APPENDIX D.2

Packer Test Results

TABLE D-2
Summary of Packer Tests

Boring Designation	Test Number	Depth Interval (feet)	Boring Diameter (inches)	Packer Size (inches)	Bedrock Type
R-09-Z1B3	1	124-134	5.5	4-7	Topanga Fm – Silty Sandstone
	2*	173-183	5.5	4-7	Topanga Fm – Interbedded Siltstone and Silty Sandstone
	3	215-225	5.5	4-7	Topanga Fm – Sandstone
	4*	270-280	5.5	4-7	Topanga Fm – Sandstone
R-09-Z1B4	1*	133-143	3.9	3-6 (PQ)	Puente Fm – Sandstone
	2*	170-180	3.9	3-6 (PQ)	Puente Fm – Mudstone and Sandstone
	3*	241-251	3.9	3-6 (PQ)	Puente Fm – Sandstone
	4*	280-289.5	3.9	3-6 (PQ)	Puente Fm – Mudstone and Sandstone
R-09-Z1B5	1	321.9-330	5.5	4-7	Puente Fm – Sandstone
	2	379.9-388	5.5	4-7	Puente Fm – Sandstone and Siltstone
	3	421.9-430	5.5	4-7	Puente Fm – Sandstone
	4*	451.9-460	5.5	4-7	Puente Fm – Sandstone
R-09-Z1B6	1	255-265.6	5.5-6	4-7	Puente Fm – Siltstone with Interbedded Sandstone
	2	295-305.6	5.5-6	4-7	Puente Fm – Siltstone with Interbedded Sandstone
	3*	330-340.6	5.5-6.0	4-7	Puente Fm – Siltstone with Interbedded Sandstone
	4	372.3-382.9	5.5-6.0	4-7	Puente Fm – Siltstone with Interbedded Sandstone
R-09-Z1B7	1*	212-222	6.0	4-7	Puente Fm – Shale, Siltstone, Sandstone and Limestone
	2*	232-242	6.0	4-7	Puente Fm – Siltstone and Sandstone
	3	262-272	6.0	4-7	Puente Fm – Siltstone and Sandstone
R-09-Z1B8	1*	70-80	4.33-5.12	3-6 (PQ)	Fernando Fm – Siltstone
	2	90-100	4.33-5.12	3-6 (PQ)	Fernando Fm – Siltstone
	3	130-140	4.33-5.12	3-6 (PQ)	Fernando Fm – Siltstone
	4	170-180	4.33-5.12	3-6 (PQ)	Fernando Fm – Siltstone
R-09-Z2B1	1	137-150	6.0	3-6 (PQ)	Topanga Fm – Interbedded Siltstone and Sandstone
R-09-Z2B3	1	174-182.3	3.9-4.23	3-6 (PQ)	Topanga Fm – Siltstone
	2	230-238.3	3.9-4.23	3-6 (PQ)	Topanga Fm – Siltstone
	3	270-278.3	3.9-4.23	3-6 (PQ)	Topanga Fm – Siltstone
	4	320-328.3	3.9-4.23	3-6 (PQ)	Topanga Fm – Siltstone

TABLE D-2
Summary of Packer Tests

Boring Designation	Test Number	Depth Interval (feet)	Boring Diameter (inches)	Packer Size (inches)	Bedrock Type
R-09-Z2B4	1	207-214.5	4.23	3-6 (PQ)	Puente Fm – Siltstone and Sandstone
	2*	234-241.5	4.23	3-6 (PQ)	Puente Fm – Siltstone
	3	295-302.5	4.23	3-6 (PQ)	Puente Fm – Siltstone
	4*	320-327.5	4.23	3-6 (PQ)	Puente Fm – Siltstone
	5*	340-347.5	4.23	3-6 (PQ)	Puente Fm – Siltstone and Sandstone
R-09-Z2B5	1	150-159.5	4.53-4.57	3-6 (PQ)	Puente Fm – Claystone
	2	190-199.5	4.52-4.57	3-6 (PQ)	Puente Fm – Claystone
	3*	220-229.5	4.49-4.52	3-6 (PQ)	Puente Fm – Siltstone
	4	280.3-289.8	4.25-4.28	3-6 (PQ)	Puente Fm – Siltstone and Sandstone
R-09-Z3B1	1	147.9-158.6	5.5	4-7	Topanga Fm – Conglomerate
	2	182.9-193.6	5.5	4-7	Topanga Fm – Conglomerate
	3	212.9-223.6	5.5	4-7	Topanga Fm – Conglomerate
	4	272.9-283.6	5.5	4-7	Topanga Fm – Conglomerate
R-09-Z3B2	1	150-159.5	3.8-4.0	3-6 (PQ)	Wilson Quartz Diorite
	2	170-179.5	3.8-4.0	3-6 (PQ)	Wilson Quartz Diorite
	3	210-219.5	3.8-4.0	3-6 (PQ)	Wilson Quartz Diorite
	4	230-239.5	3.8-4.0	3-6 (PQ)	Wilson Quartz Diorite
R-09-Z3B3	1*	249.5-275.5	6.0	3-6 (PQ)	Wilson Quartz Diorite and Fault Gouge
R-09-Z3B4	1	221-230	5.5	4-7	Wilson Quartz Diorite
	2	261-270	5.5	4-7	Wilson Quartz Diorite
R-09-Z3B5	1	225-234.5	4.25-4.53	3-6 (PQ)	Topanga Fm – Sandstone
	2	265-274.5	4.09-4.57	3-6 (PQ)	Topanga Fm – Sandstone and Mudstone
	3*	303-312.5	3.82-4.25	3-6 (PQ)	Topanga Fm – Sandstone and Mudstone
	4*	374-383.5	3.82-4.25	3-6 (PQ)	Topanga Fm – Sandstone and Mudstone
R-09-Z3B6	1	165.2-175.9	5.5	4-7	Topanga Fm – Conglomerate
	2	195.2-205.9	5.5	4-7	Topanga Fm – Sandstone
	3	255.1-265.8	5.5	4-7	Topanga Fm – Sandstone
	4	294.0-305.7	5.5	4-7	Topanga Fm – Sandstone
	5	305.2-315.9	5.5	4-7	Topanga Fm – Sandstone

TABLE D-2
Summary of Packer Tests

Boring Designation	Test Number	Depth Interval (feet)	Boring Diameter (inches)	Packer Size (inches)	Bedrock Type
R-09-Z3B7	1	255-264.5	4.2-4.4	3-6 (PQ)	Topanga Fm – Sandstone with Interbedded Claystone
	2*	280-289.5	4.2-4.4	3-6 (PQ)	Topanga Fm – Sandstone to Conglomerate
	3*	290-299.5	4.2-4.4	3-6 (PQ)	Topanga Fm – Sandstone with Interbedded Claystone
	4*	300-309.5	4.2-4.4	3-6 (PQ)	Topanga Fm – Sandstone with Interbedded Claystone
R-09-Z3B8	1	155-163.3	4.2-4.3	3-6 (PQ)	Topanga Fm – Interbedded Sandstone, Siltstone and Claystone
	2	185-193.3	4.2-4.3	3-6 (PQ)	Topanga Fm – Interbedded Sandstone, Siltstone and Claystone
	3	220-228.3	4.2-4.3	3-6 (PQ)	Topanga Fm – Interbedded Sandstone, Siltstone and Claystone
R-09-Z3B9	1*	190-199.5	4.54-4.64	3-6 (PQ)	Wilson Quartz Diorite
	2*	218-227.5	4.27-4.42	3-6 (PQ)	Wilson Quartz Diorite
	3*	270-279.5	4.18-4.28	3-6 (PQ)	Wilson Quartz Diorite
R-09-Z3B10	1	243-252.5	4.6-4.8	3-6 (PQ)	Topanga Fm – Interbedded Siltstone and Claystone
	2	331-340.5	4.5-4.7	3-6 (PQ)	Topanga Fm – Interbedded Sandstone and Siltstone
	3*	357-366.5	4.5-4.6	3-6 (PQ)	Topanga Fm – Interbedded Sandstone, Siltstone and Claystone
	4	362-371.5	4.5-4.6	3-6 (PQ)	Topanga Fm – Interbedded Sandstone, Siltstone and Claystone
R-09-Z3B11	1*	165-174.5	3.8-5.0	3-6 (PQ)	Topanga Fm – Siltstone
	2*	203-212.5	3.8-5.0	3-6 (PQ)	Topanga Fm – Siltstone
	3*	246-255.5	3.8	3-6 (PQ)	Topanga Fm – Siltstone
R-09-Z3B12	1	180-190	6.0	4-7	Puente Fm – Shale
	2	220-230	6.0	4-7	Puente Fm – Shale
	3	245-255	6.0	4-7	Puente Fm – Shale
R-09-Z4B4	1	220-229.5	5.5	4-7	Fernando Fm – Siltstone
	2	230-239.5	5.5	4-7	Fernando Fm – Siltstone
	3	251-260.5	5.5	4-7	Fernando Fm – Siltstone

*Indicates unsuccessful packer test.

Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z1-B3**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	124 to 134
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	1/23/09-1/31/09	Boring Logger	J. Castle/B. Schell	Groundwater Depth (ft)	29.9
Drilling Method	Rotary Wash	Boring Dia. (in)	6	Ground Surface Elevation (ft)	343.23
Drill Rig Type	Speedstar 30K	Drill Bit Type	PQ	Boring Depth (ft)	303
Performed By	J. Castle	Date	2/2/2009	Depth to Bedrock (ft)	75

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3	ft	A
Depth to Bottom of Top Packer	124	ft	B
Depth to Top of Bottom Packer	134	ft	C
Groundwater Depth	29.9	ft	D
Overburden Depth to Packer Interval Midpoint	129	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	99.1	ft	F=(E-D)
Packer Inflation Pressure	225	psi	
Maximum Net Applied Pressure	86	psi	G=E-0.433F
Maximum Gauge Pressure	72	psi	H=(G)-(P)

Lugeon Calculations

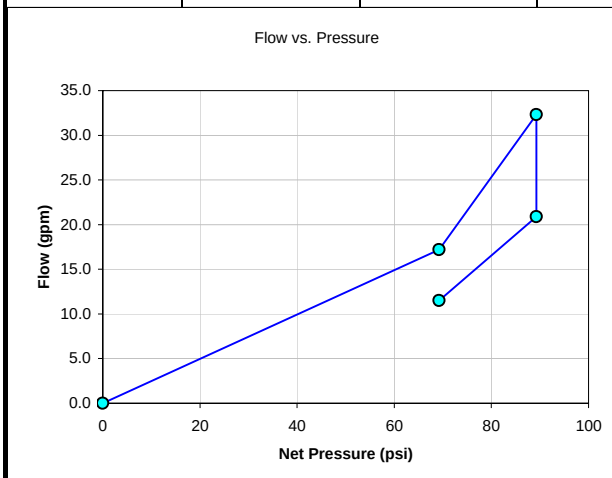
Depth to Bottom of Top Packer	124	ft	B	
Depth to Top of Bottom Packer	134	ft	C	
Length of Packer Interval	10	ft	J=(C-B)	
Water Column Pressure	14	psi	P=0.433*(A+D)	
Friction Loss	0	psi		
Gauge Pressure Steps Step 1&5	55	psi		
Step 2&4	75	psi		
Step 3	100	psi		
Water Temperature	60	°F		

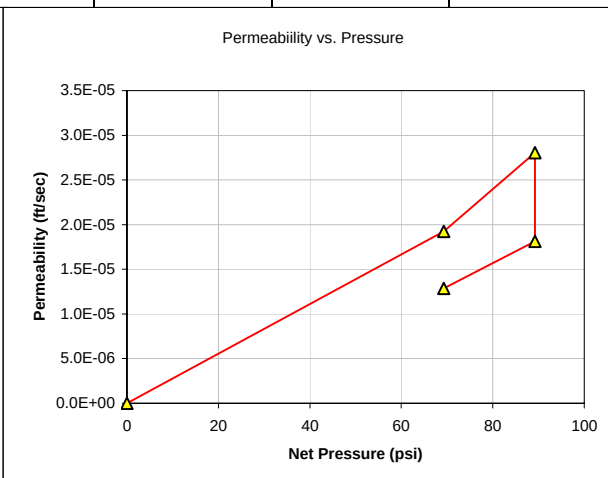
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
17.93	35.83	17.9	55	69	47.047	2.00E-05
35.83	53.73	17.9	55	69	47.047	2.00E-05
53.73	71.41	17.68	55	69	46.469	1.98E-05
71.41	88.78	17.37	55	69	45.654	1.94E-05
88.78	105.79	17.01	55	69	44.708	1.90E-05
	Average	17.19				1.92E-05
32.57	65	32.43	75	89	66.135	2.82E-05
65	97.46	32.46	75	89	66.196	2.82E-05
97.46	129.82	32.36	75	89	65.992	2.81E-05
129.82	162.14	32.32	75	89	65.911	2.81E-05
162.14	194.35	32.21	75	89	65.686	2.80E-05
	Average	32.30				2.81E-05

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z1-B3**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	124 to 134
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons)		(gallons)	(psi)	(psi)	(Lu)	(ft/sec)
Start	End	Take	Gauge	Net	Lugeons	Permeability
19.95	40.36	20.41	75	89	41.622	1.77E-05
40.36	60.99	20.63	75	89	42.071	1.79E-05
60.99	81.69	20.7	75	89	42.214	1.80E-05
81.69	102.53	20.84	75	89	42.499	1.81E-05
102.53	123.44	20.91	75	89	42.642	1.82E-05
	Average	20.875				1.81E-05
9.11	19.17	10.06	55	69	26.441	1.13E-05
19.17	29.91	10.74	55	69	28.228	1.20E-05
29.91	41.14	11.23	55	69	29.516	1.26E-05
41.14	52.91	11.77	55	69	30.935	1.32E-05
52.91	65.17	12.26	55	69	32.223	1.37E-05
	Average	11.5				1.29E-05





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z1-B3**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	215-225
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	1/23/09-1/31/09	Boring Logger	J. Castle/B. Schell	Groundwater Depth (ft)	29.9
Drilling Method	Rotary Wash	Boring Dia. (in)	6	Ground Surface Elevation (ft)	343.23
Drill Rig Type	Speedstar 30K	Drill Bit Type	PQ	Boring Depth (ft)	303
Performed By	J. Castle	Date	2/2/2009	Depth to Bedrock (ft)	75

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3	ft	A
Depth to Bottom of Top Packer	215	ft	B
Depth to Top of Bottom Packer	225	ft	C
Groundwater Depth	29.9	ft	D
Overburden Depth to Packer Interval Midpoint	220	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	190.1	ft	F=(E-D)
Packer Inflation Pressure	270	psi	
Maximum Net Applied Pressure	138	psi	G=E-0.433F
Maximum Gauge Pressure	123	psi	H=(G)-(P)

Lugeon Calculations

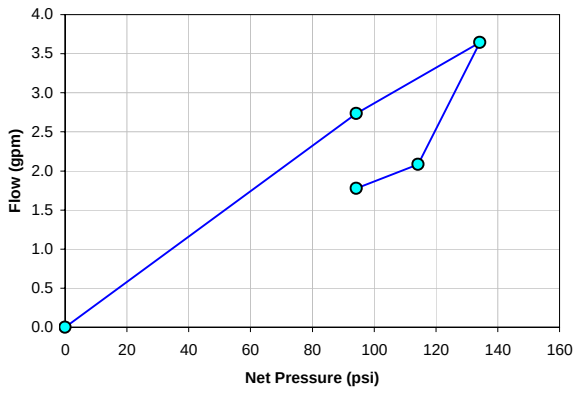
Depth to Bottom of Top Packer	215	ft	B
Depth to Top of Bottom Packer	225	ft	C
Length of Packer Interval	10	ft	J=(C-B)
Water Column Pressure	14	psi	P=0.433*(A+D)
Friction Loss	0	psi	
Gauge Pressure Steps Step 1&5	80	psi	
Step 2&4	120/100	psi	
Step 3	160	psi	
Water Temperature	56	°F	

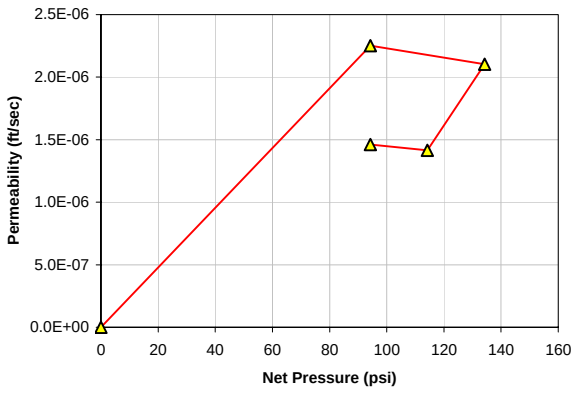
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
2.495	4.861	2.366	80	94	4.569	1.95E-06
4.861	7.246	2.385	80	94	4.606	1.96E-06
7.246	9.825	2.579	80	94	4.980	2.12E-06
9.825	12.544	2.719	80	94	5.251	2.24E-06
12.544	15.297	2.753	80	94	5.316	2.26E-06
	Average	2.74				2.25E-06
3.472	7.098	3.626	120	134	4.916	2.09E-06
7.098	9.554	2.456	120	134	3.330	1.42E-06
9.554	13.18	3.626	120	134	4.916	2.09E-06
13.18	16.791	3.611	120	134	4.896	2.09E-06
16.791	20.481	3.690	120	134	5.003	2.13E-06
	Average	3.642				2.10E-06

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z1-B3**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	215-225
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons)		(gallons)	(psi)	(psi)	(Lu)	(ft/sec)
Start	**End**	**Take**	**Gauge**	**Net**	**Lugeons**	**Permeability**
1.929	3.963	2.034	100	114	3.240	1.38E-06
3.963	6.066	2.10	100	114	3.350	1.43E-06
6.066	8.129	2.063	100	114	3.286	1.40E-06
8.129	10.237	2.108	100	114	3.358	1.43E-06
10.237	12.3	2.063	100	114	3.286	1.40E-06
	Average	2.08				1.41E-06
1.844	3.674	1.83	80	94	3.534	1.51E-06
3.674	5.484	1.81	80	94	3.495	1.49E-06
5.484	7.225	1.741	80	94	3.362	1.43E-06
7.225	9.011	1.786	80	94	3.449	1.47E-06
9.011	10.816	1.805	80	94	3.486	1.48E-06
	Average	1.78				1.46E-06





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z1-B5**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	321.85 to 330
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	2/16/09-2/24/09	Boring Logger	D. Jankly	Groundwater Depth (ft)	22.7
Drilling Method	Rotary Wash	Boring Dia. (in)	6	Ground Surface Elevation (ft)	442
Drill Rig Type	Speedstar 30K	Drill Bit Type	PQ	Boring Depth (ft)	502
Performed By	JL	Date	2/26/2009	Depth to Bedrock (ft)	65

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3	ft	A
Depth to Bottom of Top Packer	321.85	ft	B
Depth to Top of Bottom Packer	330	ft	C
Groundwater Depth	22.7	ft	D
Overburden Depth to Packer Interval Midpoint	325.925	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	303.225	ft	F=(E-D)
Packer Inflation Pressure	345	psi	
Maximum Net Applied Pressure	195	psi	G=E-0.433F
Maximum Gauge Pressure	184	psi	H=(G)-(P)

Lugeon Calculations

Depth to Bottom of Top Packer	321.85	ft	B
Depth to Top of Bottom Packer	330	ft	C
Length of Packer Interval	8.15	ft	J=(C-B)
Water Column Pressure	11	psi	P=0.433*(A+D)
Friction Loss	0	psi	
Gauge Pressure Steps Step 1&5	55	psi	
Step 2&4	110	psi	
Step 3	165	psi	
Water Temperature	62	°F	

(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
92.9	93	0.1	55	66	0.338	1.44E-07
93	93	0	55	66	0.000	0.00E+00
93	93	0	55	66	0.000	0.00E+00
93	93	0	55	66	0.000	0.00E+00
	Average	0.00				0.00E+00
95.6	95.8	0.2	110	121	0.369	2.88E-08
95.8	96	0.2	110	121	0.369	1.57E-07
96	96	0	110	121	0.000	0.00E+00
96	96	0	110	121	0.000	0.00E+00
96	96	0	110	121	0.000	0.00E+00
	Average	0.00				0.00E+00
99	99	0	165	176	0.000	0.00E+00

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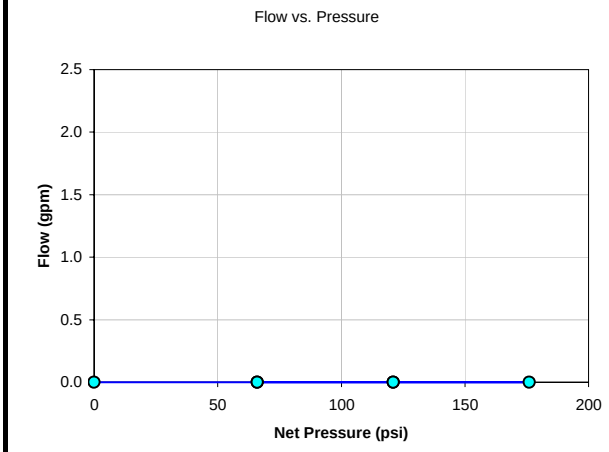
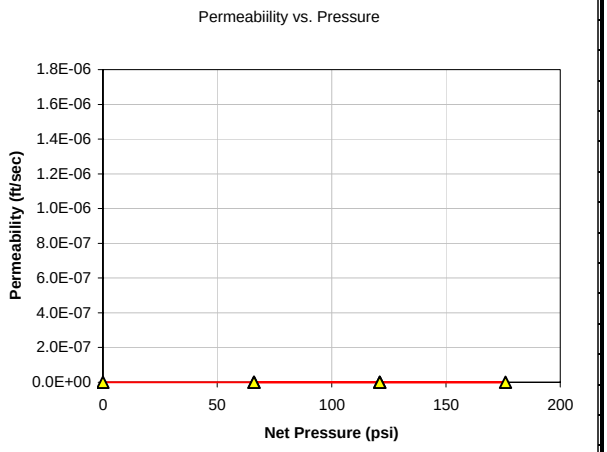
Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z1-B5**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	321.85 to 330
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
99	99	0	165	176	0.000	0.00E+00
99	99.1	0.1	165	176	0.127	5.40E-08
99.1	99.1	0	165	176	0.000	0.00E+00
99.1	99.2	0.1	165	176	0.127	5.40E-08
99.2	99.2	0	165	176	0.000	0.00E+00
99.2	99.2	0	165	176	0.000	0.00E+00
99.2	99.2	0	165	176	0.000	0.00E+00
	Average	0.00				0.00E+00
99.8	99.8	0	110	121	0.000	0.00E+00
99.8	99.8	0	110	121	0.000	0.00E+00
99.8	99.8	0	110	121	0.000	0.00E+00
99.8	99.8	0	110	121	0.000	0.00E+00
	Average	0.00				0.00E+00
101.9	102.2	0.3	55	66	1.013	4.32E-07
102.2	102.3	0.1	55	66	0.338	1.44E-07
102.3	102.3	0	55	66	0.000	0.00E+00
102.3	102.3	0	55	66	0.000	0.00E+00
102.3	102.3	0	55	66	0.000	0.00E+00
	Average	0				0.00E+00





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z1-B5**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	379.65 to 388
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	2/16/09-2/24/09	Boring Logger	D. Jankly	Groundwater Depth (ft)	22.7
Drilling Method	Rotary Wash	Boring Dia. (in)	6	Ground Surface Elevation (ft)	442
Drill Rig Type	Speedstar 30K	Drill Bit Type	PQ	Boring Depth (ft)	502
Performed By	JL	Date	2/26/2009	Depth to Bedrock (ft)	65

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3.2	ft	A
Depth to Bottom of Top Packer	379.65	ft	B
Depth to Top of Bottom Packer	388	ft	C
Groundwater Depth	22.7	ft	D
Overburden Depth to Packer Interval Midpoint	383.825	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	361.125	ft	F=(E-D)
Packer Inflation Pressure	390	psi	
Maximum Net Applied Pressure	227	psi	G=E-0.433F
Maximum Gauge Pressure	216	psi	H=(G)-(P)

Lugeon Calculations

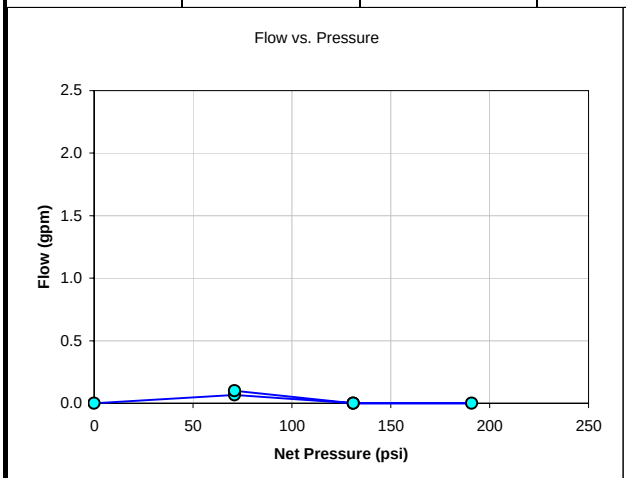
Depth to Bottom of Top Packer		379.65	ft	B
Depth to Top of Bottom Packer		388	ft	C
Length of Packer Interval		8.35	ft	J=(C-B)
Water Column Pressure		11	psi	P=0.433*(A+D)
Friction Loss		0	psi	
Gauge Pressure Steps	Step 1&5	60	psi	
	Step 2&4	120	psi	
	Step 3	180	psi	
Water Temperature		66	°F	

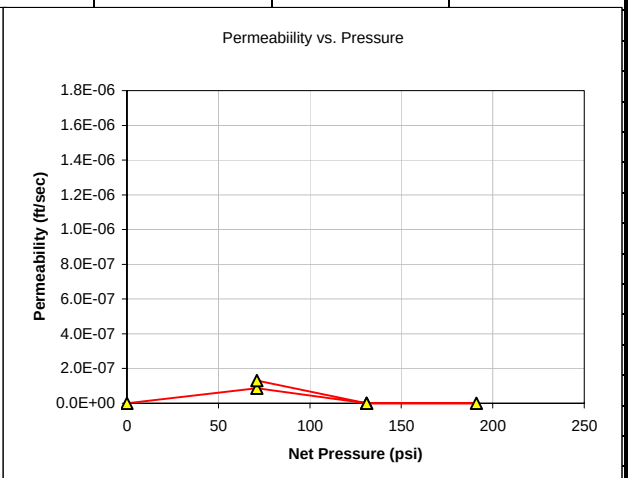
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
62.7	63.2	0.5	60	71	1.530	6.52E-07
63.2	63.8	0.6	60	71	1.836	7.82E-07
63.8	64.4	0.6	60	71	1.836	7.82E-07
64.4	65.2	0.8	60	71	2.449	1.04E-06
65.2	66.1	0.9	60	71	2.755	1.17E-06
66.1	67.4	1.3	60	71	3.979	1.69E-06
67.4	68.3	0.9	60	71	2.755	1.17E-06
68.3	68.3	0	60	71	0.000	0.00E+00
68.3	68.4	0.1	60	71	0.306	1.30E-07
68.4	68.6	0.2	60	71	0.612	2.61E-07
68.6	68.7	0.1	60	71	0.306	1.30E-07
68.7	68.7	0	60	71	0.000	0.00E+00

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z1-B5**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	379.65 to 388
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons)		(gallons)	(psi)	(psi)	(Lu)	(ft/sec)
Start	End	Take	Gauge	Net	Lugeons	Permeability
68.7	68.7	0	60	71	0.000	0.00E+00
	Average	0.07				8.69E-08
77.7	78	0.3	120	131	0.498	2.12E-07
78	78	0	120	131	0.000	0.00E+00
78	78	0	120	131	0.000	0.00E+00
78	78	0	120	131	0.000	0.00E+00
	Average	0.00				0.00E+00
80.2	80.4	0.20	180	191	0.228	4.27E-08
80.4	80.9	0.50	180	191	0.570	2.43E-07
80.9	80.9	0.00	180	191	0.000	0.00E+00
80.9	80.9	0.00	180	191	0.000	0.00E+00
80.9	80.9	0.00	180	191	0.000	0.00E+00
	Average	0.00				0.00E+00
81.8	81.8	0	120	131	0.000	0.00E+00
81.8	81.8	0	120	131	0.000	0.00E+00
81.8	81.8	0	120	131	0.000	0.00E+00
81.8	81.8	0	120	131	0.000	0.00E+00
	Average	0.00				0.00E+00
83.4	83.7	0.30	60	71	0.918	3.91E-07
83.7	83.9	0.20	60	71	0.612	2.61E-07
83.9	84.1	0.20	60	71	0.612	2.61E-07
84.1	84.4	0.30	60	71	0.918	3.91E-07
84.4	84.6	0.20	60	71	0.612	2.61E-07
84.6	84.7	0.10	60	71	0.306	1.30E-07
84.7	84.8	0.10	60	71	0.306	1.30E-07
84.8	84.9	0.10	60	71	0.306	1.30E-07
	Average	0.10				1.30E-07





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z1-B5**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	421.85 to 430
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	2/16/09-2/24/09	Boring Logger	D. Jankly	Groundwater Depth (ft)	22.7
Drilling Method	Rotary Wash	Boring Dia. (in)	6	Ground Surface Elevation (ft)	442
Drill Rig Type	Speedstar 30K	Drill Bit Type	PQ	Boring Depth (ft)	502
Performed By	JL	Date	2/26/2009	Depth to Bedrock (ft)	65

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3.2	ft	A
Depth to Bottom of Top Packer	421.85	ft	B
Depth to Top of Bottom Packer	430	ft	C
Groundwater Depth	22.7	ft	D
Overburden Depth to Packer Interval Midpoint	425.925	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	403.225	ft	F=(E-D)
Packer Inflation Pressure	450	psi	
Maximum Net Applied Pressure	251	psi	G=E-0.433F
Maximum Gauge Pressure	240	psi	H=(G)-(P)

Lugeon Calculations

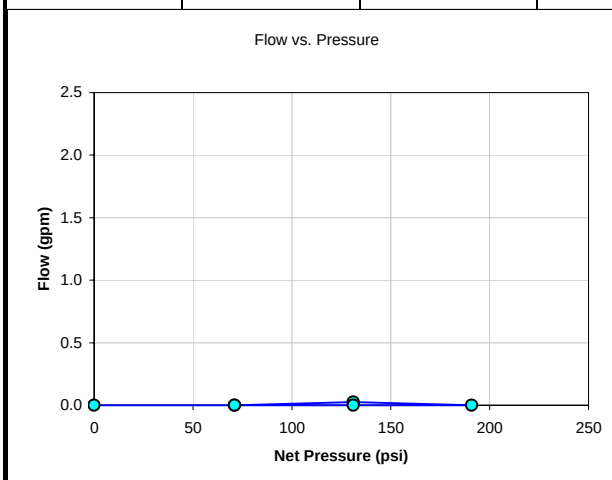
Depth to Bottom of Top Packer	421.85	ft	B
Depth to Top of Bottom Packer	430	ft	C
Length of Packer Interval	8.15	ft	J=(C-B)
Water Column Pressure	11	psi	P=0.433*(A+D)
Friction Loss	0	psi	
Gauge Pressure Steps Step 1&5	65	psi	
Step 2&4	130	psi	
Step 3	195	psi	
Water Temperature	68	°F	

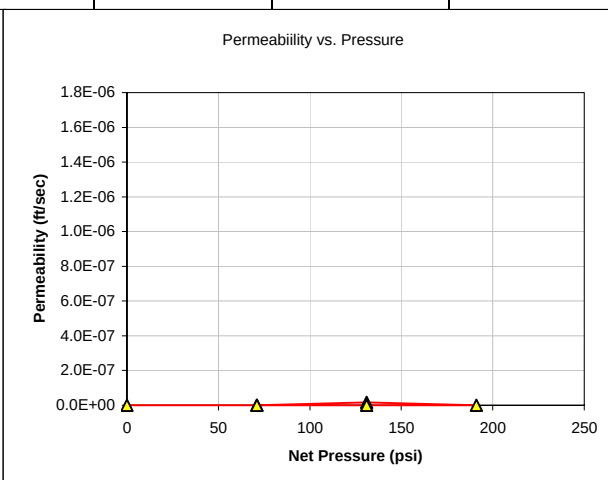
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
55.6	55.9	0.3	65	76	0.879	3.74E-07
55.9	56.1	0.2	65	76	0.586	2.50E-07
56.1	56.4	0.3	65	76	0.879	3.74E-07
56.4	56.7	0.3	65	76	0.879	3.74E-07
56.7	57	0.3	65	76	0.879	3.74E-07
	Average	0.30				3.74E-07
57.4	57.4	0	130	141	0.000	0.00E+00
57.4	57.4	0	130	141	0.000	0.00E+00
57.4	57.5	0.1	130	141	0.158	6.74E-08
57.5	57.5	0	130	141	0.000	0.00E+00
57.5	57.5	0	130	141	0.000	0.00E+00
57.5	57.5	0	130	141	0.000	0.00E+00

Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**		**Z1-B5**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)		421.85 to 430
Project Number :	379312.04.08.01					Sheet 2 of 2

Flow Meter (gallons)		(gallons)	(psi)	(psi)	(Lu)	(ft/sec)
Start	**End**	**Take**	**Gauge**	**Net**	**Lugeons**	**Permeability**
	Average	0.00				0.00E+00
57.9	57.9	0	195	206	0.000	0.00E+00
57.9	57.9	0	195	206	0.000	0.00E+00
57.9	57.9	0	195	206	0.000	0.00E+00
	Average	0.00				0.00E+00
58.8	58.9	0.1	130	141	0.158	6.74E-08
58.9	58.9	0.03	130	141	0.040	1.68E-08
58.9	59	0.10	130	141	0.158	6.74E-08
59	59	0.00	130	141	0.000	0.00E+00
59	59	0.00	130	141	0.000	0.00E+00
59	59	0.00	130	141	0.000	0.00E+00
	Average	0.00				0.00E+00
60.7	60.7	0	65	76	0.000	0.00E+00
60.7	60.7	0	65	76	0.000	0.00E+00
60.7	60.7	0	65	76	0.000	0.00E+00
	Average	0.00				0.00E+00





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z1-B5**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	421.85-430
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	2/16/09-2/24/09	Boring Logger	D. Jankly	Groundwater Depth (ft)	22.7
Drilling Method	Rotary Wash	Boring Dia. (in)	6	Ground Surface Elevation (ft)	442
Drill Rig Type	Speedstar 30K	Drill Bit Type	PQ	Boring Depth (ft)	502
Performed By	JL	Date	2/26/2009	Depth to Bedrock (ft)	65

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3	ft	A
Depth to Bottom of Top Packer	421.85	ft	B
Depth to Top of Bottom Packer	430	ft	C
Groundwater Depth	22.7	ft	D
Overburden Depth to Packer Interval Midpoint	425.925	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	403.225	ft	F=(E-D)
Packer Inflation Pressure	500	psi	
Maximum Net Applied Pressure	251	psi	G=E-0.433F
Maximum Gauge Pressure	240	psi	H=(G)-(P)

Lugeon Calculations

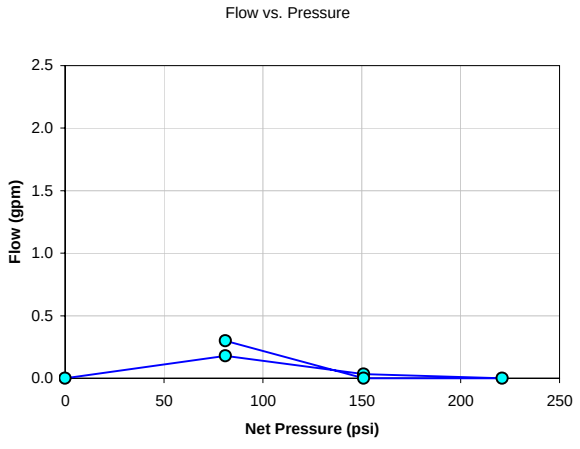
Depth to Bottom of Top Packer	421.85	ft	B
Depth to Top of Bottom Packer	430	ft	C
Length of Packer Interval	8.15	ft	J=(C-B)
Water Column Pressure	11	psi	P=0.433*(A+D)
Friction Loss	0	psi	
Gauge Pressure Steps Step 1&5	70	psi	
Step 2&4	140	psi	
Step 3	210	psi	
Water Temperature	68	°F	

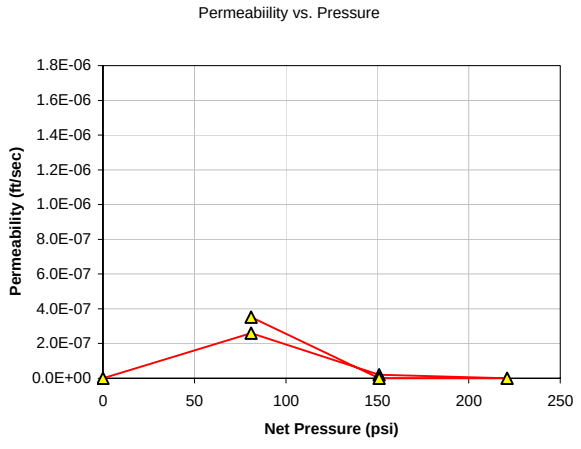
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
26.6	27	0.4	70	81	1.101	4.69E-07
27	27.5	0.5	70	81	1.376	5.86E-07
27.5	27.9	0.4	70	81	1.101	4.69E-07
27.9	28.4	0.5	70	81	1.376	5.86E-07
28.4	28.9	0.5	70	81	1.376	5.86E-07
28.9	29.5	0.6	70	81	1.652	5.39E-07
29.5	30.3	0.8	70	81	2.202	9.38E-07
36	36.3	0.3	70	81	0.826	5.96E-07
36.3	36.9	0.6	70	81	1.652	7.04E-07
36.9	36.9	0	70	81	0.000	0.00E+00
36.9	36.9	0	70	81	0.000	0.00E+00
36.9	36.9	0	70	81	0.000	0.00E+00

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z1-B5**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	421.85-430
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
	Average	0.18				2.60E-07
40.1	40.4	0.3	140	151	0.443	1.89E-07
40.4	40.5	0.1	140	151	0.148	6.29E-08
40.5	40.5	0	140	151	0.000	0.00E+00
40.5	40.5	0	140	151	0.000	0.00E+00
40.5	40.7	0.2	140	151	0.296	1.26E-07
40.7	40.7	0	140	151	0.000	0.00E+00
40.7	40.7	0	140	151	0.000	0.00E+00
40.7	40.7	0	140	151	0.000	0.00E+00
	Average	0.03				2.10E-08
42.4	42.5	0.1	210	221	0.101	4.30E-08
42.5	42.7	0.2	210	221	0.202	8.60E-08
42.7	42.7	0	210	221	0.000	0.00E+00
42.7	42.7	0	210	221	0.000	0.00E+00
42.7	42.7	0	210	221	0.000	0.00E+00
42.7	42.7	0	210	221	0.000	0.00E+00
	Average	0				0.00E+00
44.9	44.9	0	140	151	0.000	0.00E+00
44.9	44.9	0	140	151	0.000	0.00E+00
44.9	44.9	0	140	151	0.000	0.00E+00
	Average	0				0.00E+00
48.2	48.6	0.4	70	81	1.101	4.69E-07
48.6	48.9	0.3	70	81	0.826	3.52E-07
48.9	49.1	0.2	70	81	0.551	2.35E-07
49.1	49.5	0.4	70	81	1.101	4.69E-07
49.5	50	0.5	70	81	1.376	5.86E-07
50	50.3	0.3	70	81	0.826	3.52E-07
50.3	50.5	0.2	70	81	0.551	2.35E-07
50.5	50.8	0.3	70	81	0.826	3.52E-07
50.8	51.1	0.3	70	81	0.826	3.52E-07
51.1	51.4	0.3	70	81	0.826	3.52E-07
	Average	0.3				3.52E-07





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z1-B6**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	255-265.6
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	1/30/09-2/10/09	Boring Logger	R. Chavez/D.Jankly	Groundwater Depth (ft)	21.5
Drilling Method	Rotary Wash	Boring Dia. (in)	5.5-6	Ground Surface Elevation (ft)	425.7
Drill Rig Type	Ingersoll Rand A400	Drill Bit Type	PQ	Boring Depth (ft)	400.5
Performed By	JL	Date	2/12/2009	Depth to Bedrock (ft)	68

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3.2	ft	A
Depth to Bottom of Top Packer	255	ft	B
Depth to Top of Bottom Packer	265.6	ft	C
Groundwater Depth	21.5	ft	D
Overburden Depth to Packer Interval Midpoint	260.3	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	238.8	ft	F=(E-D)
Packer Inflation Pressure	275	psi	
Maximum Net Applied Pressure	157	psi	G=E-0.433F
Maximum Gauge Pressure	146	psi	H=(G)-(P)

Lugeon Calculations

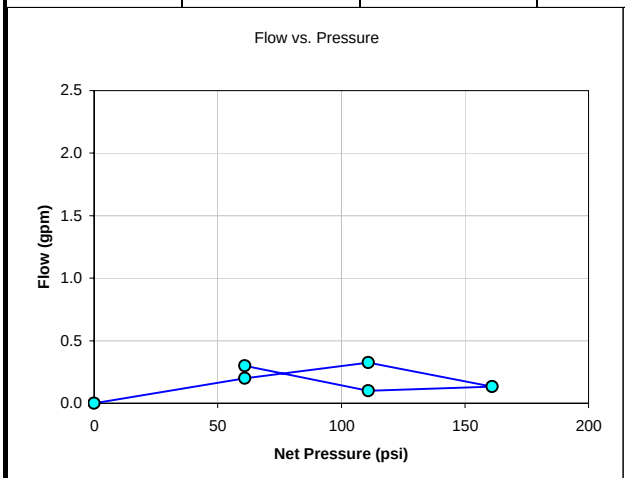
Depth to Bottom of Top Packer	255	ft	B	
Depth to Top of Bottom Packer	265.6	ft	C	
Length of Packer Interval	10.6	ft	J=(C-B)	
Water Column Pressure	11	psi	P=0.433*(A+D)	
Friction Loss	0	psi		
Gauge Pressure Steps Step 1&5	50	psi		
Step 2&4	100	psi		
Step 3	150	psi		
Water Temperature	69	°F		

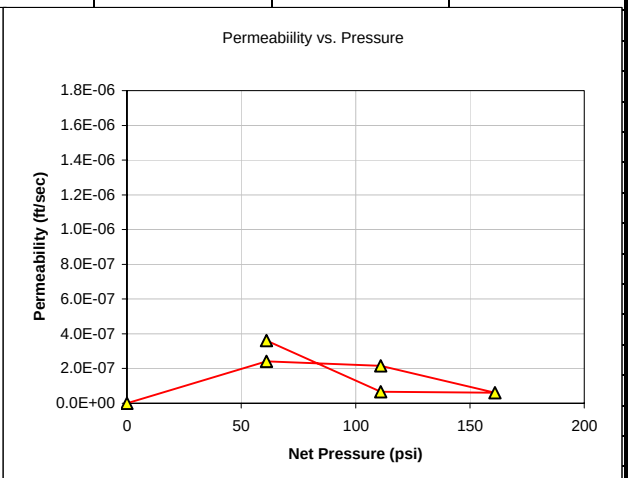
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
440.9	441.1	0.2	50	61	0.566	2.41E-07
441.1	441.2	0.1	50	61	0.283	1.21E-07
441.2	441.4	0.2	50	61	0.566	2.41E-07
441.4	441.6	0.2	50	61	0.566	2.41E-07
441.6	441.8	0.2	50	61	0.566	2.41E-07
	Average	0.20				2.41E-07
442	442.3	0.3	100	111	0.465	1.98E-07
442.3	442.6	0.3	100	111	0.465	1.98E-07
442.6	443	0.4	100	111	0.620	2.64E-07
443	443.3	0.3	100	111	0.465	1.98E-07
443.3	443.6	0.3	100	111	0.465	1.98E-07
	Average	0.33				2.15E-07

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z1-B6**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	255-265.6
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons)		(gallons)	(psi)	(psi)	(Lu)	(ft/sec)
Start	End	Take	Gauge	Net	Lugeons	Permeability
444.2	444.3	0.1	150	161	0.107	4.55E-08
444.3	444.4	0.1	150	161	0.107	4.55E-08
444.4	444.5	0.1	150	161	0.107	4.55E-08
444.5	444.7	0.2	150	161	0.214	9.10E-08
444.7	444.8	0.1	150	161	0.107	4.55E-08
444.8	444.9	0.1	150	161	0.107	4.55E-08
444.9	445.1	0.2	150	161	0.214	9.10E-08
	Average	0.13				6.07E-08
445.3	445.4	0.1	100	111	0.155	6.61E-08
445.4	445.5	0.1	100	111	0.155	6.18E-08
445.5	445.7	0.2	100	111	0.310	1.32E-07
445.7	445.8	0.1	100	111	0.155	6.61E-08
445.8	445.9	0.1	100	111	0.155	6.61E-08
445.9	446	0.1	100	111	0.155	6.61E-08
	Average	0.10				6.61E-08
446.1	446.5	0.4	50	61	1.132	4.82E-07
446.5	446.8	0.17	50	61	0.471	1.46E-07
446.8	447.1	0.3	50	61	0.849	3.62E-07
447.1	447.4	0.3	50	61	0.849	3.62E-07
447.4	447.7	0.3	50	61	0.849	3.62E-07
447.7	448	0.3	50	61	0.849	3.62E-07
	Average	0.30				3.62E-07





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z1-B6**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	295-305.6
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	1/30/09-2/10/09	Boring Logger	R. Chavez/D.Jankly	Groundwater Depth (ft)	21.5
Drilling Method	Rotary Wash	Boring Dia. (in)	5.5-6	Ground Surface Elevation (ft)	425.7
Drill Rig Type	Ingersoll Rand A400	Drill Bit Type	PQ	Boring Depth (ft)	400.5
Performed By	JL	Date	2/12/2009	Depth to Bedrock (ft)	68

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3.2	ft	A
Depth to Bottom of Top Packer	295	ft	B
Depth to Top of Bottom Packer	305.6	ft	C
Groundwater Depth	21.5	ft	D
Overburden Depth to Packer Interval Midpoint	300.3	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	278.8	ft	F=(E-D)
Packer Inflation Pressure	300	psi	
Maximum Net Applied Pressure	180	psi	G=E-0.433F
Maximum Gauge Pressure	169	psi	H=(G)-(P)

Lugeon Calculations

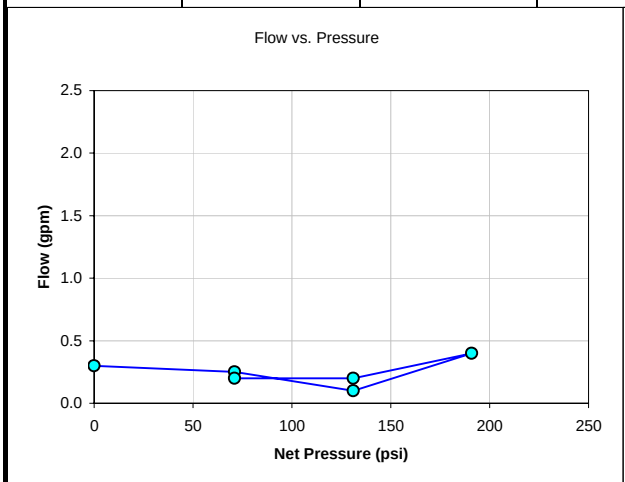
Depth to Bottom of Top Packer	295	ft	B	
Depth to Top of Bottom Packer	305.6	ft	C	
Length of Packer Interval	10.6	ft	J=(C-B)	
Water Column Pressure	11	psi	P=0.433*(A+D)	
Friction Loss	0	psi		
Gauge Pressure Steps Step 1&5	60	psi		
Step 2&4	120	psi		
Step 3	180	psi		
Water Temperature	69	°F		

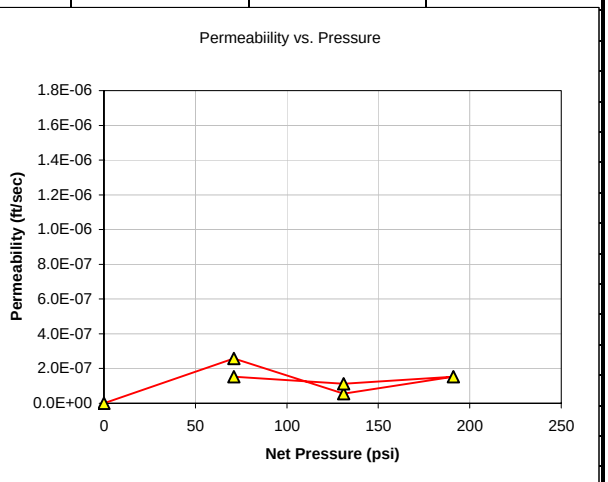
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
433.3	433.6	0.3	60	71	0.729	3.10E-07
433.6	433.8	0.2	60	71	0.486	2.07E-07
433.8	434.1	0.3	60	71	0.729	3.10E-07
434.1	434.3	0.2	60	71	0.486	2.07E-07
434.3	434.6	0.3	60	71	0.729	3.10E-07
	Average	0.25				2.59E-07
434.7	434.8	0.1	120	131	0.131	5.60E-08
434.8	434.9	0.1	120	131	0.131	5.60E-08
434.9	435	0.1	120	131	0.131	5.60E-08
435	435.1	0.1	120	131	0.131	5.60E-08
435.1	435.2	0.1	120	131	0.131	5.60E-08
	Average	0.10				5.60E-08

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z1-B6**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	295-305.6
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons)		(gallons)	(psi)	(psi)	(Lu)	(ft/sec)
Start	**End**	**Take**	**Gauge**	**Net**	**Lugeons**	**Permeability**
435.8	436.1	0.3	180	191	0.270	1.15E-07
436.1	436.4	0.3	180	191	0.270	1.15E-07
436.4	436.7	0.3	180	191	0.270	1.15E-07
436.7	437.1	0.4	180	191	0.360	1.53E-07
437.1	437.5	0.4	180	191	0.360	1.53E-07
437.5	437.9	0.4	180	191	0.360	1.53E-07
	Average	0.40				1.53E-07
438.2	438.3	0.10	120	131	0.131	5.60E-08
438.3	438.5	0.20	120	131	0.263	1.12E-07
438.5	438.7	0.20	120	131	0.263	1.12E-07
438.7	438.9	0.20	120	131	0.263	1.12E-07
438.9	439.1	0.20	120	131	0.263	1.12E-07
	Average	0.20				1.12E-07
439.3	439.5	0.2	60	71	0.486	2.07E-07
439.5	439.8	0.3	60	71	0.729	3.10E-07
439.8	440	0.2	60	71	0.486	2.07E-07
440	440.2	0.2	60	71	0.486	2.07E-07
440.2	440.4	0.2	60	71	0.486	2.07E-07
	Average	0.20				2.07E-07





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z1-B6**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	372.3-382.9
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	1/30/09-2/10/09	Boring Logger	R. Chavez/D.Jankly	Groundwater Depth (ft)	21.5
Drilling Method	Rotary Wash	Boring Dia. (in)	5.5-6	Ground Surface Elevation (ft)	425.7
Drill Rig Type	Ingersoll Rand A400	Drill Bit Type	PQ	Boring Depth (ft)	400.5
Performed By	JL	Date	2/12/2009	Depth to Bedrock (ft)	68

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3	ft	A
Depth to Bottom of Top Packer	372.3	ft	B
Depth to Top of Bottom Packer	382.9	ft	C
Groundwater Depth	11	ft	D
Overburden Depth to Packer Interval Midpoint	377.6	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	366.6	ft	F=(E-D)
Packer Inflation Pressure	350	psi	
Maximum Net Applied Pressure	219	psi	G=E-0.433F
Maximum Gauge Pressure	213	psi	H=(G)-(P)

Lugeon Calculations

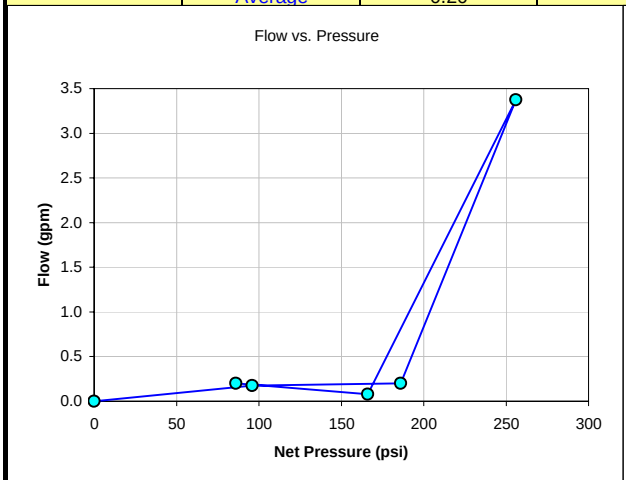
Depth to Bottom of Top Packer	372.3	ft	B
Depth to Top of Bottom Packer	382.9	ft	C
Length of Packer Interval	10.6	ft	J=(C-B)
Water Column Pressure	6	psi	P=0.433*(A+D)
Friction Loss	0	psi	
Gauge Pressure Steps Step 1&5	90	psi	
Step 2&4	180	psi	
Step 3	270	psi	
Water Temperature	67	°F	

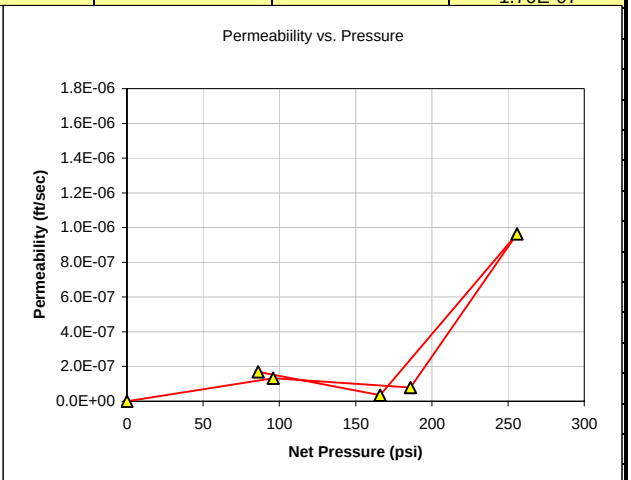
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
299.6	299.8	0.2	90	96	0.357	1.52E-07
299.8	300	0.2	90	96	0.357	1.52E-07
300	300.1	0.1	90	96	0.179	7.61E-08
300.1	300.4	0.3	90	96	0.536	2.28E-07
300.4	300.6	0.20	90	96	0.357	1.52E-07
300.6	300.8	0.2	90	96	0.357	1.52E-07
300.8	300.9	0.1	90	96	0.179	7.61E-08
300.9	301.1	0.2	90	96	0.357	1.52E-07
301.1	301.3	0.2	90	96	0.357	1.52E-07
	Average	0.17				1.33E-07
302.9	303.3	0.4	180	186	0.369	1.57E-07
303.3	303.6	0.3	180	186	0.277	1.18E-07

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z1-B6**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	372.3-382.9
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons)		(gallons)	(psi)	(psi)	(Lu)	(ft/sec)
Start	**End**	**Take**	**Gauge**	**Net**	**Lugeons**	**Permeability**
303.6	303.9	0.3	180	186	0.277	1.18E-07
303.9	304.1	0.2	180	186	0.185	7.86E-08
304.1	304.3	0.2	180	186	0.185	7.86E-08
304.3	304.5	0.2	180	186	0.185	7.86E-08
304.5	304.7	0.2	180	186	0.185	7.86E-08
	Average	0.20				7.86E-08
334.6	337.7	3.1	250	256	2.079	8.86E-07
337.7	341.6	3.9	250	256	2.615	1.11E-06
341.6	344.9	3.3	250	256	2.213	9.43E-07
344.9	348.2	3.3	250	256	2.213	9.43E-07
348.2	351.5	3.3	250	256	2.213	9.43E-07
351.5	355.1	3.6	250	256	2.414	1.03E-06
	Average	3.38				9.64E-07
369.3	371.2	1.9	160	166	1.964	8.37E-07
371.2	371.9	0.7	160	166	0.724	3.08E-07
371.9	372.3	0.4	160	166	0.414	1.76E-07
372.3	372.5	0.2	160	166	0.207	8.81E-08
372.5	372.6	0.1	160	166	0.103	4.40E-08
372.6	372.6	0	160	166	0.000	0.00E+00
372.6	372.7	0.1	160	166	0.103	4.40E-08
372.7	372.8	0.1	160	166	0.103	4.40E-08
372.8	372.9	0.1	160	166	0.103	4.40E-08
	Average	0.08				3.52E-08
374.2	375.1	0.9	80	86	1.796	7.65E-07
375.1	375.5	0.4	80	86	0.798	3.40E-07
375.5	375.9	0.4	80	86	0.798	3.40E-07
375.9	376.1	0.2	80	86	0.399	1.70E-07
376.1	376.4	0.3	80	86	0.599	2.55E-07
376.4	376.6	0.2	80	86	0.399	1.70E-07
376.6	376.8	0.2	80	86	0.399	1.70E-07
376.8	377	0.2	80	86	0.399	1.70E-07
	Average	0.20				1.70E-07





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z1-B7**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	262 to 272
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	1/19/09-1/23/09	Boring Logger	R. Chavez	Groundwater Depth (ft)	40
Drilling Method	Rotary Wash	Boring Dia. (in)	6	Ground Surface Elevation (ft)	481
Drill Rig Type	Ingersoll Rand A400	Drill Bit Type	PQ	Boring Depth (ft)	300
Performed By	KR	Date	1/27/2009	Depth to Bedrock (ft)	38.5

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3	ft	A
Depth to Bottom of Top Packer	262	ft	B
Depth to Top of Bottom Packer	272	ft	C
Groundwater Depth	40	ft	D
Overburden Depth to Packer Interval Midpoint	267	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	227	ft	F=(E-D)
Packer Inflation Pressure	270	psi	
Maximum Net Applied Pressure	169	psi	G=E-0.433F
Maximum Gauge Pressure	150	psi	H=(G)-(P)

Lugeon Calculations

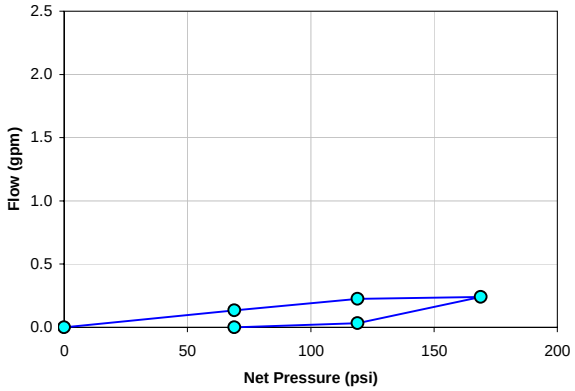
Depth to Bottom of Top Packer		262	ft	B
Depth to Top of Bottom Packer		272	ft	C
Length of Packer Interval		10	ft	J=(C-B)
Water Column Pressure		19	psi	P=0.433*(A+D)
Friction Loss		0	psi	
Gauge Pressure Steps	Step 1&5	50	psi	
	Step 2&4	100	psi	
	Step 3	150	psi	
Water Temperature		50	°F	

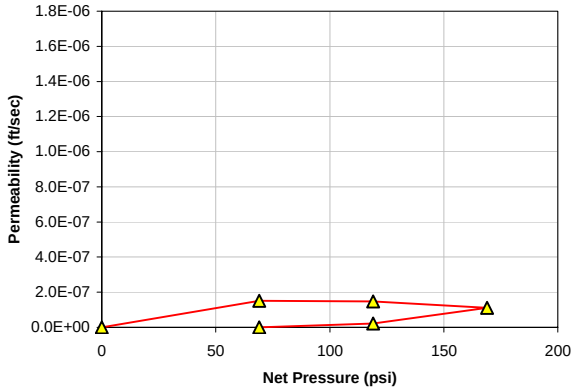
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
38.3	38.4	0.1	50	69	0.265	1.13E-07
38.4	38.6	0.2	50	69	0.530	2.26E-07
38.6	38.7	0.1	50	69	0.265	1.13E-07
38.7	38.9	0.2	50	69	0.530	2.26E-07
38.9	39	0.1	50	69	0.265	1.13E-07
	Average	0.13				1.51E-07
39.8	40.1	0.3	100	119	0.460	1.96E-07
40.1	40.3	0.2	100	119	0.307	1.31E-07
40.3	40.5	0.2	100	119	0.307	1.31E-07
40.5	40.8	0.3	100	119	0.460	1.96E-07
40.8	41	0.2	100	119	0.307	1.31E-07
	Average	0.225				1.47E-07

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z1-B7**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	262 to 272
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
52.8	53	0.2	150	169	0.216	9.20E-08
53	53.3	0.3	150	169	0.324	1.38E-07
53.3	53.5	0.2	150	169	0.216	9.20E-08
53.5	53.7	0.2	150	169	0.216	9.20E-08
53.7	54	0.3	150	169	0.324	1.38E-07
	Average	0.24				1.10E-07
54.2	54.2	0	100	119	0.000	0.00E+00
54.2	54.3	0.1	100	119	0.153	6.54E-08
54.3	54.3	0	100	119	0.000	0.00E+00
54.3	54.4	0.1	100	119	0.153	6.54E-08
54.4	54.4	0	100	119	0.000	0.00E+00
	Average	0.03				2.18E-08
54.7	54.7	0	50	69	0.000	0.00E+00
54.7	54.7	0	50	69	0.000	0.00E+00
54.7	54.7	0	50	69	0.000	0.00E+00
54.7	54.7	0	50	69	0.000	0.00E+00
54.7	54.7	0	50	69	0.000	0.00E+00
	Average	0				0.00E+00





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z1-B8**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	90-100
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	1/6/09-1/12/09	Boring Logger	CB	Groundwater Depth (ft)	25
Drilling Method	Rotarty Wash	Boring Dia. (in)	4.33-5.12	Ground Surface Elevation (ft)	419.6
Drill Rig Type	CME 85	Drill Bit Type	HQ	Boring Depth (ft)	200
Performed By	RR	Date	1/12/2009	Depth to Bedrock (ft)	42

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3	ft	A
Depth to Bottom of Top Packer	90	ft	B
Depth to Top of Bottom Packer	100	ft	C
Groundwater Depth	25	ft	D
Overburden Depth to Packer Interval Midpoint	95	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	70	ft	F=(E-D)
Packer Inflation Pressure	180	psi	
Maximum Net Applied Pressure	65	psi	G=E-0.433F
Maximum Gauge Pressure	53	psi	H=(G)-(P)

Lugeon Calculations

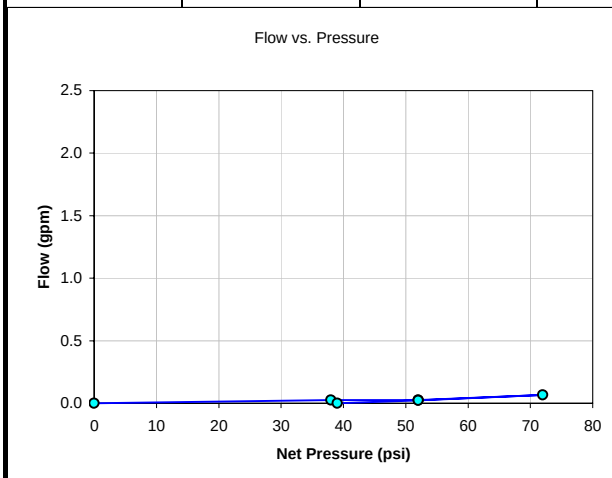
Depth to Bottom of Top Packer	90	ft	B
Depth to Top of Bottom Packer	100	ft	C
Length of Packer Interval	10	ft	J=(C-B)
Water Column Pressure	12	psi	P=0.433*(A+D)
Friction Loss	0	psi	
Gauge Pressure Steps Step 1&5	26	psi	
Step 2&4	40	psi	
Step 3	60	psi	
Water Temperature	70	°F	

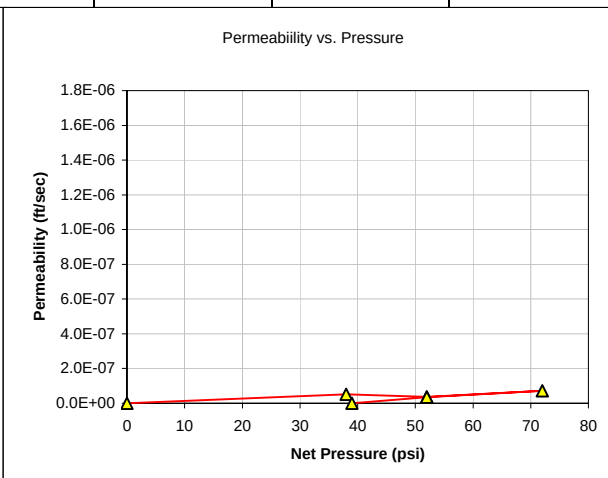
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
30	30	0	26	38	0.000	0.00E+00
30	30.1	0.1	26	38	0.477	2.03E-07
30.1	30.1	0	26	38	0.000	0.00E+00
30.1	30.1	0	26	38	0.000	0.00E+00
30.1	30.1	0	26	38	0.000	0.00E+00
	Average	0.03				5.08E-08
30.1	30.1	0	40	52	0.000	0.00E+00
30.1	30.2	0.1	40	52	0.349	1.49E-07
30.2	30.2	0	40	52	0.000	0.00E+00
30.2	30.2	0	40	52	0.000	0.00E+00
30.2	30.2	0	40	52	0.000	0.00E+00
	Average	0.02				3.72E-08

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z1-B8**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	90-100
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons)		(gallons)	(psi)	(psi)	(Lu)	(ft/sec)
Start	**End**	**Take**	**Gauge**	**Net**	**Lugeons**	**Permeability**
30.2	30.3	0.1	60	72	0.252	1.07E-07
30.3	30.4	0.1	60	72	0.252	1.07E-07
30.4	30.4	0	60	72	0.000	0.00E+00
30.4	30.5	0.1	60	72	0.252	1.07E-07
30.5	30.6	0.1	60	72	0.252	1.07E-07
30.6	30.6	0	60	72	0.000	0.00E+00
	Average	0.07				7.17E-08
30.6	30.6	0.00	40	52	0.000	0.00E+00
30.6	30.6	0.00	40	52	0.000	0.00E+00
30.6	30.6	0.00	40	52	0.000	0.00E+00
30.6	30.6	0.00	40	52	0.000	0.00E+00
30.6	30.7	0.10	40	52	0.349	1.49E-07
30.7	30.7	0.02	40	52	0.070	2.97E-08
	Average	0.02				3.57E-08
30.7	30.7	0	27	39	0.000	0.00E+00
30.7	30.7	0	27	39	0.000	0.00E+00
30.7	30.7	0	27	39	0.000	0.00E+00
30.7	30.7	0	27	39	0.000	0.00E+00
	Average	0.00				0.00E+00





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z1-B8**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	130-140
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	1/6/09-1/12/09	Boring Logger	CB	Groundwater Depth (ft)	25
Drilling Method	Rotarty Wash	Boring Dia. (in)	4.33-5.12	Ground Surface Elevation (ft)	419.6
Drill Rig Type	CME 85	Drill Bit Type	HQ	Boring Depth (ft)	200
Performed By	RR	Date	1/12/2009	Depth to Bedrock (ft)	42

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3	ft	A
Depth to Bottom of Top Packer	130	ft	B
Depth to Top of Bottom Packer	140	ft	C
Groundwater Depth	11	ft	D
Overburden Depth to Packer Interval Midpoint	135	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	124	ft	F=(E-D)
Packer Inflation Pressure	200	psi	
Maximum Net Applied Pressure	81	psi	G=E-0.433F
Maximum Gauge Pressure	75	psi	H=(G)-(P)

Lugeon Calculations

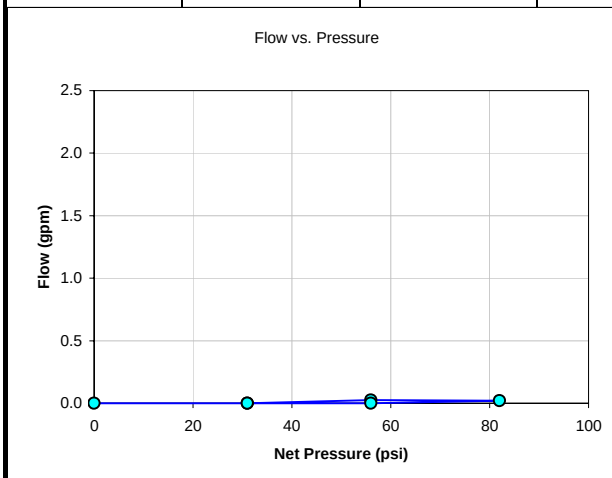
Depth to Bottom of Top Packer		130	ft	B
Depth to Top of Bottom Packer		140	ft	C
Length of Packer Interval		10	ft	J=(C-B)
Water Column Pressure		6	psi	P=0.433*(A+D)
Friction Loss		0	psi	
Gauge Pressure Steps	Step 1&5	25	psi	
	Step 2&4	50	psi	
	Step 3	75	psi	
Water Temperature		71	°F	

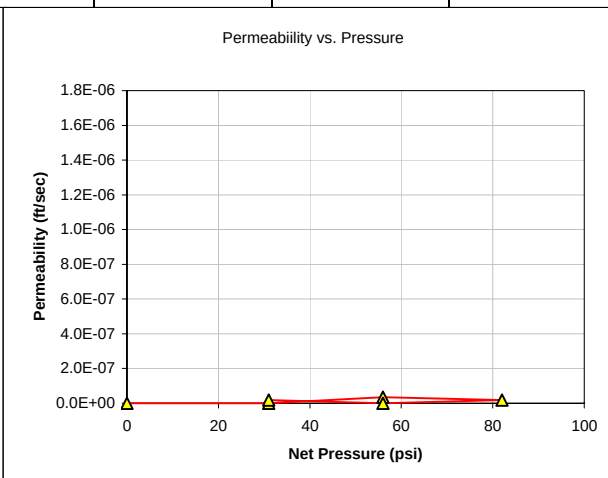
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
28.2	28.2	0	25	31	0.000	0.00E+00
28.2	28.2	0	25	31	0.000	0.00E+00
28.2	28.2	0	25	31	0.000	0.00E+00
28.2	28.2	0	25	31	0.000	0.00E+00
28.2	28.2	0	25	31	0.000	0.00E+00
	Average	0.00				0.00E+00
28.6	28.6	0	50	56	0.000	0.00E+00
28.6	28.7	0.1	50	56	0.325	1.38E-07
28.7	28.7	0	50	56	0.000	0.00E+00
28.7	28.7	0	50	56	0.000	0.00E+00
28.7	28.7	0	50	56	0.000	0.00E+00
	Average	0.02				3.46E-08

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z1-B8**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	130-140
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons)		(gallons)	(psi)	(psi)	(Lu)	(ft/sec)
Start	**End**	**Take**	**Gauge**	**Net**	**Lugeons**	**Permeability**
28.8	28.8	0	76	82	0.000	0.00E+00
28.8	28.8	0	76	82	0.000	0.00E+00
28.8	28.8	0	76	82	0.000	0.00E+00
28.8	28.9	0.1	76	82	0.222	9.45E-08
28.9	28.9	0	76	82	0.000	0.00E+00
28.9	28.9	0	76	82	0.000	0.00E+00
	Average	0.02				1.89E-08
28.9	29	0.10	50	56	0.325	1.38E-07
29	29	0.00	50	56	0.000	0.00E+00
29	29	0.00	50	56	0.000	0.00E+00
29	29	0.00	50	56	0.000	0.00E+00
29	29	0.00	50	56	0.000	0.00E+00
	Average	0.00				0.00E+00
29	29	0	25	31	0.000	0.00E+00
29	29	0	25	31	0.000	0.00E+00
29	29	0	25	31	0.000	0.00E+00
29	29	0	25	31	0.000	0.00E+00
29	29	0	25	31	0.000	0.00E+00
	Average	0.00				0.00E+00





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z1-B8**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	170-180
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	1/6/09-1/12/09	Boring Logger	CB	Groundwater Depth (ft)	25
Drilling Method	Rotarty Wash	Boring Dia. (in)	4.33-5.12	Ground Surface Elevation (ft)	419.6
Drill Rig Type	CME 85	Drill Bit Type	HQ	Boring Depth (ft)	200
Performed By	RR	Date	1/12/2009	Depth to Bedrock (ft)	42

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3	ft	A
Depth to Bottom of Top Packer	170	ft	B
Depth to Top of Bottom Packer	180	ft	C
Groundwater Depth	11	ft	D
Overburden Depth to Packer Interval Midpoint	175	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	164	ft	F=(E-D)
Packer Inflation Pressure	220	psi	
Maximum Net Applied Pressure	104	psi	G=E-0.433F
Maximum Gauge Pressure	98	psi	H=(G)-(P)

Lugeon Calculations

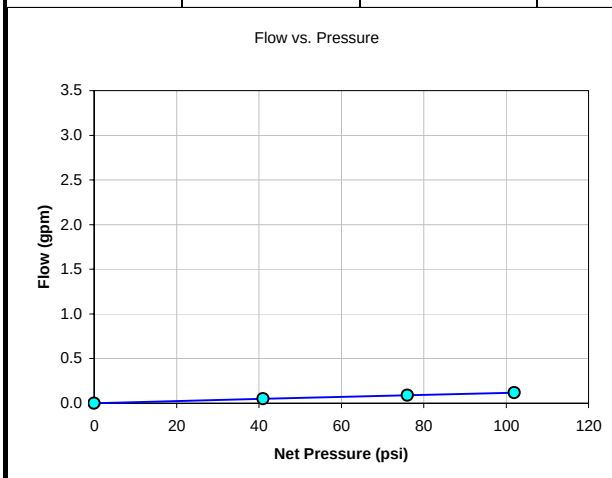
Depth to Bottom of Top Packer	170	ft	B
Depth to Top of Bottom Packer	180	ft	C
Length of Packer Interval	10	ft	J=(C-B)
Water Column Pressure	6	psi	P=0.433*(A+D)
Friction Loss	0	psi	
Gauge Pressure Steps Step 1&5	35	psi	
Step 2&4	70	psi	
Step 3	100	psi	
Water Temperature	78	°F	

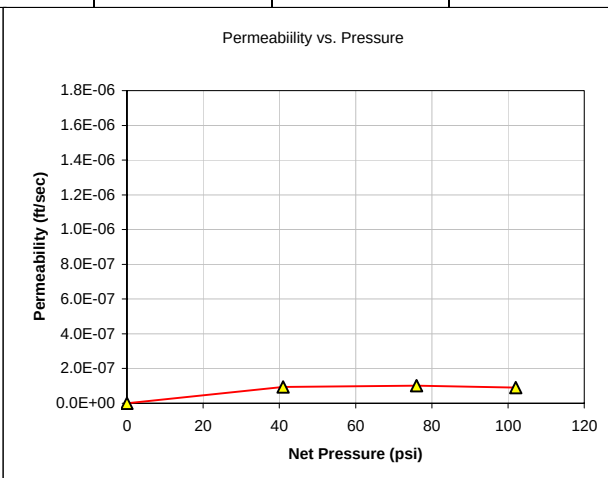
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
1.7	1.7	0	35	41	0.000	0.00E+00
1.7	1.8	0.1	35	41	0.443	1.89E-07
1.8	1.9	0.1	35	41	0.443	1.89E-07
1.9	1.9	0	35	41	0.000	0.00E+00
1.9	2	0.1	35	41	0.443	1.89E-07
2	2	0	35	41	0.000	0.00E+00
	Average	0.05				9.44E-08
2.2	2.3	0.1	70	76	0.239	1.02E-07
2.3	2.4	0.1	70	76	0.239	1.02E-07
2.4	2.5	0.06	70	76	0.146	9.61E-08
2.5	2.6	0.1	70	76	0.239	1.02E-07
2.6	2.7	0.1	70	76	0.239	1.02E-07

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z1-B8**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	170-180
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
	Average	0.09				1.00E-07
6.1	6.1	0	96	102	0.000	0.00E+00
6.1	6.3	0.2	96	102	0.357	1.52E-07
6.3	6.3	0	96	102	0.000	0.00E+00
6.3	6.5	0.2	96	102	0.357	1.52E-07
6.5	6.5	0.1	96	102	0.176	7.49E-08
6.5	6.6	0.1	96	102	0.178	7.60E-08
	Average	0.12				9.09E-08





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z2-B1**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	137 to 150
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	1/13/09-1/21/09	Boring Logger	J. Castle	Groundwater Depth (ft)	13.9
Drilling Method	Rotary Wash	Boring Dia. (in)	6	Ground Surface Elevation (ft)	451.02
Drill Rig Type	Speedstar 30K	Drill Bit Type	PQ	Boring Depth (ft)	150
Performed By	J. Castle	Date	1/21/2009	Depth to Bedrock (ft)	10

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3	ft	A
Depth to Bottom of Top Packer	137	ft	B
Depth to Top of Bottom Packer	150	ft	C
Groundwater Depth	41.3	ft	D
Overburden Depth to Packer Interval Midpoint	143.5	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	102.2	ft	F=(E-D)
Packer Inflation Pressure	226	psi	
Maximum Net Applied Pressure	99	psi	G=E-0.433F
Maximum Gauge Pressure	80	psi	H=(G)-(P)

Lugeon Calculations

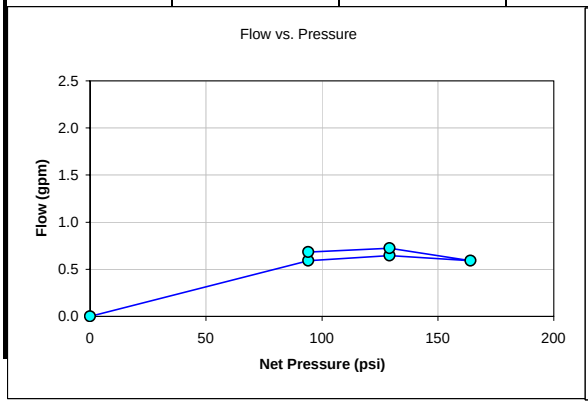
Depth to Bottom of Top Packer		137	ft	B
Depth to Top of Bottom Packer		150	ft	C
Length of Packer Interval		13	ft	J=(C-B)
Water Column Pressure		19	psi	P=0.433*(A+D)
Friction Loss		0	psi	
Gauge Pressure Steps	Step 1&5	85	psi	
	Step 2&4	130	psi	
	Step 3	170	psi	
Water Temperature			°F	

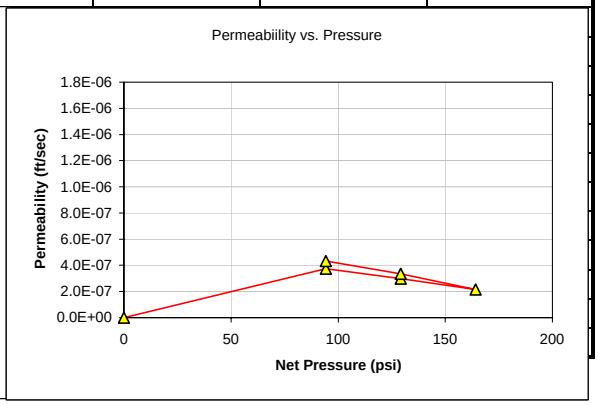
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
0.585	1.175	0.6	75	94	0.877	3.74E-07
1.175	1.74	0.6	75	94	0.840	3.58E-07
1.74	2.33	0.6	75	94	0.877	3.74E-07
2.33	2.94	0.6	75	94	0.907	3.86E-07
2.94	3.54	0.6	75	94	0.892	3.80E-07
	Average	0.6				3.74E-07
0.61	1.2	0.6	110	129	0.639	2.72E-07
1.2	1.88	0.7	110	129	0.737	3.14E-07
1.88	2.53	0.7	110	129	0.704	3.00E-07
2.53	3.19	0.7	110	129	0.715	3.05E-07
3.19	3.83	0.6	110	129	0.694	2.95E-07
	Average	0.6				2.97E-07

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z2-B1**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	137 to 150
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons)		**(gallons)**	**(psi)**	**(psi)**	**(Lu)**	**(ft/sec)**
Start	**End**	**Take**	**Gauge**	**Net**	**Lugeons**	**Permeability**
0.58	1.16	0.6	145	164	0.495	2.11E-07
1.16	1.77	0.6	145	164	0.520	2.22E-07
1.77	2.35	0.6	145	164	0.495	2.11E-07
2.35	2.96	0.6	145	164	0.520	2.22E-07
2.96	3.54	0.6	145	164	0.495	2.11E-07
	Average	0.6				2.15E-07
0.66	1.35	0.69	110	129	0.748	3.19E-07
1.35	2.08	0.73	110	129	0.791	3.37E-07
2.08	2.83	0.75	110	129	0.813	3.46E-07
2.83	3.53	0.70	110	129	0.759	3.23E-07
3.53	4.28	0.75	110	129	0.813	3.46E-07
	Average	0.7				3.34E-07
0.605	1.26	0.7	75	94	0.974	4.15E-07
1.26	1.93	0.7	75	94	0.996	4.24E-07
1.93	2.63	0.7	75	94	1.033	4.40E-07
2.63	3.33	0.7	75	94	1.046	4.46E-07
3.33	4.02	0.7	75	94	1.024	4.36E-07
	Average	0.7				4.32E-07





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z2-B3**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	174 to 182.33
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	3/3/09-3/12/09	Boring Logger	Lai, Halda, Barker	Groundwater Depth (ft)	48
Drilling Method	Rotary Wash	Boring Dia. (in)	3.9-4.23	Ground Surface Elevation (ft)	546.93
Drill Rig Type	CS 2000	Drill Bit Type	HQ	Boring Depth (ft)	350
Performed By	Caltrans	Date	3/18/2009	Depth to Bedrock (ft)	36.5

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3.08	ft	A
Depth to Bottom of Top Packer	174	ft	B
Depth to Top of Bottom Packer	182.3	ft	C
Groundwater Depth	70	ft	D
Overburden Depth to Packer Interval Midpoint	178.15	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	108.15	ft	F=(E-D)
Packer Inflation Pressure	210	psi	
Maximum Net Applied Pressure	131	psi	G=E-0.433F
Maximum Gauge Pressure	100	psi	H=(G)-(P)

Lugeon Calculations

Depth to Bottom of Top Packer	174	ft	B
Depth to Top of Bottom Packer	182.3	ft	C
Length of Packer Interval	8.3	ft	J=(C-B)
Water Column Pressure	32	psi	P=0.433*(A+D)
Friction Loss	0	psi	
Gauge Pressure Steps Step 1&5	30	psi	
Step 2&4	60	psi	
Step 3	90	psi	
Water Temperature	64	°F	

(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
240.8	241.2	0.3	30	62	1.067	4.55E-07
241.2	241.6	0.4	30	62	1.423	6.06E-07
241.6	241.9	0.3	30	62	1.067	4.55E-07
241.9	242.3	0.4	30	62	1.423	6.06E-07
247.3	247.6	0.3	30	62	1.067	4.55E-07
242.6	243	0.4	30	62	1.423	6.06E-07
243	243.3	0.3	30	62	1.067	4.55E-07
	Average	0.34				5.20E-07
243.6	244.1	0.5	60	92	1.196	5.10E-07
244.10	244.6	0.50	60	92	1.196	5.10E-07
244.60	245.1	0.5	60	92	1.196	5.10E-07
245.10	245.6	0.5	60	92	1.196	5.10E-07

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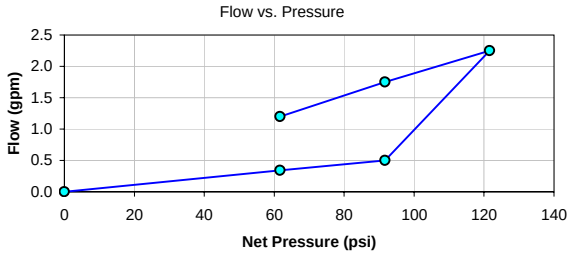
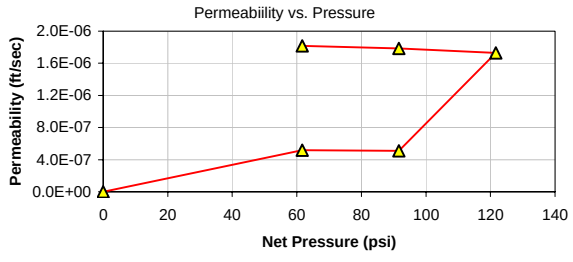
Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z2-B3**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	174 to 182.33
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons)		(gallons)	(psi)	(psi)	(Lu)	(ft/sec)
Start	**End**	**Take**	**Gauge**	**Net**	**Lugeons**	**Permeability**
245.6	246.1	0.5	60	92	1.196	5.10E-07
	Average	0.5				5.10E-07
247.4	248.5	0.9	90	122	1.622	6.91E-07
248.4	249.6	1.2	90	122	2.163	9.21E-07
249.6	250.9	1.3	90	122	2.343	9.98E-07
250.9	253.2	2.3	90	122	4.146	1.77E-06
253.2	255.5	2.3	90	122	4.146	1.77E-06
255.5	257.7	2.2	90	122	3.966	1.69E-06
257.7	259.9	2.2	90	122	3.966	1.69E-06
	Average	2.3				1.73E-06
261.0	262.8	1.8	60	92	4.307	1.83E-06
262.80	264.6	1.8	60	92	4.307	1.83E-06
264.60	266.3	1.7	60	92	4.068	1.73E-06
266.30	268	1.7	60	92	4.068	1.73E-06
268.00	269.8	1.8	60	92	4.307	1.83E-06
269.80	271.5	1.7	60	92	4.068	1.73E-06
	Average	1.8				1.78E-06
272.1	273.3	1.2	30	62	4.269	1.82E-06
273.3	274.5	1.2	30	62	4.269	1.82E-06
274.5	275.7	1.2	30	62	4.269	1.82E-06
275.7	276.9	1.2	30	62	4.269	1.82E-06
276.9	278.1	1.2	30	62	4.269	1.82E-06
	Average	1.20				1.82E-06





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z2-B3**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	230 to 238.3
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	3/3/09-3/12/09	Boring Logger	Lai, Halda, Barker	Groundwater Depth (ft)	48
Drilling Method	Rotary Wash	Boring Dia. (in)	3.9-4.23	Ground Surface Elevation (ft)	546.93
Drill Rig Type	CS 2000	Drill Bit Type	HQ	Boring Depth (ft)	350
Performed By	Caltrans	Date	3/18/2009	Depth to Bedrock (ft)	36.5

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3.08	ft	A
Depth to Bottom of Top Packer	230	ft	B
Depth to Top of Bottom Packer	238.33	ft	C
Groundwater Depth	70	ft	D
Overburden Depth to Packer Interval Midpoint	234.165	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	164.165	ft	F=(E-D)
Packer Inflation Pressure	300	psi	
Maximum Net Applied Pressure	163	psi	G=E-0.433F
Maximum Gauge Pressure	131	psi	H=(G)-(P)

Lugeon Calculations

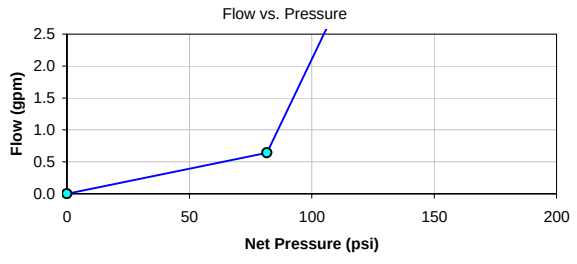
Depth to Bottom of Top Packer		230	ft	B
Depth to Top of Bottom Packer		238.33	ft	C
Length of Packer Interval		8.33	ft	J=(C-B)
Water Column Pressure		32	psi	P=0.433*(A+D)
Friction Loss		0	psi	
Gauge Pressure Steps	Step 1&5	50	psi	
	Step 2&4	100	psi	
	Step 3	150	psi	
Water Temperature		64	°F	

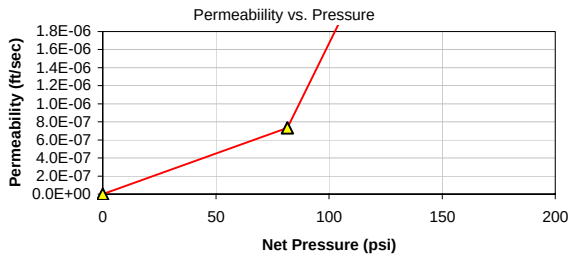
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
52.1	52.7	0.6	50	82	1.606	6.84E-07
52.7	53.3	0.6	50	82	1.606	6.84E-07
53.3	53.9	0.6	50	82	1.606	6.84E-07
53.9	54.6	0.7	50	82	1.873	7.98E-07
54.6	55.2	0.6	50	82	1.606	6.84E-07
55.2	55.9	0.7	50	82	1.873	7.98E-07
55.9	56.5	0.6	50	82	1.606	6.84E-07
56.5	57.2	0.7	50	82	1.873	7.98E-07
57.2	57.8	0.6	50	82	1.606	6.84E-07
	Average	0.64				7.33E-07
61.4	65.2	3.8	100	132	6.307	2.69E-06
65.2	69	3.8	100	132	6.307	2.69E-06

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z2-B3**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	230 to 238.3
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons)		(gallons)	(psi)	(psi)	(Lu)	(ft/sec)
Start	**End**	**Take**	**Gauge**	**Net**	**Lugeons**	**Permeability**
68.9	72.8	3.9	100	132	6.473	2.76E-06
72.9	77	4.1	100	132	6.805	2.90E-06
77.0	81.7	4.7	100	132	7.800	3.32E-06
81.7	86.3	4.6	100	132	7.634	3.25E-06
86.3	90.9	4.6	100	132	7.634	3.25E-06
	Average	4.6				3.28E-06
98.0	107.9	9.9	150	182	11.908	5.07E-06
107.9	117.9	10.0	145	177	12.369	5.27E-06
117.9	128	10.1	145	177	12.492	5.32E-06
128.0	138.1	10.1	145	177	12.492	5.32E-06
138.0	148.1	10.1	145	177	12.492	5.32E-06
	Average	10.1				5.32E-06
154.4	161	5.6	95	127	9.661	4.12E-06
161.0	167.5	6.5	95	127	11.214	4.78E-06
167.5	174	6.5	95	127	11.214	4.78E-06
174.0	180.5	6.5	95	127	11.214	4.78E-06
180.5	188.2	7.7	95	127	13.284	5.66E-06
188.2	195.9	7.7	95	127	13.284	5.66E-06
195.9	203.3	7.4	95	127	12.766	5.44E-06
	Average	7.60				5.59E-06
208.3	213	4.70	50	82	12.577	5.36E-06
213.0	217.7	4.70	50	82	12.577	5.36E-06
217.7	222.4	4.70	50	82	12.577	5.36E-06
222.4	227	4.60	50	82	12.310	5.24E-06
227.0	231.6	4.60	50	82	12.310	5.24E-06
231.6	236.3	4.70	50	82	12.577	5.36E-06
	Average	4.65				5.30E-06





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z2-B3**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	270 to 278.33
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	3/3/09-3/12/09	Boring Logger	Lai, Halda, Barker	Groundwater Depth (ft)	48
Drilling Method	Rotary Wash	Boring Dia. (in)	3.9-4.23	Ground Surface Elevation (ft)	546.93
Drill Rig Type	CS 2000	Drill Bit Type	HQ	Boring Depth (ft)	350
Performed By	Caltrans	Date	3/18/2009	Depth to Bedrock (ft)	36.5

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3.08	ft	A
Depth to Bottom of Top Packer	270	ft	B
Depth to Top of Bottom Packer	278.33	ft	C
Groundwater Depth	70	ft	D
Overburden Depth to Packer Interval Midpoint	274.165	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	204.165	ft	F=(E-D)
Packer Inflation Pressure	340	psi	
Maximum Net Applied Pressure	186	psi	G=E-0.433F
Maximum Gauge Pressure	154	psi	H=(G)-(P)

Lugeon Calculations

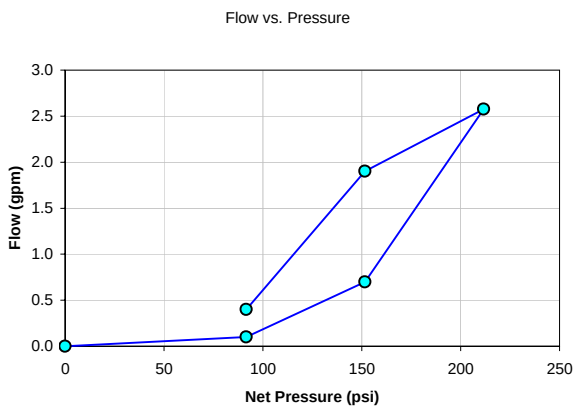
Depth to Bottom of Top Packer	270	ft	B	
Depth to Top of Bottom Packer	278.33	ft	C	
Length of Packer Interval	8.33	ft	J=(C-B)	
Water Column Pressure	32	psi	P=0.433*(A+D)	
Friction Loss	0	psi		
Gauge Pressure Steps Step 1&5	60	psi		
Step 2&4	120	psi		
Step 3	180	psi		
Water Temperature	76	°F		

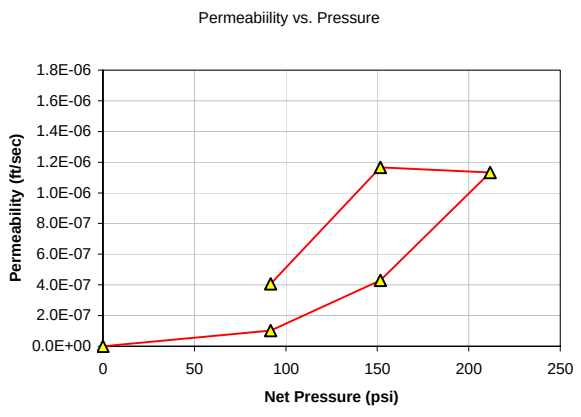
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
18.7	18.7	0	60	92	0.000	0.00E+00
18.7	18.8	0.1	60	92	0.238	1.02E-07
18.8	18.9	0.1	60	92	0.238	1.02E-07
18.9	19	0.1	60	92	0.238	1.02E-07
19	19.1	0.1	60	92	0.238	1.02E-07
19.1	19.2	0.1	60	92	0.238	1.02E-07
	Average	0.1				1.02E-07
19.4	19.8	0.4	120	152	0.576	2.46E-07
19.8	20.3	0.5	120	152	0.720	3.07E-07
20.3	20.9	0.6	120	152	0.864	3.68E-07
20.9	21.6	0.7	120	152	1.009	4.30E-07
21.6	22.3	0.7	120	152	1.009	4.30E-07

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z2-B3**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	270 to 278.33
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons)		(gallons)	(psi)	(psi)	(Lu)	(ft/sec)
Start	**End**	**Take**	**Gauge**	**Net**	**Lugeons**	**Permeability**
22.3	23	0.7	120	152	1.009	4.30E-07
	Average	0.7				4.30E-07
24.7	27.2	2.5	180	212	2.581	1.10E-06
27.2	29.6	2.4	180	212	2.478	1.06E-06
29.6	32.2	2.6	180	212	2.684	1.14E-06
32.2	34.8	2.6	180	212	2.684	1.14E-06
34.8	37.3	2.5	180	212	2.581	1.10E-06
37.3	39.9	2.6	180	212	2.684	1.14E-06
	Average	2.6				1.13E-06
41.80	42.5	1.80	120	152	2.593	1.10E-06
41.50	43.4	1.90	120	152	2.737	1.17E-06
42.40	44.1	1.70	120	152	2.449	1.04E-06
43.10	45	1.90	120	152	2.737	1.17E-06
44.00	45.9	1.9	120	152	2.737	1.17E-06
44.90	46.8	1.9	120	152	2.737	1.17E-06
	Average	1.9				1.17E-06
47.8	47.9	0.1	60	92	0.238	1.02E-07
47.9	48.2	0.3	60	92	0.715	3.05E-07
48.2	48.6	0.4	60	92	0.954	4.06E-07
48.6	49	0.4	60	92	0.954	4.06E-07
49.0	49.4	0.4	60	92	0.954	4.06E-07
49.4	49.8	0.4	60	92	0.954	4.06E-07
	Average	0.4				4.06E-07





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z2-B3**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	320 to 328.3 ft
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	3/3/09-3/12/09	Boring Logger	Lai, Halda, Barker	Groundwater Depth (ft)	48
Drilling Method	Rotary Wash	Boring Dia. (in)	3.9-4.23	Ground Surface Elevation (ft)	546.93
Drill Rig Type	CS 2000	Drill Bit Type	HQ	Boring Depth (ft)	350
Performed By	Caltrans	Date	3/18/2009	Depth to Bedrock (ft)	36.5

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3.08	ft	A
Depth to Bottom of Top Packer	320	ft	B
Depth to Top of Bottom Packer	328.33	ft	C
Groundwater Depth	70	ft	D
Overburden Depth to Packer Interval Midpoint	324.165	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	254.165	ft	F=(E-D)
Packer Inflation Pressure	380	psi	
Maximum Net Applied Pressure	214	psi	G=E-0.433F
Maximum Gauge Pressure	182	psi	H=(G)-(P)

Lugeon Calculations

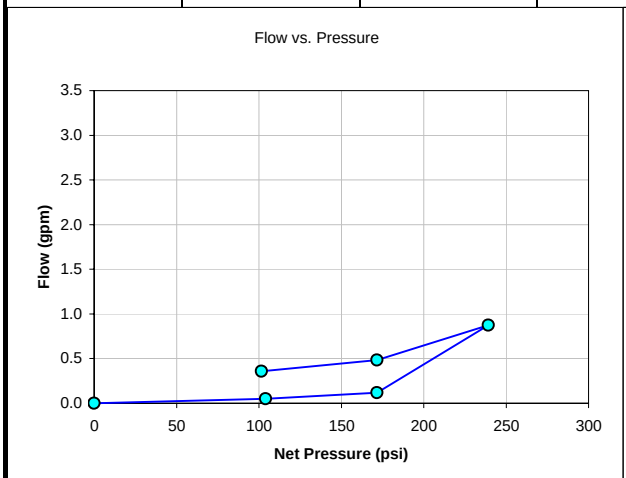
Depth to Bottom of Top Packer	320	ft	B	
Depth to Top of Bottom Packer	328.33	ft	C	
Length of Packer Interval	8.33	ft	J=(C-B)	
Water Column Pressure	32	psi	P=0.433*(A+D)	
Friction Loss	0	psi		
Gauge Pressure Steps Step 1&5	70	psi		
Step 2&4	140	psi		
Step 3	210	psi		
Water Temperature	64	°F		

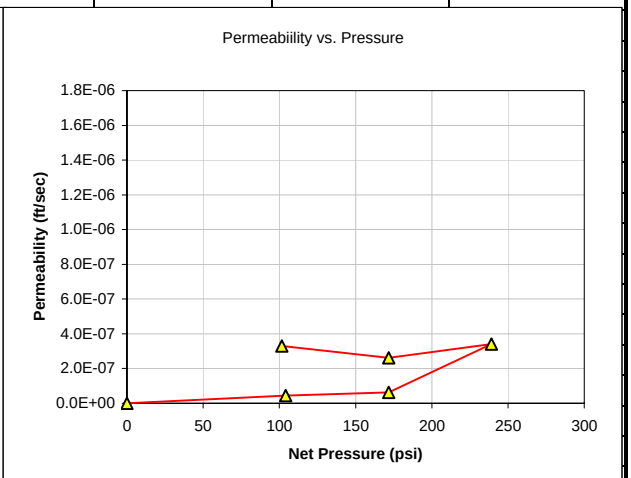
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
1.1	1.1	0	72.5	104	0.000	0.00E+00
1.1	1.2	0.1	72.5	104	0.210	8.94E-08
1.2	1.2	0	72.5	104	0.000	0.00E+00
1.2	1.2	0	72.5	104	0.000	0.00E+00
1.2	1.3	0.1	72.5	104	0.210	8.94E-08
1.3	1.3	0	72.5	104	0.000	0.00E+00
1.3	1.4	0.1	72.5	104	0.210	8.94E-08
	Average	0.05				4.47E-08
1.5	1.6	0.1	140	172	0.127	5.42E-08
1.6	1.7	0.1	140	172	0.127	5.42E-08
1.7	1.8	0.1	140	172	0.127	5.42E-08
1.8	2	0.2	140	172	0.255	1.08E-07

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z2-B3**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	320 to 328.3 ft
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons)		(gallons)	(psi)	(psi)	(Lu)	(ft/sec)
Start	**End**	**Take**	**Gauge**	**Net**	**Lugeons**	**Permeability**
2.00	2.1	0.10	140	172	0.127	5.42E-08
2.10	2.2	0.1	140	172	0.127	5.42E-08
	Average	0.12				6.33E-08
4	4.7	0.7	207.5	239	0.640	2.72E-07
4.7	5.5	0.8	207.5	239	0.731	3.11E-07
5.5	6.4	0.9	207.5	239	0.822	3.50E-07
6.4	7.2	0.8	207.5	239	0.731	3.11E-07
7.2	8.1	0.9	207.5	239	0.822	3.50E-07
8.1	9	0.9	207.5	239	0.822	3.50E-07
	Average	0.9				3.41E-07
9.7	10.2	0.5	140	172	0.636	2.71E-07
10.2	10.7	0.5	140	172	0.636	2.71E-07
10.7	11.2	0.5	140	172	0.636	2.71E-07
11.2	11.7	0.5	140	172	0.636	2.71E-07
11.7	12.1	0.4	140	172	0.509	2.17E-07
12.1	12.6	0.5	140	172	0.636	2.71E-07
	Average	0.5				2.62E-07
15.1	15.5	0.4	70	102	0.860	3.66E-07
15.5	15.8	0.3	70	102	0.645	2.75E-07
15.8	16.2	0.4	70	102	0.860	3.66E-07
16.2	16.6	0.4	70	102	0.860	3.66E-07
16.6	16.9	0.3	70	102	0.645	2.75E-07
16.9	17.2	0.30	70	102	0.645	2.75E-07
17.2	17.6	0.4	70	102	0.860	3.66E-07
	Average	0.36				3.30E-07





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z2-B4**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	207 to 214.5
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	3/19/09-4/3/09	Boring Logger	K. Barker	Groundwater Depth (ft)	10
Drilling Method	Rotary Wash	Boring Dia. (in)	4.23	Ground Surface Elevation (ft)	558.11
Drill Rig Type	CS 2000	Drill Bit Type	HQ	Boring Depth (ft)	400
Performed By	Caltrans	Date	4/2/2009	Depth to Bedrock (ft)	56.5

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3	ft	A
Depth to Bottom of Top Packer	207	ft	B
Depth to Top of Bottom Packer	214.5	ft	C
Groundwater Depth	30	ft	D
Overburden Depth to Packer Interval Midpoint	210.75	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	180.75	ft	F=(E-D)
Packer Inflation Pressure	250	psi	
Maximum Net Applied Pressure	132	psi	G=E-0.433F
Maximum Gauge Pressure	118	psi	H=(G)-(P)

Lugeon Calculations

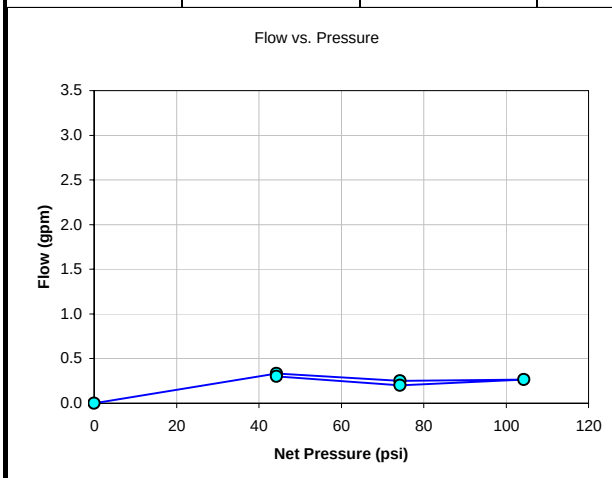
Depth to Bottom of Top Packer	207	ft	B	
Depth to Top of Bottom Packer	214.5	ft	C	
Length of Packer Interval	7.5	ft	J=(C-B)	
Water Column Pressure	14	psi	P=0.433*(A+D)	
Friction Loss	0	psi		
Gauge Pressure Steps Step 1&5	30	psi		
Step 2&4	60	psi		
Step 3	90	psi		
Water Temperature	72	°F		

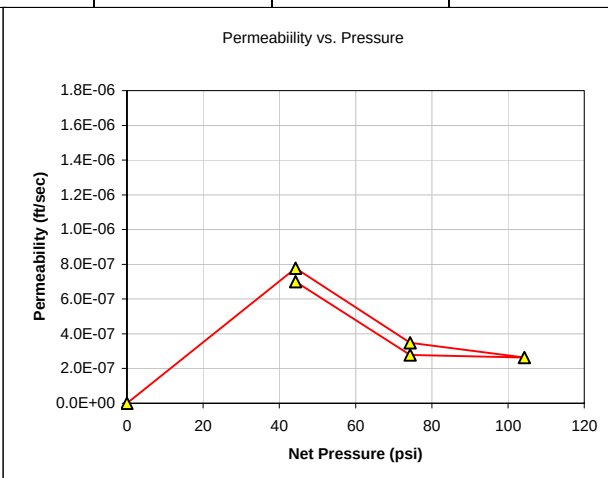
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
52.6	53	0.4	30	44	2.192	9.34E-07
53	53.3	0.3	30	44	1.644	7.00E-07
53.5	53.7	0.2	30	44	1.096	4.67E-07
53.7	54.1	0.4	30	44	2.192	9.34E-07
54.1	54.5	0.4	30	44	2.192	9.34E-07
	Average	0.33				7.78E-07
54.7	54.9	0.2	60	74	0.653	2.78E-07
54.9	55.2	0.3	60	74	0.980	4.17E-07
55.2	55.5	0.3	60	74	0.980	4.17E-07
55.5	55.7	0.2	60	74	0.653	2.78E-07
55.7	56	0.3	60	74	0.980	4.17E-07
56	56.2	0.2	60	74	0.653	2.78E-07

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z2-B4**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	207 to 214.5
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
	Average	0.25				3.48E-07
56.6	56.9	0.3	90	104	0.698	2.97E-07
56.9	57.2	0.3	90	104	0.698	2.97E-07
57.2	57.4	0.2	90	104	0.465	1.98E-07
57.4	57.7	0.3	90	104	0.698	2.97E-07
57.7	58	0.3	90	104	0.698	2.97E-07
	Average	0.27				2.64E-07
58.3	58.5	0.2	60	74	0.653	2.78E-07
58.5	58.7	0.2	60	74	0.653	2.78E-07
58.7	58.9	0.2	60	74	0.653	2.78E-07
58.9	59.1	0.2	60	74	0.653	2.78E-07
59.1	59.3	0.2	60	74	0.653	2.78E-07
	Average	0.20				2.78E-07
59.6	59.9	0.3	30	44	1.644	7.00E-07
59.9	60.2	0.3	30	44	1.644	7.00E-07
60.2	60.6	0.4	30	44	2.192	9.34E-07
60.6	60.9	0.3	30	44	1.644	7.00E-07
60.9	61.2	0.3	30	44	1.644	7.00E-07
	Average	0.30				7.00E-07





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z2-B4**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	295 to 302.5
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	3/19/09-4/3/2009	Boring Logger	K. Barker	Groundwater Depth (ft)	10
Drilling Method	Rotary Wash	Boring Dia. (in)	4.23	Ground Surface Elevation (ft)	558.11
Drill Rig Type	CS 2000	Drill Bit Type	HQ	Boring Depth (ft)	400
Performed By	Caltrans	Date	4/2/2009	Depth to Bedrock (ft)	56.5

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3	ft	A
Depth to Bottom of Top Packer	295	ft	B
Depth to Top of Bottom Packer	302.5	ft	C
Groundwater Depth	30	ft	D
Overburden Depth to Packer Interval Midpoint	298.75	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	268.75	ft	F=(E-D)
Packer Inflation Pressure	300	psi	
Maximum Net Applied Pressure	182	psi	G=E-0.433F
Maximum Gauge Pressure	150	psi	H=(G)-(P)

Lugeon Calculations

Depth to Bottom of Top Packer	295	ft	B	
Depth to Top of Bottom Packer	302.5	ft	C	
Length of Packer Interval	7.5	ft	J=(C-B)	
Water Column Pressure	14	psi	P=0.433*(A+D)	
Friction Loss	0	psi		
Gauge Pressure Steps	Step 1&5	50	psi	
	Step 2&4	100	psi	
	Step 3	150	psi	
Water Temperature			°F	

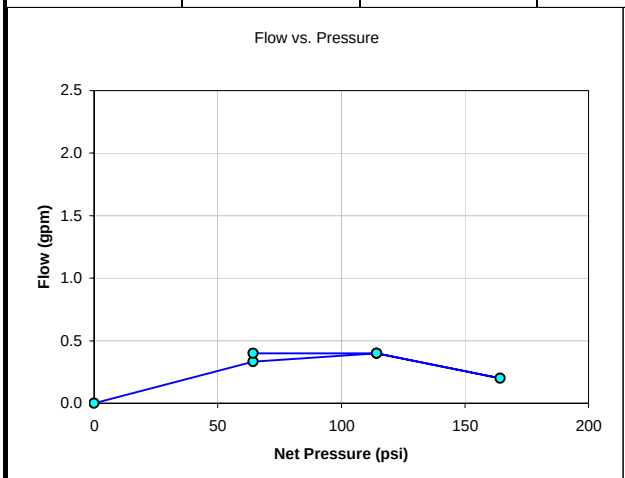
(assumes each Start/End Cycle time is 1 minute)

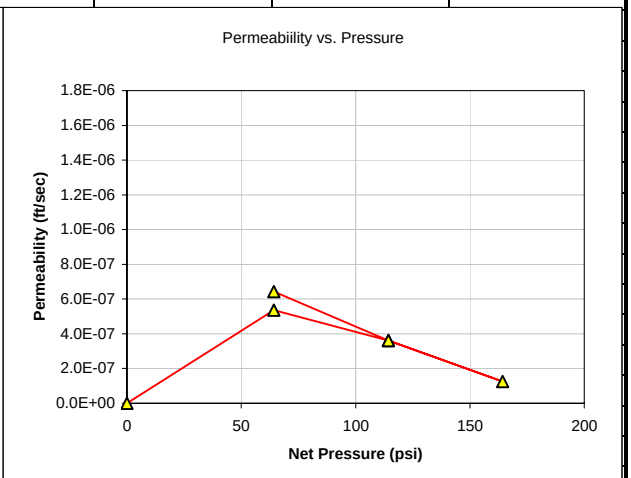
Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
32.8	33.1	0.3	50	64	1.132	4.82E-07
33.1	33.5	0.4	50	64	1.510	6.43E-07
33.5	33.9	0.4	50	64	1.510	6.43E-07
33.9	34.2	0.3	50	64	1.132	4.82E-07
34.2	34.6	0.4	50	64	1.510	6.43E-07
34.6	34.9	0.3	50	64	1.132	4.82E-07
	Average	0.33				5.36E-07
35.2	35.6	0.4	100	114	0.849	3.62E-07
35.6	36.1	0.5	100	114	1.062	4.52E-07
36.1	36.5	0.4	100	114	0.849	3.62E-07
36.5	37	0.5	100	114	1.062	4.52E-07
37	37.4	0.40	100	114	0.849	3.62E-07

CH2MHILL

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z2-B4**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	295 to 302.5
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons)		(gallons)	(psi)	(psi)	(Lu)	(ft/sec)
Start	**End**	**Take**	**Gauge**	**Net**	**Lugeons**	**Permeability**
37.4	37.8	0.4	100	114	0.849	3.62E-07
	Average	0.4				3.62E-07
38.1	38.3	0.2	150	164	0.295	1.26E-07
38.3	38.4	0.1	150	164	0.148	6.29E-08
38.4	38.6	0.2	150	164	0.295	1.26E-07
38.6	38.8	0.2	150	164	0.295	1.26E-07
38.8	39	0.2	150	164	0.295	1.26E-07
	Average	0.2				1.26E-07
39.2	39.5	0.3	100	114	0.637	2.71E-07
39.5	39.9	0.4	100	114	0.849	3.62E-07
39.9	40.3	0.4	100	114	0.849	3.62E-07
40.3	40.7	0.4	100	114	0.849	3.62E-07
40.7	41.1	0.4	100	114	0.849	3.62E-07
	Average	0.40				3.62E-07
41.3	41.7	0.4	50	64	1.510	6.43E-07
41.7	42.1	0.4	50	64	1.510	6.43E-07
42.1	42.5	0.4	50	64	1.510	6.43E-07
42.5	42.9	0.4	50	64	1.510	6.43E-07
42.9	43.3	0.4	50	64	1.510	6.43E-07
	Average	0.40				6.43E-07





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z2-B5**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	150 to 159.5
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	4/6/09-4/14/09	Boring Logger	Lai, Islam, Barker	Groundwater Depth (ft)	10.8
Drilling Method	Rotary Wash	Boring Dia. (in)	3.9-4.23	Ground Surface Elevation (ft)	452.38
Drill Rig Type	CS 2000	Drill Bit Type	HQ	Boring Depth (ft)	300
Performed By	Caltrans	Date	4/14/2009	Depth to Bedrock (ft)	136.5

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3.08	ft	A
Depth to Bottom of Top Packer	150	ft	B
Depth to Top of Bottom Packer	159.5	ft	C
Groundwater Depth	200	ft	D
Overburden Depth to Packer Interval Midpoint	154.75	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	-45.25	ft	F=(E-D)
Packer Inflation Pressure	220	psi	
Maximum Net Applied Pressure	174	psi	G=E-0.433F
Maximum Gauge Pressure	86	psi	H=(G)-(P)

Lugeon Calculations

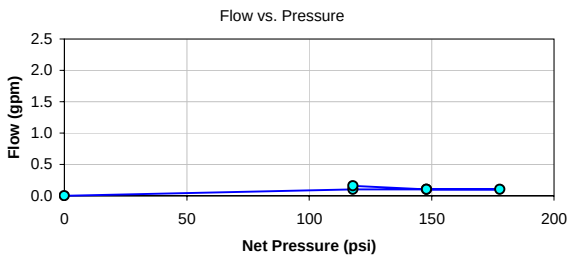
Depth to Bottom of Top Packer	150	ft	B
Depth to Top of Bottom Packer	159.5	ft	C
Length of Packer Interval	9.5	ft	J=(C-B)
Water Column Pressure	88	psi	P=0.433*(A+D)
Friction Loss	0	psi	
Gauge Pressure Steps Step 1&5	30	psi	
Step 2&4	60	psi	
Step 3	90	psi	
Water Temperature	62	°F	

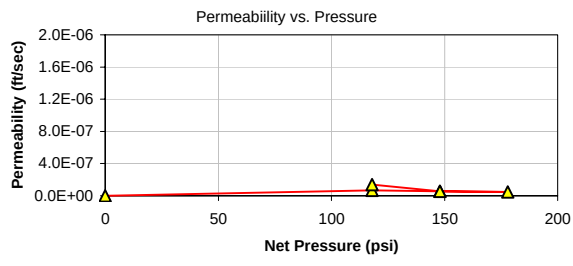
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
7.8	7.9	0.1	30	118	0.162	6.92E-08
7.9	8	0.1	30	118	0.162	6.92E-08
8	8.1	0.1	30	118	0.162	6.92E-08
8.1	8.3	0.2	30	118	0.325	1.38E-07
8.3	8.4	0.1	30	118	0.162	6.92E-08
8.4	8.5	0.1	30	118	0.162	6.92E-08
8.5	8.6	0.1	29	117	0.164	6.98E-08
	Average	0.10				6.94E-08
8.9	9	0.1	60	148	0.130	5.52E-08
9.00	9.1	0.10	60	148	0.130	5.52E-08
9.10	9.2	0.1	60	148	0.130	5.52E-08
9.20	9.3	0.1	60	148	0.130	5.52E-08

Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**		**Z2-B5**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)		150 to 159.5
Project Number :	379312.04.08.01					Sheet 2 of 2

Flow Meter (gallons)		**(gallons)**	**(psi)**	**(psi)**	**(Lu)**	**(ft/sec)**
Start	**End**	**Take**	**Gauge**	**Net**	**Lugeons**	**Permeability**
9.3	9.4	0.1	60	148	0.130	5.52E-08
9.4	9.5	0.1	60	148	0.130	5.52E-08
9.5	9.6	0.1	60	148	0.130	5.52E-08
9.8	9.9	0.1	60	148	0.130	5.52E-08
	Average	0.1				5.52E-08
1.5	1.6	0.1	90	178	0.108	4.59E-08
1.6	1.7	0.1	90	178	0.108	4.59E-08
1.7	1.8	0.1	90	178	0.108	4.59E-08
1.8	2	0.2	90	178	0.215	9.17E-08
2.0	2.1	0.1	90	178	0.108	4.59E-08
2.1	2.2	0.1	90	178	0.108	4.59E-08
2.2	2.3	0.1	90	178	0.108	4.59E-08
	Average	0.1				4.59E-08
2.50	2.6	0.1	60	148	0.130	5.52E-08
2.60	2.7	0.1	60	148	0.130	5.52E-08
2.70	2.8	0.1	58	146	0.131	5.59E-08
2.80	2.9	0.1	58	146	0.131	5.59E-08
2.90	3	0.1	59	147	0.130	5.55E-08
3.00	3.1	0.1	58	146	0.131	5.59E-08
3.10	3.2	0.1	58	146	0.131	5.59E-08
	Average	0.1				5.57E-08
3.8	3.9	0.1	30	118	0.162	6.92E-08
3.9	4.1	0.20	30	118	0.325	1.38E-07
4.1	4.2	0.10	30	118	0.162	6.92E-08
4.2	4.4	0.20	30	118	0.325	1.38E-07
4.4	4.6	0.20	30	118	0.325	1.38E-07
4.6	4.8	0.20	30	118	0.325	1.38E-07
4.8	4.9	0.10	30	118	0.162	6.92E-08
	Average	0.2				1.09E-07





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z2-B5**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	190 to 199.5
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	4/6/09-4/14/09	Boring Logger	Lai, Islam, Barker	Groundwater Depth (ft)	10.8
Drilling Method	Rotary Wash	Boring Dia. (in)	3.9-4.23	Ground Surface Elevation (ft)	452.38
Drill Rig Type	CS 2000	Drill Bit Type	HQ	Boring Depth (ft)	300
Performed By	Caltrans	Date	4/14/2009	Depth to Bedrock (ft)	136.5

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3.08	ft	A
Depth to Bottom of Top Packer	190	ft	B
Depth to Top of Bottom Packer	199.5	ft	C
Groundwater Depth	200	ft	D
Overburden Depth to Packer Interval Midpoint	194.75	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	-5.25	ft	F=(E-D)
Packer Inflation Pressure	260	psi	
Maximum Net Applied Pressure	197	psi	G=E-0.433F
Maximum Gauge Pressure	109	psi	H=(G)-(P)

Lugeon Calculations

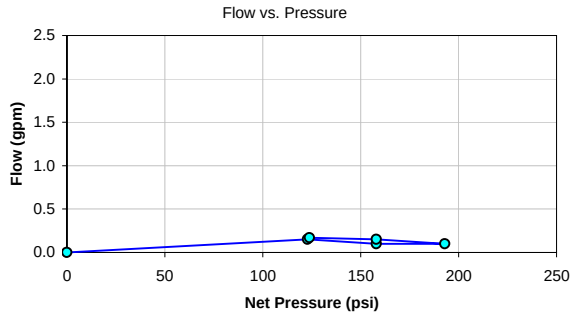
Depth to Bottom of Top Packer	190	ft	B	
Depth to Top of Bottom Packer	199.5	ft	C	
Length of Packer Interval	9.5	ft	J=(C-B)	
Water Column Pressure	88	psi	P=0.433*(A+D)	
Friction Loss	0	psi		
Gauge Pressure Steps Step 1&5	35	psi		
Step 2&4	70	psi		
Step 3	105	psi		
Water Temperature	61	°F		

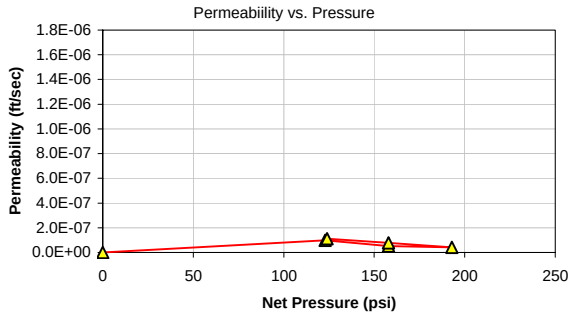
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
0.8	0.9	0.1	35	123	0.156	6.64E-08
0.9	1.1	0.2	35	123	0.312	1.33E-07
1.1	1.2	0.1	35	123	0.156	6.64E-08
1.2	1.3	0.1	35	123	0.156	6.64E-08
1.3	1.5	0.2	35	123	0.312	1.33E-07
1.5	1.6	0.1	35	123	0.156	6.64E-08
1.6	1.8	0.2	35	123	0.312	1.33E-07
	Average	0.15				9.96E-08
0.1	0.2	0.1	70	158	0.121	5.17E-08
0.20	0.3	0.10	70	158	0.121	5.17E-08
0.30	0.4	0.1	70	158	0.121	5.17E-08
0.40	0.5	0.1	70	158	0.121	5.17E-08

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z2-B5**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	190 to 199.5
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons)		(gallons)	(psi)	(psi)	(Lu)	(ft/sec)
Start	End	Take	Gauge	Net	Lugeons	Permeability
0.5	0.6	0.1	70	158	0.121	5.17E-08
0.6	0.7	0.1	70	158	0.121	5.17E-08
0.7	0.8	0.1	70	158	0.121	5.17E-08
	Average	0.1				5.17E-08
1.8	2.5	0.7	105	193	0.695	2.96E-07
2.5	2.7	0.2	105	193	0.199	8.46E-08
2.7	2.9	0.2	105	193	0.199	8.46E-08
2.9	3.1	0.2	105	193	0.199	8.46E-08
3.1	3.2	0.1	105	193	0.099	4.23E-08
3.2	3.3	0.1	105	193	0.099	4.23E-08
3.3	3.4	0.1	105	193	0.099	4.23E-08
	Average	0.1				4.23E-08
3.7	3.8	0.1	70	158	0.121	5.17E-08
3.8	4	0.2	70	158	0.243	1.03E-07
4.0	4.1	0.1	70	158	0.121	5.17E-08
4.1	4.2	0.1	70	158	0.121	5.17E-08
4.2	4.4	0.2	70	158	0.243	1.03E-07
4.4	4.5	0.1	70	158	0.121	5.17E-08
4.5	4.7	0.2	70	158	0.243	1.03E-07
	Average	0.15				7.75E-08
5.2	5.3	0.10	36	124	0.155	6.59E-08
5.3	5.5	0.20	37	125	0.307	1.31E-07
5.5	5.7	0.20	37	125	0.307	1.31E-07
5.7	5.9	0.20	37	125	0.307	1.31E-07
5.9	6	0.10	36	124	0.155	6.59E-08
6.0	6.2	0.20	37	125	0.307	1.31E-07
6.2	6.4	0.20	37	125	0.307	1.31E-07
	Average	0.17				1.12E-07





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z2-B5**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	280.4 to 289.8
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	4/6/09-4/14/09	Boring Logger	Lai, Islam, Barker	Groundwater Depth (ft)	10.8
Drilling Method	Rotary Wash	Boring Dia. (in)	3.9-4.23	Ground Surface Elevation (ft)	452.38
Drill Rig Type	CS 2000	Drill Bit Type	HQ	Boring Depth (ft)	300
Performed By	Caltrans	Date	4/14/2009	Depth to Bedrock (ft)	136.5

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3.08	ft	A
Depth to Bottom of Top Packer	280.4	ft	B
Depth to Top of Bottom Packer	289.8	ft	C
Groundwater Depth	200	ft	D
Overburden Depth to Packer Interval Midpoint	285.1	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	85.1	ft	F=(E-D)
Packer Inflation Pressure	340	psi	
Maximum Net Applied Pressure	248	psi	G=E-0.433F
Maximum Gauge Pressure	160	psi	H=(G)-(P)

Lugeon Calculations

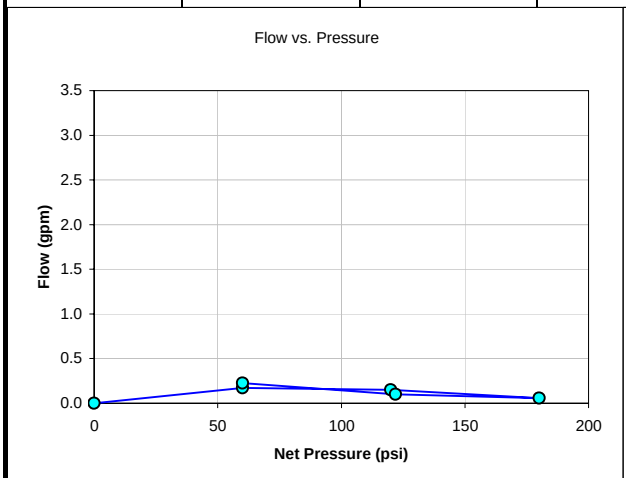
Depth to Bottom of Top Packer	280.4	ft	B
Depth to Top of Bottom Packer	289.8	ft	C
Length of Packer Interval	9.4	ft	J=(C-B)
Water Column Pressure	88	psi	P=0.433*(A+D)
Friction Loss	0	psi	
Gauge Pressure Steps Step 1&5	60	psi	
Step 2&4	120	psi	
Step 3	180	psi	
Water Temperature	60	°F	

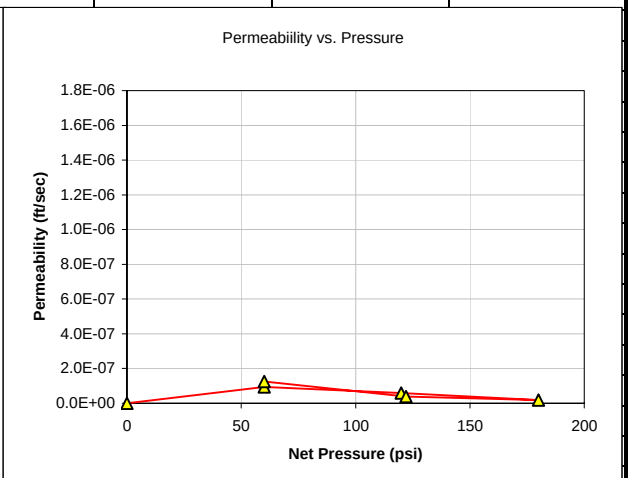
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
0.4	0.6	0.2	60	148	0.262	1.12E-07
0.6	0.7	0.1	63	151	0.128	5.46E-08
0.7	0.9	0.2	63	151	0.257	1.09E-07
0.9	1.1	0.2	63	151	0.257	1.09E-07
1.1	1.3	0.2	63	151	0.257	1.09E-07
1.3	1.4	0.1	65	153	0.127	5.39E-08
1.4	1.6	0.2	65	153	0.253	1.08E-07
	Average	0.17				9.37E-08
2.1	2.2	0.1	120	208	0.093	3.97E-08
2.2	2.2	0	120	208	0.000	0.00E+00
2.2	2.2	0	120	208	0.000	0.00E+00
2.2	2.3	0.1	120	208	0.093	3.97E-08

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z2-B5**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	280.4 to 289.8
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons)		(gallons)	(psi)	(psi)	(Lu)	(ft/sec)
Start	End	Take	Gauge	Net	Lugeons	Permeability
2.30	2.5	0.20	120	208	0.186	7.93E-08
2.50	2.6	0.1	120	208	0.093	3.97E-08
2.60	2.8	0.20	120	208	0.186	7.93E-08
	Average	0.15				5.95E-08
3.6	3.6	0	180	268	0.000	0.00E+00
3.6	3.7	0.1	180	268	0.072	3.08E-08
3.7	3.7	0.0	180	268	0.000	0.00E+00
3.7	3.8	0.1	180	268	0.072	3.08E-08
3.7	3.8	0.1	180	268	0.072	3.08E-08
3.8	3.8	0.0	180	268	0.000	0.00E+00
3.8	3.9	0.1	180	268	0.072	3.08E-08
	Average	0.06				1.76E-08
4.5	4.6	0.1	122	210	0.092	3.93E-08
4.6	4.7	0.1	123	211	0.092	3.91E-08
4.7	4.7	0.0	122	210	0.000	0.00E+00
4.7	4.8	0.1	123	211	0.092	3.91E-08
4.8	4.9	0.1	122	210	0.092	3.93E-08
4.9	5	0.1	123	211	0.092	3.91E-08
4.9	5	0.1	123	211	0.092	3.91E-08
	Average	0.1				3.91E-08
5.9	6.1	0.2	60	148	0.262	1.12E-07
6.1	6.3	0.2	60	148	0.262	1.12E-07
6.3	6.6	0.30	60	148	0.393	1.67E-07
6.6	6.8	0.2	60	148	0.262	1.12E-07
6.8	7	0.2	60	148	0.262	1.12E-07
7	7.3	0.3	60	148	0.393	1.67E-07
7.3	7.5	0.2	60	148	0.262	1.12E-07
	Average	0.225				1.25E-07





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z3-B1**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	148 to 159
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	3/12/09-3/24/09	Boring Logger	M. Torsiello	Groundwater Depth (ft)	23.9
Drilling Method	Rotary Wash	Boring Dia. (in)	5.5	Ground Surface Elevation (ft)	885
Drill Rig Type	Ingersoll Rand A400	Drill Bit Type	PQ	Boring Depth (ft)	300
Performed By	M. Torsiello	Date	3/20/2009	Depth to Bedrock (ft)	30.5

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3	ft	A
Depth to Bottom of Top Packer	148	ft	B
Depth to Top of Bottom Packer	159	ft	C
Groundwater Depth	23.9	ft	D
Overburden Depth to Packer Interval Midpoint	153.5	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	129.6	ft	F=(E-D)
Packer Inflation Pressure	250	psi	
Maximum Net Applied Pressure	97	psi	G=E-0.433F
Maximum Gauge Pressure	86	psi	H=(G)-(P)

Lugeon Calculations

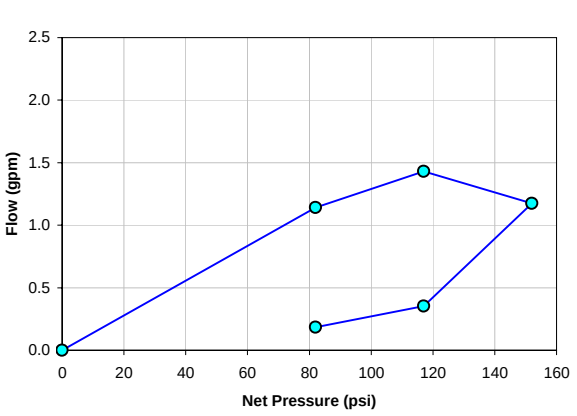
Depth to Bottom of Top Packer	148	ft	B	
Depth to Top of Bottom Packer	159	ft	C	
Length of Packer Interval	11	ft	J=(C-B)	
Water Column Pressure	12	psi	P=0.433*(A+D)	
Friction Loss	0	psi		
Gauge Pressure Steps Step 1&5	70	psi		
Step 2&4	105	psi		
Step 3	140	psi		
Water Temperature	60	°F		

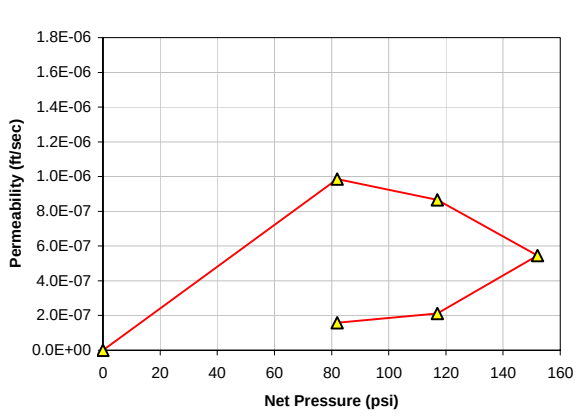
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
1.235	2.401	1.166	70	82	2.363	1.01E-06
2.401	3.586	1.185	70	82	2.401	1.02E-06
3.586	4.723	1.137	70	82	2.304	9.82E-07
4.723	5.854	1.131	70	82	2.292	9.76E-07
5.854	7.01	1.156	70	82	2.343	9.98E-07
	Average	1.14				9.85E-07
0.675	1.28	0.605	105	117	0.858	3.66E-07
0.68	1.91	1.23	105	117	1.745	7.43E-07
0.243	2.401	2.158	105	117	3.061	1.30E-06
2.401	2.837	0.436	105	117	0.618	2.63E-07
2.837	3.199	0.362	105	117	0.513	2.19E-07
3.199	3.541	0.342	105	117	0.485	2.07E-07

Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**		**Z3-B1**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)		148 to 159
Project Number :	379312.04.08.01					Sheet 2 of 2

Flow Meter (gallons)		**(gallons)**	**(psi)**	**(psi)**	**(Lu)**	**(ft/sec)**
Start	**End**	**Take**	**Gauge**	**Net**	**Lugeons**	**Permeability**
0.342	3.933	3.591	105	117	5.094	2.17E-06
	Average	1.43				8.65E-07
1.086	2.167	1.081	140	152	1.179	5.02E-07
2.167	3.293	1.126	140	152	1.229	5.23E-07
3.293	4.434	1.141	140	152	1.245	5.30E-07
4.434	5.605	1.171	140	152	1.278	5.44E-07
5.605	6.781	1.176	140	152	1.283	5.47E-07
	Average	1.17				5.45E-07
0.352	0.625	0.273	105	117	0.387	1.65E-07
0.625	1.002	0.377	105	117	0.535	2.28E-07
1.002	1.354	0.352	105	117	0.499	2.13E-07
1.354	1.706	0.352	105	117	0.499	2.13E-07
1.706	2.058	0.352	105	117	0.499	2.13E-07
	Average	0.35				2.13E-07
0.193	0.416	0.223	70	82	0.452	1.93E-07
0.416	0.619	0.203	70	82	0.411	1.75E-07
0.619	0.793	0.174	70	82	0.353	1.50E-07
0.793	0.986	0.193	70	82	0.391	1.67E-07
0.248	1.17	0.184	70	82	0.373	1.59E-07
	Average	0.18				1.59E-07





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z3-B1**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	183 to 194
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	3/12/09-3/24/09	Boring Logger	M. Torsiello	Groundwater Depth (ft)	23.9
Drilling Method	Rotary Wash	Boring Dia. (in)	5.5	Ground Surface Elevation (ft)	885.1
Drill Rig Type	Ingersoll Rand A400	Drill Bit Type	PQ	Boring Depth (ft)	300
Performed By	M. Torsiello	Date	3/20/2009	Depth to Bedrock (ft)	30.5

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3	ft	A
Depth to Bottom of Top Packer	183	ft	B
Depth to Top of Bottom Packer	194	ft	C
Groundwater Depth	23.9	ft	D
Overburden Depth to Packer Interval Midpoint	188.5	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	164.6	ft	F=(E-D)
Packer Inflation Pressure	300	psi	
Maximum Net Applied Pressure	117	psi	G=E-0.433F
Maximum Gauge Pressure	106	psi	H=(G)-(P)

Lugeon Calculations

Depth to Bottom of Top Packer		183	ft	B
Depth to Top of Bottom Packer		194	ft	C
Length of Packer Interval		11	ft	J=(C-B)
Water Column Pressure		12	psi	P=0.433*(A+D)
Friction Loss		0	psi	
Gauge Pressure Steps	Step 1&5	50	psi	
	Step 2&4	100	psi	
	Step 3	150	psi	
Water Temperature		60	°F	

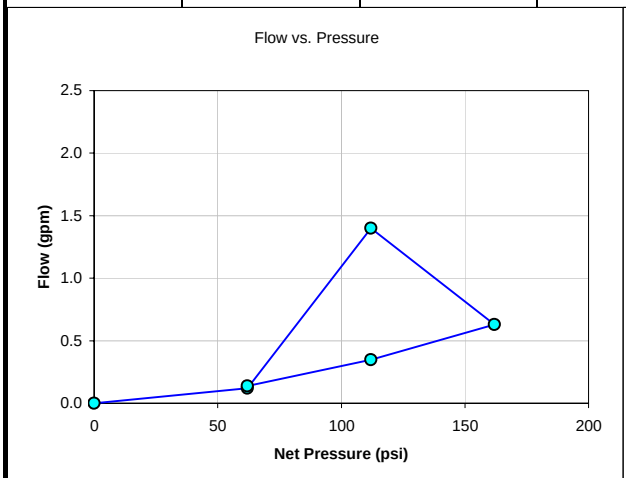
(assumes each Start/End Cycle time is 1 minute)

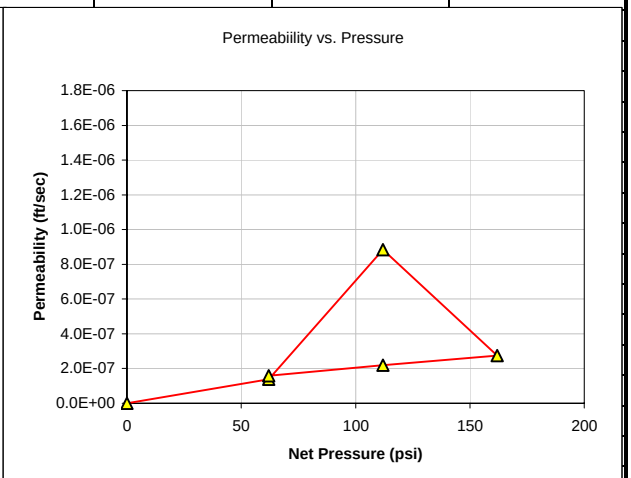
Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
0.198	0.357	0.159	50	62	0.427	1.82E-07
0.357	0.481	0.124	50	62	0.333	1.42E-07
0.481	0.6	0.119	50	62	0.319	1.36E-07
0.6	0.724	0.124	50	62	0.333	1.42E-07
0.724	0.833	0.109	50	62	0.293	1.25E-07
0.833	0.962	0.129	50	62	0.346	1.47E-07
	Average	0.12				1.38E-07
0.68	1.25	0.57	100	112	0.845	3.60E-07
0.243	1.751	1.508	100	112	2.235	9.52E-07
1.751	2.262	0.511	100	112	0.757	3.23E-07
2.262	2.743	0.481	100	112	0.713	3.04E-07
2.743	3.224	0.481	100	112	0.713	3.04E-07

CH2MHILL

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z3-B1**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	183 to 194
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons)		(gallons)	(psi)	(psi)	(Lu)	(ft/sec)
Start	**End**	**Take**	**Gauge**	**Net**	**Lugeons**	**Permeability**
0.481	3.72	3.239	100	112	4.800	2.04E-06
	Average	1.40				8.84E-07
1.171	2.173	1.002	150	162	1.026	4.37E-07
2.173	3.036	0.863	150	162	0.883	3.76E-07
3.036	3.825	0.789	150	162	0.808	3.44E-07
3.825	4.574	0.749	150	162	0.767	3.27E-07
4.574	5.303	0.729	150	162	0.746	3.18E-07
5.303	6.002	0.699	150	162	0.715	3.05E-07
6.002	6.642	0.64	150	162	0.655	2.79E-07
6.642	7.272	0.63	150	162	0.645	2.75E-07
7.272	7.912	0.64	150	162	0.655	2.79E-07
7.912	8.522	0.61	150	162	0.624	2.66E-07
	Average	0.63				2.75E-07
0.402	0.799	0.397	100	112	0.588	2.51E-07
0.799	1.151	0.352	100	112	0.522	2.22E-07
1.151	1.478	0.327	100	112	0.485	2.06E-07
1.478	1.825	0.347	100	112	0.514	2.19E-07
1.825	2.187	0.362	100	112	0.536	2.29E-07
	Average	0.35				2.19E-07
0.248	0.466	0.218	50	62	0.585	2.49E-07
0.466	0.689	0.223	50	62	0.599	2.55E-07
0.689	0.823	0.134	50	62	0.360	1.53E-07
0.823	0.977	0.154	50	62	0.413	1.76E-07
0.977	1.106	0.129	50	62	0.346	1.47E-07
1.106	1.245	0.139	50	62	0.373	1.59E-07
	Average	0.14				1.59E-07





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z3-B1**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	213 to 224
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	3/12/09-3/24/09	Boring Logger	M. Torsiello	Groundwater Depth (ft)	23.9
Drilling Method	Rotary Wash	Boring Dia. (in)	5.5	Ground Surface Elevation (ft)	885.1
Drill Rig Type	Ingersoll Rand A400	Drill Bit Type	PQ	Boring Depth (ft)	300
Performed By	M. Torsiello	Date	3/20/2009	Depth to Bedrock (ft)	30.5

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3	ft	A
Depth to Bottom of Top Packer	213	ft	B
Depth to Top of Bottom Packer	224	ft	C
Groundwater Depth	23.9	ft	D
Overburden Depth to Packer Interval Midpoint	218.5	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	194.6	ft	F=(E-D)
Packer Inflation Pressure	320	psi	
Maximum Net Applied Pressure	134	psi	G=E-0.433F
Maximum Gauge Pressure	123	psi	H=(G)-(P)

Lugeon Calculations

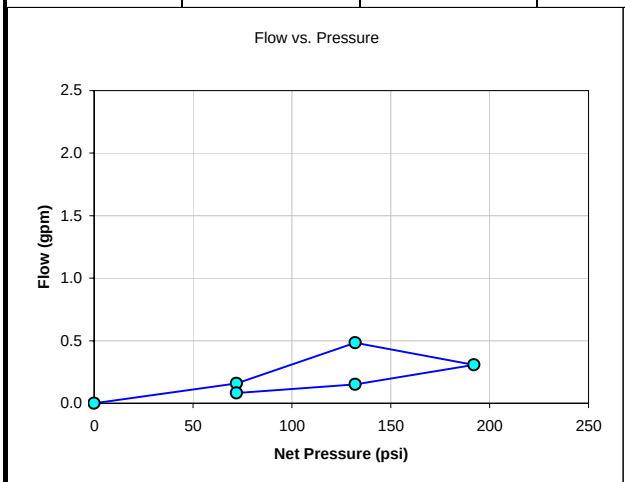
Depth to Bottom of Top Packer	213	ft	B	
Depth to Top of Bottom Packer	224	ft	C	
Length of Packer Interval	11	ft	J=(C-B)	
Water Column Pressure	12	psi	P=0.433*(A+D)	
Friction Loss	0	psi		
Gauge Pressure Steps	Step 1&5	60	psi	
	Step 2&4	120	psi	
	Step 3	180	psi	
Water Temperature	60	°F		

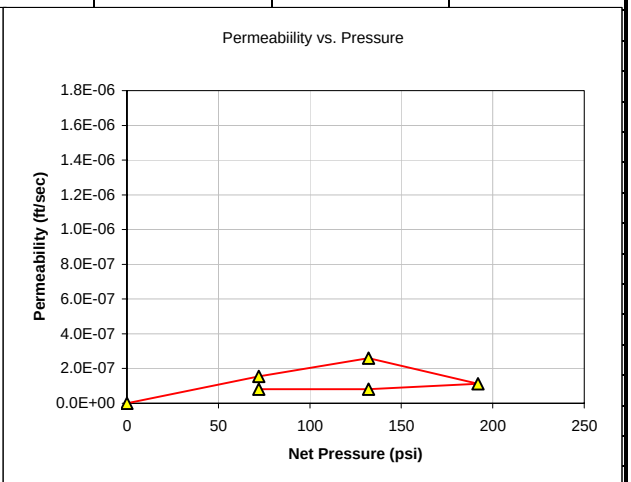
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
0.179	0.363	0.184	60	72	0.425	1.81E-07
0.363	0.502	0.139	60	72	0.321	1.37E-07
0.502	0.661	0.159	60	72	0.367	1.56E-07
0.661	0.849	0.188	60	72	0.434	1.85E-07
0.849	0.983	0.134	60	72	0.309	1.32E-07
0.983	1.147	0.164	60	72	0.379	1.58E-07
1.147	1.281	0.134	60	72	0.309	1.32E-07
	Average	0.16				1.54E-07
0.243	0.486	0.243	120	132	0.305	1.30E-07
0.486	0.764	0.278	120	132	0.349	1.49E-07
0.764	1.071	0.307	120	132	0.386	1.64E-07
1.071	1.349	0.278	120	132	0.349	1.49E-07

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z3-B1**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	213 to 224
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons)		(gallons)	(psi)	(psi)	(Lu)	(ft/sec)
Start	**End**	**Take**	**Gauge**	**Net**	**Lugeons**	**Permeability**
0.278	1.592	1.314	120	132	1.651	7.04E-07
	Average	0.48				2.59E-07
0.312	0.605	0.293	180	192	0.253	1.08E-07
0.605	0.908	0.303	180	192	0.262	1.11E-07
0.908	1.216	0.308	180	192	0.266	1.13E-07
1.216	1.533	0.317	180	192	0.274	1.17E-07
1.533	1.826	0.293	180	192	0.253	1.08E-07
1.826	2.148	0.322	180	192	0.278	1.18E-07
	Average	0.31				1.13E-07
0.149	0.278	0.13	120	132	0.162	6.91E-08
0.278	0.417	0.14	120	132	0.175	7.44E-08
0.417	0.556	0.14	120	132	0.175	7.44E-08
0.556	0.72	0.16	120	132	0.206	8.78E-08
0.72	0.879	0.16	120	132	0.200	8.51E-08
0.879	1.033	0.15	120	132	0.194	8.25E-08
1.033	1.172	0.14	120	132	0.175	7.44E-08
	Average	0.15				8.08E-08
0.064	0.148	0.08	60	72	0.194	8.26E-08
0.148	0.242	0.09	60	72	0.217	9.25E-08
0.242	0.336	0.09	60	72	0.217	9.25E-08
0.336	0.391	0.06	60	72	0.127	5.41E-08
0.391	0.475	0.08	60	72	0.194	8.26E-08
0.475	0.525	0.05	60	72	0.115	4.92E-08
0.525	0.609	0.08	60	72	0.194	8.26E-08
0.609	0.713	0.10	60	72	0.240	1.02E-07
0.713	0.807	0.09	60	72	0.217	9.25E-08
	Average	0.08				8.12E-08





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z3-B1**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	273 to 284
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	3/12/09-3/24/09	Boring Logger	M. Torsiello	Groundwater Depth (ft)	23.9
Drilling Method	Rotary Wash	Boring Dia. (in)	5.5	Ground Surface Elevation (ft)	885.1
Drill Rig Type	Ingersoll Rand A400	Drill Bit Type	PQ	Boring Depth (ft)	300
Performed By	M. Torsiello	Date	3/20/2009	Depth to Bedrock (ft)	30.5

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3	ft	A
Depth to Bottom of Top Packer	273	ft	B
Depth to Top of Bottom Packer	284	ft	C
Groundwater Depth	23.9	ft	D
Overburden Depth to Packer Interval Midpoint	278.5	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	254.6	ft	F=(E-D)
Packer Inflation Pressure	320	psi	
Maximum Net Applied Pressure	168	psi	G=E-0.433F
Maximum Gauge Pressure	157	psi	H=(G)-(P)

Lugeon Calculations

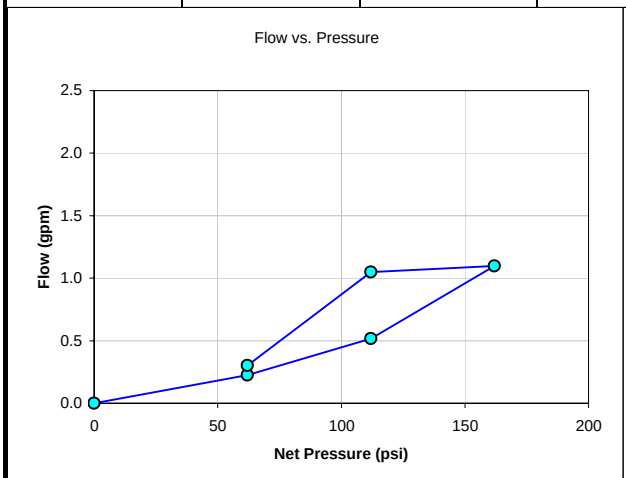
Depth to Bottom of Top Packer		273	ft	B
Depth to Top of Bottom Packer		284	ft	C
Length of Packer Interval		11	ft	J=(C-B)
Water Column Pressure		12	psi	P=0.433*(A+D)
Friction Loss		0	psi	
Gauge Pressure Steps	Step 1&5	50	psi	
	Step 2&4	100	psi	
	Step 3	150	psi	
Water Temperature		60	°F	

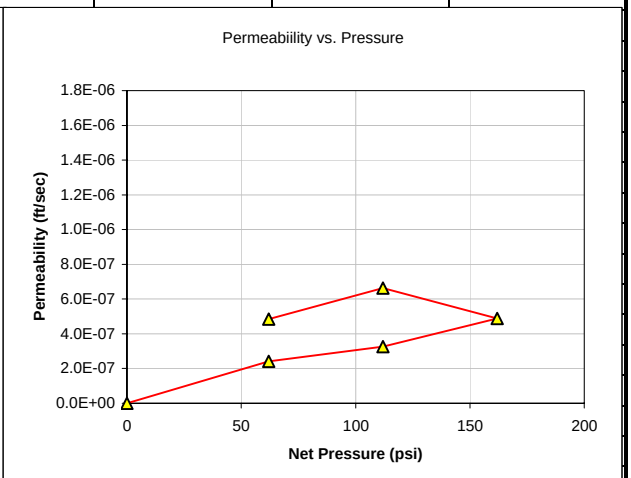
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
0.188	0.317	0.129	50	62	0.346	1.47E-07
0.317	0.486	0.169	50	62	0.454	1.93E-07
0.486	0.704	0.218	50	62	0.585	2.49E-07
0.704	0.937	0.233	50	62	0.625	2.66E-07
0.937	1.19	0.253	50	62	0.679	2.89E-07
1.19	1.488	0.298	50	62	0.800	2.29E-07
1.488	1.761	0.273	50	62	0.733	3.12E-07
	Average	0.22				2.41E-07
0.719	1.23	0.511	100	112	0.757	3.23E-07
1.23	1.771	0.541	100	112	0.802	3.42E-07
1.771	2.292	0.521	100	112	0.772	3.29E-07
2.292	2.798	0.506	100	112	0.750	3.19E-07

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z3-B1**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	273 to 284
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons)		(gallons)	(psi)	(psi)	(Lu)	(ft/sec)
Start	End	Take	Gauge	Net	Lugeons	Permeability
0.506	3.284	2.778	100	112	4.117	1.75E-06
3.284	3.795	0.511	100	112	0.757	3.23E-07
	Average	0.52				3.27E-07
0.903	1.855	0.952	150	162	0.974	4.15E-07
1.855	2.921	1.066	150	162	1.091	4.65E-07
2.921	4.037	1.116	150	162	1.142	4.87E-07
4.037	5.148	1.111	150	162	1.137	4.84E-07
5.148	6.324	1.176	150	162	1.204	5.13E-07
6.324	7.534	1.21	150	162	1.238	5.28E-07
7.534	8.789	0.96	150	162	0.980	4.95E-07
8.789	9.989	1.2	150	162	1.228	5.23E-07
	Average	1.10				4.89E-07
1.131	2.212	1.081	100	112	1.602	6.82E-07
2.212	3.288	1.076	100	112	1.595	6.79E-07
3.288	4.364	1.076	100	112	1.595	6.79E-07
4.364	5.341	0.977	100	112	1.448	6.17E-07
5.341	6.383	1.042	100	112	1.544	6.58E-07
	Average	1.05				6.63E-07
0.327	0.6	0.273	140	152	0.298	1.27E-07
0.6	0.893	0.293	140	152	0.320	1.36E-07
0.893	1.196	0.303		12	4.304	1.83E-06
1.196	1.528	0.332	70	82	0.673	2.87E-07
1.528	1.821	0.293	70	82	0.594	2.53E-07
1.821	2.133	0.312	70	82	0.632	2.69E-07
	Average	0.30				4.84E-07





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z3-B2**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	150-159.5
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	1/13/09-1/22/09	Boring Logger	J. Pratt/T. Halda	Groundwater Depth (ft)	144.4
Drilling Method	Rotary Wash	Boring Dia. (in)	3.8-4.0	Ground Surface Elevation (ft)	781.4
Drill Rig Type	CS 2000	Drill Bit Type	HQ	Boring Depth (ft)	275
Performed By	RR	Date	1/21/2009	Depth to Bedrock (ft)	120.7

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3	ft	A
Depth to Bottom of Top Packer	150	ft	B
Depth to Top of Bottom Packer	159.5	ft	C
Groundwater Depth	144.4	ft	D
Overburden Depth to Packer Interval Midpoint	154.75	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	10.35	ft	F=(E-D)
Packer Inflation Pressure	210	psi	
Maximum Net Applied Pressure	150	psi	G=E-0.433F
Maximum Gauge Pressure	86	psi	H=(G)-(P)

Lugeon Calculations

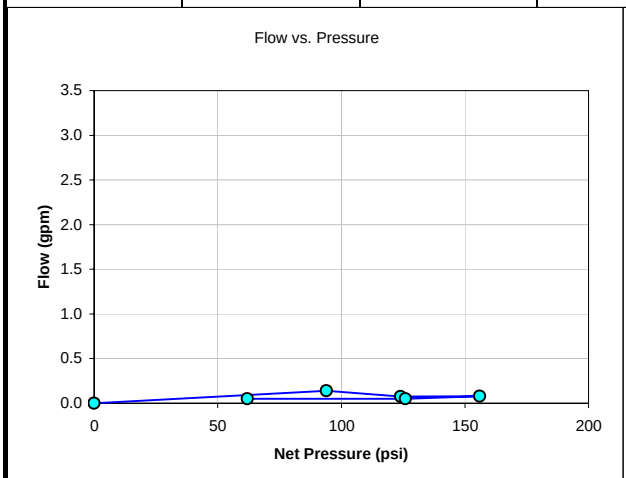
Depth to Bottom of Top Packer	150	ft	B	
Depth to Top of Bottom Packer	159.5	ft	C	
Length of Packer Interval	9.5	ft	J=(C-B)	
Water Column Pressure	64	psi	P=0.433*(A+D)	
Friction Loss	0	psi		
Gauge Pressure Steps Step 1&5	30	psi		
Step 2&4	60	psi		
Step 3	90	psi		
Water Temperature	70	°F		

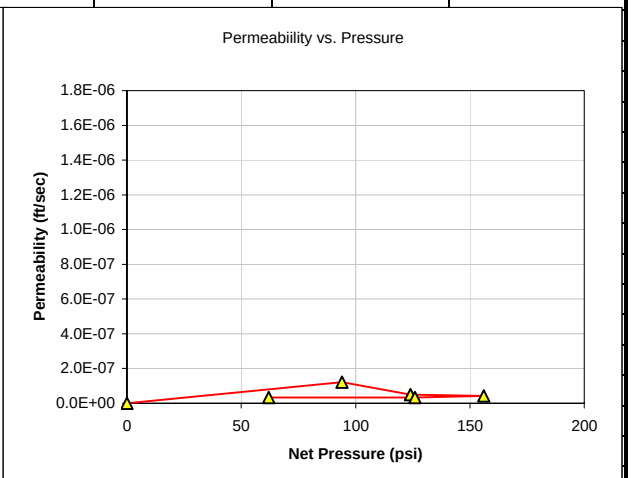
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
30.8	30.9	0.1	30	94	0.204	8.70E-08
30.9	31	0.1	30	94	0.204	8.70E-08
31	31.2	0.2	30	94	0.408	1.74E-07
31.2	31.3	0.1	30	94	0.204	8.70E-08
31.3	31.4	0.1	30	94	0.204	8.70E-08
31.4	31.6	0.2	30	94	0.408	1.74E-07
31.6	31.7	0.1	30	94	0.204	8.70E-08
	Average	0.14				1.22E-07
32.2	32.3	0.1	60	124	0.155	6.59E-08
32.3	32.3	0	60	124	0.000	0.00E+00
32.3	32.4	0.1	60	124	0.155	6.59E-08
32.4	32.5	0.1	60	124	0.155	6.59E-08

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z3-B2**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	150-159.5
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons)		(gallons)	(psi)	(psi)	(Lu)	(ft/sec)
Start	**End**	**Take**	**Gauge**	**Net**	**Lugeons**	**Permeability**
32.5	32.5	0	60	124	0.000	0.00E+00
32.5	32.6	0.1	60	124	0.155	6.59E-08
	Average	0.08				4.94E-08
33.5	33.5	0	92	156	0.000	0.00E+00
33.5	33.6	0.1	92	156	0.123	5.24E-08
33.6	33.8	0.2	92	156	0.246	1.05E-07
33.8	33.8	0	92	156	0.000	0.00E+00
33.8	33.9	0.1	92	156	0.123	5.24E-08
33.9	33.9	0	92	156	0.000	0.00E+00
33.9	34	0.1	92	156	0.123	5.24E-08
	Average	0.08				4.19E-08
34.5	34.6	0.1	62	126	0.152	6.49E-08
34.6	34.6	0	62	126	0.000	0.00E+00
34.6	34.7	0.1	62	126	0.152	6.49E-08
34.7	34.7	0	62	126	0.000	0.00E+00
34.7	34.8	0.1	62	126	0.152	6.49E-08
34.8	34.8	0	62	126	0.000	0.00E+00
34.8	34.9	0.1	62	126	0.152	6.49E-08
	Average	0.05				3.24E-08
35.2	35.2	0	62	126	0.000	0.00E+00
35.2	35.2	0	62	126	0.000	0.00E+00
35.2	35.3	0.1	62	126	0.152	6.49E-08
35.3	35.3	0	62	126	0.000	0.00E+00
35.3	35.4	0.1	62	126	0.152	6.49E-08
35.4	35.4	0	62	126	0.000	0.00E+00
	Average	0.05				3.24E-08





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z3-B2**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	170-179.5
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	1/13/09-1/22/09	Boring Logger	J. Pratt/T. Halda	Groundwater Depth (ft)	144.4
Drilling Method	Rotary Wash	Boring Dia. (in)	3.8-4.0	Ground Surface Elevation (ft)	781.4
Drill Rig Type	CS 2000	Drill Bit Type	HQ	Boring Depth (ft)	275
Performed By	RR	Date	1/21/2009	Depth to Bedrock (ft)	120.7

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3	ft	A
Depth to Bottom of Top Packer	170	ft	B
Depth to Top of Bottom Packer	179.5	ft	C
Groundwater Depth	144.4	ft	D
Overburden Depth to Packer Interval Midpoint	174.75	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	30.35	ft	F=(E-D)
Packer Inflation Pressure	220	psi	
Maximum Net Applied Pressure	162	psi	G=E-0.433F
Maximum Gauge Pressure	98	psi	H=(G)-(P)

Lugeon Calculations

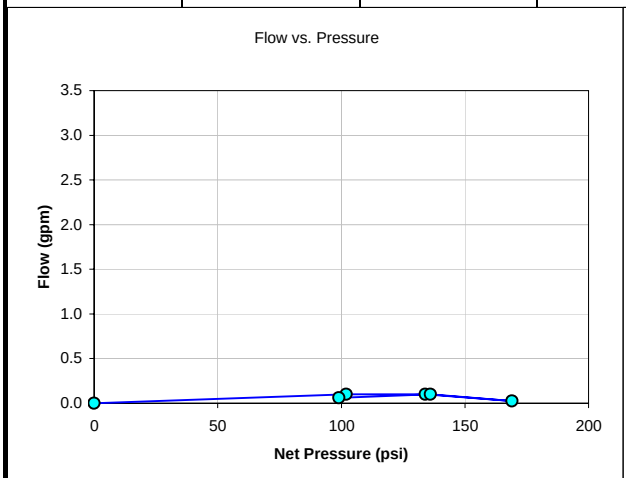
Depth to Bottom of Top Packer		170	ft	B
Depth to Top of Bottom Packer		179.5	ft	C
Length of Packer Interval		9.5	ft	J=(C-B)
Water Column Pressure		64	psi	P=0.433*(A+D)
Friction Loss		0	psi	
Gauge Pressure Steps	Step 1&5	35	psi	
	Step 2&4	70	psi	
	Step 3	105	psi	
Water Temperature		62	°F	

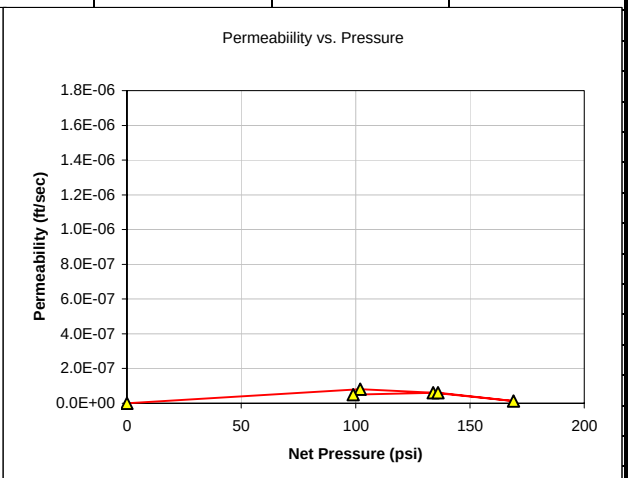
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
20.6	20.7	0.1	36	100	0.192	8.18E-08
20.7	20.8	0.1	38	102	0.188	8.02E-08
20.8	20.8	0	38	102	0.000	0.00E+00
20.8	20.9	0.1	38	102	0.188	8.02E-08
20.9	21	0.1	38	102	0.188	8.02E-08
21	21.1	0.1	38	102	0.188	8.02E-08
	Average	0.10				8.02E-08
21.4	21.5	0.1	70	134	0.143	6.10E-08
21.5	21.6	0.1	70	134	0.143	6.10E-08
21.6	21.6	0	70	134	0.000	0.00E+00
21.6	21.7	0.1	70	134	0.143	6.10E-08
21.7	21.8	0.1	70	134	0.143	6.10E-08

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z3-B2**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	170-179.5
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons)		(gallons)	(psi)	(psi)	(Lu)	(ft/sec)
Start	End	Take	Gauge	Net	Lugeons	Permeability
21.8	21.9	0.1	70	134	0.143	6.10E-08
	Average	0.10				6.10E-08
22.6	22.6	0	105	169	0.000	0.00E+00
22.6	22.6	0	105	169	0.000	0.00E+00
22.6	22.6	0	105	169	0.000	0.00E+00
22.6	22.6	0	105	169	0.000	0.00E+00
22.6	22.7	0.1	105	169	0.113	4.83E-08
22.7	22.7	0	105	169	0.000	0.00E+00
22.7	22.7	0	105	169	0.000	0.00E+00
22.7	22.7	0	105	169	0.000	0.00E+00
	Average	0.02				1.21E-08
22.8	22.9	0.1	72	136	0.141	6.01E-08
22.9	23	0.1	72	136	0.141	6.01E-08
23	23.1	0.1	72	136	0.141	6.01E-08
23.1	23.2	0.1	72	136	0.141	6.01E-08
23.2	23.3	0.1	72	136	0.141	6.01E-08
23.3	23.4	0.1	72	136	0.141	6.01E-08
	Average	0.10				6.01E-08
23.8	23.9	0.1	35	99	0.194	8.26E-08
23.9	23.9	0	35	99	0.000	0.00E+00
23.9	24	0.1	35	99	0.194	8.26E-08
24	24	0	35	99	0.000	0.00E+00
24	24.1	0.1	35	99	0.194	8.26E-08
24.1	24.2	0.1	35	99	0.194	8.26E-08
24.2	24.2	0	35	99	0.000	0.00E+00
	Average	0.06				4.96E-08





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z3-B2**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	210-219.5
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	1/13/09-1/22/09	Boring Logger	J. Pratt/T. Halda	Groundwater Depth (ft)	144.4
Drilling Method	Rotary Wash	Boring Dia. (in)	3.8-4.0	Ground Surface Elevation (ft)	781.4
Drill Rig Type	CS 2000	Drill Bit Type	HQ	Boring Depth (ft)	275
Performed By	RR	Date	1/21/2009	Depth to Bedrock (ft)	120.7

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3	ft	A
Depth to Bottom of Top Packer	210	ft	B
Depth to Top of Bottom Packer	219.5	ft	C
Groundwater Depth	144.4	ft	D
Overburden Depth to Packer Interval Midpoint	214.75	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	70.35	ft	F=(E-D)
Packer Inflation Pressure	220	psi	
Maximum Net Applied Pressure	184	psi	G=E-0.433F
Maximum Gauge Pressure	120	psi	H=(G)-(P)

Lugeon Calculations

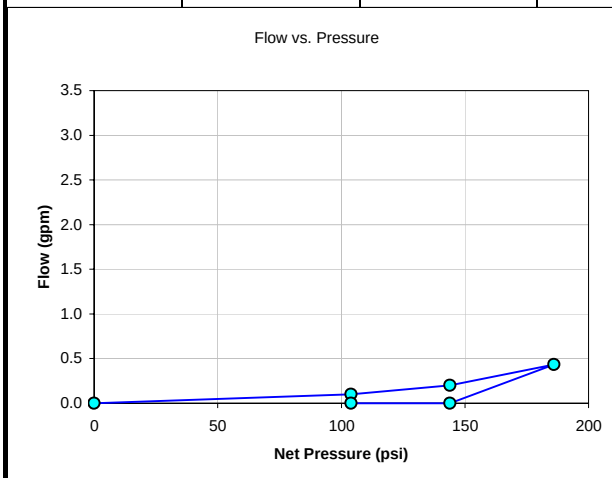
Depth to Bottom of Top Packer	210	ft	B	
Depth to Top of Bottom Packer	219.5	ft	C	
Length of Packer Interval	9.5	ft	J=(C-B)	
Water Column Pressure	64	psi	P=0.433*(A+D)	
Friction Loss	0	psi		
Gauge Pressure Steps Step 1&5	40	psi		
Step 2&4	80	psi		
Step 3	120	psi		
Water Temperature	64	°F		

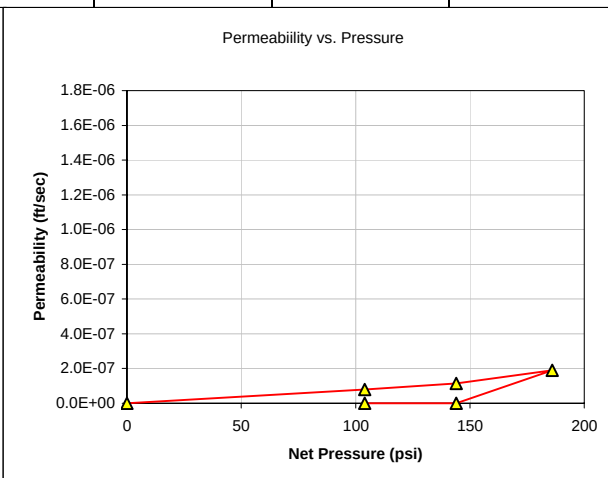
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
12.6	12.7	0.1	40	104	0.185	7.86E-08
12.7	12.8	0.1	40	104	0.185	7.86E-08
12.8	12.9	0.1	40	104	0.185	7.86E-08
12.9	13.1	0.2	40	104	0.369	1.57E-07
13.1	13.2	0.1	40	104	0.185	7.86E-08
13.2	13.3	0.1	40	104	0.185	7.86E-08
13.3	13.4	0.1	40	104	0.185	7.86E-08
	Average	0.10				7.86E-08
13.7	13.9	0.2	80	144	0.266	1.13E-07
13.9	14.2	0.3	80	144	0.400	1.70E-07
14.2	14.4	0.2	80	144	0.266	1.13E-07
14.4	14.6	0.2	80	144	0.266	1.13E-07

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z3-B2**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	210-219.5
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons)		(gallons)	(psi)	(psi)	(Lu)	(ft/sec)
Start	**End**	**Take**	**Gauge**	**Net**	**Lugeons**	**Permeability**
14.6	14.8	0.2	80	144	0.266	1.13E-07
	Average	0.20				1.13E-07
15	15.5	0.5	122	186	0.515	2.20E-07
15.5	16	0.5	122	186	0.515	2.20E-07
16	16.5	0.5	122	186	0.515	2.20E-07
16.5	16.9	0.4	122	186	0.412	1.76E-07
16.9	17.3	0.4	122	186	0.412	1.76E-07
17.3	17.8	0.5	122	186	0.515	2.20E-07
	Average	0.43				1.90E-07
17.9	17.9	0	80	144	0.000	0.00E+00
17.9	17.9	0	80	144	0.000	0.00E+00
17.9	17.9	0	80	144	0.000	0.00E+00
17.9	17.9	0	80	144	0.000	0.00E+00
17.9	17.9	0	80	144	0.000	0.00E+00
	Average	0.00				0.00E+00
17.9	17.9	0	40	104	0.000	0.00E+00
17.9	17.9	0	40	104	0.000	0.00E+00
17.9	17.9	0	40	104	0.000	0.00E+00
17.9	17.9	0	40	104	0.000	0.00E+00
17.9	17.9	0	40	104	0.000	0.00E+00
	Average	0.00				0.00E+00





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z3-B2**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	230-239.5
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	1/13/09-1/22/09	Boring Logger	J. Pratt/T. Halda	Groundwater Depth (ft)	144.4
Drilling Method	Rotary Wash	Boring Dia. (in)	3.8-4.0	Ground Surface Elevation (ft)	781.4
Drill Rig Type	CS 2000	Drill Bit Type	HQ	Boring Depth (ft)	275
Performed By	RR	Date	1/21/2009	Depth to Bedrock (ft)	120.7

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3	ft	A
Depth to Bottom of Top Packer	230	ft	B
Depth to Top of Bottom Packer	239.5	ft	C
Groundwater Depth	144.4	ft	D
Overburden Depth to Packer Interval Midpoint	234.75	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	90.35	ft	F=(E-D)
Packer Inflation Pressure	260	psi	
Maximum Net Applied Pressure	196	psi	G=E-0.433F
Maximum Gauge Pressure	132	psi	H=(G)-(P)

Lugeon Calculations

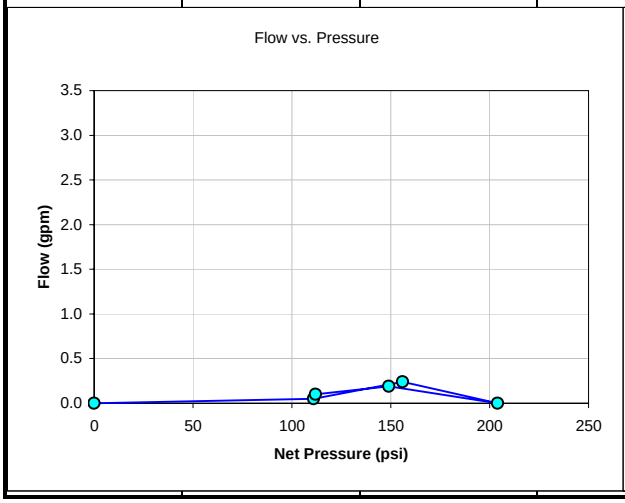
Depth to Bottom of Top Packer	230	ft	B	
Depth to Top of Bottom Packer	239.5	ft	C	
Length of Packer Interval	9.5	ft	J=(C-B)	
Water Column Pressure	64	psi	P=0.433*(A+D)	
Friction Loss	0	psi		
Gauge Pressure Steps	Step 1&5	45	psi	
	Step 2&4	90	psi	
	Step 3	135	psi	
Water Temperature	60	°F		

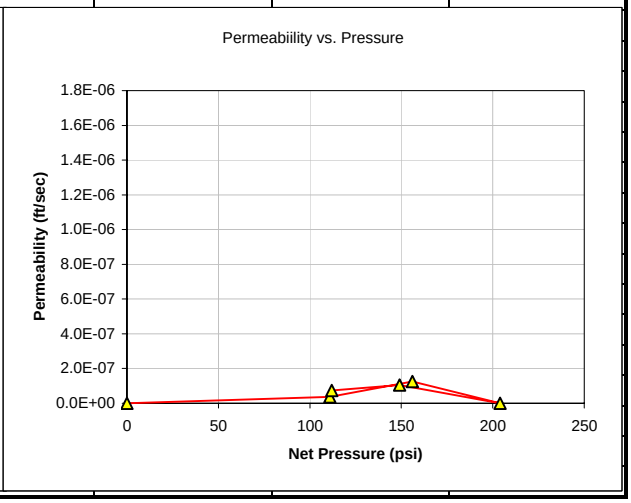
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
2.1	2.2	0.1	45	109	0.176	7.50E-08
2.2	2.2	0	47	111	0.000	0.00E+00
2.2	2.3	0.1	47	111	0.173	7.36E-08
2.3	2.3	0	47	111	0.000	0.00E+00
2.3	2.4	0.1	47	111	0.173	7.36E-08
2.4	2.4	0	47	111	0.000	0.00E+00
	Average	0.05				3.68E-08
2.5	2.9	0.05	90	154	0.062	3.70E-08
2.9	3.2	0.3	92	156	0.369	1.57E-07
3.2	3.4	0.2	92	156	0.246	1.05E-07
3.4	3.7	0.3	92	156	0.369	1.57E-07
3.7	3.9	0.2	92	156	0.246	1.05E-07

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z3-B2**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	230-239.5
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons)		(gallons)	(psi)	(psi)	(Lu)	(ft/sec)
Start	**End**	**Take**	**Gauge**	**Net**	**Lugeons**	**Permeability**
3.9	4.1	0.2	92	156	0.246	1.05E-07
	Average	0.24				1.26E-07
4.4	5	0.6	140	204	0.564	2.40E-07
5	5.6	0.6	140	204	0.564	2.40E-07
5.6	6.1	0.5	140	204	0.470	2.00E-07
6.1	6.2	0.1	140	204	0.094	4.00E-08
6.2	6.2	0	140	204	0.000	0.00E+00
6.2	6.2	0	140	204	0.000	0.00E+00
6.2	6.2	0	140	204	0.000	0.00E+00
	Average	0.00				0.00E+00
6.3	6.5	0.2	85	149	0.257	1.10E-07
6.5	6.7	0.2	85	149	0.257	1.10E-07
6.7	6.9	0.2	85	149	0.257	1.10E-07
6.9	7.1	0.2	85	149	0.257	1.10E-07
7.1	7.3	0.16	85	149	0.206	8.77E-08
7.3	7.5	0.2	85	149	0.257	1.10E-07
	Average	0.19				1.04E-07
7.5	7.5	0	48	112	0.000	0.00E+00
7.5	7.6	0.1	48	112	0.171	7.30E-08
7.6	7.7	0.1	48	112	0.171	7.30E-08
7.7	7.8	0.1	48	112	0.171	7.30E-08
7.8	7.9	0.1	48	112	0.171	7.30E-08
7.9	8	0.1	48	112	0.171	7.30E-08
	Average	0.10				7.30E-08





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z3-B4**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	221 to 230
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	3/2/09-3/6/09	Boring Logger	D. Jankly	Groundwater Depth (ft)	unknown
Drilling Method	Rotary Wash	Boring Dia. (in)	5.5	Ground Surface Elevation (ft)	768
Drill Rig Type	Speedstar 30K	Drill Bit Type	PQ	Boring Depth (ft)	276
Performed By	JL	Date	3/9/2009	Depth to Bedrock (ft)	200

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	4	ft	A
Depth to Bottom of Top Packer	221	ft	B
Depth to Top of Bottom Packer	230	ft	C
Groundwater Depth		ft	D
Overburden Depth to Packer Interval Midpoint	225.5	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	225.5	ft	F=(E-D)
Packer Inflation Pressure	280	psi	
Maximum Net Applied Pressure	128	psi	G=E-0.433F
Maximum Gauge Pressure	126	psi	H=(G)-(P)

Lugeon Calculations

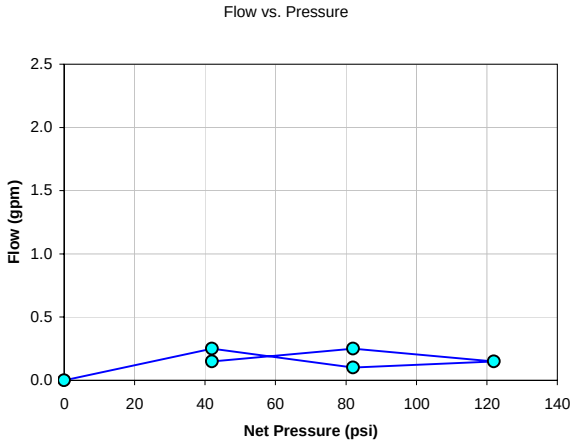
Depth to Bottom of Top Packer	221	ft	B
Depth to Top of Bottom Packer	230	ft	C
Length of Packer Interval	9	ft	J=(C-B)
Water Column Pressure	2	psi	P=0.433*(A+D)
Friction Loss	0	psi	
Gauge Pressure Steps Step 1&5	40	psi	
Step 2&4	80	psi	
Step 3	120	psi	
Water Temperature	58	°F	

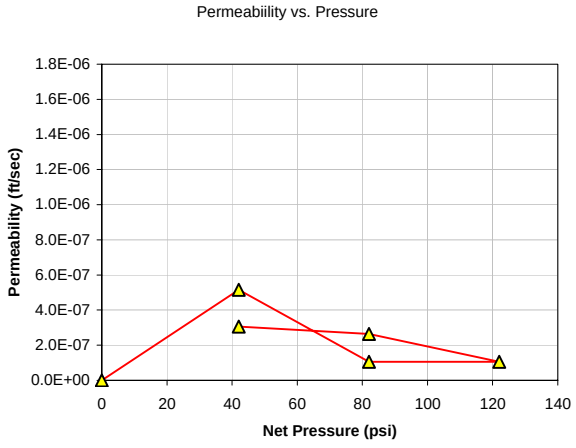
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
13.8	14.1	0.3	40	42	1.454	6.19E-07
14.1	14.3	0.2	40	42	0.969	4.13E-07
14.3	14.6	0.3	40	42	1.454	6.19E-07
14.6	14.8	0.2	40	42	0.969	4.13E-07
14.8	15.1	0.3	40	42	1.454	6.19E-07
	Average	0.25				5.16E-07
15.5	15.6	0.1	80	82	0.247	1.05E-07
15.6	15.8	0.2	80	82	0.495	2.11E-07
15.8	15.9	0.1	80	82	0.247	1.05E-07
15.9	16	0.1	80	82	0.247	1.05E-07
16	16.1	0.1	80	82	0.247	1.05E-07
	Average	0.10				1.05E-07

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z3-B4**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	221 to 230
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
16.8	16.9	0.1	120	122	0.166	7.08E-08
16.9	17.1	0.2	120	122	0.332	1.42E-07
17.1	17.2	0.1	120	122	0.166	7.08E-08
17.2	17.4	0.2	120	122	0.332	1.42E-07
17.4	17.5	0.1	120	122	0.166	7.08E-08
17.5	17.7	0.2	120	122	0.332	1.42E-07
	Average	0.15				1.06E-07
17.9	18.2	0.3	80	82	0.742	3.16E-07
18.2	18.5	0.3	80	82	0.742	3.16E-07
18.5	18.7	0.2	80	82	0.495	2.11E-07
18.7	19	0.3	80	82	0.742	3.16E-07
19	19.2	0.2	80	82	0.495	2.11E-07
19.2	19.5	0.3	80	82	0.742	3.16E-07
19.5	19.7	0.2	80	82	0.495	2.11E-07
	Average	0.25				2.64E-07
20.6	20.8	0.2	40	42	0.969	4.13E-07
20.8	20.9	0.1	40	42	0.485	2.06E-07
20.9	21	0.1	40	42	0.485	2.06E-07
21	21.2	0.2	40	42	0.969	4.13E-07
21.2	21.3	0.1	40	42	0.485	2.06E-07
21.3	21.5	0.2	40	42	0.969	4.13E-07
21.5	21.6	0.1	40	42	0.485	3.10E-07
21.6	21.8	0.2	40	42	0.969	2.92E-07
	Average	0.15				3.07E-07





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z3-B4**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	261-270
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	3/2/09-3/6/09	Boring Logger	D. Jankly	Groundwater Depth (ft)	unknown
Drilling Method	Rotary Wash	Boring Dia. (in)	5.5	Ground Surface Elevation (ft)	768
Drill Rig Type	Speedstar 30K	Drill Bit Type	PQ	Boring Depth (ft)	276
Performed By	JL	Date	3/9/2009	Depth to Bedrock (ft)	200

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	4	ft	A
Depth to Bottom of Top Packer	261	ft	B
Depth to Top of Bottom Packer	270	ft	C
Groundwater Depth		ft	D
Overburden Depth to Packer Interval Midpoint	265.5	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	265.5	ft	F=(E-D)
Packer Inflation Pressure	300	psi	
Maximum Net Applied Pressure	151	psi	G=E-0.433F
Maximum Gauge Pressure	149	psi	H=(G)-(P)

Lugeon Calculations

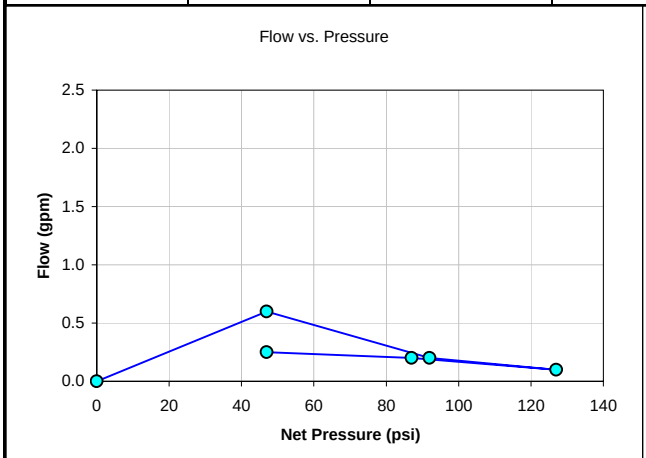
Depth to Bottom of Top Packer		261	ft	B
Depth to Top of Bottom Packer		270	ft	C
Length of Packer Interval		9	ft	J=(C-B)
Water Column Pressure		2	psi	P=0.433*(A+D)
Friction Loss		0	psi	
Gauge Pressure Steps	Step 1&5	50	psi	
	Step 2&4	100	psi	
	Step 3	150	psi	
Water Temperature		55	°F	

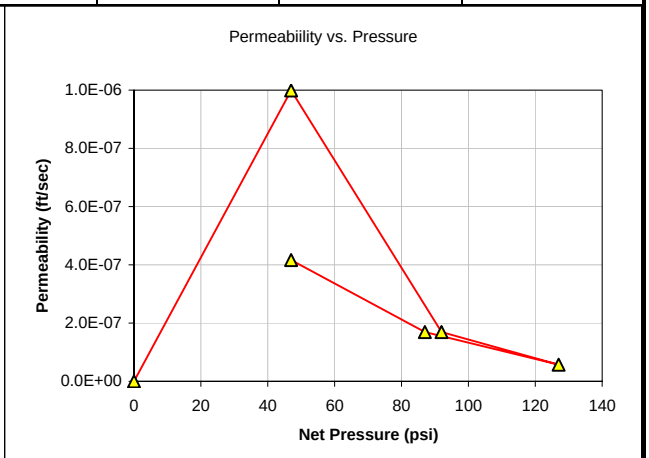
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
2.5	3.1	0.6	50	52	2.345	9.99E-07
2.5	3.7	0.6	50	52	2.345	9.99E-07
2.5	4.3	0.6	50	52	2.345	9.99E-07
2.5	4.9	0.6	50	52	2.345	9.99E-07
2.5	5.5	0.6	50	52	2.345	9.99E-07
	Average	0.6				9.99E-07
6.2	6.4	0.2	100	102	0.398	1.69E-07
6.2	6.7	0.3	100	102	0.596	2.54E-07
6.2	6.9	0.2	100	102	0.398	1.69E-07
6.2	7.1	0.2	100	102	0.398	1.69E-07
6.2	7.3	0.2	100	102	0.398	1.69E-07

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z3-B4**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	261-270
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
	Average	0.200				1.69E-07
7.4	7.5	0.1	150	152	0.133	5.68E-08
7.4	7.6	0.1	150	152	0.133	5.68E-08
7.4	7.7	0.1	150	152	0.133	5.68E-08
7.4	7.8	0.1	150	152	0.133	5.68E-08
	Average	0.1				5.68E-08
7.9	8.1	0.2	100	102	0.398	1.69E-07
7.9	8.2	0.1	100	102	0.199	8.47E-08
7.9	8.4	0.2	100	102	0.398	1.69E-07
7.9	8.6	0.2	100	102	0.398	1.69E-07
7.9	8.8	0.2	100	102	0.398	1.69E-07
	Average	0.200				1.69E-07
9.1	9.4	0.3	50	52	1.173	5.00E-07
9.1	9.6	0.2	50	52	0.782	3.33E-07
9.1	9.8	0.2	50	52	0.782	3.33E-07
9.1	10.1	0.3	50	52	1.173	5.00E-07
9.1	10.3	0.2	50	52	0.782	3.33E-07
9.1	10.6	0.3	50	52	1.173	5.00E-07
9.1	10.8	0.2	50	52	0.782	3.33E-07
9.1	11.1	0.3	50	52	1.173	5.00E-07
	Average	0.250				4.16E-07





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z3-B5**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	225 to 234.5
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	4/15/09-5/1/09	Boring Logger	K. Lai, J. Pratt	Groundwater Depth (ft)	22.5
Drilling Method	Rotary Wash	Boring Dia. (in)	4.25-4.28	Ground Surface Elevation (ft)	698.18
Drill Rig Type	CS 2000	Drill Bit Type	HQ	Boring Depth (ft)	402.1
Performed By	Caltrans	Date	5/1/2009	Depth to Bedrock (ft)	69

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3.08	ft	A
Depth to Bottom of Top Packer	225	ft	B
Depth to Top of Bottom Packer	234.5	ft	C
Groundwater Depth	100	ft	D
Overburden Depth to Packer Interval Midpoint	229.75	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	129.75	ft	F=(E-D)
Packer Inflation Pressure	280	psi	
Maximum Net Applied Pressure	174	psi	G=E-0.433F
Maximum Gauge Pressure	129	psi	H=(G)-(P)

Lugeon Calculations

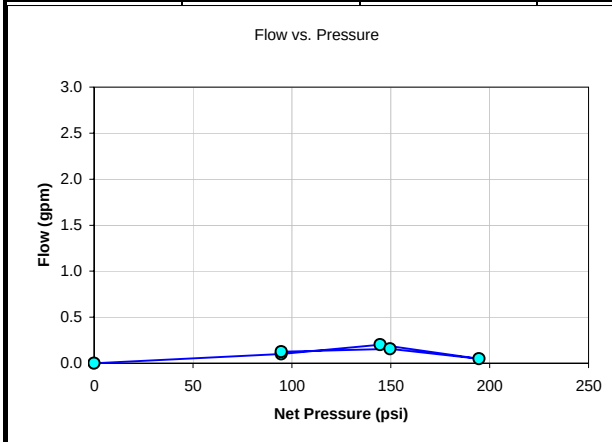
Depth to Bottom of Top Packer		225	ft	B
Depth to Top of Bottom Packer		234.5	ft	C
Length of Packer Interval		9.5	ft	J=(C-B)
Water Column Pressure		45	psi	P=0.433*(A+D)
Friction Loss		0	psi	
Gauge Pressure Steps	Step 1&5	50	psi	
	Step 2&4	100	psi	
	Step 3	150	psi	
Water Temperature		72	°F	

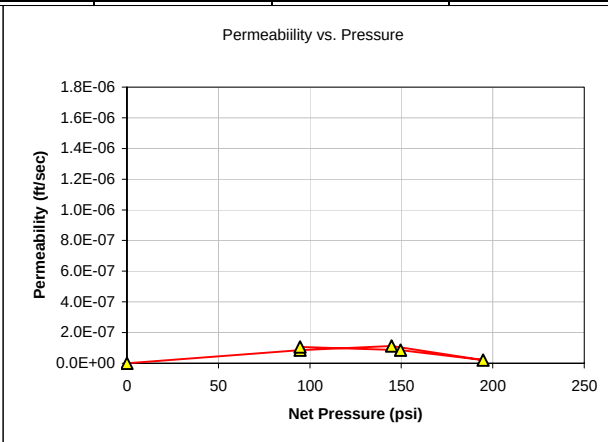
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
5	5.1	0.1	50	95	0.202	8.62E-08
5.1	5.2	0.1	50	95	0.202	8.62E-08
5.2	5.3	0.1	50	95	0.202	8.62E-08
5.3	5.4	0.1	50	95	0.202	8.62E-08
5.4	5.5	0.1	50	95	0.202	8.62E-08
5.5	5.6	0.1	50	95	0.202	8.62E-08
5.6	5.7	0.1	50	95	0.202	8.62E-08
	Average	0.10				8.62E-08
6.2	6.4	0.2	100	145	0.265	1.13E-07
6.4	6.6	0.2	100	145	0.265	1.13E-07
6.6	6.8	0.2	100	145	0.265	1.13E-07
6.8	7	0.2	100	145	0.265	1.13E-07

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z3-B5**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	225 to 234.5
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons)		(gallons)	(psi)	(psi)	(Lu)	(ft/sec)
Start	**End**	**Take**	**Gauge**	**Net**	**Lugeons**	**Permeability**
7	7.2	0.2	100	145	0.265	1.13E-07
7.2	7.4	0.2	100	145	0.265	1.13E-07
7.4	7.6	0.2	100	145	0.265	1.13E-07
	Average	0.2				1.13E-07
9.2	9.2	0.0	150	195	0.000	0.00E+00
9.2	9.3	0.1	150	195	0.098	4.19E-08
9.3	9.3	0.0	150	195	0.000	0.00E+00
9.3	9.4	0.1	150	195	0.098	4.19E-08
9.4	9.4	0.0	150	195	0.000	0.00E+00
9.4	9.5	0.1	150	195	0.098	4.19E-08
9.5	9.5	0.0	150	195	0.000	0.00E+00
9.5	9.6	0.1	150	195	0.098	4.19E-08
	Average	0.05				2.10E-08
10.10	10.2	0.1	105	150	0.128	5.45E-08
10.30	10.4	0.1	100	145	0.132	5.64E-08
10.40	10.5	0.1	110	155	0.124	5.28E-08
10.50	10.7	0.2	115	160	0.240	1.02E-07
10.70	10.8	0.1	105	150	0.128	5.45E-08
10.80	11	0.2	104	149	0.258	1.10E-07
11.00	11.3	0.3	103	148	0.389	1.66E-07
	Average	0.2				8.52E-08
11.7	11.8	0.1	50	95	0.202	8.62E-08
11.8	12.1	0.3	50	95	0.607	2.59E-07
12.1	12.2	0.1	50	95	0.202	8.62E-08
12.2	12.3	0.1	52	97	0.198	8.45E-08
12.3	12.4	0.1	53	98	0.196	8.36E-08
12.4	12.6	0.2	50	95	0.405	1.72E-07
	Average	0.1				1.07E-07





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z3-B5**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	265 to 274.5
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	4/15/09-5/1/09	Boring Logger	K. Lai, J. Pratt	Groundwater Depth (ft)	22.5
Drilling Method	Rotary Wash	Boring Dia. (in)	4.25-4.28	Ground Surface Elevation (ft)	698.18
Drill Rig Type	CS 2000	Drill Bit Type	HQ	Boring Depth (ft)	402.1
Performed By	Caltrans	Date	5/1/2009	Depth to Bedrock (ft)	69

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3.00	ft	A
Depth to Bottom of Top Packer	265	ft	B
Depth to Top of Bottom Packer	274.5	ft	C
Groundwater Depth	100	ft	D
Overburden Depth to Packer Interval Midpoint	269.75	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	169.75	ft	F=(E-D)
Packer Inflation Pressure	300	psi	
Maximum Net Applied Pressure	196	psi	G=E-0.433F
Maximum Gauge Pressure	152	psi	H=(G)-(P)

Lugeon Calculations

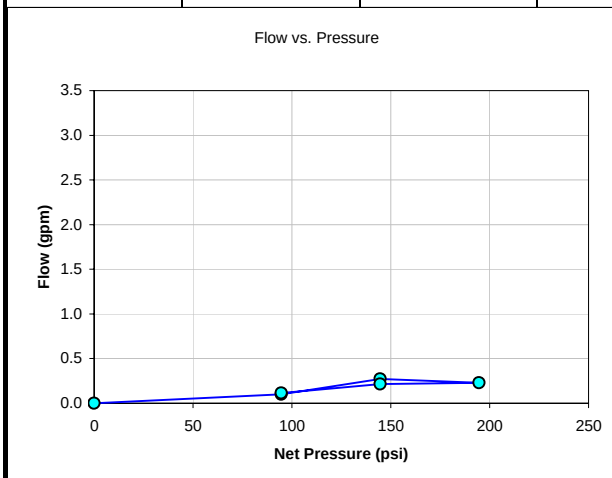
Depth to Bottom of Top Packer		265	ft	B
Depth to Top of Bottom Packer		274.5	ft	C
Length of Packer Interval		9.5	ft	J=(C-B)
Water Column Pressure		45	psi	P=0.433*(A+D)
Friction Loss		0	psi	
Gauge Pressure Steps	Step 1&5	50	psi	
	Step 2&4	100	psi	
	Step 3	150	psi	
Water Temperature		72	°F	

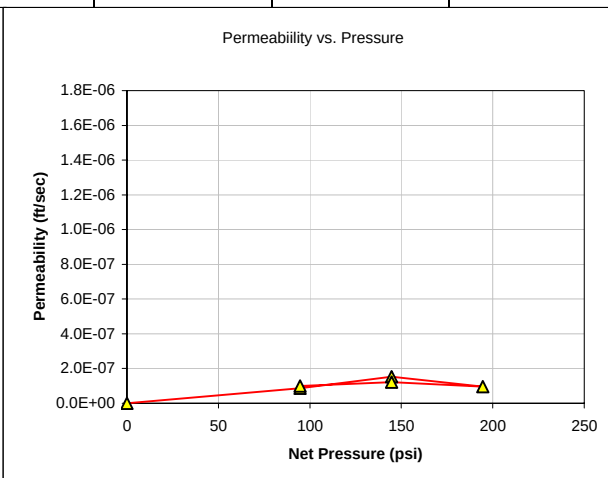
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
9.2	9.3	0.1	50	95	0.203	8.63E-08
9.3	9.4	0.1	50	95	0.203	8.63E-08
9.4	9.5	0.1	50	95	0.203	8.63E-08
9.5	9.7	0.2	50	95	0.405	1.73E-07
9.7	9.8	0.1	50	95	0.203	8.63E-08
9.8	9.9	0.1	50	95	0.203	8.63E-08
9.9	10	0.1	50	95	0.203	8.63E-08
	Average	0.10				8.63E-08
10.5	10.8	0.3	100	145	0.397	1.69E-07
10.8	11	0.2	100	145	0.265	1.13E-07
11	11.3	0.3	100	145	0.397	1.69E-07
11.3	11.6	0.3	100	145	0.397	1.69E-07

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z3-B5**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	265 to 274.5
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons)		(gallons)	(psi)	(psi)	(Lu)	(ft/sec)
Start	End	Take	Gauge	Net	Lugeons	Permeability
11.60	11.9	0.30	100	145	0.397	1.69E-07
12.00	12.3	0.3	100	145	0.397	1.69E-07
12.30	12.5	0.20	100	145	0.265	1.13E-07
	Average	0.27				1.53E-07
14.2	14.4	0.2	150	195	0.197	8.39E-08
14.4	14.6	0.2	150	195	0.197	8.39E-08
14.6	14.9	0.3	150	195	0.295	1.26E-07
14.9	15.1	0.2	150	195	0.197	8.39E-08
15.1	15.3	0.2	150	195	0.197	8.39E-08
15.3	15.5	0.2	150	195	0.197	8.39E-08
15.5	15.8	0.3	150	195	0.295	1.26E-07
	Average	0.23				9.59E-08
0.3	0.5	0.2	100	145	0.265	1.13E-07
0.5	0.7	0.2	100	145	0.265	1.13E-07
0.7	0.9	0.2	100	145	0.265	1.13E-07
0.9	1.1	0.2	100	145	0.265	1.13E-07
1.1	1.3	0.2	100	145	0.265	1.13E-07
1.3	1.5	0.2	100	145	0.265	1.13E-07
1.5	1.8	0.3	100	145	0.397	1.69E-07
	Average	0.21				1.21E-07
2.4	2.5	0.1	50	95	0.203	8.63E-08
2.5	2.6	0.1	50	95	0.203	8.63E-08
2.6	2.7	0.10	50	95	0.203	8.63E-08
2.7	2.8	0.1	50	95	0.203	8.63E-08
2.8	2.9	0.1	50	95	0.203	8.63E-08
2.9	3	0.1	50	95	0.203	8.63E-08
3	3.2	0.2	50	95	0.405	1.73E-07
	Average	0.11				9.86E-08





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z3-B6**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	165.2 to 175.9
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	2/17/09-3/11/09	Boring Logger	M. Torsiello	Groundwater Depth (ft)	51.2
Drilling Method	Rotary Wash	Boring Dia. (in)	5.5	Ground Surface Elevation (ft)	750
Drill Rig Type	Ingersoll Rand A400	Drill Bit Type	PQ	Boring Depth (ft)	326
Performed By	J.Yao	Date	3/6/2009	Depth to Bedrock (ft)	43

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3	ft	A
Depth to Bottom of Top Packer	165.2	ft	B
Depth to Top of Bottom Packer	175.9	ft	C
Groundwater Depth	41.3	ft	D
Overburden Depth to Packer Interval Midpoint	170.55	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	129.25	ft	F=(E-D)
Packer Inflation Pressure	350	psi	
Maximum Net Applied Pressure	115	psi	G=E-0.433F
Maximum Gauge Pressure	95	psi	H=(G)-(P)

Lugeon Calculations

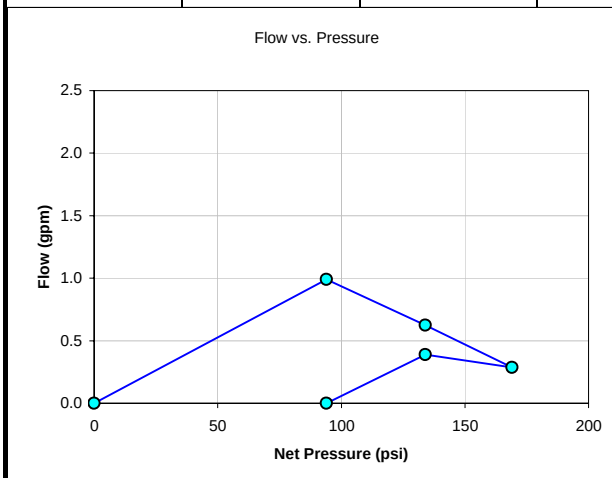
Depth to Bottom of Top Packer	165.2	ft	B	
Depth to Top of Bottom Packer	175.9	ft	C	
Length of Packer Interval	10.7	ft	J=(C-B)	
Water Column Pressure	19	psi	P=0.433*(A+D)	
Friction Loss	0	psi		
Gauge Pressure Steps Step 1&5	90	psi		
Step 2&4	135	psi		
Step 3	180	psi		
Water Temperature	60	°F		

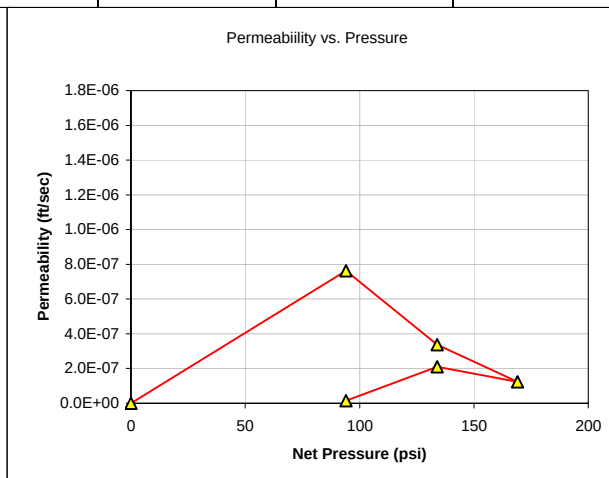
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
1.056	2.053	0.997	75	94	1.801	7.67E-07
2.053	3.025	0.972	75	94	1.755	7.48E-07
3.025	4.007	0.982	75	94	1.774	7.56E-07
4.007	4.969	0.962	75	94	1.737	7.40E-07
4.969	5.971	1.002	75	94	1.810	7.71E-07
5.971	7.003	1.032	75	94	1.864	7.94E-07
	Average	0.99				7.63E-07
0.605	1.19	0.585	115	134	0.742	3.16E-07
0.243	1.81	1.567	115	134	1.986	8.46E-07
1.81	2.45	0.64	115	134	0.811	3.46E-07
2.45	3.055	0.605	115	134	0.767	3.27E-07
3.055	3.685	0.63	115	134	0.799	3.40E-07

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z3-B6**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	165.2 to 175.9
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons)		(gallons)	(psi)	(psi)	(Lu)	(ft/sec)
Start	**End**	**Take**	**Gauge**	**Net**	**Lugeons**	**Permeability**
	Average	0.63				3.38E-07
0.203	0.441	0.24	150	169	0.239	1.02E-07
0.441	0.694	0.253	150	169	0.254	1.08E-07
0.694	1.006	0.312	150	169	0.314	1.34E-07
1.006	1.333	0.27	150	169	0.269	1.15E-07
1.333	1.561	0.228	150	169	0.229	9.77E-08
1.561	1.898	0.27	150	169	0.267	1.14E-07
1.898	2.245	0.27	150	169	0.267	1.14E-07
2.245	2.637	0.39	150	169	0.394	1.68E-07
2.637	3.004	0.37	150	169	0.369	1.57E-07
	Average	0.29				1.23E-07
0.377	0.759	0.38	115	134	0.484	2.06E-07
0.759	1.146	0.39	115	134	0.491	2.09E-07
1.146	1.538	0.39	115	134	0.497	2.12E-07
1.538	1.93	0.39	115	134	0.497	2.12E-07
1.93	2.322	0.39	115	134	0.497	2.12E-07
	Average	0.39				2.10E-07
0.01	0.015	0.01	75	94	0.009	3.85E-09
0.015	0.089	0.07	75	94	0.134	5.69E-08
0.089	0.104	0.02	75	94	0.027	1.15E-08
0.104	0.129	0.03	75	94	0.045	1.92E-08
0.129	0.149	0.02	75	94	0.036	1.54E-08
	Average	0.02				1.54E-08





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z3-B6**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	195 to 206
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	2/17/09-3/11/09	Boring Logger	M. Torsiello	Groundwater Depth (ft)	51.2
Drilling Method	Rotary Wash	Boring Dia. (in)	5.5	Ground Surface Elevation (ft)	750
Drill Rig Type	Ingersoll Rand A400	Drill Bit Type	PQ	Boring Depth (ft)	326
Performed By	J.Yao	Date	3/6/2009	Depth to Bedrock (ft)	43

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3	ft	A
Depth to Bottom of Top Packer	195	ft	B
Depth to Top of Bottom Packer	206	ft	C
Groundwater Depth	41.3	ft	D
Overburden Depth to Packer Interval Midpoint	200.5	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	159.2	ft	F=(E-D)
Packer Inflation Pressure	350	psi	
Maximum Net Applied Pressure	132	psi	G=E-0.433F
Maximum Gauge Pressure	112	psi	H=(G)-(P)

Lugeon Calculations

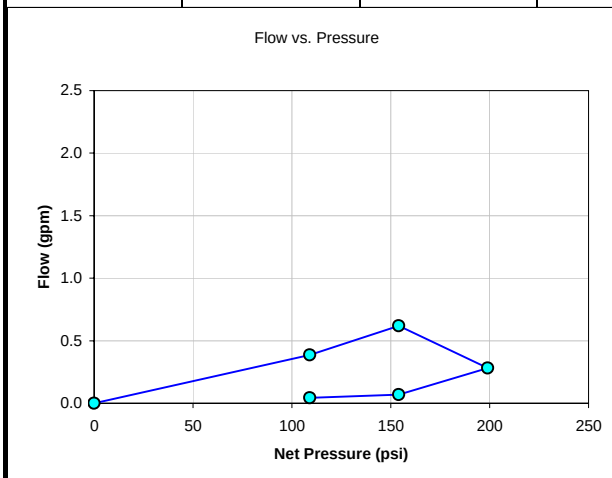
Depth to Bottom of Top Packer	195	ft	B
Depth to Top of Bottom Packer	206	ft	C
Length of Packer Interval	11	ft	J=(C-B)
Water Column Pressure	19	psi	P=0.433*(A+D)
Friction Loss	0	psi	
Gauge Pressure Steps Step 1&5	90	psi	
Step 2&4	135	psi	
Step 3	180	psi	
Water Temperature	60	°F	

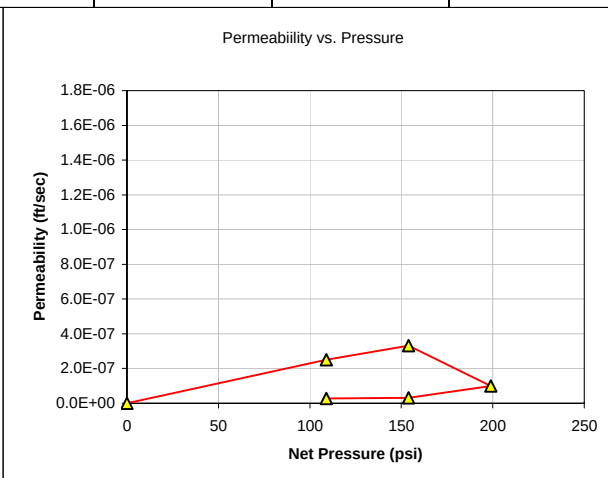
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
0.337	0.694	0.357	90	109	0.541	2.30E-07
0.694	1.081	0.387	90	109	0.586	2.50E-07
1.081	1.478	0.397	90	109	0.602	2.56E-07
1.478	1.83	0.352	90	109	0.533	2.27E-07
1.83	2.231	0.401	90	109	0.608	2.59E-07
2.231	2.623	0.392	90	109	0.594	2.53E-07
2.623	3.01	0.387	90	109	0.586	2.50E-07
	Average	0.39				2.50E-07
0.575	1.18	0.605	135	154	0.649	2.77E-07
1.18	1.745	0.565	135	154	0.606	2.58E-07
1.745	2.305	0.56	135	154	0.601	2.56E-07
2.305	2.905	0.6	135	154	0.644	2.74E-07

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z3-B6**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	195 to 206
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons)		(gallons)	(psi)	(psi)	(Lu)	(ft/sec)
Start	**End**	**Take**	**Gauge**	**Net**	**Lugeons**	**Permeability**
0.6	3.545	2.945	135	154	3.160	1.35E-06
3.545	4.14	0.595	135	154	0.639	4.16E-07
4.14	4.75	0.61	135	154	0.655	2.79E-07
4.75	5.405	0.655	135	154	0.703	2.99E-07
	Average	0.62				3.31E-07
0.169	0.377	0.208	180	199	0.173	7.36E-08
0.377	0.64	0.52	180	199	0.435	1.85E-07
0.64	0.938	0.52	180	199	0.435	2.34E-07
0.938	1.211	0.27	180	199	0.227	9.66E-08
1.211	1.499	0.29	180	199	0.239	1.02E-07
1.499	1.757	0.26	180	199	0.214	9.13E-08
1.757	2.06	0.30	180	199	0.252	1.07E-07
2.06	2.293	0.28	180	199	0.233	9.93E-08
	Average	0.28	180			9.93E-08
0.02	0.055	0.28	135	154	0.301	1.28E-07
0.055	0.06	0.01	135	154	0.005	2.29E-09
0.06	0.08	0.23	135	154	0.247	1.05E-07
0.08	0.095	0.02	135	154	0.016	6.86E-09
0.095	0.11	0.16	135	154	0.174	7.41E-08
0.11	0.14	0.03	135	154	0.032	1.37E-08
	Average	0.07				3.16E-08
0.015	0.05	0.09	90	109	0.129	5.50E-08
0.05	0.085	0.04	90	109	0.053	2.26E-08
0.085	0.11	0.08	90	109	0.116	4.92E-08
0.11	0.115	0.01	90	109	0.008	3.23E-09
0.115	0.13	0.05	90	109	0.082	3.49E-08
	Average	0.04				2.75E-08





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z3-B6**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	255 to 266
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	2/17/09-3/11/09	Boring Logger	M. Torsiello	Groundwater Depth (ft)	51.2
Drilling Method	Rotary Wash	Boring Dia. (in)	5.5	Ground Surface Elevation (ft)	750
Drill Rig Type	Ingersoll Rand A400	Drill Bit Type	PQ	Boring Depth (ft)	326
Performed By	J.Yao	Date	3/6/2009	Depth to Bedrock (ft)	43

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3	ft	A
Depth to Bottom of Top Packer	255	ft	B
Depth to Top of Bottom Packer	266	ft	C
Groundwater Depth	41.3	ft	D
Overburden Depth to Packer Interval Midpoint	260.5	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	219.2	ft	F=(E-D)
Packer Inflation Pressure	360	psi	
Maximum Net Applied Pressure	166	psi	G=E-0.433F
Maximum Gauge Pressure	146	psi	H=(G)-(P)

Lugeon Calculations

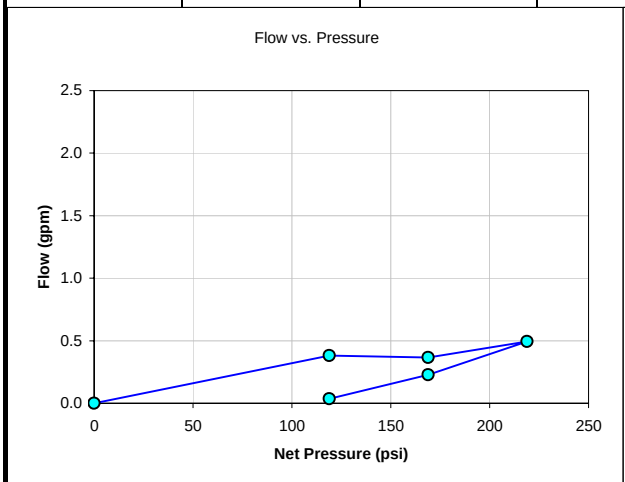
Depth to Bottom of Top Packer	255	ft	B	
Depth to Top of Bottom Packer	266	ft	C	
Length of Packer Interval	11	ft	J=(C-B)	
Water Column Pressure	19	psi	P=0.433*(A+D)	
Friction Loss	0	psi		
Gauge Pressure Steps Step 1&5	100	psi		
Step 2&4	150	psi		
Step 3	200	psi		
Water Temperature	60	°F		

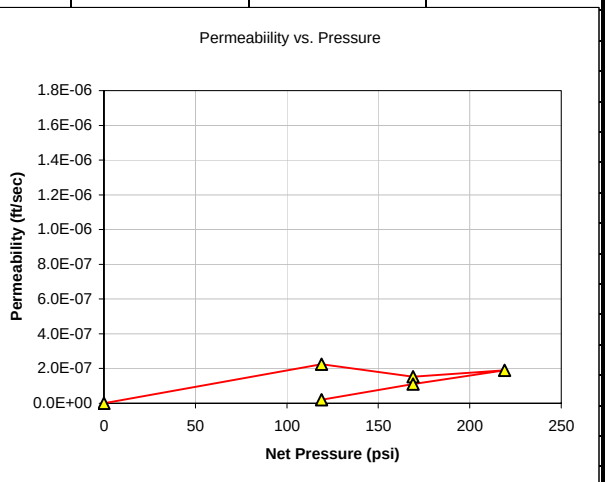
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
0.377	0.759	0.382	100	119	0.530	2.26E-07
0.759	1.166	0.407	100	119	0.565	2.41E-07
1.166	1.548	0.382	100	119	0.530	2.26E-07
1.548	1.925	0.377	100	119	0.523	2.23E-07
1.925	2.307	0.382	100	119	0.530	2.26E-07
	Average	0.38				2.25E-07
0.159	0.263	0.39	150	169	0.377	1.60E-07
0.68	0.357	0.39	150	169	0.377	1.60E-07
0.243	0.59	0.347	150	169	0.339	1.45E-07
0.59	0.833	0.243	150	169	0.238	1.01E-07
0.347	1.21	0.863	150	169	0.844	3.60E-07
1.21	1.577	0.367	150	169	0.359	1.53E-07

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z3-B6**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	255 to 266
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons)		(gallons)	(psi)	(psi)	(Lu)	(ft/sec)
Start	**End**	**Take**	**Gauge**	**Net**	**Lugeons**	**Permeability**
0.367	1.934	1.567	150	169	1.532	6.53E-07
1.934	2.276	0.342	150	169	0.334	1.42E-07
2.276	2.668	0.392	150	169	0.383	1.63E-07
	Average	0.37				1.53E-07
1.22	2.321	1.101	200	219	0.831	3.54E-07
2.321	3.283	0.962	200	219	0.726	3.09E-07
3.283	4.087	0.804	200	219	0.607	2.59E-07
4.087	4.861	0.774	200	219	0.584	2.49E-07
4.861	5.342	0.481	200	219	0.363	2.48E-07
5.342	5.848	0.506	200	219	0.382	1.63E-07
5.848	6.354	0.506	200	219	0.382	1.63E-07
6.354	6.84	0.486	200	219	0.367	1.56E-07
6.84	7.326	0.486	200	219	0.367	2.22E-07
	Average	0.49				1.90E-07
0.357	0.501	0.14	150	169	0.141	6.00E-08
0.501	0.595	0.09	150	169	0.092	3.92E-08
0.595	0.719	0.12	150	169	0.121	1.33E-07
0.719	0.798	0.08	150	169	0.077	3.29E-08
0.798	0.872	0.07	150	169	0.072	9.12E-08
0.248	0.941	0.69	150	169	0.678	2.89E-07
0.941	1.01	0.07	150	169	0.067	2.87E-08
	Average	0.23				1.10E-07
0.04	0.1	0.06	100	119	0.083	3.55E-08
0.1	0.199	0.10	100	119	0.137	5.85E-08
0.199	0.239	0.04	100	119	0.056	2.37E-08
0.239	0.279	0.04	100	119	0.056	2.37E-08
0.279	0.304	0.03	100	119	0.035	1.48E-08
	Average	0.04				2.07E-08





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z3-B6**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	295 to 306
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	2/17/09-3/11/09	Boring Logger	M. Torsiello	Groundwater Depth (ft)	51.2
Drilling Method	Rotary Wash	Boring Dia. (in)	5.5	Ground Surface Elevation (ft)	750
Drill Rig Type	Ingersoll Rand A400	Drill Bit Type	PQ	Boring Depth (ft)	326
Performed By	J.Yao	Date	3/6/2009	Depth to Bedrock (ft)	43

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3	ft	A
Depth to Bottom of Top Packer	295	ft	B
Depth to Top of Bottom Packer	306	ft	C
Groundwater Depth	41.3	ft	D
Overburden Depth to Packer Interval Midpoint	300.5	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	259.2	ft	F=(E-D)
Packer Inflation Pressure	360	psi	
Maximum Net Applied Pressure	188	psi	G=E-0.433F
Maximum Gauge Pressure	169	psi	H=(G)-(P)

Lugeon Calculations

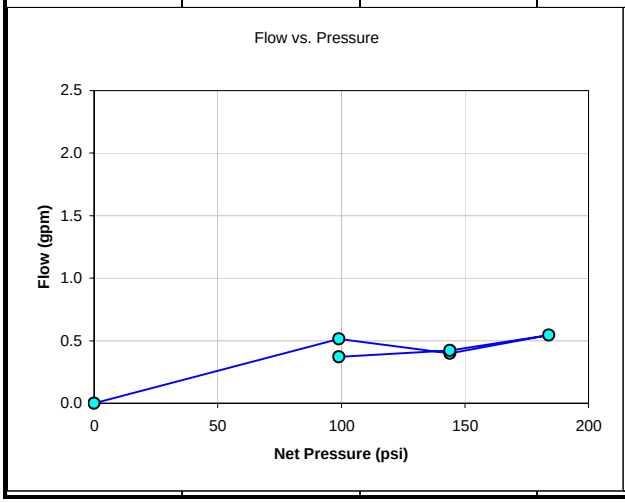
Depth to Bottom of Top Packer	295	ft	B	
Depth to Top of Bottom Packer	306	ft	C	
Length of Packer Interval	11	ft	J=(C-B)	
Water Column Pressure	19	psi	P=0.433*(A+D)	
Friction Loss	0	psi		
Gauge Pressure Steps Step 1&5	80	psi		
Step 2&4	125	psi		
Step 3	165	psi		
Water Temperature	60	°F		

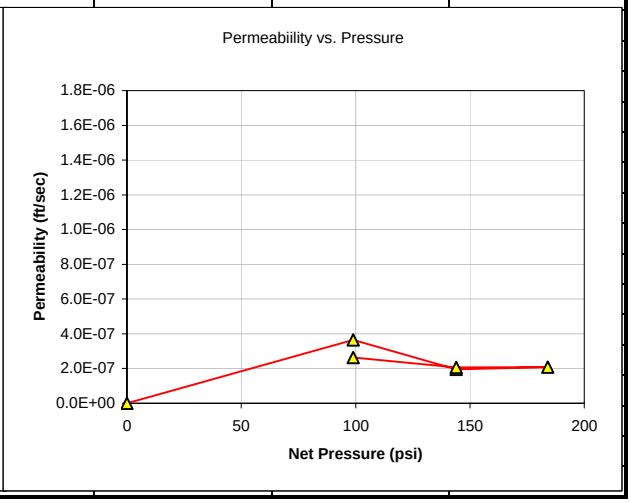
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
0.491	0.967	0.476	80	99	0.794	3.38E-07
0.967	1.498	0.531	80	99	0.886	3.77E-07
1.498	2.014	0.516	80	99	0.861	3.67E-07
2.014	2.525	0.511	80	99	0.852	3.63E-07
2.525	3.041	0.516	80	99	0.861	3.67E-07
	Average	0.51				3.66E-07
0.407	0.814	0.407	125	144	0.467	1.99E-07
0.407	1.231	0.50	125	144	0.569	3.40E-07
0.243	1.638	1.395	125	144	1.601	6.82E-07
1.638	2.025	0.387	125	144	0.444	1.89E-07
2.025	2.437	0.412	125	144	0.473	2.01E-07
	Average	0.40				1.95E-07

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z3-B6**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	295 to 306
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons)		(gallons)	(psi)	(psi)	(Lu)	(ft/sec)
Start	**End**	**Take**	**Gauge**	**Net**	**Lugeons**	**Permeability**
0.417	0.829	0.412	165	184	0.370	1.58E-07
0.312	1.201	0.60	165	184	0.540	2.30E-07
0.312	1.568	1.256	165	184	1.128	4.81E-07
1.568	2.004	0.436	165	184	0.392	1.67E-07
2.004	2.455	0.76	165	184	0.687	2.93E-07
2.455	2.887	0.432	165	184	0.388	1.65E-07
	Average	0.54				2.08E-07
0.422	0.834	0.41	125	144	0.473	2.01E-07
0.149	1.275	1.13	125	144	1.292	2.52E-07
0.149	1.716	1.57	125	144	1.798	7.66E-07
1.716	2.123	0.41	125	144	0.467	1.99E-07
2.123	2.559	0.44	125	144	0.500	2.13E-07
	Average	0.42				2.06E-07
0.377	0.724	0.35	80	99	0.579	2.47E-07
0.724	1.111	0.39	80	99	0.646	2.75E-07
1.111	1.458	0.35	80	99	0.579	2.47E-07
1.458	1.84	0.39	80	99	0.647	2.76E-07
1.84	2.222	0.38	80	99	0.637	2.71E-07
	Average	0.37				2.63E-07





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z3-B6**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	305 to 316
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	2/17/09-3/11/09	Boring Logger	M. Torsiello	Groundwater Depth (ft)	51.2
Drilling Method	Rotary Wash	Boring Dia. (in)	5.5	Ground Surface Elevation (ft)	750
Drill Rig Type	Ingersoll Rand A400	Drill Bit Type	PQ	Boring Depth (ft)	326
Performed By	J.Yao	Date	3/6/2009	Depth to Bedrock (ft)	43

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3	ft	A
Depth to Bottom of Top Packer	305	ft	B
Depth to Top of Bottom Packer	316	ft	C
Groundwater Depth	41.3	ft	D
Overburden Depth to Packer Interval Midpoint	310.5	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	269.2	ft	F=(E-D)
Packer Inflation Pressure	390	psi	
Maximum Net Applied Pressure	194	psi	G=E-0.433F
Maximum Gauge Pressure	175	psi	H=(G)-(P)

Lugeon Calculations

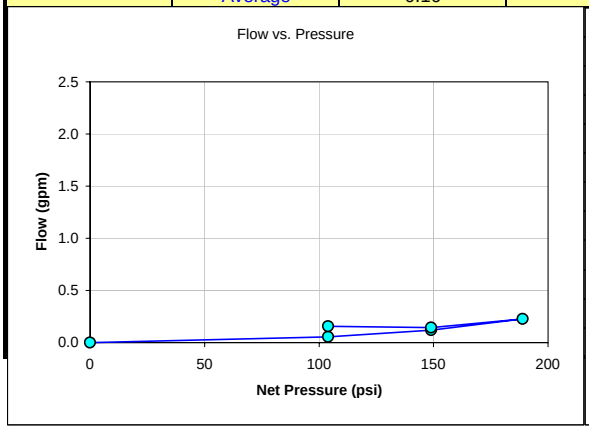
Depth to Bottom of Top Packer		305	ft	B
Depth to Top of Bottom Packer		316	ft	C
Length of Packer Interval		11	ft	J=(C-B)
Water Column Pressure		19	psi	P=0.433*(A+D)
Friction Loss		0	psi	
Gauge Pressure Steps	Step 1&5	85	psi	
	Step 2&4	130	psi	
	Step 3	170	psi	
Water Temperature		60	°F	

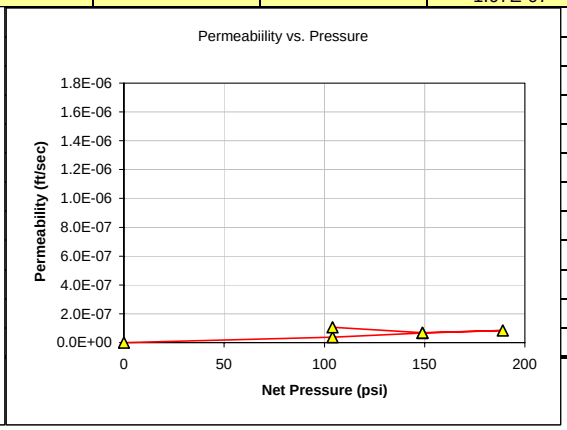
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
1.404	2.823	1.419	85	104	2.254	9.60E-07
2.823	4.207	1.384	85	104	2.198	9.36E-07
4.207	5.591	1.384	85	104	2.198	9.36E-07
5.591	7.069	1.478	85	104	2.347	1.00E-06
7.069	8.512	1.443	85	104	2.292	9.76E-07
8.512	10.005	1.493	85	104	2.371	1.01E-06
10.005	11.538	1.533	85	104	2.435	1.04E-06
11.538	13.14	1.602	85	104	2.544	1.08E-06
13.14	14.802	1.662	85	104	2.639	1.12E-06
14.802	16.474	1.672	85	104	2.655	1.13E-06
16.474	18.18	1.706	85	104	2.709	1.15E-06
18.18	19.921	1.741	85	104	2.765	1.18E-06

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z3-B6**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	305 to 316
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons)		(gallons)	(psi)	(psi)	(Lu)	(ft/sec)
Start	End	Take	Gauge	Net	Lugeons	Permeability
0.055	0.055	0	85	104	0.000	0.00E+00
0.055	0.085	0.03	85	104	0.048	2.03E-08
0.085	0.154	0.069	85	104	0.110	4.67E-08
0.154	0.214	0.06	85	104	0.095	4.06E-08
0.214	0.303	0.089	85	104	0.141	6.02E-08
0.303	0.387	0.084	85	104	0.133	5.68E-08
	Average	0.06				3.74E-08
0.164	0.338	0.174	130	149	0.193	8.22E-08
0.338	0.517	0.179	130	149	0.199	8.46E-08
0.517	0.671	0.09	130	149	0.103	6.43E-08
0.671	0.83	0.159	130	149	0.176	7.51E-08
0.83	1.009	0.11	130	149	0.124	6.27E-08
	Average	0.12				6.73E-08
0.223	0.441	0.218	170	189	0.191	8.12E-08
0.441	0.664	0.223	170	189	0.195	8.31E-08
0.664	0.907	0.243	170	189	0.213	9.05E-08
0.907	1.165	0.258	170	189	0.226	9.61E-08
1.165	1.403	0.238	170	189	0.208	8.87E-08
1.403	1.646	0.243	170	189	0.213	9.05E-08
1.646	1.869	0.223	170	189	0.195	8.31E-08
1.869	2.097	0.228	170	189	0.199	8.49E-08
	Average	0.23				8.40E-08
0.193	0.337	0.144	130	149	0.160	6.80E-08
0.337	0.535	0.198	130	149	0.220	9.35E-08
0.535	0.709	0.174	130	149	0.193	8.22E-08
0.709	0.853	0.144	130	149	0.160	6.80E-08
0.853	0.997	0.144	130	149	0.160	6.80E-08
	Average	0.14				6.80E-08
0.154	0.313	0.159	85	104	0.253	1.08E-07
0.313	0.467	0.154	85	104	0.245	1.04E-07
0.467	0.611	0.144	85	104	0.229	9.74E-08
0.611	0.76	0.149	85	104	0.237	1.01E-07
0.76	0.914	0.154	85	104	0.245	1.04E-07
0.914	1.102	0.188	85	104	0.299	1.27E-07
1.102	1.256	0.154	85	104	0.245	1.04E-07
	Average	0.16				1.07E-07





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z3-B7**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	255 to 265
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	1/26/09-2/20/09	Boring Logger	A. Tsegie, J. Pratt	Groundwater Depth (ft)	14.5
Drilling Method	Rotary Wash	Boring Dia. (in)	4.2 - 4.4	Ground Surface Elevation (ft)	596.69
Drill Rig Type	CME85	Drill Bit Type	HQ	Boring Depth (ft)	326
Performed By	Caltrans	Date	2/19/2009	Depth to Bedrock (ft)	58.5

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3.00	ft	A
Depth to Bottom of Top Packer	255	ft	B
Depth to Top of Bottom Packer	265	ft	C
Groundwater Depth	45	ft	D
Overburden Depth to Packer Interval Midpoint	260	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	215	ft	F=(E-D)
Packer Inflation Pressure	250	psi	
Maximum Net Applied Pressure	167	psi	G=E-0.433F
Maximum Gauge Pressure	146	psi	H=(G)-(P)

Lugeon Calculations

Depth to Bottom of Top Packer		255	ft	B
Depth to Top of Bottom Packer		265	ft	C
Length of Packer Interval		10	ft	J=(C-B)
Water Column Pressure		21	psi	P=0.433*(A+D)
Friction Loss		0	psi	
Gauge Pressure Steps	Step 1&5	45	psi	
	Step 2&4	90	psi	
	Step 3	135	psi	
Water Temperature		53	°F	

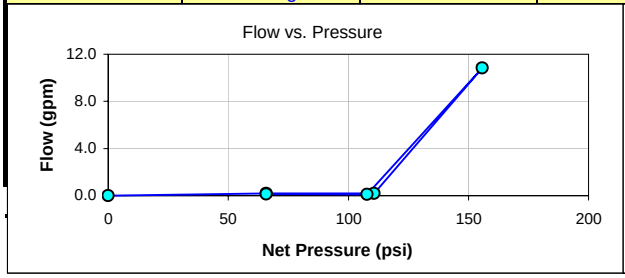
(assumes each Start/End Cycle time is 1 minute)

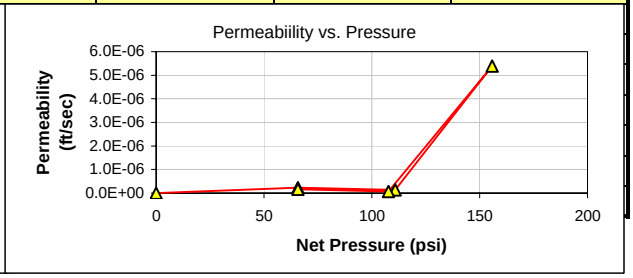
Flow Meter (gallons) Start	End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
0.1	0.3	0.2	45	66	0.553	2.36E-07
0.3	0.5	0.2	45	66	0.553	2.36E-07
0.5	0.7	0.2	45	66	0.553	2.36E-07
0.7	0.9	0.2	45	66	0.553	2.36E-07
0.9	1.1	0.2	45	66	0.553	2.36E-07
1.1	1.3	0.2	45	66	0.553	2.36E-07
1.3	1.5	0.2	45	66	0.553	2.36E-07
1.5	1.7	0.2	45	66	0.553	2.36E-07
1.7	1.7	0	45	66	0.000	0.00E+00
1.7	1.9	0.2	45	66	0.553	2.36E-07
1.9	2.1	0.2	45	66	0.553	2.36E-07
2.1	2.3	0.2	45	66	0.553	2.36E-07
	Average	0.2				2.36E-07

CH2MHILL

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z3-B7**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	255 to 265
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons) Start	End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
0.20	0.4	0.20	90	111	0.329	1.40E-07
0.40	0.7	0.30	90	111	0.493	2.10E-07
0.70	1	0.30	90	111	0.493	2.10E-07
1.00	1.2	0.20	90	111	0.329	1.40E-07
1.20	1.4	0.20	90	111	0.329	1.40E-07
1.40	1.8	0.40	90	111	0.657	2.80E-07
1.80	2	0.20	90	111	0.329	1.40E-07
2.00	2.3	0.30	90	111	0.493	2.10E-07
2.30	2.5	0.20	90	111	0.329	1.40E-07
2.50	2.7	0.20	90	111	0.329	1.40E-07
2.70	2.9	0.20	90	111	0.329	1.40E-07
	Average	0.20				1.40E-07
2.0	4.5	2.5	135	156	2.921	1.24E-06
4.5	7.4	2.9	135	156	3.388	1.44E-06
7.4	10.2	2.8	135	156	3.271	1.39E-06
10.2	13.5	3.3	135	156	3.855	1.64E-06
13.5	19.7	6.2	135	156	7.243	3.09E-06
19.7	26	6.3	135	156	7.360	3.14E-06
26.0	33.1	7.1	135	156	8.295	3.53E-06
33.1	43.5	10.4	135	156	12.150	5.18E-06
43.5	53.4	9.9	135	156	11.566	4.93E-06
53.4	64.8	11.4	135	156	13.318	5.67E-06
64.8	76.4	11.6	135	156	13.552	5.77E-06
	Average	10.8				5.39E-06
0.3	0.7	0.4	87	108	0.675	2.88E-07
0.7	0.9	0.2	87	108	0.338	1.44E-07
0.9	0.9	0	87	108	0.000	0.00E+00
0.9	0.9	0	85	106	0.000	0.00E+00
0.9	1	0.1	90	111	0.164	7.00E-08
1	1.1	0.1	90	111	0.164	7.00E-08
1.1	1.2	0.1	90	111	0.164	7.00E-08
	Average	0.10				7.00E-08
0.1	0.3	0.2	45	66	0.553	2.36E-07
0.3	0.4	0.1	45	66	0.277	1.18E-07
0.4	0.5	0.1	45	66	0.277	1.18E-07
0.5	0.7	0.2	45	66	0.553	2.36E-07
0.7	0.8	0.1	45	66	0.277	1.18E-07
0.8	0.9	0.1	45	66	0.277	1.18E-07
0.9	1	0.1	45	66	0.277	1.18E-07
1	1.2	0.2	45	66	0.553	2.36E-07
	Average	0.1				1.62E-07





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z3-B8**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	155 to 163.3
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	3/11/09-3/25-09	Boring Logger	M. Salisbury	Groundwater Depth (ft)	unknown
Drilling Method	Rotary Wash	Boring Dia. (in)	4.2-4.3	Ground Surface Elevation (ft)	594.27
Drill Rig Type	CME 85	Drill Bit Type	HQ	Boring Depth (ft)	275
Performed By	Caltrans	Date	3/24/2009	Depth to Bedrock (ft)	26.5

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3	ft	A
Depth to Bottom of Top Packer	155	ft	B
Depth to Top of Bottom Packer	163.3	ft	C
Groundwater Depth	100	ft	D
Overburden Depth to Packer Interval Midpoint	159.15	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	59.15	ft	F=(E-D)
Packer Inflation Pressure	220	psi	
Maximum Net Applied Pressure	134	psi	G=E-0.433F
Maximum Gauge Pressure	89	psi	H=(G)-(P)

Lugeon Calculations

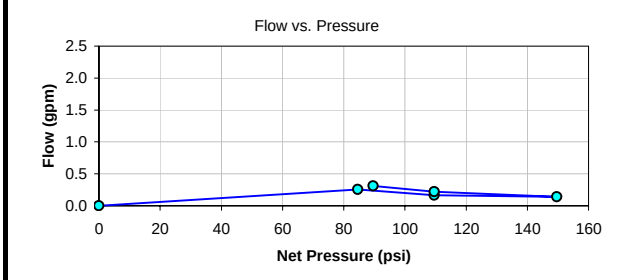
Depth to Bottom of Top Packer		155	ft	B
Depth to Top of Bottom Packer		163.3	ft	C
Length of Packer Interval		8.3	ft	J=(C-B)
Water Column Pressure		45	psi	P=0.433*(A+D)
Friction Loss		0	psi	
Gauge Pressure Steps	Step 1&5	35	psi	
	Step 2&4	70	psi	
	Step 3	105	psi	
Water Temperature			°F	

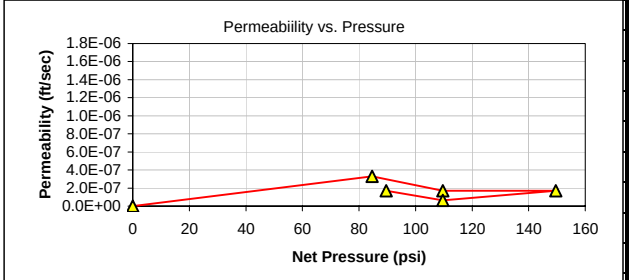
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
0	0.2	0.2	40	85	0.518	2.21E-07
0.2	0.5	0.3	40	85	0.778	3.31E-07
0.5	0.8	0.3	40	85	0.778	3.31E-07
0.8	1	0.2	40	85	0.518	2.21E-07
1.1	1.3	0.2	40	85	0.518	2.21E-07
1.2	1.5	0.3	40	85	0.778	3.31E-07
1.5	1.8	0.3	40	85	0.778	3.31E-07
1.8	2	0.2	40	85	0.518	2.21E-07
2	2.3	0.3	40	85	0.778	3.31E-07
	Average	0.26				2.82E-07
2.4	2.5	0.1	65	110	0.200	8.52E-08
2.5	2.7	0.2	65	110	0.400	1.70E-07

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z3-B8**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	155 to 163.3
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons)		(gallons)	(psi)	(psi)	(Lu)	(ft/sec)
Start	**End**	**Take**	**Gauge**	**Net**	**Lugeons**	**Permeability**
2.7	2.9	0.2	65	110	0.400	1.70E-07
2.9	3.1	0.2	65	110	0.400	1.70E-07
3.1	3.2	0.1	65	110	0.200	8.52E-08
3.2	3.4	0.2	65	110	0.400	1.70E-07
3.4	3.6	0.2	65	110	0.400	1.70E-07
3.6	3.8	0.2	65	110	0.400	1.70E-07
3.8	3.9	0.1	65	110	0.200	1.70E-07
	Average	0.17				1.52E-07
4.1	4.3	0.20	105	150	0.293	1.25E-07
4.30	4.4	0.10	105	150	0.147	6.24E-08
4.40	4.5	0.10	105	150	0.147	6.24E-08
4.50	4.7	0.20	105	150	0.293	1.25E-07
4.70	4.9	0.20	105	150	0.293	1.25E-07
4.90	5	0.10	105	150	0.147	6.24E-08
5.00	5.1	0.1	105	150	0.147	6.24E-08
5.10	5.2	0.1	105	150	0.147	6.24E-08
5.20	5.4	0.2	105	150	0.293	1.25E-07
	Average	0.14				7.81E-08
5.5	5.7	0.20	65	110	0.400	1.70E-07
5.7	5.9	0.20	65	110	0.400	1.70E-07
5.9	6.2	0.30	65	110	0.600	2.56E-07
6.2	6.4	0.20	65	110	0.400	1.70E-07
6.4	6.6	0.20	65	110	0.400	1.70E-07
6.6	6.8	0.20	65	110	0.400	1.70E-07
6.8	7.1	0.30	65	110	0.600	2.56E-07
7.1	7.3	0.20	65	110	0.400	1.70E-07
7.3	7.5	0.20	65	110	0.400	1.70E-07
	Average	0.22				1.89E-07
7.6	7.9	0.3	45	90	0.734	3.13E-07
7.9	8.3	0.4	45	90	0.979	4.17E-07
8.3	8.5	0.2	45	90	0.489	2.09E-07
8.5	8.8	0.3	45	90	0.734	3.13E-07
8.8	9.2	0.4	45	90	0.979	4.17E-07
9.2	9.5	0.3	45	90	0.734	3.13E-07
9.5	9.7	0.2	45	90	0.489	2.09E-07
9.7	10	0.3	45	90	0.734	3.13E-07
10	10.4	0.4	45	90	0.979	4.17E-07
	Average	0.31				3.24E-07





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z3-B8**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	185 to 193.3
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	3/11/09-3/25-09	Boring Logger	M. Salisbury	Groundwater Depth (ft)	unknown
Drilling Method	Rotary Wash	Boring Dia. (in)	4.2-4.3	Ground Surface Elevation (ft)	594.27
Drill Rig Type	CME 85	Drill Bit Type	HQ	Boring Depth (ft)	275
Performed By	Caltrans	Date	3/24/2009	Depth to Bedrock (ft)	26.5

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3	ft	A
Depth to Bottom of Top Packer	185	ft	B
Depth to Top of Bottom Packer	193.3	ft	C
Groundwater Depth	100	ft	D
Overburden Depth to Packer Interval Midpoint	189.15	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	89.15	ft	F=(E-D)
Packer Inflation Pressure	270	psi	
Maximum Net Applied Pressure	151	psi	G=E-0.433F
Maximum Gauge Pressure	106	psi	H=(G)-(P)

Lugeon Calculations

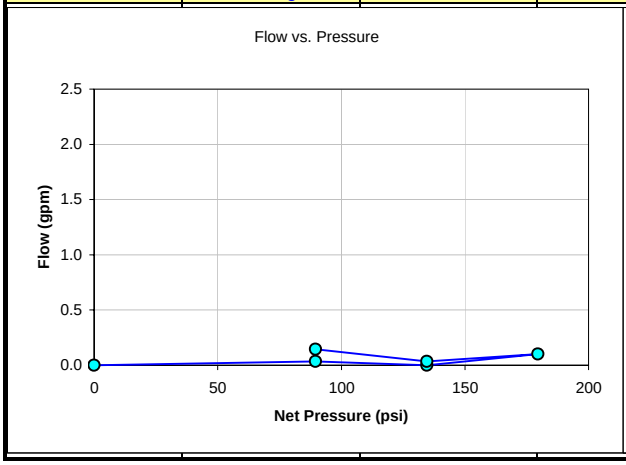
Depth to Bottom of Top Packer		185	ft	B
Depth to Top of Bottom Packer		193.3	ft	C
Length of Packer Interval		8.3	ft	J=(C-B)
Water Column Pressure		45	psi	P=0.433*(A+D)
Friction Loss		0	psi	
Gauge Pressure Steps	Step 1&5	45	psi	
	Step 2&4	90	psi	
	Step 3	135	psi	
Water Temperature		64	°F	

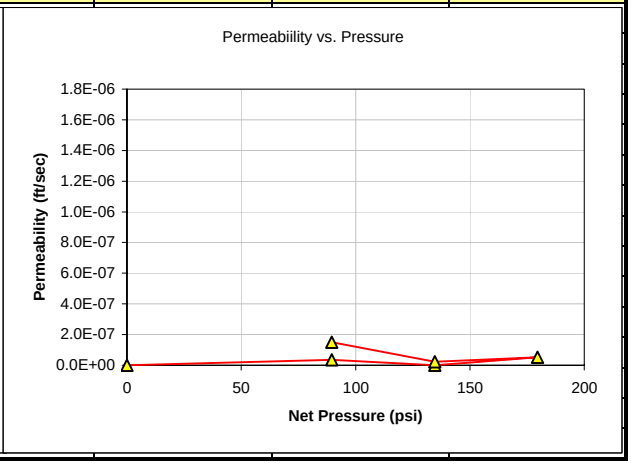
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
1.9	1.9	0.0	45	90	0.000	0.00E+00
1.9	1.9	0.0	45	90	0.000	0.00E+00
1.9	1.9	0.0	45	90	0.000	0.00E+00
1.9	1.9	0.0	45	90	0.000	0.00E+00
1.9	1.9	0.0	45	90	0.000	0.00E+00
1.9	2	0.1	45	90	0.245	1.04E-07
2	2	0.0	45	90	0.000	0.00E+00
2	2	0.0	45	90	0.000	0.00E+00
2	2.1	0.1	45	90	0.245	1.04E-07
	Average	0.03				3.48E-08
2.2	2.2	0	90	135	0.000	0.00E+00
2	2.2	0	90	135	0.000	0.00E+00

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z3-B8**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	185 to 193.3
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons)		(gallons)	(psi)	(psi)	(Lu)	(ft/sec)
Start	**End**	**Take**	**Gauge**	**Net**	**Lugeons**	**Permeability**
2.2	2.2	0	90	135	0.000	0.00E+00
2.2	2.2	0	90	135	0.000	0.00E+00
2.2	2.2	0	90	135	0.000	0.00E+00
2.2	2.2	0	90	135	0.000	0.00E+00
	Average	0				0.00E+00
2.6	2.7	0.10	135	180	0.122	5.20E-08
2.70	2.8	0.10	135	180	0.122	5.20E-08
2.80	2.9	0.10	135	180	0.122	5.20E-08
2.90	3	0.10	135	180	0.122	5.20E-08
3.00	3.1	0.10	135	180	0.122	5.20E-08
3.10	3.2	0.10	135	180	0.122	5.20E-08
3.20	3.3	0.10	135	180	0.122	5.20E-08
	Average	0.10				5.20E-08
3.5	3.5	0.0	90	135	0.000	0.00E+00
3.5	3.5	0.0	90	135	0.000	0.00E+00
3.5	3.5	0.0	90	135	0.000	0.00E+00
3.5	3.6	0.1	90	135	0.163	6.94E-08
3.6	3.6	0.0	90	135	0.000	0.00E+00
3.6	3.6	0.0	90	135	0.000	0.00E+00
3.6	3.7	0.1	90	135	0.163	6.94E-08
3.7	3.7	0.0	90	135	0.000	0.00E+00
3.7	3.7	0.0	90	135	0.000	0.00E+00
	Average	0.03				2.31E-08
3.8	4	0.2	45	90	0.489	2.09E-07
4.00	4.1	0.1	45	90	0.245	1.04E-07
4.10	4.2	0.1	45	90	0.245	1.04E-07
4.20	4.4	0.2	45	90	0.489	2.09E-07
4.40	4.5	0.1	45	90	0.245	1.04E-07
4.50	4.7	0.2	45	90	0.489	2.09E-07
4.70	4.8	0.1	45	90	0.245	1.04E-07
4.80	4.9	0.1	45	90	0.245	1.04E-07
4.90	5.1	0.2	45	90	0.489	2.09E-07
	Average	0.14				1.51E-07





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z3-B8**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	220 to 228.3
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	3/11/09-3/25-09	Boring Logger	M. Salisbury	Groundwater Depth (ft)	unknown
Drilling Method	Rotary Wash	Boring Dia. (in)	4.2-4.3	Ground Surface Elevation (ft)	594.27
Drill Rig Type	CME 85	Drill Bit Type	HQ	Boring Depth (ft)	275
Performed By	Caltrans	Date	3/24/2009	Depth to Bedrock (ft)	26.5

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3	ft	A
Depth to Bottom of Top Packer	220	ft	B
Depth to Top of Bottom Packer	228.33	ft	C
Groundwater Depth	100	ft	D
Overburden Depth to Packer Interval Midpoint	224.165	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	124.165	ft	F=(E-D)
Packer Inflation Pressure	280	psi	
Maximum Net Applied Pressure	170	psi	G=E-0.433F
Maximum Gauge Pressure	126	psi	H=(G)-(P)

Lugeon Calculations

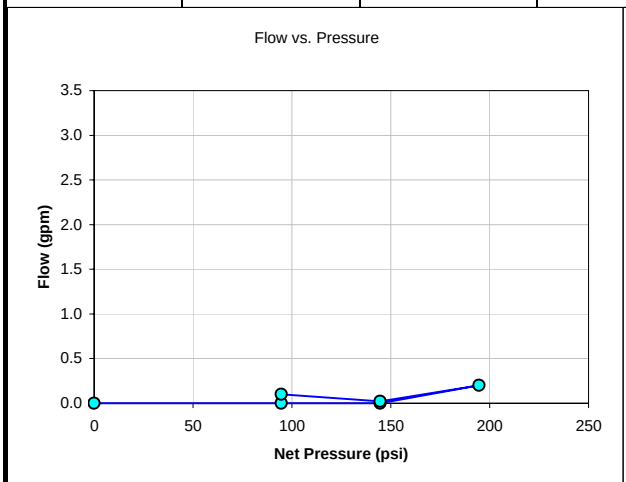
Depth to Bottom of Top Packer		220	ft	B
Depth to Top of Bottom Packer		228.33	ft	C
Length of Packer Interval		8.33	ft	J=(C-B)
Water Column Pressure		45	psi	P=0.433*(A+D)
Friction Loss		0	psi	
Gauge Pressure Steps	Step 1&5	50	psi	
	Step 2&4	100	psi	
	Step 3	150	psi	
Water Temperature		62	°F	

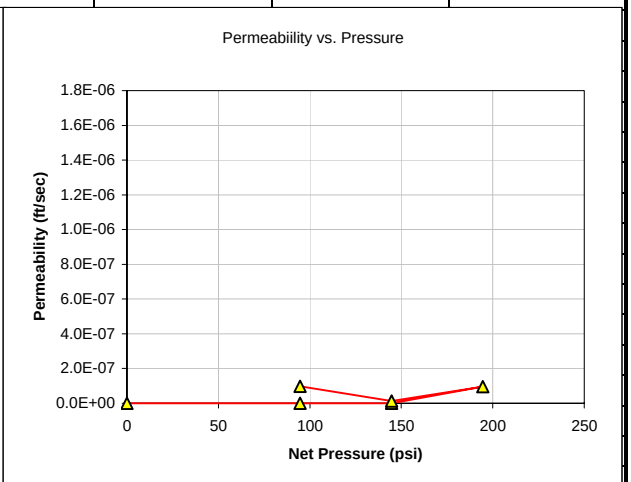
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
0.1	0.1	0	50	95	0.000	0.00E+00
0.1	0.1	0	50	95	0.000	0.00E+00
0.1	0.1	0	50	95	0.000	0.00E+00
0.1	0.1	0	50	95	0.000	0.00E+00
0.1	0.1	0	50	95	0.000	0.00E+00
	Average	0				0.00E+00
0.2	0.2	0	100	145	0.000	0.00E+00
0.2	0.2	0	100	145	0.000	0.00E+00
0.2	0.2	0	100	145	0.000	0.00E+00
0.2	0.2	0	100	145	0.000	0.00E+00
0.2	0.2	0	100	145	0.000	0.00E+00
	Average	0				0.00E+00

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z3-B8**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	220 to 228.3
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons)		(gallons)	(psi)	(psi)	(Lu)	(ft/sec)
Start	**End**	**Take**	**Gauge**	**Net**	**Lugeons**	**Permeability**
0.5	0.7	0.20	150	195	0.225	9.57E-08
0.7	0.9	0.2	150	195	0.225	9.57E-08
0.9	1.1	0.2	150	195	0.225	9.57E-08
1.1	1.3	0.2	150	195	0.225	9.57E-08
1.3	1.5	0.2	150	195	0.225	9.57E-08
	Average	0.2				9.57E-08
1.7	1.7	0.0	100	145	0.000	0.00E+00
1.7	1.7	0.0	100	145	0.000	0.00E+00
1.7	1.8	0.1	100	145	0.151	6.44E-08
1.8	1.8	0.0	100	145	0.000	0.00E+00
1.8	1.8	0.0	100	145	0.000	0.00E+00
1.8	1.8	0.0	100	145	0.000	0.00E+00
1.8	1.8	0.0	100	145	0.000	0.00E+00
1.8	1.9	0.1	100	145	0.151	6.44E-08
1.9	1.9	0.0	100	145	0.000	0.00E+00
	Average	0.02				1.29E-08
2.0	2	0	50	95	0.000	0.00E+00
2.0	2.1	0.1	50	95	0.231	9.84E-08
2.1	2.2	0.1	50	95	0.231	9.84E-08
2.2	2.3	0.1	50	95	0.231	9.84E-08
2.3	2.4	0.1	50	95	0.231	9.84E-08
2.4	2.5	0.1	50	95	0.231	9.84E-08
	Average	0.10				9.84E-08





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z3-B10**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	243 to 252.5
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	2/23/09-3/11/09	Boring Logger	M. Salisbury	Groundwater Depth (ft)	48.5
Drilling Method	Rotary Wash	Boring Dia. (in)	4.6 - 4.7	Ground Surface Elevation (ft)	626.8
Drill Rig Type	CME 85	Drill Bit Type	HQ	Boring Depth (ft)	375
Performed By	Caltrans	Date	3/10/2009	Depth to Bedrock (ft)	65

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3	ft	A
Depth to Bottom of Top Packer	243	ft	B
Depth to Top of Bottom Packer	252.5	ft	C
Groundwater Depth	70	ft	D
Overburden Depth to Packer Interval Midpoint	247.75	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	177.75	ft	F=(E-D)
Packer Inflation Pressure	260	psi	
Maximum Net Applied Pressure	171	psi	G=E-0.433F
Maximum Gauge Pressure	139	psi	H=(G)-(P)

Lugeon Calculations

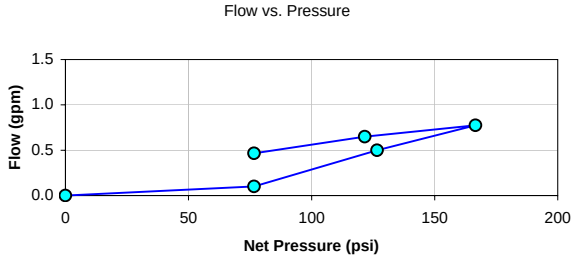
Depth to Bottom of Top Packer	243	ft	B
Depth to Top of Bottom Packer	252.5	ft	C
Length of Packer Interval	9.5	ft	J=(C-B)
Water Column Pressure	32	psi	P=0.433*(A+D)
Friction Loss	0	psi	
Gauge Pressure Steps Step 1&5	45	psi	
Step 2&4	90	psi	
Step 3	135	psi	
Water Temperature	61	°F	

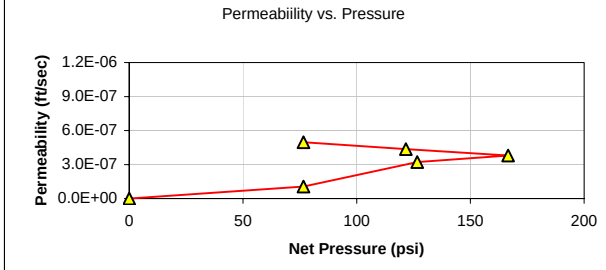
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
0	0.1	0.1	45	77	0.250	1.07E-07
0.1	0.2	0.1	45	77	0.250	1.07E-07
0.2	0.3	0.1	45	77	0.250	1.07E-07
0.3	0.5	0.2	45	77	0.500	2.13E-07
0.5	0.6	0.1	45	77	0.250	1.07E-07
0.6	0.7	0.1	45	77	0.250	1.07E-07
0.7	0.8	0.1	45	77	0.250	1.07E-07
0.8	0.9	0.1	45	77	0.250	1.07E-07
0.9	1	0.1	45	77	0.250	1.07E-07
	Average	0.1				1.07E-07
0	1.2	1.2	90	122	1.890	8.05E-07
1.2	2.4	1.2	95	127	1.816	7.74E-07

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z3-B10**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	243 to 252.5
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons)		(gallons)	(psi)	(psi)	(Lu)	(ft/sec)
Start	**End**	**Take**	**Gauge**	**Net**	**Lugeons**	**Permeability**
2.4	3.4	1.0	95	127	1.513	6.45E-07
3.4	4.2	0.8	95	127	1.211	5.16E-07
4.2	4.7	0.5	95	127	0.757	3.22E-07
4.7	5.2	0.5	95	127	0.757	3.22E-07
5.2	5.7	0.5	95	127	0.757	3.22E-07
5.7	6.2	0.5	95	127	0.757	3.22E-07
6.2	6.7	0.5	95	127	0.757	3.22E-07
	Average	0.5				3.22E-07
0.0	0.8	0.8	135	167	0.920	3.92E-07
0.8	1.6	0.8	135	167	0.920	3.92E-07
1.6	2.3	0.7	135	167	0.805	3.43E-07
2.3	3	0.7	135	167	0.805	3.43E-07
3.0	3.9	0.9	135	167	1.035	4.41E-07
3.9	4.7	0.8	135	167	0.920	3.92E-07
4.7	5.5	0.8	135	167	0.920	3.92E-07
5.5	6.3	0.8	135	167	0.920	3.92E-07
6.3	7	0.7	135	167	0.805	3.43E-07
	Average	0.8				3.80E-07
0	0.5	0.5	90	122	0.788	3.36E-07
0.5	1	0.5	90	122	0.788	3.36E-07
1	1.5	0.5	90	122	0.788	3.36E-07
1.5	2.1	0.6	90	122	0.945	4.03E-07
2.1	2.8	0.7	90	122	1.103	4.70E-07
2.8	3.4	0.6	90	122	0.945	4.03E-07
3.4	4.1	0.7	90	122	1.103	4.70E-07
4.1	4.7	0.6	90	122	0.945	4.03E-07
4.7	5.4	0.7	90	122	1.103	4.70E-07
	Average	0.7				4.36E-07
0	0.5	0.5	45	77	1.250	5.33E-07
0.5	1	0.5	45	77	1.250	5.33E-07
1	1.4	0.4	45	77	1.000	4.26E-07
1.4	1.9	0.5	45	77	1.250	5.33E-07
1.9	2.4	0.5	45	77	1.250	5.33E-07
2.4	2.9	0.5	45	77	1.250	5.33E-07
2.9	3.3	0.4	45	77	1.000	4.26E-07
3.3	3.7	0.4	45	77	1.000	4.26E-07
3.7	4.2	0.5	45	77	1.250	5.33E-07
	Average	0.5				4.97E-07





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z3-B10**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	331 to 340.5
Project Number :	379312.04.08.01				Sheet 1 of 3
Dates Drilled	2/23/09-3/11/09	Boring Logger	M. Salisbury	Groundwater Depth (ft)	48.5
Drilling Method	Rotary Wash	Boring Dia. (in)	4.6 - 4.7	Ground Surface Elevation (ft)	626.8
Drill Rig Type	CME 85	Drill Bit Type	HQ	Boring Depth (ft)	375
Performed By	Caltrans	Date	3/10/2009	Depth to Bedrock (ft)	65

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3	ft	A
Depth to Bottom of Top Packer	331	ft	B
Depth to Top of Bottom Packer	340.5	ft	C
Groundwater Depth	70	ft	D
Overburden Depth to Packer Interval Midpoint	335.75	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	265.75	ft	F=(E-D)
Packer Inflation Pressure	350	psi	
Maximum Net Applied Pressure	221	psi	G=E-0.433F
Maximum Gauge Pressure	189	psi	H=(G)-(P)

Lugeon Calculations

Depth to Bottom of Top Packer		331	ft	B
Depth to Top of Bottom Packer		340.5	ft	C
Length of Packer Interval		9.5	ft	J=(C-B)
Water Column Pressure		32	psi	P=0.433*(A+D)
Friction Loss		0	psi	
Gauge Pressure Steps	Step 1&5	60	psi	
	Step 2&4	120	psi	
	Step 3	180	psi	
Water Temperature		60	°F	

(assumes each Start/End Cycle time is 1 minute)

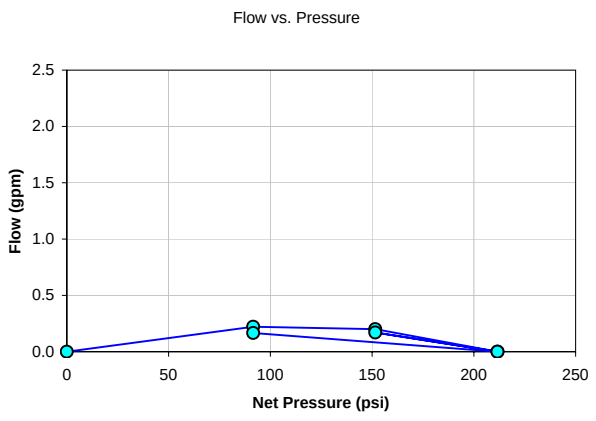
Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
0.1	0.3	0.2	60	92	0.418	1.78E-07
0.3	0.5	0.2	60	92	0.418	1.78E-07
0.5	0.7	0.2	60	92	0.418	1.78E-07
0.7	0.9	0.2	60	92	0.418	1.78E-07
0.9	1.2	0.3	60	92	0.627	2.67E-07
1.2	1.4	0.2	60	92	0.418	1.78E-07
1.4	1.6	0.2	60	92	0.418	1.78E-07
1.6	1.9	0.3	60	92	0.627	2.67E-07
1.9	2.1	0.2	60	92	0.418	1.78E-07
	Average	0.22				1.98E-07
0.1	0.3	0.2	120	152	0.253	1.08E-07
0.3	0.4	0.1	121	153	0.126	5.35E-08

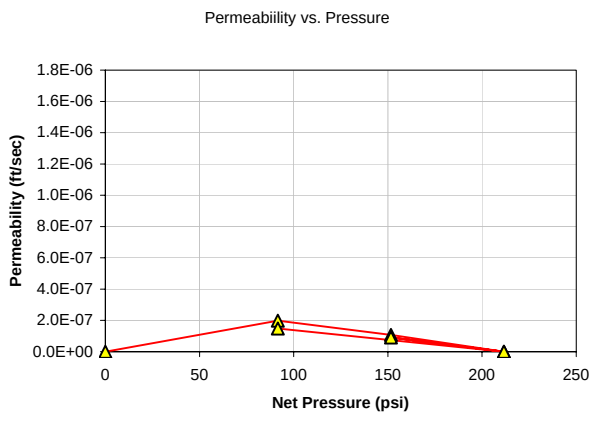
Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z3-B10**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	331 to 340.5
Project Number :	379312.04.08.01		Sheet 2 of 3

Flow Meter (gallons)		(gallons)	(psi)	(psi)	(Lu)	(ft/sec)
Start	End	Take	Gauge	Net	Lugeons	Permeability
0.4	0.6	0.2	121	153	0.251	1.07E-07
0.6	0.8	0.2	121	153	0.251	1.07E-07
0.8	1	0.2	121	153	0.251	1.07E-07
1	1.2	0.2	121	153	0.251	1.07E-07
1.2	1.4	0.2	121	153	0.251	1.07E-07
1.4	1.6	0.2	121	153	0.251	1.07E-07
1.6	1.8	0.2	121	153	0.251	1.07E-07
	Average	0.20				1.07E-07
0.10	0.1	0.00	180	212	0.000	0.00E+00
0.10	0.1	0.00	180	212	0.000	0.00E+00
0.10	0.1	0.00	180	212	0.000	0.00E+00
0.10	0.1	0.00	180	212	0.000	0.00E+00
0.10	0.1	0.00	180	212	0.000	0.00E+00
0.10	0.1	0.00	180	212	0.000	0.00E+00
	Average	0.0				0.00E+00
0.0	0.2	0.2	120	152	0.253	1.08E-07
0.2	0.3	0.1	120	152	0.126	5.38E-08
0.3	0.5	0.2	120	152	0.253	1.08E-07
0.5	0.7	0.2	120	152	0.253	1.08E-07
0.7	0.9	0.2	120	152	0.253	1.08E-07
0.9	1	0.1	120	152	0.126	5.38E-08
1.0	1.2	0.2	120	152	0.253	1.08E-07
1.2	1.3	0.1	120	152	0.126	5.38E-08
1.3	1.5	0.2	120	152	0.253	1.08E-07
1.5	1.7	0.2	120	152	0.253	1.08E-07
	Average	0.2				9.15E-08
0.00	0	0.0	180	212	0.000	0.00E+00
0.00	0	0.0	180	212	0.000	0.00E+00
0.00	0.1	0.1	180	212	0.091	3.86E-08
0.10	0.1	0.0	180	212	0.000	0.00E+00
0.10	0.1	0.0	180	212	0.000	0.00E+00
0.10	0.1	0.0	180	212	0.000	0.00E+00
	Average	0.00				0.00E+00
0	0.2	0.2	60	92	0.418	1.78E-07
0.2	0.4	0.2	60	92	0.418	1.78E-07
0.4	0.5	0.1	60	92	0.209	8.91E-08
0.5	0.7	0.2	60	92	0.418	1.78E-07
0.7	0.9	0.2	60	92	0.418	1.78E-07
0.9	1	0.1	60	92	0.209	8.91E-08
1	1.2	0.2	60	92	0.418	1.78E-07
1.2	1.3	0.1	60	92	0.209	8.91E-08
1.3	1.5	0.2	60	92	0.418	1.78E-07
	Average	0.17				1.48E-07

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z3-B10**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	331 to 340.5
Project Number :	379312.04.08.01		Sheet 3 of 3

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z3-B10**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	362 to 371.5
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	2/23/09-3/11/09	Boring Logger	M. Salisbury	Groundwater Depth (ft)	48.5
Drilling Method	Rotary Wash	Boring Dia. (in)	4.6 - 4.7	Ground Surface Elevation (ft)	626.8
Drill Rig Type	CME 85	Drill Bit Type	HQ	Boring Depth (ft)	375
Performed By	Caltrans	Date	3/10/2009	Depth to Bedrock (ft)	65

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3	ft	A
Depth to Bottom of Top Packer	362	ft	B
Depth to Top of Bottom Packer	371.5	ft	C
Groundwater Depth	70	ft	D
Overburden Depth to Packer Interval Midpoint	366.75	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	296.75	ft	F=(E-D)
Packer Inflation Pressure	350	psi	
Maximum Net Applied Pressure	238	psi	G=E-0.433F
Maximum Gauge Pressure	207	psi	H=(G)-(P)

Lugeon Calculations

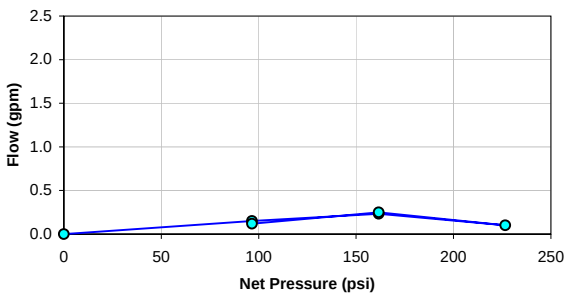
Depth to Bottom of Top Packer		362	ft	B
Depth to Top of Bottom Packer		371.5	ft	C
Length of Packer Interval		9.5	ft	J=(C-B)
Water Column Pressure		32	psi	P=0.433*(A+D)
Friction Loss		0	psi	
Gauge Pressure Steps	Step 1&5	65	psi	
	Step 2&4	130	psi	
	Step 3	195	psi	
Water Temperature		55	°F	

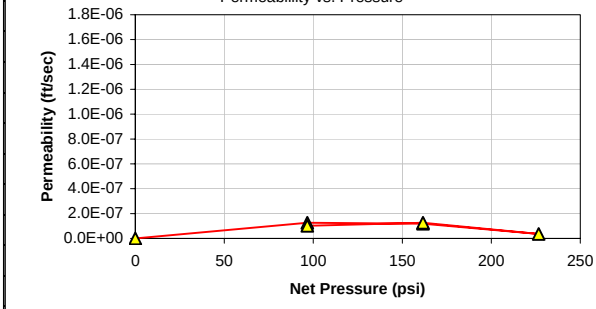
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
0.4	0.6	0.2	65	97	0.397	1.69E-07
0.6	0.7	0.1	65	97	0.198	8.45E-08
0.7	0.9	0.2	65	97	0.397	1.69E-07
0.9	1.2	0.3	65	97	0.595	2.53E-07
1.2	1.3	0.1	65	97	0.198	8.45E-08
1.3	1.5	0.2	65	97	0.397	1.69E-07
1.5	1.6	0.1	65	97	0.198	8.45E-08
1.6	1.8	0.2	65	97	0.397	1.69E-07
1.8	1.9	0.1	65	97	0.198	8.45E-08
	Average	0.15				1.27E-07
0.1	0.4	0.3	130	162	0.356	1.52E-07
0.3	0.7	0.4	130	162	0.474	2.02E-07

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z3-B10**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	362 to 371.5
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons)		(gallons)	(psi)	(psi)	(Lu)	(ft/sec)
Start	End	Take	Gauge	Net	Lugeons	Permeability
0.9	1.1	0.2	130	162	0.237	1.01E-07
0.9	1.3	0.4	130	162	0.474	2.02E-07
1.5	1.7	0.2	130	162	0.237	1.01E-07
1.5	1.9	0.4	130	162	0.474	2.02E-07
2.1	2.3	0.2	130	162	0.237	1.01E-07
2.3	2.5	0.2	130	162	0.237	1.01E-07
2.5	2.8	0.3	130	162	0.356	1.52E-07
	Average	0.23				1.18E-07
0.1	0.2	0.10	195	227	0.085	3.60E-08
0.20	0.4	0.20	195	227	0.169	7.20E-08
0.50	0.6	0.10	195	227	0.085	3.60E-08
0.60	0.7	0.10	195	227	0.085	3.60E-08
0.70	0.8	0.10	195	227	0.085	3.60E-08
0.80	0.9	0.10	195	227	0.085	3.60E-08
0.90	1	0.1	195	227	0.085	3.60E-08
	Average	0.10				3.60E-08
0.10	0.3	0.2	130	162	0.237	1.01E-07
0.30	0.6	0.30	130	162	0.356	1.52E-07
0.60	0.8	0.20	130	162	0.237	1.01E-07
0.80	1	0.20	130	162	0.237	1.01E-07
1.00	1.3	0.30	130	162	0.356	1.52E-07
1.30	1.5	0.20	130	162	0.237	1.01E-07
1.50	1.8	0.30	130	162	0.356	1.52E-07
1.80	2	0.20	130	162	0.237	1.01E-07
	Average	0.25				1.26E-07
0.0	0.1	0.10	65	97	0.198	8.45E-08
0.1	0.2	0.10	65	97	0.198	8.45E-08
0.2	0.4	0.20	65	97	0.397	1.69E-07
0.4	0.5	0.1	65	97	0.198	8.45E-08
0.5	0.6	0.1	65	97	0.198	8.45E-08
	Average	0.12				1.01E-07





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z3-B12**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	180 to 190
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	1/6/09-1/13/09	Boring Logger	R. Chavez	Groundwater Depth (ft)	12.8
Drilling Method	Rotary Wash	Boring Dia. (in)	6	Ground Surface Elevation (ft)	501
Drill Rig Type	Ingersoll Rand A400	Drill Bit Type	PQ	Boring Depth (ft)	275
Performed By	KR/RR	Date	1/15/2009	Depth to Bedrock (ft)	68.5

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3	ft	A
Depth to Bottom of Top Packer	180	ft	B
Depth to Top of Bottom Packer	190	ft	C
Groundwater Depth	12.8	ft	D
Overburden Depth to Packer Interval Midpoint	185	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	172.2	ft	F=(E-D)
Packer Inflation Pressure	240	psi	
Maximum Net Applied Pressure	110	psi	G=E-0.433F
Maximum Gauge Pressure	104	psi	H=(G)-(P)

Lugeon Calculations

Depth to Bottom of Top Packer		180	ft	B
Depth to Top of Bottom Packer		190	ft	C
Length of Packer Interval		10	ft	J=(C-B)
Water Column Pressure		7	psi	P=0.433*(A+D)
Friction Loss		0	psi	
Gauge Pressure Steps	Step 1&5	35	psi	
	Step 2&4	70	psi	
	Step 3	105	psi	
Water Temperature		68	°F	

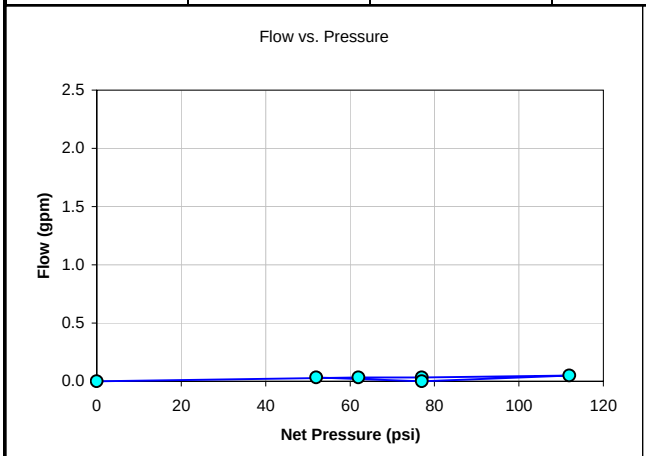
(assumes each Start/End Cycle time is 1 minute)

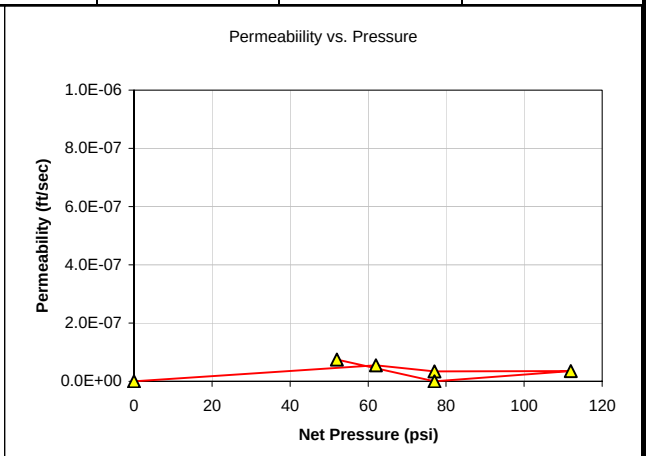
Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
12.2	12.2	0	40	47	0.000	0.00E+00
12.2	12.3	0.1	40	47	0.389	1.66E-07
12.3	12.3	0	40	47	0.000	0.00E+00
12.3	12.3	0	40	47	0.000	0.00E+00
12.3	12.4	0.1	40	47	0.389	1.66E-07
	Average	0.03				5.52E-08
12.4	12.5	0.1	70	77	0.237	1.01E-07
12.5	12.5	0	70	77	0.000	0.00E+00
12.5	12.5	0	70	77	0.000	0.00E+00
12.5	12.6	0.1	70	77	0.237	1.01E-07
12.6	12.6	0	70	77	0.000	0.00E+00

CH2MHILL

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z3-B12**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	180 to 190
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
	Average	0.033				3.36E-08
12.6	12.6	0	105	112	0.000	0.00E+00
12.6	12.6	0	105	112	0.000	0.00E+00
12.6	12.6	0	105	112	0.000	0.00E+00
12.6	12.7	0.100	105	112	0.163	6.93E-08
12.7	12.7	0.100	105	112	0.163	6.93E-08
	Average	0.050				3.47E-08
12.7	12.8	0.1	70	77	0.237	1.01E-07
12.8	12.8	0	70	77	0.000	0.00E+00
12.8	12.8	0	70	77	0.000	0.00E+00
12.8	12.8	0	70	77	0.000	0.00E+00
	Average	0.000				0.00E+00
12.9	12.9	0.000	45	52	0.000	0.00E+00
12.9	13	0.1	45	52	0.351	1.50E-07
13	13	0	45	52	0.000	0.00E+00
13	13	0	45	52	0.000	0.00E+00
13	13.1	0.1	45	52	0.351	1.50E-07
13.1	13.1	0	45	52	0.000	7.48E-08
	Average	0.033				7.48E-08





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z3-B12**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	220 to 230
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	1/6/09-1/13/09	Boring Logger	R. Chavez	Groundwater Depth (ft)	12.8
Drilling Method	Rotary Wash	Boring Dia. (in)	6	Ground Surface Elevation (ft)	501
Drill Rig Type	Ingersoll Rand A400	Drill Bit Type	PQ	Boring Depth (ft)	275
Performed By	KR/RR	Date	1/15/2009	Depth to Bedrock (ft)	68.5

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3	ft	A
Depth to Bottom of Top Packer	220	ft	B
Depth to Top of Bottom Packer	230	ft	C
Groundwater Depth	12.8	ft	D
Overburden Depth to Packer Interval Midpoint	225	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	212.2	ft	F=(E-D)
Packer Inflation Pressure	240	psi	
Maximum Net Applied Pressure	133	psi	G=E-0.433F
Maximum Gauge Pressure	126	psi	H=(G)-(P)

Lugeon Calculations

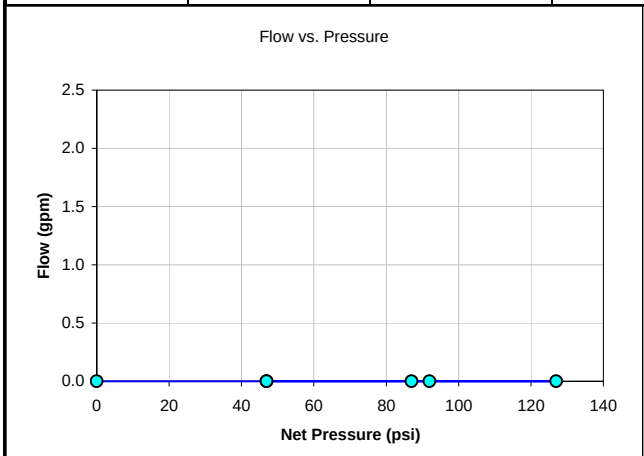
Depth to Bottom of Top Packer		220	ft	B
Depth to Top of Bottom Packer		230	ft	C
Length of Packer Interval		10	ft	J=(C-B)
Water Column Pressure		7	psi	P=0.433*(A+D)
Friction Loss		0	psi	
Gauge Pressure Steps	Step 1&5	40	psi	
	Step 2&4	80	psi	
	Step 3	120	psi	
Water Temperature		66	°F	

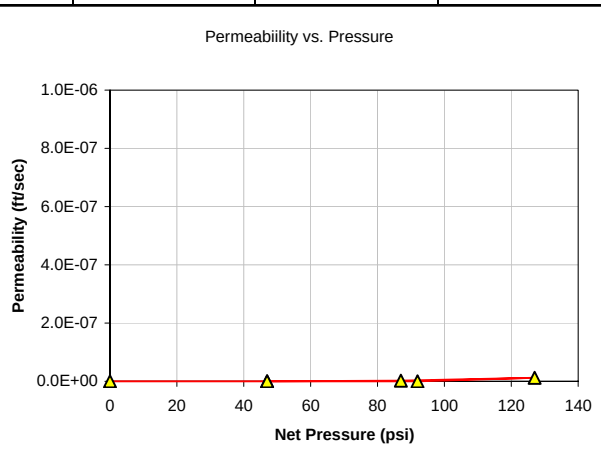
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
9.1	9.1	0	40	47	0.000	0.00E+00
9.1	9.1	0	40	47	0.000	0.00E+00
9.1	9.1	0	40	47	0.000	0.00E+00
9.1	9.1	0	40	47	0.000	0.00E+00
9.1	9.1	0	40	47	0.000	0.00E+00
	Average	0				0.00E+00
9.1	9.1	0	85	92	0.000	0.00E+00
9.1	9.1	0	85	92	0.000	0.00E+00
9.1	9.1	0	85	92	0.000	0.00E+00
9.1	9.1	0	85	92	0.000	0.00E+00
9.1	9.1	0	85	92	0.000	0.00E+00

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z3-B12**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	220 to 230
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
	Average	0.000				0.00E+00
10.1	10.2	0.1	120	127	0.143	6.11E-08
10.2	10.2	0	120	127	0.000	0.00E+00
10.2	10.2	0	120	127	0.000	0.00E+00
10.2	10.2	0	120	127	0.000	0.00E+00
10.2	10.2	0	120	127	0.000	0.00E+00
	Average	0				1.22E-08
10.2	10.2	0	80	87	0.000	0.00E+00
10.2	10.2	0	80	87	0.000	0.00E+00
10.2	10.2	0	80	87	0.000	0.00E+00
10.2	10.2	0	80	87	0.000	0.00E+00
10.2	10.2	0	80	87	0.000	0.00E+00
	Average	0.000				1.75E-09
10.2	10.2	0	40	47	0.000	0.00E+00
10.2	10.2	0	40	47	0.000	0.00E+00
10.2	10.2	0	40	47	0.000	0.00E+00
10.2	10.2	0	40	47	0.000	0.00E+00
	Average	0.000				0.00E+00





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z3-B12**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	245 to 255
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	1/6/09-1/13/09	Boring Logger	R. Chavez	Groundwater Depth (ft)	12.8
Drilling Method	Rotary Wash	Boring Dia. (in)	6	Ground Surface Elevation (ft)	501
Drill Rig Type	Ingersoll Rand A400	Drill Bit Type	PQ	Boring Depth (ft)	275
Performed By	KR/RR	Date	1/15/2009	Depth to Bedrock (ft)	68.5

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3	ft	A
Depth to Bottom of Top Packer	245	ft	B
Depth to Top of Bottom Packer	255	ft	C
Groundwater Depth	12.8	ft	D
Overburden Depth to Packer Interval Midpoint	250	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	237.2	ft	F=(E-D)
Packer Inflation Pressure	260	psi	
Maximum Net Applied Pressure	147	psi	G=E-0.433F
Maximum Gauge Pressure	140	psi	H=(G)-(P)

Lugeon Calculations

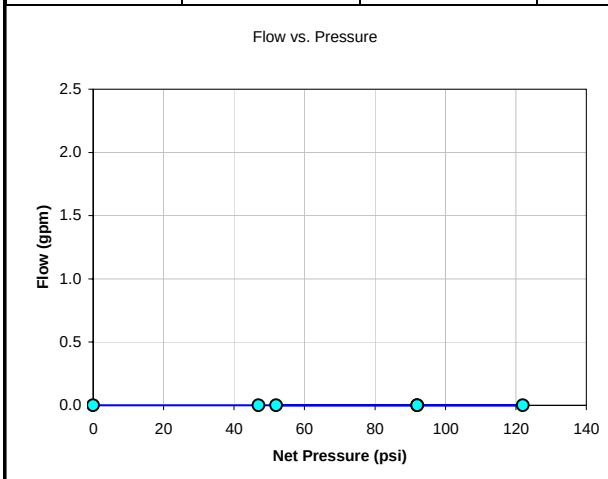
Depth to Bottom of Top Packer		245	ft	B
Depth to Top of Bottom Packer		255	ft	C
Length of Packer Interval		10	ft	J=(C-B)
Water Column Pressure		7	psi	P=0.433*(A+D)
Friction Loss		0	psi	
Gauge Pressure Steps	Step 1&5	45	psi	
	Step 2&4	90	psi	
	Step 3	135	psi	
Water Temperature		76	°F	

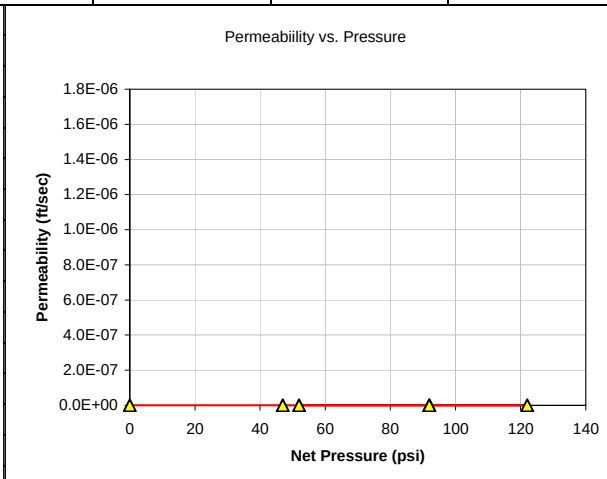
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
4.6	4.6	0	45	52	0.000	0.00E+00
4.6	4.6	0	45	52	0.000	0.00E+00
4.6	4.6	0	45	52	0.000	0.00E+00
4.6	4.6	0	45	52	0.000	0.00E+00
4.6	4.6	0	45	52	0.000	0.00E+00
	Average	0				0.00E+00
4.8	4.8	0	90	97	0.000	0.00E+00
4.8	4.8	0	90	97	0.000	0.00E+00
4.8	4.8	0	90	97	0.000	0.00E+00
4.8	4.8	0	90	97	0.000	0.00E+00
4.8	4.8	0	90	97	0.000	0.00E+00
	Average	0				0.00E+00

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z3-B12**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	245 to 255
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons)		(gallons)	(psi)	(psi)	(Lu)	(ft/sec)
Start	End	Take	Gauge	Net	Lugeons	Permeability
6.8	6.8	0	120	127	0.000	0.00E+00
6.8	6.8	0	120	127	0.000	0.00E+00
6.8	6.8	0	120	127	0.000	0.00E+00
6.8	6.8	0	120	127	0.000	0.00E+00
6.8	6.8	0	120	127	0.000	0.00E+00
	Average	0				0.00E+00
6.8	6.8	0	90	97	0.000	0.00E+00
6.8	6.8	0	90	97	0.000	0.00E+00
6.8	6.8	0	90	97	0.000	0.00E+00
6.8	6.8	0	90	97	0.000	0.00E+00
	Average	0				0.00E+00
6.8	6.8	0	50	57	0.000	0.00E+00
6.8	6.8	0	50	57	0.000	0.00E+00
6.8	6.8	0	50	57	0.000	0.00E+00
6.8	6.8	0	50	57	0.000	0.00E+00
	Average	0				0.00E+00





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z4-B4**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	220 to 229.5
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	3/10/09-3/16/09	Boring Logger	D. Jankly	Groundwater Depth (ft)	46.3
Drilling Method	Rotary Wash	Boring Dia. (in)	5.5	Ground Surface Elevation (ft)	454
Drill Rig Type	Speedstar 30K	Drill Bit Type	PQ	Boring Depth (ft)	277
Performed By	JL	Date	3/17/2009	Depth to Bedrock (ft)	83.5

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3	ft	A
Depth to Bottom of Top Packer	220	ft	B
Depth to Top of Bottom Packer	229.5	ft	C
Groundwater Depth	46.3	ft	D
Overburden Depth to Packer Interval Midpoint	224.75	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	178.45	ft	F=(E-D)
Packer Inflation Pressure	280	psi	
Maximum Net Applied Pressure	147	psi	G=E-0.433F
Maximum Gauge Pressure	126	psi	H=(G)-(P)

Lugeon Calculations

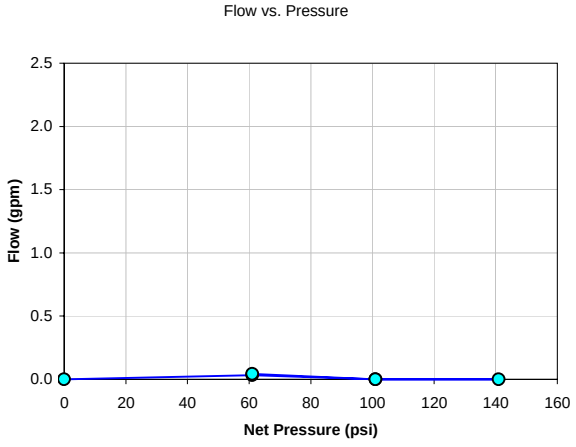
Depth to Bottom of Top Packer		220	ft	B
Depth to Top of Bottom Packer		229.5	ft	C
Length of Packer Interval		9.5	ft	J=(C-B)
Water Column Pressure		21	psi	P=0.433*(A+D)
Friction Loss		0	psi	
Gauge Pressure Steps	Step 1&5	40	psi	
	Step 2&4	80	psi	
	Step 3	120	psi	
Water Temperature		58	°F	

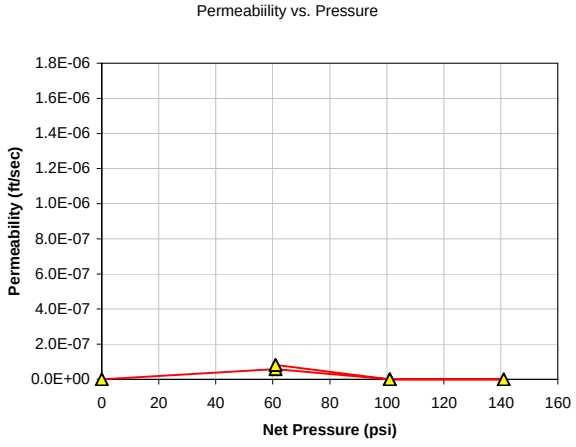
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
46.6	47	0.4	40	61	1.249	5.32E-07
47	47.2	0.2	40	61	0.625	2.66E-07
47.2	47.3	0.1	40	61	0.312	1.33E-07
47.3	47.4	0.1	40	61	0.312	1.33E-07
47.4	47.4	0	40	61	0.000	0.00E+00
47.4	47.5	0.1	40	61	0.312	2.13E-07
47.5	47.5	0	40	61	0.000	0.00E+00
47.5	47.5	0	40	61	0.000	0.00E+00
47.5	47.5	0	40	61	0.000	0.00E+00
	Average	0.03				5.76E-08
48.5	48.8	0.3	80	101	0.567	2.42E-07
48.8	49.1	0.3	80	101	0.567	8.53E-08

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z4-B4**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	220 to 229.5
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
49.1	49.2	0.1	80	101	0.189	8.05E-08
49.2	49.2	0	80	101	0.000	0.00E+00
49.2	49.2	0	80	101	0.000	0.00E+00
49.2	49.2	0	80	101	0.000	0.00E+00
	Average	0.00				0.00E+00
49.8	50.2	0.4	120	141	0.542	2.31E-07
50.2	50.6	0.4	120	141	0.542	5.19E-08
50.6	50.7	0.1	120	141	0.136	5.77E-08
50.7	50.7	0	120	141	0.000	0.00E+00
50.7	50.7	0	120	141	0.000	0.00E+00
50.7	50.7	0	120	141	0.000	0.00E+00
	Average	0.00				0.00E+00
51.3	51.3	0	80	101	0.000	0.00E+00
51.3	51.3	0	80	101	0.000	0.00E+00
51.3	51.3	0	80	101	0.000	0.00E+00
	Average	0.00				0.00E+00
52	52.1	0.1	40	61	0.312	1.33E-07
52.1	52.2	0.1	40	61	0.312	1.33E-07
52.2	52.2	0	40	61	0.000	0.00E+00
52.2	52.3	0.1	40	61	0.312	1.33E-07
52.3	52.3	0	40	61	0.000	0.00E+00
52.3	52.4	0.1	40	61	0.312	1.33E-07
52.4	52.4	0	40	61	0.000	8.87E-08
52.4	52.4	0	40	61	0.000	8.13E-08
	Average	0.04				8.13E-08





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z4-B4**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	230 to 239.5
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	3/10/09-3/16/09	Boring Logger	D. Jankly	Groundwater Depth (ft)	46.3
Drilling Method	Rotary Wash	Boring Dia. (in)	5.5	Ground Surface Elevation (ft)	454
Drill Rig Type	Speedstar 30K	Drill Bit Type	PQ	Boring Depth (ft)	277
Performed By	JL	Date	3/17/2009	Depth to Bedrock (ft)	83.5

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3	ft	A
Depth to Bottom of Top Packer	230	ft	B
Depth to Top of Bottom Packer	239.5	ft	C
Groundwater Depth	46.3	ft	D
Overburden Depth to Packer Interval Midpoint	234.75	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	188.45	ft	F=(E-D)
Packer Inflation Pressure	280	psi	
Maximum Net Applied Pressure	153	psi	G=E-0.433F
Maximum Gauge Pressure	132	psi	H=(G)-(P)

Lugeon Calculations

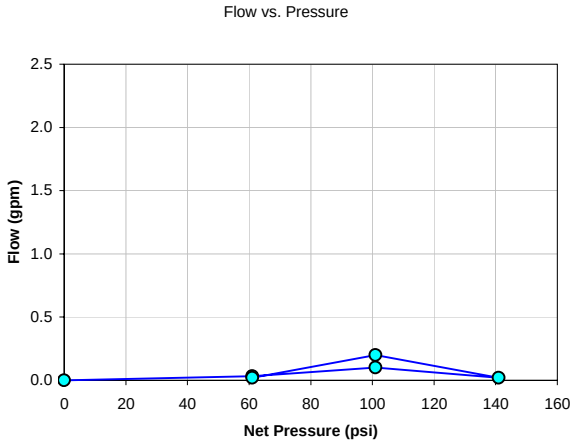
Depth to Bottom of Top Packer		230	ft	B
Depth to Top of Bottom Packer		239.5	ft	C
Length of Packer Interval		9.5	ft	J=(C-B)
Water Column Pressure		21	psi	P=0.433*(A+D)
Friction Loss		0	psi	
Gauge Pressure Steps	Step 1&5	40	psi	
	Step 2&4	80	psi	
	Step 3	120	psi	
Water Temperature		58	°F	

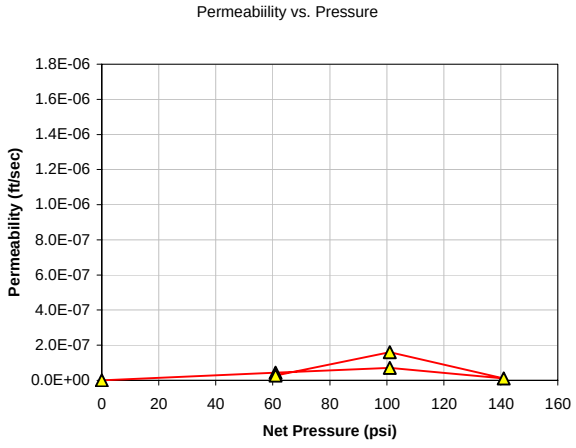
(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
31.3	32	0.7	40	61	2.186	9.31E-07
32	32.6	0.6	40	61	1.874	7.98E-07
32.6	32.8	0.2	40	61	0.625	2.66E-07
32.8	32.9	0.1	40	61	0.312	1.33E-07
32.9	33	0.1	40	61	0.312	1.33E-07
33	33	0	40	61	0.000	0.00E+00
33	33.1	0.1	40	61	0.312	1.33E-07
33.1	33.1	0	40	61	0.000	0.00E+00
33.1	33.1	0	40	61	0.000	0.00E+00
33.1	33.1	0	40	61	0.000	0.00E+00
	Average	0.03				4.43E-08
36.2	37	0.80	80	101	1.512	2.96E-08

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z4-B4**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	230 to 239.5
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
37	37.2	0.2	80	101	0.378	1.61E-07
37.2	37.3	0.1	80	101	0.189	8.05E-08
37.3	0.2	0.1	80	101	0.189	8.05E-08
37.4	37.5	0.10	80	101	0.189	8.05E-08
37.5	37.6	0.10	80	101	0.189	8.05E-08
	Average	0.10				7.03E-08
38.6	39.2	0.6	120	141	0.813	3.46E-07
39.2	39.5	0.3	120	141	0.407	1.73E-07
39.5	39.5	0	120	141	0.000	0.00E+00
39.5	39.6	0.1	120	141	0.136	5.77E-08
39.6	39.6	0	120	141	0.000	0.00E+00
39.6	39.6	0	120	141	0.000	0.00E+00
39.6	39.6	0	120	141	0.000	0.00E+00
	Average	0.02				1.15E-08
40.2	40.4	0.2	80	101	0.378	1.61E-07
40.4	40.6	0.2	80	101	0.378	1.61E-07
40.6	40.8	0.2	80	101	0.378	1.61E-07
40.8	41	0.2	80	101	0.378	1.61E-07
41	41.2	0.2	80	101	0.378	1.61E-07
	Average	0.20				1.61E-07
42.9	43.7	0.8	40	61	2.498	1.06E-06
43.7	43.7	0	40	61	0.000	0.00E+00
43.7	43.8	0.1	40	61	0.312	1.33E-07
43.8	43.8	0	40	61	0.000	0.00E+00
43.8	43.8	0	40	61	0.000	0.00E+00
43.8	43.8	0	40	61	0.000	0.00E+00
	Average	0.02				2.66E-08





Project Name :	SR-710 Tunnel Technical Study			**BORING/WELL NO.**	**Z4-B4**
Project Location :	Los Angeles County, California			Packer Depth Interval (ft)	251-260.5
Project Number :	379312.04.08.01				Sheet 1 of 2
Dates Drilled	3/10/09-3/16/09	Boring Logger	D. Jankly	Groundwater Depth (ft)	46.3
Drilling Method	Rotary Wash	Boring Dia. (in)	5.5	Ground Surface Elevation (ft)	454
Drill Rig Type	Speedstar 30K	Drill Bit Type	PQ	Boring Depth (ft)	277
Performed By	JL	Date	3/17/2009	Depth to Bedrock (ft)	83.5

PACKER TEST

To be completed in the field. Enter data into electronic spreadsheet for calculated results.

Calcs to Prepare for WPT

Gauge Height above the Ground Surface	3	ft	A
Depth to Bottom of Top Packer	251	ft	B
Depth to Top of Bottom Packer	260.5	ft	C
Groundwater Depth	100	ft	D
Overburden Depth to Packer Interval Midpoint	255.75	ft	E=(B+C)/2
Distance from Groundwater to Packer Interval Midpoint	155.75	ft	F=(E-D)
Packer Inflation Pressure	280	psi	
Maximum Net Applied Pressure	188	psi	G=E-0.433F
Maximum Gauge Pressure	144	psi	H=(G)-(P)

Lugeon Calculations

Depth to Bottom of Top Packer		251	ft	B
Depth to Top of Bottom Packer		260.5	ft	C
Length of Packer Interval		9.5	ft	J=(C-B)
Water Column Pressure		45	psi	P=0.433*(A+D)
Friction Loss		0	psi	
Gauge Pressure Steps	Step 1&5	50	psi	
	Step 2&4	100	psi	
	Step 3	150	psi	
Water Temperature		67	°F	

(assumes each Start/End Cycle time is 1 minute)

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
13.1	13.7	0.6	50	95	1.215	5.18E-07
13.7	13.8	0.1	50	95	0.203	8.63E-08
13.8	13.8	0	50	95	0.000	0.00E+00
13.8	13.8	0	50	95	0.000	0.00E+00
13.8	13.8	0	50	95	0.000	0.00E+00
	Average	0				0.00E+00
17	17.5	0.5	100	145	0.662	2.82E-07
17.5	18	0.5	100	145	0.662	2.82E-07
18	18.6	0.6	100	145	0.795	3.39E-07
18.6	18.7	0.1	100	145	0.132	5.64E-08
18.7	18.7	0	100	145	0.000	0.00E+00

Project Name :	SR-710 Tunnel Technical Study	**BORING/WELL NO.**	**Z4-B4**
Project Location :	Los Angeles County, California	Packer Depth Interval (ft)	251-260.5
Project Number :	379312.04.08.01		Sheet 2 of 2

Flow Meter (gallons) Start	Flow Meter (gallons) End	(gallons) Take	(psi) Gauge	(psi) Net	(Lu) Lugeons	(ft/sec) Permeability
18.7	18.8	0.1	100	145	0.132	5.64E-08
18.8	18.8	0	100	145	0.000	0.00E+00
18.8	18.9	0.1	100	145	0.132	5.64E-08
18.9	18.9	0	100	145	0.000	0.00E+00
18.9	19	0.1	100	145	0.132	5.64E-08
19	19	0	100	145	0.000	0.00E+00
	Average	0.05				2.82E-08
19.9	20.3	0.4	150	195	0.394	1.68E-07
20.3	20.6	0.3	150	195	0.295	1.26E-07
20.6	20.9	0.3	150	195	0.295	1.26E-07
20.9	21.2	0.3	150	195	0.295	1.26E-07
21.2	21.4	0.2	150	195	0.197	8.39E-08
21.4	21.5	0.1	150	195	0.098	4.19E-08
21.5	21.5	0	150	195	0.000	0.00E+00
21.5	21.5	0	150	195	0.000	0.00E+00
21.5	21.5	0	150	195	0.000	0.00E+00
21.5	21.5	0	150	195	0.000	0.00E+00
	Average	0.00				0.00E+00
22.1	22.2	0.1	100	145	0.132	5.64E-08
22.2	22.3	0.1	100	145	0.132	5.64E-08
22.3	22.4	0.1	100	145	0.132	5.64E-08
22.4	22.5	0.1	100	145	0.132	5.64E-08
22.5	22.6	0.1	100	145	0.132	5.64E-08
	Average	0.10				5.64E-08
28.4	28.7	0.3	50	95	0.608	2.59E-07
28.7	28.7	0	50	95	0.000	0.00E+00
28.7	28.7	0	50	95	0.000	0.00E+00
28.7	28.7	0	50	95	0.000	0.00E+00
	Average	0.00				0.00E+00