PTS File No: 41187
Client: Shaw E & I

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TABLE 1

SOIL MOISTURE RETENTION CURVE FITTING FOR QUANTIFYING THE HYDRAULIC FUNCTIONS OF UNSATURATED SOILS

PROJECT NAME: Kirtland AFB BFF
PROJECT NO: 140705
SAMPLE ID: 10678-GEO1 at 488.4 ft.

van Genuchten Parameters	
alpha (1/cm)	2.298E-02
n	2.094
residual water	0.241
total water	1.017
m	0.523
Water Perm (mD)	571
Air Perm (mD)	5380
R^2	0.99729

Notes: alpha, n, and residual saturation are capillary parameters defined by the following equation (van Genuchten, 1980), with m = 1-1/n, S = water saturation, and h = capillary head (cm):

$$S_r + [(S_s - S_r)/(1+(\alpha h)^n)^m]$$

Laboratory Measured Data

Capillary Head (cm)	**10678-GEO1 at 488.4 ft.** Volumetric Moisture	Predicted Moisture by Curve Fit	RPD (%)
0.00	1.000	1.017	0.86%
5.29	1.000	1.012	0.62%
11.9	1.000	0.992	0.42%
21.2	0.973	0.940	1.70%
33.1	0.870	0.856	0.82%
47.6	0.729	0.754	1.70%
64.8	0.648	0.657	0.69%
84.7	0.566	0.575	0.73%
132	0.472	0.460	1.24%
224	0.377	0.368	1.13%
339	0.336	0.323	2.04%
529	0.295	0.291	0.70%
1190	0.255	0.262	1.35%
2116	0.238	0.252	2.77%

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TABLE 2

FUNCTIONAL RELATIONSHIPS BASED ON DERIVED CAPILLARY PARAMETERS

PROJECT NAME: Kirtland AFB BFF
PROJECT NO: 140705
SAMPLE ID: 10678-GEO1 at 488.4 ft.

FUNCTIONAL RELATIONSHIPS BASED ON DERIVED CAPILLARY PARAMETERS

Capillary Head (cm)	(van Genuchten, 1980) Volumetric Moisture	(Mualem, 1976) Effective Water Perm.	(Mualem, 1976) Effective Air Perm.
0.001	1.017	5.71E+02	3.80E-12
0.020	1.017	5.70E+02	6.16E-08
0.040	1.017	5.70E+02	5.80E-07
0.050	1.017	5.70E+02	1.19E-06
0.080	1.017	5.69E+02	5.47E-06
0.090	1.017	5.69E+02	8.00E-06
1.00	1.017	5.52E+02	1.94E-02
1.20	1.017	5.48E+02	3.49E-02
1.30	1.017	5.46E+02	4.53E-02
1.50	1.017	5.42E+02	7.19E-02
2.00	1.017	5.32E+02	1.82E-01
3.00	1.016	5.11E+02	6.75E-01
5.00	1.013	4.68E+02	3.49E+00
7.00	1.009	4.26E+02	1.02E+01
9.00	1.003	3.85E+02	2.25E+01
11.0	0.995	3.46E+02	4.20E+01
15.0	0.977	2.76E+02	1.07E+02
20.0	0.948	2.03E+02	2.43E+02
25.0	0.914	1.48E+02	4.38E+02
30.0	0.878	1.06E+02	6.80E+02
35.0	0.842	7.64E+01	9.52E+02
40.0	0.806	5.51E+01	1.24E+03
45.0	0.771	4.00E+01	1.52E+03
50.0	0.739	2.92E+01	1.80E+03
60.0	0.681	1.61E+01	2.30E+03
70.0	0.632	9.30E+00	2.73E+03
75.0	0.611	7.17E+00	2.91E+03
80.0	0.591	5.59E+00	3.08E+03
85.0	0.574	4.40E+00	3.23E+03
90.0	0.557	3.50E+00	3.37E+03
95.0	0.542	2.80E+00	3.50E+03
100	0.528	2.27E+00	3.61E+03
120	0.482	1.04E+00	3.97E+03
140	0.448	5.30E-01	4.23E+03
160	0.422	2.92E-01	4.41E+03
180	0.401	1.71E-01	4.55E+03
200	0.384	1.06E-01	4.66E+03
220	0.370	6.82E-02	4.74E+03
240	0.359	4.56E-02	4.81E+03
260	0.349	3.14E-02	4.87E+03
280	0.341	2.23E-02	4.92E+03

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TABLE 2

FUNCTIONAL RELATIONSHIPS BASED ON DERIVED CAPILLARY PARAMETERS

PROJECT NAME: Kirtland AFB BFF
PROJECT NO: 140705
SAMPLE ID: 10678-GEO1 at 488.4 ft.

FUNCTIONAL RELATIONSHIPS BASED ON DERIVED CAPILLARY PARAMETERS

Capillary Head (cm)	(van Genuchten, 1980) Volumetric Moisture	(Mualem, 1976) Effective Water Perm.	(Mualem, 1976) Effective Air Perm.
300	0.334	1.61E-02	4.96E+03
320	0.328	1.19E-02	4.99E+03
340	0.322	8.98E-03	5.02E+03
360	0.317	6.87E-03	5.05E+03
380	0.313	5.33E-03	5.07E+03
400	0.309	4.19E-03	5.09E+03
420	0.306	3.33E-03	5.10E+03
440	0.302	2.68E-03	5.12E+03
460	0.300	2.17E-03	5.13E+03
480	0.297	1.78E-03	5.15E+03
500	0.294	1.47E-03	5.16E+03
550	0.289	9.35E-04	5.18E+03
600	0.285	6.20E-04	5.20E+03
650	0.281	4.25E-04	5.22E+03
700	0.278	2.99E-04	5.23E+03
750	0.275	2.16E-04	5.25E+03
800	0.273	1.59E-04	5.26E+03
850	0.271	1.20E-04	5.26E+03
900	0.269	9.12E-05	5.27E+03
950	0.268	7.07E-05	5.28E+03
1000	0.266	5.54E-05	5.28E+03
1050	0.265	4.40E-05	5.29E+03
1100	0.264	3.53E-05	5.29E+03
1150	0.263	2.86E-05	5.30E+03
1200	0.262	2.34E-05	5.30E+03
1250	0.261	1.93E-05	5.31E+03
1300	0.260	1.60E-05	5.31E+03
1350	0.259	1.34E-05	5.31E+03
1400	0.258	1.13E-05	5.32E+03
1450	0.258	9.55E-06	5.32E+03
1500	0.257	8.14E-06	5.32E+03
1550	0.257	6.97E-06	5.32E+03
1600	0.256	5.99E-06	5.32E+03
1650	0.256	5.18E-06	5.33E+03
1700	0.255	4.50E-06	5.33E+03
1750	0.255	3.92E-06	5.33E+03
1800	0.254	3.43E-06	5.33E+03
1850	0.254	3.01E-06	5.33E+03
1900	0.253	2.66E-06	5.33E+03
1950	0.253	2.35E-06	5.34E+03
2000	0.253	2.08E-06	5.34E+03

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TABLE 2

FUNCTIONAL RELATIONSHIPS BASED ON DERIVED CAPILLARY PARAMETERS

PROJECT NAME: Kirtland AFB BFF
PROJECT NO: 140705
SAMPLE ID: 10678-GEO1 at 488.4 ft.

FUNCTIONAL RELATIONSHIPS BASED ON DERIVED CAPILLARY PARAMETERS

Capillary Head (cm)	(van Genuchten, 1980) Volumetric Moisture	(Mualem, 1976) Effective Water Perm.	(Mualem, 1976) Effective Air Perm.
2200	0.252	1.33E-06	5.34E+03
2400	0.251	8.79E-07	5.35E+03
2600	0.250	6.02E-07	5.35E+03
2800	0.249	4.24E-07	5.35E+03
3000	0.249	3.06E-07	5.35E+03
3200	0.248	2.25E-07	5.35E+03
3400	0.248	1.69E-07	5.36E+03
3600	0.247	1.29E-07	5.36E+03
3800	0.247	9.97E-08	5.36E+03
4000	0.246	7.82E-08	5.36E+03
4200	0.246	6.21E-08	5.36E+03
4400	0.246	4.98E-08	5.36E+03
4600	0.246	4.04E-08	5.36E+03
4800	0.246	3.30E-08	5.36E+03
5000	0.245	2.72E-08	5.36E+03
5200	0.245	2.26E-08	5.37E+03
5400	0.245	1.89E-08	5.37E+03
5600	0.245	1.59E-08	5.37E+03
5800	0.245	1.35E-08	5.37E+03
6000	0.245	1.15E-08	5.37E+03
6500	0.244	7.85E-09	5.37E+03
7000	0.244	5.53E-09	5.37E+03
7500	0.244	3.99E-09	5.37E+03
8000	0.244	2.94E-09	5.37E+03
8500	0.243	2.20E-09	5.37E+03
9000	0.243	1.68E-09	5.37E+03
9500	0.243	1.30E-09	5.37E+03
10000	0.243	1.02E-09	5.37E+03

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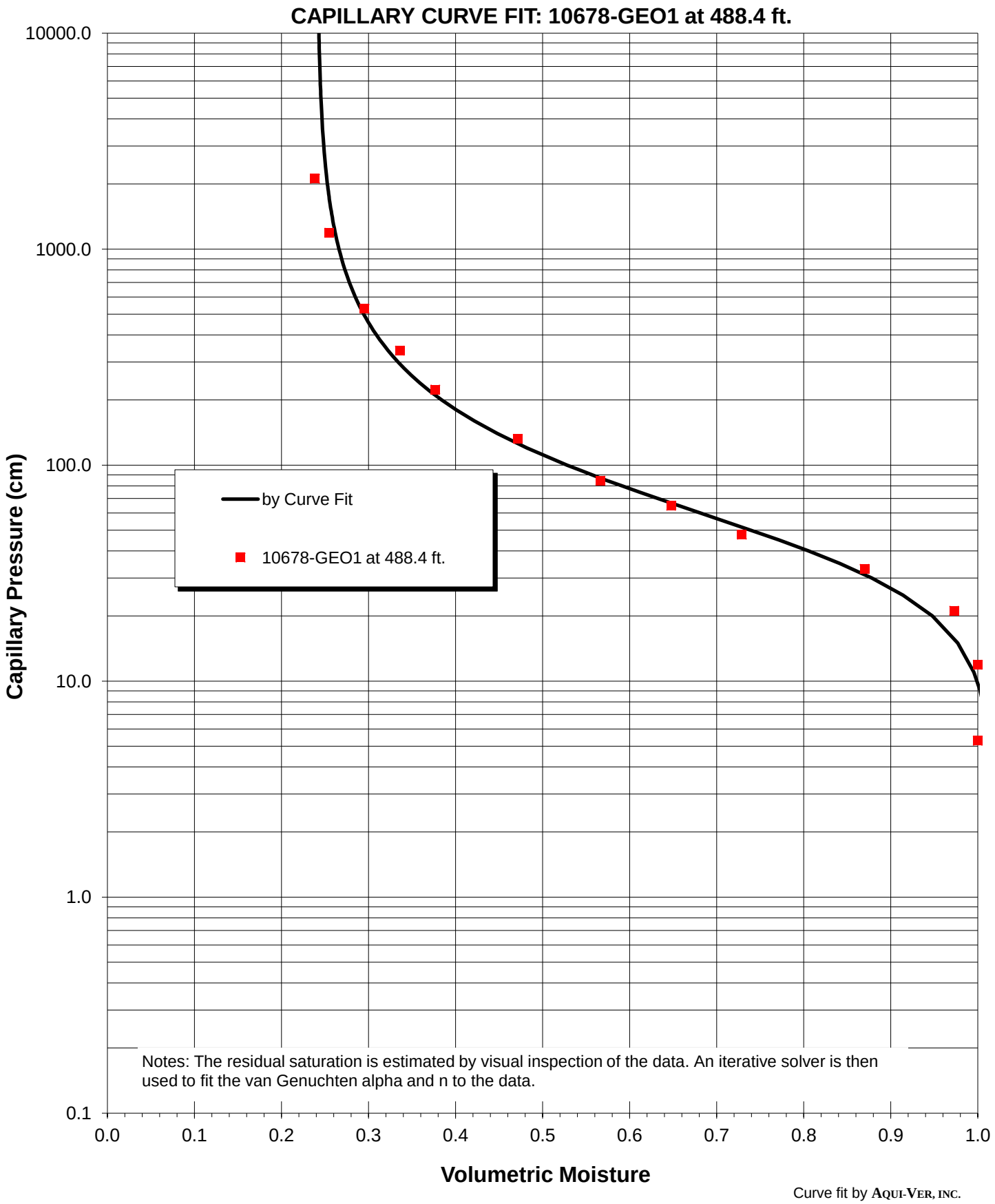

Curve fit by AQUI-VER, INC.

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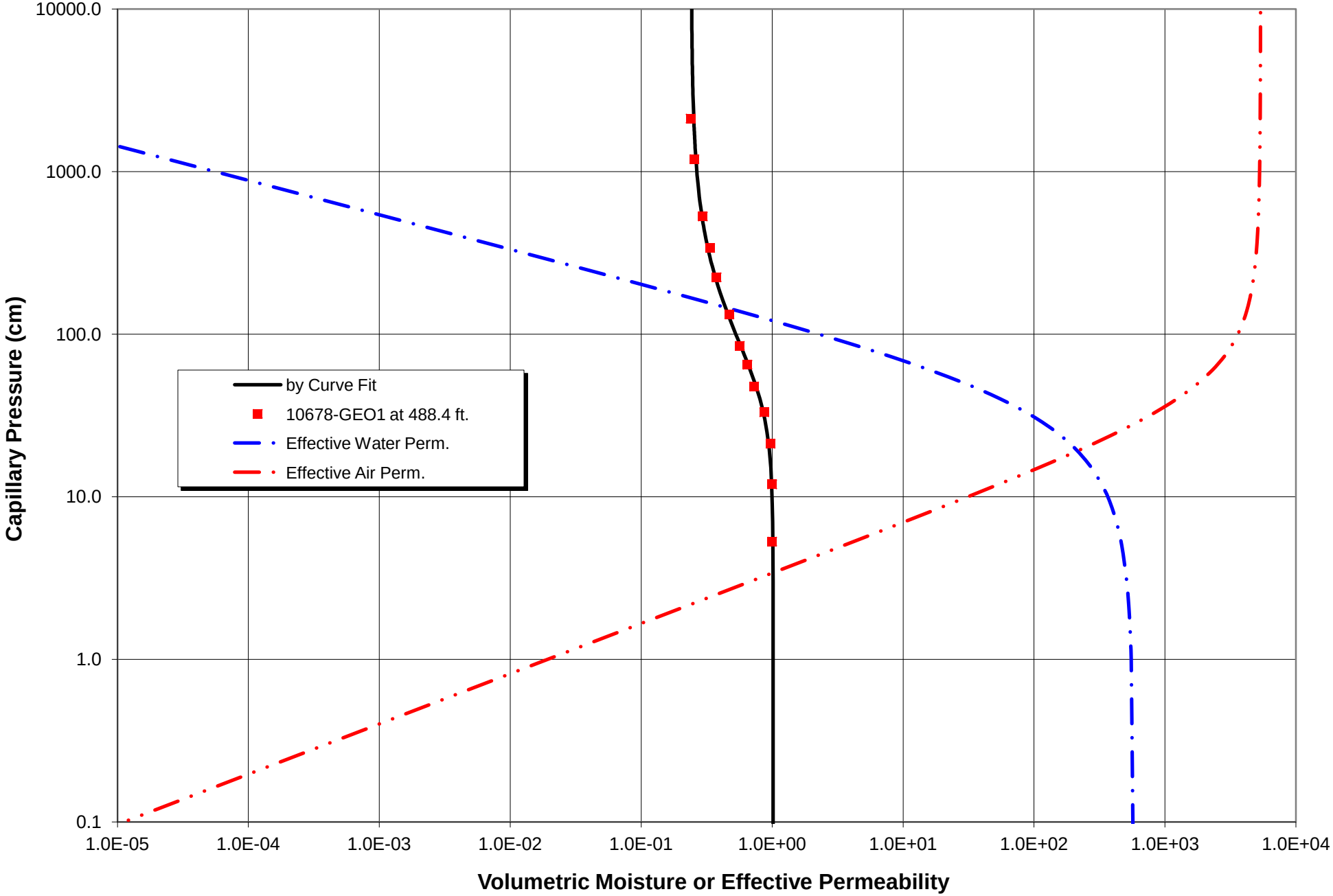
CAPILLARY CURVE FIT: 10678-GEO1 at 488.4 ft.



Curve fit by AQUI-VER, INC.