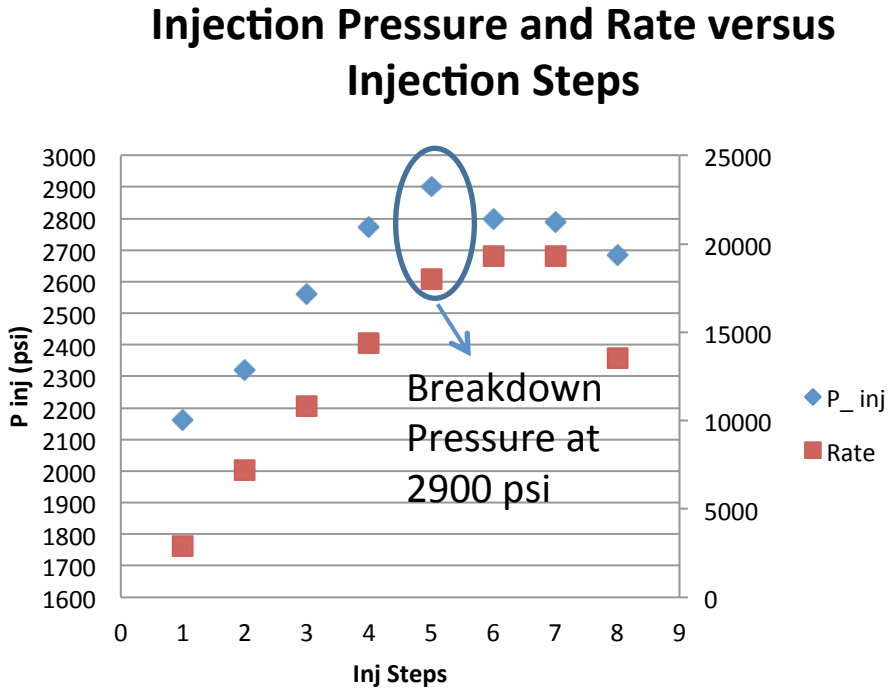
Fracture Pressure in Arbuckle Based on Step-Rate Test

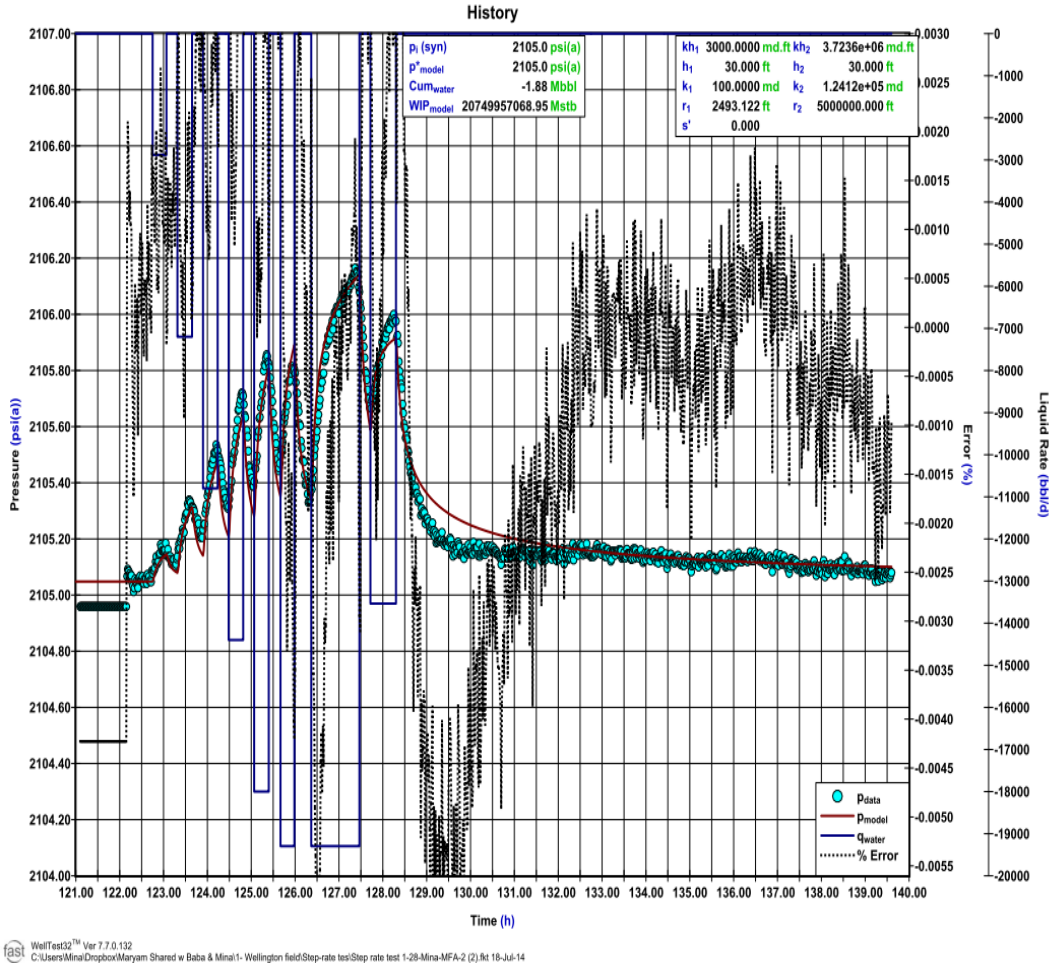
Inj	Pinj(psi)	Rate (bbl/d)	InJ Index
1	2160	2880	57.6
2	2321	7200	34.12
3	2562	10800	23.89
4	2773	14400	21.72
5	2901	18000	22.76
6	2800	19296	27.97
7	2788	19296	28.46
8	2684	13536	23.58

Arbuckle	
2666	closure pressure (psi)
2900	breakdown pressure (psi)
4869	Gauge depth,ft
0.55	Closure Fracture gradient (psi/ft)
0.60	breakdown Fracture gradient (psi/ft)



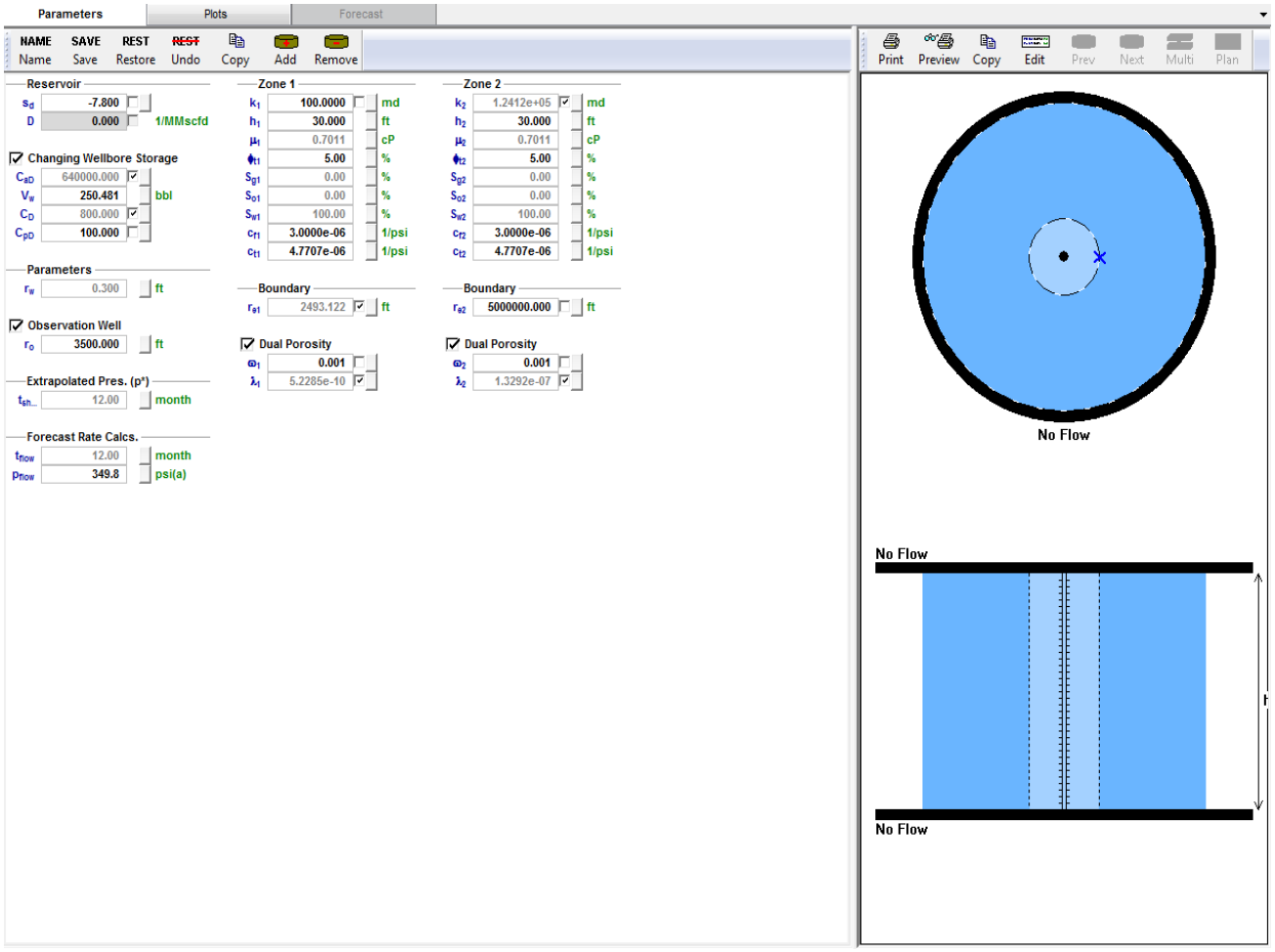
Interference Test Results in 1-32 and Choosing 1-28 as an Observation Well

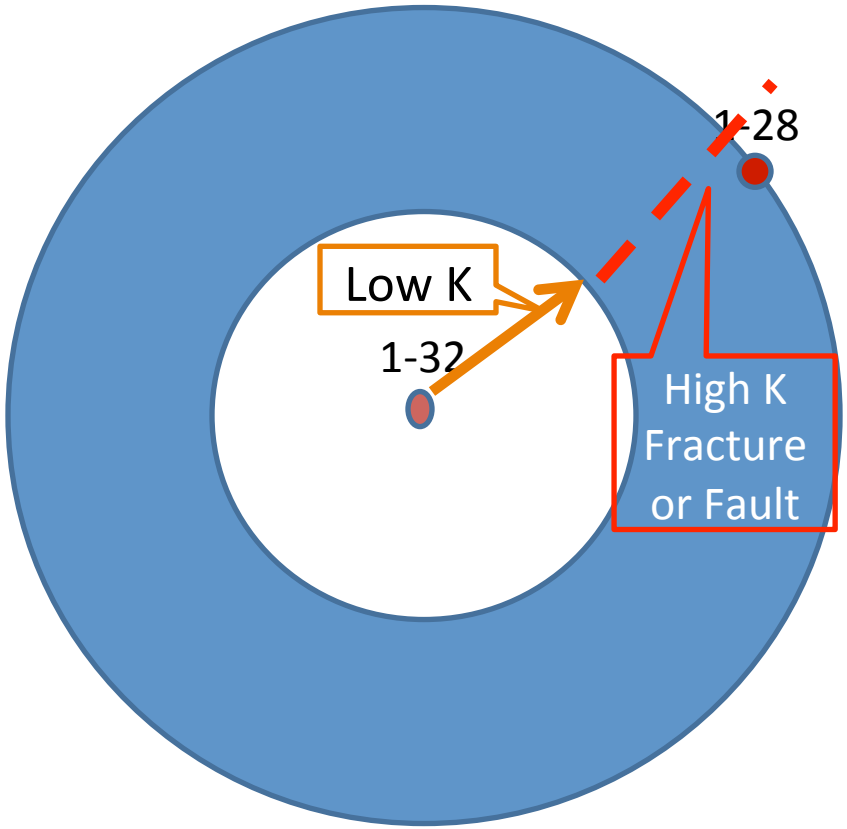
Well 1-32 was the injection well and 1-28 was the observation well. Distance between 1-32 and 1-28 is 3,500 ft. Better results were obtained when Composite model with Dual porosity-permeability was considered. Based on this model, permeability around well 1-32 to a radius of 2,493 ft (region 1) has a lower value (100 mD) for 30 ft interval that is in vertical communication. Permeability is 124 D from radius of 2,493 ft to the vicinity of 1-28. Permeability derived from the Interference test is close to log derived average permeability (74mD). Bigger permeability for the farther radius can be associated with fracture or fault between two wells.



Composite Model Diagram and Parameters

This model shows the two zones with different radius and permeabilities. Zone 1 is from well 1-32 to a radius of 2,493 ft and zone 2 is from 2,493 ft to well 1-28.




1-28
Low K
1-32
High K
Fracture
or Fault