

FORGE Utah 16A DFN Permeability Tensor Supplement

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The files in this GDR contribution provide supplementary data for the Utah FORGE Well 16A(78)-32 Simplified Discrete Fracture Network Data (<http://gdr.openei.org/submissions/1317>) dated June 22, 2021. For the three Discrete Fracture Network (DFN) realizations provided, the six unique tensor values for fracture permeability are provided in both the global UTM coordinates and the local coordinate frame used for the 1317 submission. Note that the permeability values in this submission only include the contribution of large fractures having a radius greater than 10 m. In the files on the GDR for submission 1317, the diagonal permeability tensor values for the small background fractures having a radius less than 10 m are provided (PermI_BG, PermJ_BG, and PermK_BG) as well as the total permeability which is the permeability from the small background fractures plus the permeability contribution from the large discrete fractures having a radius greater than 10 m (Perm_I, Perm_J, and Perm_K). The files in this submission for the full tensor values only cover the large, discrete fractures (Oda_Kii, Oda_Kjj, Oda_Kkk, Oda_Kij, Oda_Kik, Oda_Kki)...where for example, Oda_Kii = Perm_I – PermI_BG. The full permeability tensor values for the smaller, background fractures are not available.

Note that Oda_Kij = Oda_Kji, Oda_Kjk = Oda_Kkj, and Oda_Kki = Oda_Kik so there are only six unique values in the 3x3 permeability tensor.

Upscaled_DF_Permeability_1.csv

	A	B	C	D	E	F	G	H	I	J
1	CellX[m]	CellY[m]	CellZ[m]	Oda_Kii[m2]	Oda_Kjj[m2]	Oda_Kkk[m2]	Oda_Kij[m2]	Oda_Kjk[m2]	Oda_Kki[m2]	
2	335506.1521	4263755.448	-441	2.23E-18	3.69E-19	2.33E-18	-7.02E-19	5.31E-19	1.78E-19	
3	335506.1521	4263755.448	-451	2.18E-17	3.60E-18	2.28E-17	-6.85E-18	5.18E-18	1.73E-18	
4	335506.1521	4263755.448	-461	9.70E-18	1.61E-18	1.01E-17	-3.05E-18	2.31E-18	7.72E-19	
5	335506.1521	4263755.448	-471	4.76E-20	7.87E-21	4.97E-20	-1.50E-20	1.13E-20	3.79E-21	
6	335506.1521	4263755.448	-481	0	0	0	0	0	0	

Upscaled_Properties_1.csv

	A	B	C	D	E	F	G
1	CellX[m]	CellY[m]	CellZ[m]	Compressibility_BG[1/kPa]	Porosity_BG[fraction]	PermI_BG[m2]	PermJ_BG
2	335506.1521	4263755.448	-441	2.26E-08	2.22E-05	1.24E-17	1.5
3	335506.1521	4263755.448	-451	2.88E-08	2.08E-05	9.39E-18	1.1

Diagram:

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    graph TD
      A[New GDR submission] --> B[Oda_Kii = Perm_I - PermI_BG]
      C[GDR 1317 submission] --> B
  
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Upscaled permeability tensor value for large discrete fractures included in DFN

File in GDR submission 1317

Oda_Kii Oda_Kjj Oda_Kkk

	P	Q	R	S
	Oda_Kii	Oda_Kjj	Oda_Kkk	
	2.23E-18	3.69E-19	2.33E-18	