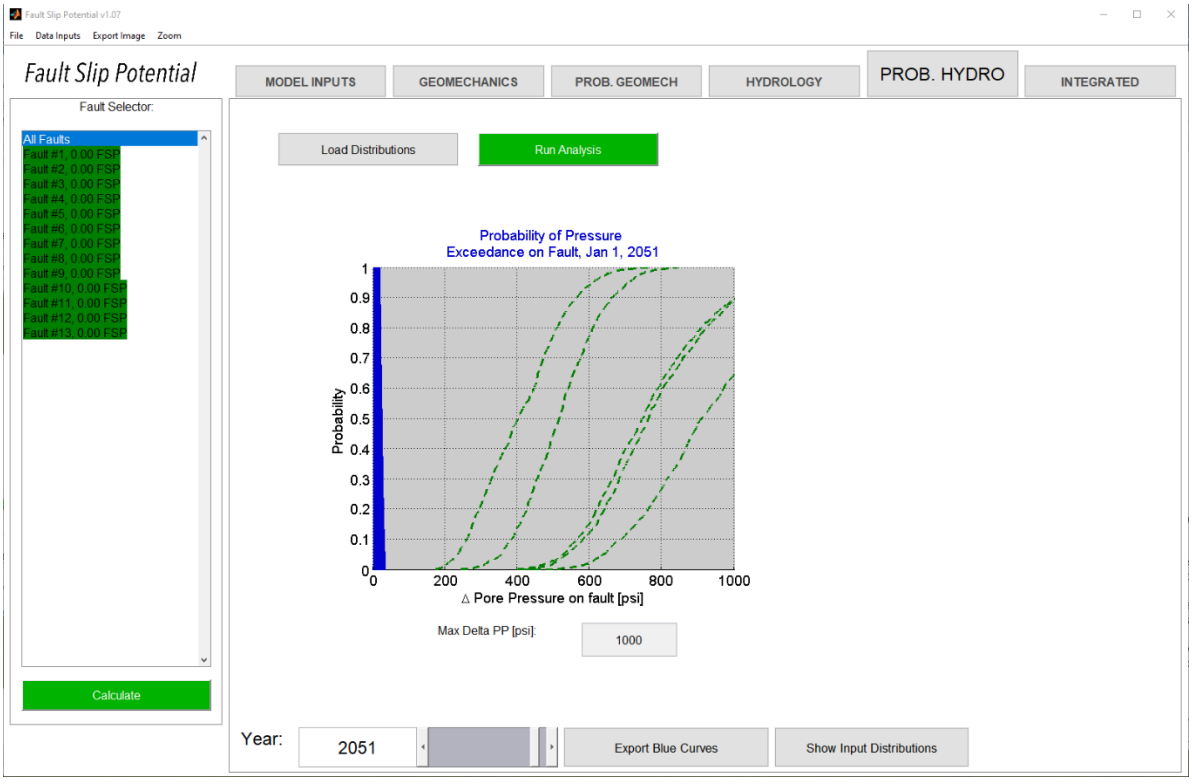
**Year 20 Fault Slip Probability** (0% after 20 years)



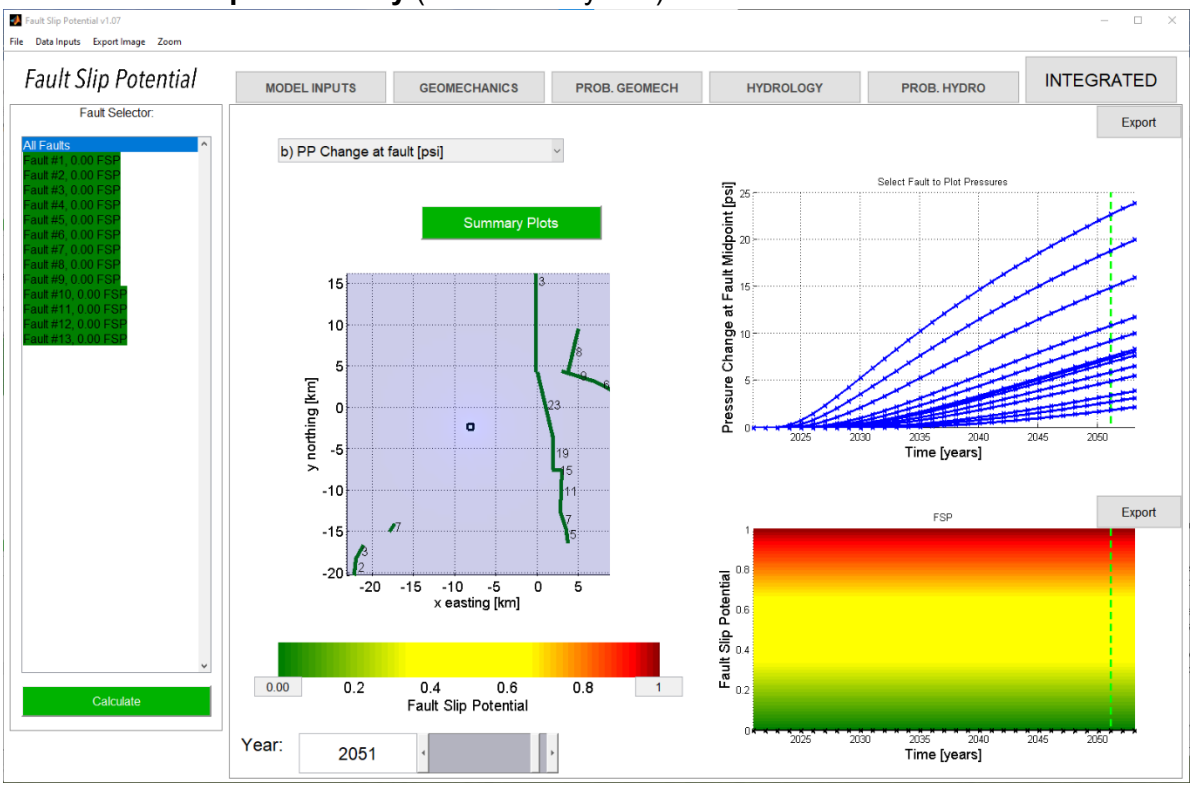
## Year 30 Hydrology




## Year 30 Probabilistic Hydrology (note no crossover between blue delta-press. & green fault slip press.)



**Year 30 Fault Slip Probability** (0% after 30 years)




As per NM OCD requirements (injection well to injection well spacing minimum of 1.5 miles), this proposed above referenced SWD well is located 1.83 miles away from the nearest active or permitted Devonian disposal well (Permian Oilfield Partners, Bullseye Federal SWD #1, Sec. 6, T25S, R33E).


gfisher@popmidstream.com
(817) 606-7630