Appendix C

Soils Data – Total Uranium Concentrations (on-site laboratory)

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

ANOMALY D

DATE SAMPLED: 8-25-99

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1238	E	-	791	N	0-1	5	2
2	1238	E	-	791	N	1-2	6	2
3	1238	E	-	791	N	2-3	4	2
4	1238	E	-	791	N	3-4	1	1
5	1238	E	-	791	N	4-5	5	1
6	1238	E	-	791	N	5-6	6	1
7	1238	E	-	791	N	6-7	5	1

ANOMALY D

DATE SAMPLED: 8-25-99

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1236	E	-	801	N	0-1	9	1
2	1236	E	-	801	N	1-2	4	2
3	1236	E	-	801	N	2-3	5	1

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

TMW #2

DATE SAMPLED: 8-17-99

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1240	E	-	830	N	0-1	5	2
2	1240	E	-	830	N	1-2	6	1
3	1240	E	-	830	N	2-3	10	2
4	1240	E	-	830	N	3-4	8	1
5	1240	E	-	830	N	4-5	18	1
6	1240	E	-	830	N	5-6	5	2
7	1240	E	-	830	N	6-7	9	2
8	1240	E	-	830	N	7-8	4	2
9	1240	E	-	830	N	8-9	9	2
10	1240	E	-	830	N	9-10	9	2
11	1240	E	-	830	N	10-11	11	2
12	1240	E	-	830	N	11-12	9	2
13	1240	E	-	830	N	12-13	8	2
14	1240	E	-	830	N	13-14	NO SAMPLE	
15	1240	E	-	830	N	14-15	NO SAMPLE	
16	1240	E	-	830	N	15-16	10	1
17	1240	E	-	830	N	16-17	4	1
18	1240	E	-	830	N	17-18	4	1
19	1240	E	-	830	N	18-19	6	1
20	1240	E	-	830	N	19-20	3	1
21	1240	E	-	830	N	20-21	6	1
22	1240	E	-	830	N	21-22	4	1
23	1240	E	-	830	N	22-23	4	1
24	1240	E	-	830	N	23-24	6	1
25	1240	E	-	830	N	24-25	6	1
26	1240	E	-	830	N	25-26	6	1
27	1240	E	-	830	N	26-27	5	1
28	1240	E	-	830	N	27-28	2	1
29	1240	E	-	830	N	28-29	3	1
30	1240	E	-	830	N	29-30	7	2
31	1240	E	-	830	N	30-31	2	2
32	1240	E	-	830	N	31-32	5	1
33	1240	E	-	830	N	32-33	6	1
34	1240	E	-	830	N	33-34	6	2
35	1240	E	-	830	N	34-35	7	2

ANOMALY C

DATE SAMPLED: 8-25-99

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1224	E	-	841	N	0-1	7	1
2	1224	E	-	841	N	1-2	4	2
3	1224	E	-	841	N	2-3	6	2
4	1224	E	-	841	N	3-4	NO SAMPLE	
5	1224	E	-	841	N	4-5	NO SAMPLE	
6	1224	E	-	841	N	5-6	9	2
7	1224	E	-	841	N	6-7	10	2
8	1224	E	-	841	N	7-8	10	2
9	1224	E	-	841	N	8-9	NO SAMPLE	
10	1224	E	-	841	N	9-10	NO SAMPLE	
11	1224	E	-	841	N	10-11	6	2

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

TMW #1

DATE SAMPLED: 8-10-99

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1240	E	-	860	N	0-1	8	2
2	1240	E	-	860	N	1-2	6	2
3	1240	E	-	860	N	2-3	4	2
4	1240	E	-	860	N	3-4	9	1
5	1240	E	-	860	N	4-5	NO SAMPLE	
6	1240	E	-	860	N	5-6	4	2
7	1240	E	-	860	N	6-7	4	1
8	1240	E	-	860	N	7-8	5	2
9	1240	E	-	860	N	8-9	6	1
10	1240	E	-	860	N	9-10	15	1
11	1240	E	-	860	N	10-11	13	1
12	1240	E	-	860	N	11-12	10	1
13	1240	E	-	860	N	12-13	4	1
14	1240	E	-	860	N	13-14	2	1
15	1240	E	-	860	N	14-15	4	1
16	1240	E	-	860	N	15-16	6	1
17	1240	E	-	860	N	16-17	6	1
18	1240	E	-	860	N	17-18	6	2
19	1240	E	-	860	N	18-19	4	2
20	1240	E	-	860	N	19-20	4	1
21	1240	E	-	860	N	20-21	5	1
22	1240	E	-	860	N	21-22	4	2
23	1240	E	-	860	N	22-23	6	2
24	1240	E	-	860	N	23-24	9	1
25	1240	E	-	860	N	24-25	4	1
26	1240	E	-	860	N	25-26	6	1
27	1240	E	-	860	N	26-27	5	2
28	1240	E	-	860	N	27-28	4	2
29	1240	E	-	860	N	28-29	8	1
30	1240	E	-	860	N	29-30	3	1

ANOMALY B

DATE SAMPLED: 8-18-99

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1228	E	-	861	N	0-1	5	1
2	1228	E	-	861	N	1-2	4	2
3	1228	E	-	861	N	2-3	5	2
4	1228	E	-	861	N	3-4	5	2
5	1228	E	-	861	N	4-5	NO SAMPLE	
6	1228	E	-	861	N	5-6	8	1
7	1228	E	-	861	N	6-7	6	2
8	1228	E	-	861	N	7-8	8	1
9	1228	E	-	861	N	8-9	11	1

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

ANOMALY B OFFSET

DATE SAMPLED: 8-19-99

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1246	E	-	864	N	0-1	7	1
2	1246	E	-	864	N	1-2	4	2
3	1246	E	-	864	N	2-3	7	1
4	1246	E	-	864	N	3-4	7	2
5	1246	E	-	864	N	4-5	7	1
6	1246	E	-	864	N	5-6	19	2

ANOMALY B OFFSET

DATE SAMPLED: 8-19-99

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1251	E	-	864	N	0-1	6	1
2	1251	E	-	864	N	1-2	8	1
3	1251	E	-	864	N	2-3	6	1
4	1251	E	-	864	N	3-4	10	1
5	1251	E	-	864	N	4-5	20	1

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

ANOMALY A OFFSET

DATE SAMPLED: 8-20-99

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1256	E	-	864	N	0-1	7	1
2	1256	E	-	864	N	1-2	8	2
3	1256	E	-	864	N	2-3	9	1
4	1256	E	-	864	N	3-4	9	2

ANOMALY A OFFSET

DATE SAMPLED: 8-19-99

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1246	E	-	867	N	0-1	3	2
2	1246	E	-	867	N	1-2	6	1
3	1246	E	-	867	N	2-3	6	1
4	1246	E	-	867	N	3-4	11	2
5	1246	E	-	867	N	4-5	16	1
6	1246	E	-	867	N	5-6	11	1
7	1246	E	-	867	N	6-7	5	2
8	1246	E	-	867	N	7-8	12	1

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

TMW #8

DATE SAMPLED: 8-31-99

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1251	E	-	867	N	0-1	4	2
2	1251	E	-	867	N	1-2	5	1
3	1251	E	-	867	N	2-3	4	2
4	1251	E	-	867	N	3-4	6	2
5	1251	E	-	867	N	4-5	NO SAMPLE	
6	1251	E	-	867	N	5-6	11	1
7	1251	E	-	867	N	6-7	8	1
8	1251	E	-	867	N	7-8	20	1
9	1251	E	-	867	N	8-9	15	1
10	1251	E	-	867	N	9-10	12	1
11	1251	E	-	867	N	10-11	15	2
12	1251	E	-	867	N	11-12	9	1
13	1251	E	-	867	N	12-13	4	1
14	1251	E	-	867	N	13-14	7	2
15	1251	E	-	867	N	14-15	9	1
16	1251	E	-	867	N	15-16	2	1
17	1251	E	-	867	N	16-17	5	1
18	1251	E	-	867	N	17-18	3	1
19	1251	E	-	867	N	18-19	5	1
20	1251	E	-	867	N	19-20	7	1
21	1251	E	-	867	N	20-21	2	1
22	1251	E	-	867	N	21-22	4	1
23	1251	E	-	867	N	22-23	7	1
24	1251	E	-	867	N	23-24	2	1
25	1251	E	-	867	N	24-25	5	2

ANOMALY A OFFSET

DATE SAMPLED: 8-20-99

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1256	E	-	868	N	0-1	9	1
2	1256	E	-	868	N	1-2	5	2
3	1256	E	-	868	N	2-3	4	2
4	1256	E	-	868	N	3-4	4	2
5	1256	E	-	868	N	4-5	7	2
6	1256	E	-	868	N	5-6	5	2
7	1256	E	-	868	N	6-7	7	2
8	1256	E	-	868	N	7-8	10	1
9	1256	E	-	868	N	8-9	NO SAMPLE	
10	1256	E	-	868	N	9-10	NO SAMPLE	
11	1256	E	-	868	N	10-11	15	1

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

ANOMALY A

DATE SAMPLED: 8-18-99 SB-1

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1252	E	-	871	N	0-1	6	2
2	1252	E	-	871	N	1-2	6	2
3	1252	E	-	871	N	2-3	5	2
4	1252	E	-	871	N	3-4	10	1
5	1252	E	-	871	N	4-5	8	1
6	1252	E	-	871	N	5-6	11	2
7	1252	E	-	871	N	6-7	5	2
8	1252	E	-	871	N	7-8	8	2
9	1252	E	-	871	N	8-9	6	2
10	1252	E	-	871	N	9-10	9	2
11	1252	E	-	871	N	10-11	10	2
12	1252	E	-	871	N	11-12	11	1
13	1252	E	-	871	N	12-13	5	1
14	1252	E	-	871	N	13-14	6	1

SB-10

DATE SAMPLED: 8-23-99

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1261	E	-	871	N	0-1	4	1
2	1261	E	-	871	N	1-2	5	1
3	1261	E	-	871	N	2-3	5	2
4	1261	E	-	871	N	3-4	2	2
5	1261	E	-	871	N	4-5	4	2
6	1261	E	-	871	N	5-6	5	1
7	1261	E	-	871	N	6-7	4	2
8	1261	E	-	871	N	7-8	6	1
9	1261	E	-	871	N	8-9	NO SAMPLE	
10	1261	E	-	871	N	9-10	NO SAMPLE	
11	1261	E	-	871	N	10-11	8	1
12	1261	E	-	871	N	11-12	6	1
13	1261	E	-	871	N	12-13	5	1
14	1261	E	-	871	N	13-14	NO SAMPLE	
15	1261	E	-	871	N	14-15	NO SAMPLE	
16	1261	E	-	871	N	15-16	13	1
17	1261	E	-	871	N	16-17	8	2
18	1261	E	-	871	N	17-18	11	2
19	1261	E	-	871	N	18-19	12	2
20	1261	E	-	871	N	19-20	NO SAMPLE	
21	1261	E	-	871	N	20-21	11	1
22	1261	E	-	871	N	21-22	7	2
23	1261	E	-	871	N	22-23	9	1

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

SB-4

DATE SAMPLED: 8-19-99

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1246	E	-	872	N	0-1	2	2
2	1246	E	-	872	N	1-2	7	1
3	1246	E	-	872	N	2-3	5	2
4	1246	E	-	872	N	3-4	11	1
5	1246	E	-	872	N	4-5	6	1
6	1246	E	-	872	N	5-6	5	1
7	1246	E	-	872	N	6-7	5	1
8	1246	E	-	872	N	7-8	5	2
9	1246	E	-	872	N	8-9	NO SAMPLE	
10	1246	E	-	872	N	9-10	NO SAMPLE	
11	1246	E	-	872	N	10-11	12	1
12	1246	E	-	872	N	11-12	9	1
13	1246	E	-	872	N	12-13	9	1
14	1246	E	-	872	N	13-14	NO SAMPLE	
15	1246	E	-	872	N	14-15	NO SAMPLE	
16	1246	E	-	872	N	15-16	8	1
17	1246	E	-	872	N	16-17	7	1

SB-5

DATE SAMPLED: 8-19-99 ANOMALY A OFFSET

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1256	E	-	873	N	0-1	4	2
2	1256	E	-	873	N	1-2	16	1
3	1256	E	-	873	N	2-3	8	2
4	1256	E	-	873	N	3-4	6	2
5	1256	E	-	873	N	4-5	10	2
6	1256	E	-	873	N	5-6	10	2
7	1256	E	-	873	N	6-7	17	2
8	1256	E	-	873	N	7-8	10	2
9	1256	E	-	873	N	8-9	11	1
10	1256	E	-	873	N	9-10	11	1
11	1256	E	-	873	N	10-11	14	1
12	1256	E	-	873	N	11-12	14	1
13	1256	E	-	873	N	12-13	12	2
14	1256	E	-	873	N	13-14	14	1
15	1256	E	-	873	N	14-15	18	1
16	1256	E	-	873	N	15-16	18	1
17	1256	E	-	873	N	16-17	16	2
18	1256	E	-	873	N	17-18	14	2
19	1256	E	-	873	N	18-19	16	2

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

ANOMALY A OFFSET

DATE SAMPLED: 8-20-99

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1251	E	-	877	N	0-1	4	2
2	1251	E	-	877	N	1-2	3	2
3	1251	E	-	877	N	2-3	6	1
4	1251	E	-	877	N	3-4	5	2
5	1251	E	-	877	N	4-5	9	1

SB-7

DATE SAMPLED: 8-20-99

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1256	E	-	877	N	0-1	7	1
2	1256	E	-	877	N	1-2	2	2
3	1256	E	-	877	N	2-3	5	1
4	1256	E	-	877	N	3-4	5	2
5	1256	E	-	877	N	4-5	NO SAMPLE	
6	1256	E	-	877	N	5-6	5	1
7	1256	E	-	877	N	6-7	8	2
8	1256	E	-	877	N	7-8	7	1
9	1256	E	-	877	N	8-9	7	2
10	1256	E	-	877	N	9-10	7	1
11	1256	E	-	877	N	10-11	5	1
12	1256	E	-	877	N	11-12	9	1
13	1256	E	-	877	N	12-13	7	1
14	1256	E	-	877	N	13-14	8	1
15	1256	E	-	877	N	14-15	NO SAMPLE	
16	1256	E	-	877	N	15-16	11	1
17	1256	E	-	877	N	16-17	7	1
18	1256	E	-	877	N	17-18	11	2
19	1256	E	-	877	N	18-19	8	2

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

SB-6

DATE SAMPLED: 8-20-99

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1246	E	-	878	N	0-1	7	2
2	1246	E	-	878	N	1-2	8	1
3	1246	E	-	878	N	2-3	5	2
4	1246	E	-	878	N	3-4	4	1
5	1246	E	-	878	N	4-5	5	1
6	1246	E	-	878	N	5-6	5	1
7	1246	E	-	878	N	6-7	4	1
8	1246	E	-	878	N	7-8	5	2
9	1246	E	-	878	N	8-9	10	2
10	1246	E	-	878	N	9-10	12	1
11	1246	E	-	878	N	10-11	11	1
12	1246	E	-	878	N	11-12	15	1
13	1246	E	-	878	N	12-13	13	2
14	1246	E	-	878	N	13-14	14	1
15	1246	E	-	878	N	14-15	12	1
16	1246	E	-	878	N	15-16	20	2
17	1246	E	-	878	N	16-17	13	1

SB-2

DATE SAMPLED: 8-18-99

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1263	E	-	882	N	0-1	2	1
2	1263	E	-	882	N	1-2	4	2
3	1263	E	-	882	N	2-3	2	2
4	1263	E	-	882	N	3-4	5	1
5	1263	E	-	882	N	4-5	7	1
6	1263	E	-	882	N	5-6	4	2
7	1263	E	-	882	N	6-7	6	1
8	1263	E	-	882	N	7-8	7	1
9	1263	E	-	882	N	8-9	6	1
10	1263	E	-	882	N	9-10	NO SAMPLE	
11	1263	E	-	882	N	10-11	10	1
12	1263	E	-	882	N	11-12	9	1
13	1263	E	-	882	N	12-13	8	1
14	1263	E	-	882	N	13-14	7	1
15	1263	E	-	882	N	14-15	NO SAMPLE	
16	1263	E	-	882	N	15-16	9	2
17	1263	E	-	882	N	16-17	2	1
18	1263	E	-	882	N	17-18	10	1
19	1263	E	-	882	N	18-19	6	1
20	1263	E	-	882	N	19-20	6	2
21	1263	E	-	882	N	20-21	5	2
22	1263	E	-	882	N	21-22	7	2
23	1263	E	-	882	N	22-23	3	2
24	1263	E	-	882	N	23-24	3	2

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

SB-11, SB-15

DATE SAMPLED: 8-23-99

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1246	E	-	883	N	0-1	7	1
2	1246	E	-	883	N	1-2	2	2
3	1246	E	-	883	N	2-3	4	2
4	1246	E	-	883	N	3-4	6	2
5	1246	E	-	883	N	4-5	8	2
6	1246	E	-	883	N	5-6	9	1
7	1246	E	-	883	N	6-7	12	1
8	1246	E	-	883	N	7-8	8	1
9	1246	E	-	883	N	8-9	11	1
10	1246	E	-	883	N	9-10	NO SAMPLE	
11	1246	E	-	883	N	10-11	10	1
12	1246	E	-	883	N	11-12	8	1
13	1246	E	-	883	N	12-13	12	1
14	1246	E	-	883	N	13-14	15	1
15	1246	E	-	883	N	14-15	16	1
16	1246	E	-	883	N	15-16	12	1
17	1246	E	-	883	N	16-17	13	1
18	1246	E	-	883	N	17-18	15	1
19	1246	E	-	883	N	18-19	16	1
20	1246	E	-	883	N	19-20	29	2

SB-8

DATE SAMPLED: 8-24-99

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1251	E	-	883	N	0-1	8	2
2	1251	E	-	883	N	1-2	7	2
3	1251	E	-	883	N	2-3	8	2
4	1251	E	-	883	N	3-4	2	2
5	1251	E	-	883	N	4-5	5	2
6	1251	E	-	883	N	5-6	6	2
7	1251	E	-	883	N	6-7	3	2
8	1251	E	-	883	N	7-8	3	2
9	1251	E	-	883	N	8-9	12	1
10	1251	E	-	883	N	9-10	NO SAMPLE	
11	1251	E	-	883	N	10-11	11	1
12	1251	E	-	883	N	11-12	9	2
13	1251	E	-	883	N	12-13	12	1
14	1251	E	-	883	N	13-14	11	2
15	1251	E	-	883	N	14-15	NO SAMPLE	
16	1251	E	-	883	N	15-16	12	1
17	1251	E	-	883	N	16-17	12	1
18	1251	E	-	883	N	17-18	9	1
19	1251	E	-	883	N	18-19	11	1
20	1251	E	-	883	N	19-20	13	2
21	1251	E	-	883	N	20-21	10	2
22	1251	E	-	883	N	21-22	10	2
23	1251	E	-	883	N	22-23	12	1

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

SB-9

DATE SAMPLED: 8-24-99

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1256	E	-	883	N	0-1	4	1
2	1256	E	-	883	N	1-2	6	1
3	1256	E	-	883	N	2-3	3	2
4	1256	E	-	883	N	3-4	5	1
5	1256	E	-	883	N	4-5	3	1
6	1256	E	-	883	N	5-6	3	1
7	1256	E	-	883	N	6-7	5	1
8	1256	E	-	883	N	7-8	6	1
9	1256	E	-	883	N	8-9	6	1
10	1256	E	-	883	N	9-10	7	1
11	1256	E	-	883	N	10-11	4	1
12	1256	E	-	883	N	11-12	10	1
13	1256	E	-	883	N	12-13	6	1
14	1256	E	-	883	N	13-14	11	1
15	1256	E	-	883	N	14-15	11	1
16	1256	E	-	883	N	15-16	11	1
17	1256	E	-	883	N	16-17	12	1
18	1256	E	-	883	N	17-18	12	1
19	1256	E	-	883	N	18-19	10	1
20	1256	E	-	883	N	19-20	6	2
21	1256	E	-	883	N	20-21	7	1
22	1256	E	-	883	N	21-22	10	2
23	1256	E	-	883	N	22-23	9	2
24	1256	E	-	883	N	23-24	15	2
25	1256	E	-	883	N	24-25	10	2

TMW #6

DATE SAMPLED: 8-12-99

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1280	E	-	890	N	0-1	3	2
2	1280	E	-	890	N	1-2	5	1
3	1280	E	-	890	N	2-3	3	1
4	1280	E	-	890	N	3-4	7	1
5	1280	E	-	890	N	4-5	5	1
6	1280	E	-	890	N	5-6	4	1
7	1280	E	-	890	N	6-7	5	1
8	1280	E	-	890	N	7-8	6	1
9	1280	E	-	890	N	8-9	3	2
10	1280	E	-	890	N	9-10	5	2
11	1280	E	-	890	N	10-11	5	2
12	1280	E	-	890	N	11-12	2	1
13	1280	E	-	890	N	12-13	4	1
14	1280	E	-	890	N	13-14	3	1
15	1280	E	-	890	N	14-15	3	2
16	1280	E	-	890	N	15-16	5	2
17	1280	E	-	890	N	16-17	11	2
18	1280	E	-	890	N	17-18	4	1
19	1280	E	-	890	N	18-19	4	2
20	1280	E	-	890	N	19-20	4	1
21	1280	E	-	890	N	20-21	6	2
22	1280	E	-	890	N	21-22	2	2
23	1280	E	-	890	N	22-23	4	2
24	1280	E	-	890	N	23-24	5	2
25	1280	E	-	890	N	24-25	3	2
26	1280	E	-	890	N	25-26	7	2
27	1280	E	-	890	N	26-27	3	2
28	1280	E	-	890	N	27-28	5	1
29	1280	E	-	890	N	28-29	3	1
30	1280	E	-	890	N	29-30	3	1

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

TMW #11

DATE SAMPLED: 8-31-99

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1240	E	-	894	N	0-1	9	2
2	1240	E	-	894	N	1-2	6	2
3	1240	E	-	894	N	2-3	NO SAMPLE	
4	1240	E	-	894	N	3-4	NO SAMPLE	
5	1240	E	-	894	N	4-5	NO SAMPLE	
6	1240	E	-	894	N	5-6	8	1
7	1240	E	-	894	N	6-7	28	2
8	1240	E	-	894	N	7-8	23	2
9	1240	E	-	894	N	8-9	23	1
10	1240	E	-	894	N	9-10	15	2
11	1240	E	-	894	N	10-11	10	1
12	1240	E	-	894	N	11-12	12	1
13	1240	E	-	894	N	12-13	20	1
14	1240	E	-	894	N	13-14	19	2
15	1240	E	-	894	N	14-15	NO SAMPLE	
16	1240	E	-	894	N	15-16	8	1
17	1240	E	-	894	N	16-17	17	2
18	1240	E	-	894	N	17-18	21	2
19	1240	E	-	894	N	18-19	NO SAMPLE	
20	1240	E	-	894	N	19-20	NO SAMPLE	
21	1240	E	-	894	N	20-21	19	2
22	1240	E	-	894	N	21-22	15	2
23	1240	E	-	894	N	22-23	6	2

SB-19

DATE SAMPLED: 11-15-99

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1226	E	-	900	N	0-1	3	1
2	1226	E	-	900	N	1-2	4	2
3	1226	E	-	900	N	2-3	4	1
4	1226	E	-	900	N	3-4	4	1
5	1226	E	-	900	N	4-5	2	1
6	1226	E	-	900	N	5-6	NO SAMPLE	
7	1226	E	-	900	N	6-7	5	1
8	1226	E	-	900	N	7-8	9	1
9	1226	E	-	900	N	8-9	8	1
10	1226	E	-	900	N	9-10	8	1
11	1226	E	-	900	N	10-11	7	1
12	1226	E	-	900	N	11-12	14	1
13	1226	E	-	900	N	12-13	14	1
14	1226	E	-	900	N	13-14	11	1
15	1226	E	-	900	N	14-15	7	1

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

TMW #9

DATE SAMPLED: 8-30-99

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1235	E	-	900	N	0-1	7	1
2	1235	E	-	900	N	1-2	4	1
3	1235	E	-	900	N	2-3	7	1
4	1235	E	-	900	N	3-4	NO SAMPLE	
5	1235	E	-	900	N	4-5	NO SAMPLE	
6	1235	E	-	900	N	5-6	11	1
7	1235	E	-	900	N	6-7	15	1
8	1235	E	-	900	N	7-8	32	2
9	1235	E	-	900	N	8-9	17	1
10	1235	E	-	900	N	9-10	16	2
11	1235	E	-	900	N	10-11	15	1
12	1235	E	-	900	N	11-12	16	2
13	1235	E	-	900	N	12-13	18	2
14	1235	E	-	900	N	13-14	16	1
15	1235	E	-	900	N	14-15	15	2
16	1235	E	-	900	N	15-16	11	1
17	1235	E	-	900	N	16-17	12	1
18	1235	E	-	900	N	17-18	12	1
19	1235	E	-	900	N	18-19	11	2
20	1235	E	-	900	N	19-20	19	2
21	1235	E	-	900	N	20-21	17	2
22	1235	E	-	900	N	21-22	10	2
23	1235	E	-	900	N	22-23	3	1
24	1235	E	-	900	N	23-24	4	1

TMW #3

DATE SAMPLED: 8-25-99

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1240	E	-	900	N	0-1	7	2
2	1240	E	-	900	N	1-2	9	2
3	1240	E	-	900	N	2-3	4	1
4	1240	E	-	900	N	3-4	5	1
5	1240	E	-	900	N	4-5	NO SAMPLE	
6	1240	E	-	900	N	5-6	5	1
7	1240	E	-	900	N	6-7	6	2
8	1240	E	-	900	N	7-8	3	2
9	1240	E	-	900	N	8-9	10	2
10	1240	E	-	900	N	9-10	14	1
11	1240	E	-	900	N	10-11	19	1
12	1240	E	-	900	N	11-12	16	2
13	1240	E	-	900	N	12-13	17	2
14	1240	E	-	900	N	13-14	25	2
15	1240	E	-	900	N	14-15	30	2

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

TMW 12

DATE SAMPLED: 9-1-99

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1245	E	-	900	N	0-1	5	2
2	1245	E	-	900	N	1-2	5	2
3	1245	E	-	900	N	2-3	5	1
4	1245	E	-	900	N	3-4	NO SAMPLE	
5	1245	E	-	900	N	4-5	7	1
6	1245	E	-	900	N	5-6	6	1
7	1245	E	-	900	N	6-7	8	2
8	1245	E	-	900	N	7-8	9	2
9	1245	E	-	900	N	8-9	23	1
10	1245	E	-	900	N	9-10	20	1
11	1245	E	-	900	N	10-11	12	1
12	1245	E	-	900	N	11-12	15	1
13	1245	E	-	900	N	12-13	13	2
14	1245	E	-	900	N	13-14	18	2
15	1245	E	-	900	N	14-15	18	2
16	1245	E	-	900	N	15-16	14	2
17	1245	E	-	900	N	16-17	19	2
18	1245	E	-	900	N	17-18	12	2
19	1245	E	-	900	N	18-19	7	2
20	1245	E	-	900	N	19-20	5	2
21	1245	E	-	900	N	20-21	8	1
22	1245	E	-	900	N	21-22	8	1

TMW #10

DATE SAMPLED: 8-31-99

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1240	E	-	905	N	0-1	6	1
2	1240	E	-	905	N	1-2	3	1
3	1240	E	-	905	N	2-3	9	1
4	1240	E	-	905	N	3-4	NO SAMPLE	
5	1240	E	-	905	N	4-5	NO SAMPLE	
6	1240	E	-	905	N	5-6	3	1
7	1240	E	-	905	N	6-7	4	2
8	1240	E	-	905	N	7-8	11	2
9	1240	E	-	905	N	8-9	12	2
10	1240	E	-	905	N	9-10	12	1
11	1240	E	-	905	N	10-11	9	1
12	1240	E	-	905	N	11-12	12	1
13	1240	E	-	905	N	12-13	11	2
14	1240	E	-	905	N	13-14	15	2
15	1240	E	-	905	N	14-15	14	2
16	1240	E	-	905	N	15-16	11	2
17	1240	E	-	905	N	16-17	12	1
18	1240	E	-	905	N	17-18	10	2
19	1240	E	-	905	N	18-19	8	2
20	1240	E	-	905	N	19-20	4	2
21	1240	E	-	905	N	20-21	3	2

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

SB-18

DATE SAMPLED: 11-19-99

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1214	E	-	915	N	0-1	2	1
2	1214	E	-	915	N	1-2	6	1
3	1214	E	-	915	N	2-3	3	2
4	1214	E	-	915	N	3-4	5	2
5	1214	E	-	915	N	4-5	5	1
6	1214	E	-	915	N	5-6	7	1
7	1214	E	-	915	N	6-7	8	1
8	1214	E	-	915	N	7-8	18	2
9	1214	E	-	915	N	8-9	15	2
10	1214	E	-	915	N	9-10	22	1
11	1214	E	-	915	N	10-11	5	1
12	1214	E	-	915	N	11-12	4	1
13	1214	E	-	915	N	12-13	5	1
14	1214	E	-	915	N	13-14	4	1
15	1214	E	-	915	N	14-15	5	2
16	1214	E	-	915	N	15-16	5	2
17	1214	E	-	915	N	16-17	3	2

TMW #5

DATE SAMPLED: 8-9-99

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1255	E	-	915	N	0-1	7	1
2	1255	E	-	915	N	1-2	3	1
3	1255	E	-	915	N	2-3	2	1
4	1255	E	-	915	N	3-4	7	1
5	1255	E	-	915	N	4-5	NO SAMPLE	
6	1255	E	-	915	N	5-6	6	1
7	1255	E	-	915	N	6-7	2	1
8	1255	E	-	915	N	7-8	9	1
9	1255	E	-	915	N	8-9	3	1
10	1255	E	-	915	N	9-10	NO SAMPLE	
11	1255	E	-	915	N	10-11	3	1
12	1255	E	-	915	N	11-12	5	1
13	1255	E	-	915	N	12-13	3	1
14	1255	E	-	915	N	13-14	5	1
15	1255	E	-	915	N	14-15	3	1
16	1255	E	-	915	N	15-16	3	2
17	1255	E	-	915	N	16-17	4	1
18	1255	E	-	915	N	17-18	4	1
19	1255	E	-	915	N	18-19	10	1
20	1255	E	-	915	N	19-20	6	1
21	1255	E	-	915	N	20-21	5	2
22	1255	E	-	915	N	21-22	3	2
23	1255	E	-	915	N	22-23	4	1
24	1255	E	-	915	N	23-24	3	1
25	1255	E	-	915	N	24-25	2	1

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

TMW #7

DATE SAMPLED: 8-31-99 SB-14

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1241	E	-	920	N	0-1	4	2
2	1241	E	-	920	N	1-2	5	2
3	1241	E	-	920	N	2-3	6	1
4	1241	E	-	920	N	3-4	6	1
5	1241	E	-	920	N	4-5	NO SAMPLE	
6	1241	E	-	920	N	5-6	8	1
7	1241	E	-	920	N	6-7	5	1
8	1241	E	-	920	N	7-8	9	1
9	1241	E	-	920	N	8-9	6	1
10	1241	E	-	920	N	9-10	NO SAMPLE	
11	1241	E	-	920	N	10-11	5	2
12	1241	E	-	920	N	11-12	6	2
13	1241	E	-	920	N	12-13	7	2
14	1241	E	-	920	N	13-14	7	2
15	1241	E	-	920	N	14-15	9	1

SB-17

DATE SAMPLED: 11-15-99

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1210	E	-	925	N	0-1	3	1
2	1210	E	-	925	N	1-2	5	1
3	1210	E	-	925	N	2-3	5	1
4	1210	E	-	925	N	3-4	5	1
5	1210	E	-	925	N	4-5	NO SAMPLE	
6	1210	E	-	925	N	5-6	8	2
7	1210	E	-	925	N	6-7	12	1
8	1210	E	-	925	N	7-8	16	2
9	1210	E	-	925	N	8-9	10	1
10	1210	E	-	925	N	9-10	13	2
11	1210	E	-	925	N	10-11	12	1
12	1210	E	-	925	N	11-12	12	1
13	1210	E	-	925	N	12-13	8	1
14	1210	E	-	925	N	13-14	NO SAMPLE	
15	1210	E	-	925	N	14-15	NO SAMPLE	
16	1210	E	-	925	N	15-16	2	1
17	1210	E	-	925	N	16-17	5	1

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

TMW #4

DATE SAMPLED: 8-9-99

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1230	E	-	930	N	0-1	10	2
2	1230	E	-	930	N	1-2	5	1
3	1230	E	-	930	N	2-3	7	1
4	1230	E	-	930	N	3-4	5	2
5	1230	E	-	930	N	4-5	NO SAMPLE	
6	1230	E	-	930	N	5-6	8	2
7	1230	E	-	930	N	6-7	9	2
8	1230	E	-	930	N	7-8	7	2
9	1230	E	-	930	N	8-9	NO SAMPLE	
10	1230	E	-	930	N	9-10	NO SAMPLE	
11	1230	E	-	930	N	10-11	5	2
12	1230	E	-	930	N	11-12	7	1
13	1230	E	-	930	N	12-13	5	2
14	1230	E	-	930	N	13-14	6	2
15	1230	E	-	930	N	14-15	4	2
16	1230	E	-	930	N	15-16	3	2
17	1230	E	-	930	N	16-17	6	2
18	1230	E	-	930	N	17-18	4	1
19	1230	E	-	930	N	18-19	5	1

SB-16

DATE SAMPLED: 11-15-99

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1220	E	-	935	N	0-1	2	1
2	1220	E	-	935	N	1-2	5	1
3	1220	E	-	935	N	2-3	6	1
4	1220	E	-	935	N	3-4	6	1
5	1220	E	-	935	N	4-5	8	2
6	1220	E	-	935	N	5-6	9	1
7	1220	E	-	935	N	6-7	13	1
8	1220	E	-	935	N	7-8	11	2
9	1220	E	-	935	N	8-9	13	2
10	1220	E	-	935	N	9-10	14	2
11	1220	E	-	935	N	10-11	8	2
12	1220	E	-	935	N	11-12	5	1
13	1220	E	-	935	N	12-13	NO SAMPLE	
14	1220	E	-	935	N	13-14	NO SAMPLE	
15	1220	E	-	935	N	14-15	NO SAMPLE	
16	1220	E	-	935	N	15-16	2	1
17	1220	E	-	935	N	16-17	5	1

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

TMW #13

DATE SAMPLED: 11-16-99

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1204	E	-	938	N	0-1	4	1
2	1204	E	-	938	N	1-2	1	1
3	1204	E	-	938	N	2-3	4	2
4	1204	E	-	938	N	3-4	6	1
5	1204	E	-	938	N	4-5	NO SAMPLE	
6	1204	E	-	938	N	5-6	8	2
7	1204	E	-	938	N	6-7	4	1
8	1204	E	-	938	N	7-8	8	1
9	1204	E	-	938	N	8-9	7	1
10	1204	E	-	938	N	9-10	NO SAMPLE	
11	1204	E	-	938	N	10-11	NO SAMPLE	
12	1204	E	-	938	N	11-12	5	1
13	1204	E	-	938	N	12-13	2	1

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

02-W-50

DATE SAMPLED: 8-8-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	820	N	-	1246	E	5' - T	1.2	0.7
2	820	N	-	1246	E	20' - 25'	1.4	0.8
3	820	N	-	1246	E	25' - 30'	1.2	1.3
4	820	N	-	1246	E	5' - B	2.0	2.0

02-W-52

DATE SAMPLED: 8-12-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	820	N	-	1257	E	10' - 24'	1.0	0.5
2	820	N	-	1257	E	28' - 33.5'	2.4	1.2

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

02-W-51

DATE SAMPLED: 8-9-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	826	N	-	1230	E	4.5' - 9'	1.7	1.4
2	826	N	-	1230	E	30' - 34'	1.3	1.5

02-W-47

DATE SAMPLED: 8-7-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	837	N	-	1246	E	10' - 15'	2.0	1.6
2	837	N	-	1246	E	25' - 30'	1.2	0.9

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

02-W-25

DATE SAMPLED: 7-29-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	846	N	-	1228	E	0 -1'	3.1	1.6
2	846	N	-	1228	E	1' - 2'	1.9	1.7
3	846	N	-	1228	E	2' - 3'	3.0	1.3
4	846	N	-	1228	E	6' - 7'	3.7	1.7
5	846	N	-	1228	E	7' -8'	3.5	1.8
6	846	N	-	1228	E	8' - 9'	2.9	1.6
7	846	N	-	1228	E	9' - 10'	4.7	1.8
8	846	N	-	1228	E	10' - 11'	6.3	2.6
9	846	N	-	1228	E	11' - 12'	16.4	7.8
10	846	N	-	1228	E	12' - 13'	3.7	2.3
11	846	N	-	1228	E	13' - 14'	2.5	1.9
12	846	N	-	1228	E	14' - 15'	3.1	2.2
13	846	N	-	1228	E	15' - 16'	2.0	2.2
14	846	N	-	1228	E	16' - 17'	2.8	2.4
15	846	N	-	1228	E	17' - 18'	2.4	2.2
16	846	N	-	1228	E	18' - 19'	0.8	1.6
17	846	N	-	1228	E	22' - 23'	1.8	0.9
18	846	N	-	1228	E	23' - 24'	1.3	1.2
19	846	N	-	1228	E	24' - 25'	1.5	1.3
20	846	N	-	1228	E	25' - 26'	0.9	1.3
21	846	N	-	1228	E	26' - 27'	1.5	1.0
22	846	N	-	1228	E	27' - 28'	1.4	1.7
23	846	N	-	1228	E	30' - 31'	2.2	1.6
24	846	N	-	1228	E	31' - 32'	2.0	1.7

02-W-20

DATE SAMPLED: 7-23-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	846	N	-	1292	E	0' - 1'	2.2	1.8
2	846	N	-	1292	E	1' - 2'	3.6	1.8
3	846	N	-	1292	E	2' - 3'	3.0	1.7
4	846	N	-	1292	E	3' - 4'	3.2	1.6
5	846	N	-	1292	E	4' - 5'	2.5	1.7
6	846	N	-	1292	E	5' - 6'	1.8	1.2
7	846	N	-	1292	E	6' - 7'	2.9	1.6
8	846	N	-	1292	E	7' - 8'	2.1	1.7
9	846	N	-	1292	E	8' - 9'	3.0	2.0
10	846	N	-	1292	E	9' - 10'	2.1	1.7
11	846	N	-	1292	E	10' - 11'	1.9	1.2
12	846	N	-	1292	E	11' - 12'	2.3	1.5
13	846	N	-	1292	E	12' - 13'	2.6	1.8
14	846	N	-	1292	E	13' - 14'	2.5	2.1
15	846	N	-	1292	E	14' - 15'	2.8	1.8
16	846	N	-	1292	E	15' - 16'	0.4	1.5
17	846	N	-	1292	E	16' - 17'	2.0	1.5
18	846	N	-	1292	E	17' - 18'	1.8	1.4
19	846	N	-	1292	E	18' - 19'	1.8	1.6
20	846	N	-	1292	E	19' - 20'	2.8	1.5
21	846	N	-	1292	E	20' - 21'	0.4	1.3
22	846	N	-	1292	E	21' - 22'	1.9	1.5
23	846	N	-	1292	E	22' - 23'	1.9	1.4

CIMARRON CORPORATION

CIMARRON CORPORATION

Burial Ground #1 Investigation

Soil Sample Data (Bkg. Not Subtracted)

APPENDIX C

02-W-40

DATE SAMPLED: 8-5-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	848	N	-	1249	E	17' - 22'	2.2	1.4
2	848	N	-	1249	E	25' - 30'	1.8	1.7

02-W-41

DATE SAMPLED: 8-5-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	854	N	-	1263	E	23' - 28'	0.6	1.5

CIMARRON CORPORATION

CIMARRON CORPORATION

Burial Ground #1 Investigation

Soil Sample Data (Bkg. Not Subtracted)

APPENDIX C

02-W-26

DATE SAMPLED: 7-29-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	863	N	-	1280	E	0' - 5'	3.2	1.6
2	863	N	-	1280	E	5' - 10'	2.1	1.7
3	863	N	-	1280	E	10' - 15'	2.2	1.1
4	863	N	-	1280	E	15' - 20'	2.8	1.4
5	863	N	-	1280	E	20' - 24'	2.6	1.6

02-W-42

DATE SAMPLED: 8-5-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	868	N	-	1230	E	23' - 28'	2.5	1.5

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

02-W-39

DATE SAMPLED: 8-2-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	871	N	-	1263	E	10' - 15'	3.5	1.5
2	871	N	-	1263	E	17' - 22'	5.6	1.8

02-W-29

DATE SAMPLED: 7-31-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	877	N	-	1256	E	9.5' - 14.5	4.6	1.1
2	877	N	-	1256	E	14.5'-19.8	8.1	1.5

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

1315 R

DATE SAMPLED: 7-25-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	878	N	-	1242	E	12' - 15'	6.1	1.4
2	878	N	-	1242	E	12' - 13'	8.1	1.5
3	878	N	-	1242	E	13' - 14'	4.9	1.3
4	878	N	-	1242	E	14' - 15'	3.2	1.3
5	878	N	-	1242	E	15' - 16'	4.3	1.2
6	878	N	-	1242	E	16' - 17'	4.3	1.3
7	878	N	-	1242	E	17' - 18'	4.6	1.1
8	878	N	-	1242	E	18' - 20'	2.5	1.2
9	878	N	-	1242	E	20' - 21'	2.3	1.6
10	878	N	-	1242	E	21' - 22'	1.1	2.5
11	878	N	-	1242	E	22' - 23'	1.9	2.1
12	878	N	-	1242	E	23' - 24'	2.3	1.7
13	878	N	-	1242	E	24' - 25'	1.7	2.1

02-W-09

DATE SAMPLED: 7-18-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	879	N	-	1269	E	8.5' - 13.5	1.8	1.4
2	879	N	-	1269	E	17.5'-22.5	1.9	1.7

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

02-W-30

DATE SAMPLED: 7-31-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	880	N	-	1230	E	17.5'-22.5	2.1	1.4

1316 R

DATE SAMPLED: 7-30-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	884	N	-	1221	E	20' - 25'	2.5	2.1

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

02-W-53

DATE SAMPLED: 8-16-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	898	N	-	1203	E	10' - 15'	1.0	0.6
2	898	N	-	1203	E	15' - 20'	1.5	1.7

02-W-27

DATE SAMPLED: 7-30-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	899	N	-	1208	E	13' - 16'	1.8	0.7

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

02-W-10

DATE SAMPLED: 7-18-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	899	N	-	1264	E	7.5' - 12.5	2.2	1.5
2	899	N	-	1264	E	15.5'-20.5	3.3	2.2

02-W-28

DATE SAMPLED: 7-30-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	900	N	-	1251	E	9.5' - 14.5	4.3	1.6
2	900	N	-	1251	E	18' - 23'	2.1	2.0

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

02-W-01

DATE SAMPLED: 7-15-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	907	N	-	1222	E	8' - 12'	6.1	1.5
2	907	N	-	1222	E	15' - 20'	3.0	2.1

02-W-31

DATE SAMPLED: 7-31-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	909	N	-	1240	E	5.5' - 10.5	6.2	1.2
2	909	N	-	1240	E	15' - 20'	4.1	1.8

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

02-W-55

DATE SAMPLED: 8-16-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	911	N	-	1210	E	0 -1'	2.5	1.2
2	911	N	-	1210	E	1' - 2'	2.3	1.3
3	911	N	-	1210	E	2' - 3'	3.2	1.3
4	911	N	-	1210	E	3' - 4'	2.8	1.3
5	911	N	-	1210	E	4' - 5'	3.3	1.4
6	911	N	-	1210	E	5' - 6'	4.9	1.3
7	911	N	-	1210	E	6' - 7'	8.2	1.3
8	911	N	-	1210	E	7' - 8'	9.5	1.5
9	911	N	-	1210	E	8' - 9'	8.7	1.3
10	911	N	-	1210	E	9' - 10'	8.7	1.2
11	911	N	-	1210	E	10' - 11'	21.3	1.9
12	911	N	-	1210	E	11' - 12'	16.2	1.6
13	911	N	-	1210	E	12' - 13'	18.5	1.7
14	911	N	-	1210	E	13' - 14'	12.8	1.4
15	911	N	-	1210	E	14' - 15'	20.9	1.4
16	911	N	-	1210	E	15' - 16'	7.0	0.7
17	911	N	-	1210	E	16' - 17'	4.0	2.4
18	911	N	-	1210	E	17' - 18'	3.4	2.2
19	911	N	-	1210	E	18' - 19'	3.3	2.1
20	911	N	-	1210	E	19' - 20'	1.4	1.8
21	911	N	-	1210	E	20' - 21'	1.6	1.4
22	911	N	-	1210	E	21' - 22'	2.2	1.7

02-W-57

DATE SAMPLED:

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	914	N	-	1128	E			
2		N	-		E			
3		N	-		E			
4		N	-		E			
5		N	-		E			
6		N	-		E			
7		N	-		E			
8		N	-		E			
9		N	-		E			
10		N	-		E			
11		N	-		E			
12		N	-		E			
13		N	-		E			
14		N	-		E			
15		N	-		E			
16		N	-		E			
17		N	-		E			
18		N	-		E			
19		N	-		E			
20		N	-		E			
21		N	-		E			
22		N	-		E			
23		N	-		E			
24		N	-		E			
25		N	-		E			
26		N	-		E			
27		N	-		E			
28		N	-		E			
29		N	-		E			
30		N	-		E			
31		N	-		E			
32		N	-		E			
33		N	-		E			
34		N	-		E			
35		N	-		E			

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

02-W-02

DATE SAMPLED: 7-15-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	915	N	-	1225	E	0 -1'	2.7	1.1
2	915	N	-	1225	E	1' - 2'	2.9	1.4
3	915	N	-	1225	E	2' - 3'	2.8	1.4
4	915	N	-	1225	E	3' - 4'	7.4	1.3
5	915	N	-	1225	E	4' - 5'	9.6	1.4
6	915	N	-	1225	E	5' - 6'	12.8	1.3
7	915	N	-	1225	E	6' - 7'	12.8	1.5
8	915	N	-	1225	E	7' - 8'	8.6	1.5
9	915	N	-	1225	E	8' - 9'	8.0	1.4
10	915	N	-	1225	E	9' - 10'	7.7	1.6
11	915	N	-	1225	E	10' - 11'	5.8	1.1
12	915	N	-	1225	E	11' - 12'	5.1	1.4
13	915	N	-	1225	E	12' - 13'	3.2	1.9
14	915	N	-	1225	E	13' - 14'	3.1	2.1
15	915	N	-	1225	E	14' - 15'	4.1	2.1
16	915	N	-	1225	E	15' - 16'	3.1	1.6
17	915	N	-	1225	E	16' - 17'	2.6	1.9
18	915	N	-	1225	E	17' - 18'	2.4	2.0

02-W-03

DATE SAMPLED: 7-15-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	917	N	-	1202	E	8' - 13'	9.1	1.2
2	917	N	-	1202	E	15' - 18'	2.6	2.0

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

02-W-15

DATE SAMPLED: 7-22-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	921	N	-	1174	E	9.5' - 12'	1.8	0.7

02-W-54

DATE SAMPLED: 8-16-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	922	N	-	1195	E	0 -1'	3.0	1.5
2	922	N	-	1195	E	1' - 2'	1.4	0.9
3	922	N	-	1195	E	2' - 3'	2.1	1.6
4	922	N	-	1195	E	3' - 4'	2.6	2.2
5	922	N	-	1195	E	4' - 5'	3.3	2.0
6	922	N	-	1195	E	5' - 6'	5.1	2.1
7	922	N	-	1195	E	6' - 7'	3.6	0.9
8	922	N	-	1195	E	7' - 8'	14.9	2.6
9	922	N	-	1195	E	8' - 9'	6.9	1.3
10	922	N	-	1195	E	9' - 10'	8.4	1.6
11	922	N	-	1195	E	10' - 11'	2.1	0.3
12	922	N	-	1195	E	11' - 12'	8.4	1.4
13	922	N	-	1195	E	12' - 13'	5.9	1.2
14	922	N	-	1195	E	13' - 14'	1.0	0.6

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

02-W-04

DATE SAMPLED: 7-16-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	923	N	-	1189	E	3' - 5'	3.3	2.2
2	923	N	-	1189	E	9' - 10'	3.4	1.0
3	923	N	-	1189	E	10' - 15'	4.1	0.4
4	923	N	-	1189	E	15' - 16'	1.6	0.8

02-W-46

DATE SAMPLED: 8-6-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	923	N	-	1232	E	10' - 15'	2.8	2.0
2	923	N	-	1232	E	15' - 19'	3.5	1.9

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

02-W-33

DATE SAMPLED: 8-1-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	927	N	-	1164	E	6' - 11'	1.7	1.0

02-W-22

DATE SAMPLED: 7-26-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	933	N	-	1154	E	0' - 5'	1.2	0.7
2	933	N	-	1154	E	8' - 13'	2.0	0.6

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

02-W-16

DATE SAMPLED: 7-22-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	936	N	-	1170	E	8' - 10'	1.9	1.0
2	936	N	-	1170	E	15' - 17'	2.1	0.5

02-W-05

DATE SAMPLED: 7-16-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	936	N	-	1186	E	5' - 10'	3.0	0.8
2	936	N	-	1186	E	10' - 15'	2.1	0.4

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

02-W-56

DATE SAMPLED: 9-3-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	939	N	-	1122	E		2.1	0.4

02-W-32

DATE SAMPLED: 7-31-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	941	N	-	1219	E	9.5'-14.5'	2.7	0.7
2	941	N	-	1219	E	14.5'-20'	1.3	0.6

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

02-W-49

DATE SAMPLED: 8-8-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	942	N	-	1197	E	6' - 18'	1.8	0.5
2	942	N	-	1197	E	18' - 19'	1.9	0.7

02-W-13

DATE SAMPLED: 7-19-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	947	N	-	1234	E	7' - 12'	2.4	1.6
2	947	N	-	1234	E	19' - 24'	1.6	1.0

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

02-W-07

DATE SAMPLED: 7-17-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	954	N	-	1193	E	7' - 8'	2.8	2.1
2	954	N	-	1193	E	5' - 10'	2.9	1.1
3	954	N	-	1193	E	10' - 15'	2.0	0.4
4	954	N	-	1193	E	15' - 20	2.3	0.3
5	954	N	-	1193	E	20' - 22'	0.8	0.5

02-W-23

DATE SAMPLED: 7-26-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	955	N	-	1152	E	9.5' - 15'	1.0	0.5
2	955	N	-	1152	E	20' - 22.5'	1.9	0.6

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

02-W-17

DATE SAMPLED: 7-22-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	955	N	-	1167	E	8' - 13'	2.2	0.7
2	955	N	-	1167	E	15' - 23'	1.3	0.4
3	955	N	-	1167	E	22.5' - 23'	0.6	0.8

02-W-06

DATE SAMPLED: 7-17-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	955	N	-	1182	E	0' - 1'	2.2	1.3
2	955	N	-	1182	E	1' - 2'	2.9	1.8
3	955	N	-	1182	E	2' - 3'	3.3	1.7
4	955	N	-	1182	E	3' - 4'	2.4	1.2
5	955	N	-	1182	E	4' - 5'	1.8	0.6
6	955	N	-	1182	E	5' - 10'	2.5	1.1
7	955	N	-	1182	E	20' - 21.5'	1.2	0.9

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

02-W-08

DATE SAMPLED: 7-17-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	956	N	-	1208	E	0' - 1'	2.6	1.5
2	956	N	-	1208	E	1' - 2'	2.8	1.4
3	956	N	-	1208	E	2' - 3'	2.9	1.4
4	956	N	-	1208	E	3' - 4'	1.8	1.4
5	956	N	-	1208	E	4' - 5'	2.4	1.4
6	956	N	-	1208	E	10' - 11'	3.6	1.6
7	956	N	-	1208	E	11' - 12'	3.1	1.7
8	956	N	-	1208	E	12' - 13'	2.5	1.0
9	956	N	-	1208	E	13' - 14'	2.2	0.9
10	956	N	-	1208	E	14' - 15'	2.7	0.5
11	956	N	-	1208	E	15' - 16'	1.4	0.4
12	956	N	-	1208	E	16' - 17'	2.7	0.3
13	956	N	-	1208	E	17' - 18'	1.9	0.4
14	956	N	-	1208	E	18' - 19'	1.5	0.3
15	956	N	-	1208	E	20' - 21'	3.1	2.2
16	956	N	-	1208	E	21' - 22'	3.7	2.7
17	956	N	-	1208	E	22' - 23'	2.1	1.6

02-W-12

DATE SAMPLED: 7-19-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	963	N	-	1226	E	8' - 13'	2.3	1.1
2	963	N	-	1226	E	20' - 25'	1.5	0.4

CIMARRON CORPORATION

CIMARRON CORPORATION

Burial Ground #1 Investigation

Soil Sample Data (Bkg. Not Subtracted)

APPENDIX C

ATTACHMENT 2

02-W-24

DATE SAMPLED: 7-26-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	969	N	-	1167	E	9' - 16'	1.8	0.5
2	969	N	-	1167	E	23' - 24'	1.8	0.3
3	969	N	-	1167	E	25' - 25.5'	1.4	0.8
4	969	N	-	1167	E	24' - 26'	2.2	0.6

02-W-19

DATE SAMPLED: 7-23-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	969	N	-	1188	E	7.5' - 15'	2.1	1.2
2	969	N	-	1188	E	15' - 20'	2.4	0.6

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

02-W-14

DATE SAMPLED: 7-19-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	969	N	-	1208	E	8' - 13'	3.2	1.0
2	969	N	-	1208	E	21' - 26'	1.7	1.0

02-W-11

DATE SAMPLED: 7-18-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	969	N	-	1222	E	8' - 15'	2.9	1.3
2	969	N	-	1222	E	20' - 25'	1.6	0.4

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

02-W-21

DATE SAMPLED: 7-25-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	970	N	-	1149	E	0' - 5'	2.7	0.8
2	970	N	-	1149	E	11' - 12.5'	1.3	0.5
3	970	N	-	1149	E	20' - 25'	1.9	0.5

02-W-18

DATE SAMPLED: 7-23-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	981	N	-	1194	E	0' - 1'	2.2	1.9
2	981	N	-	1194	E	1' - 2'	2.6	1.3
3	981	N	-	1194	E	2' - 3'	2.7	1.5
4	981	N	-	1194	E	3' - 4'	1.8	1.8
5	981	N	-	1194	E	4' - 5'	2.0	1.4
6	981	N	-	1194	E	5' - 6'	2.0	1.6
7	981	N	-	1194	E	6' - 7'	1.8	0.7
8	981	N	-	1194	E	10' - 15'	2.1	0.8
9	981	N	-	1194	E	10' - 15'	3.0	0.8
10	981	N	-	1194	E	15' - 20'	1.5	0.7
11	981	N	-	1194	E	25' - 25.5'	0.8	1.0
12	981	N	-	1194	E	25.5' - 26'	0.3	0.9

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

02-W-38

DATE SAMPLED: 8-2-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	982	N	-	1208	E	21' - 26'	1.4	0.7

02-W-34

DATE SAMPLED: 8-1-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	984	N	-	1145	E	9' - 14'	1.6	0.4

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

02-W-36

DATE SAMPLED: 8-2-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	984	N	-	1165	E	20' - 25'	1.4	0.6

02-W-44

DATE SAMPLED: 8-6-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	999	N	-	1203	E	10' - 15'	1.2	0.5
2	999	N	-	1203	E	22' - 26.5'	1.6	0.5

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

02-W-37

DATE SAMPLED: 8-2-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1000	N	-	1188	E	20' - 25'	1.8	0.4

02-W-35

DATE SAMPLED: 8-1-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1001	N	-	1166	E	9' - 14'	1.1	0.4

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

02-W-45

DATE SAMPLED: 8-6-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1014	N	-	1178	E	10' - 15'	2.0	0.3
2	1014	N	-	1178	E	23' - 28'	3.8	0.9

02-W-43

DATE SAMPLED: 8-6-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1016	N	-	1188	E	20' - 27.5'	1.7	0.4

CIMARRON CORPORATION
CIMARRON FACILITY
Burial Ground #1 Investigation
Soil Sample Data (Bkg. Not Subtracted)
APPENDIX C

02-W-48

DATE SAMPLED: 8-7-02

LN #	SAMPLE LOCATION					DEPTH	TOTAL U pCi/g	Th (Nat) pCi/g
1	1075	N	-	1219	E	5' - 10'	1.5	0.4
2	1075	N	-	1219	E	10' - 15'	1.6	0.6
3	1075	N	-	1219	E	15' - 20'	2.6	0.4
4	1075	N	-	1219	E	20' - 25'	2.4	0.7
5	1075	N	-	1219	E	25' - 30'	2.2	0.5
6	1075	N	-	1219	E	30' - 31'	2.2	0.6
7	1075	N	-	1219	E	29' - 34'	1.8	0.6
8	1075	N	-	1219	E	34' - 39'	1.5	0.7
9	1075	N	-	1219	E	39' - 44'	1.2	1.0
10	1075	N	-	1219	E	44' - 49'	2.1	1.7

Appendix D

Aquifer Test Data

Detailed Evaluation Aquifer (Pumping) Test

Prior to the 02W56 aquifer test, a step drawdown test was conducted to select an optimal pumping rate for the test. The step drawdown test was conducted with pumping rates of 8.7 gallons per minute (gpm), 18.4 gpm, and 32.7 gpm for each step used (i.e., 30 minutes at most). It was determined that a rate of 26 gpm would be used.

A baseline water level was recorded in 02W56 from September 7, 2002 to October 15, 2002 (prior to the aquifer test). During the period of September 27 through October 4, 2002, the measured depth to water in well 02W56 dropped from 6.64 feet to 6.92 feet. On October 3, 2002, the Cimarron rain gauge located near the main gate recorded 0.6 inches of precipitation at the Facility. On October 7, 2002, the depth to water in well 02W56 was recorded to be 6.45 feet. It was further confirmed from the Cimarron River gauging station located approximately 10 miles east of the BA#1 area at Guthrie, Oklahoma that the elevation of the Cimarron River increased during the same time. It appeared, then that the rise of the water table in the aquifer was directly related to the increase of the river stage. Later observations of the river stage and water level elevation in the well confirmed this relationship.

It was decided to start the step drawdown test when the aquifer water table stabilized or had at least entered a declining phase. On October 15, 2002, 7:05 P.M., the step drawdown test was conducted. Prior to the test, the baseline water level showed a declining trend at a rate of 3×10^{-5} ft/min (the following pages include the calibration curve showing the R square to be 0.91). With this information, the aquifer test data was corrected by the declining rate of the measured water level in well 02W56.

Jacob's semi-log graphical approach was used for analysis of the aquifer test data and recovery data (i.e., ratio t/t' vs. residual drawdown). The value of μ is less than 0.05 so the modified non-equilibrium equation is applicable for data analyses (Driscoll, 1986). A distance-drawdown analysis was also conducted. It is believed that the distance-drawdown data is more representative of a larger volume of the aquifer (Kruseman and Ridder, 2000). Comparing a theoretical drawdown of 2.08 ft to the actual drawdown of 2.20 ft after 35.3 hours of pumping from 02W56, a projected well efficiency for 02W56 of 94.5% is calculated. The well specific capacity was estimated to be 11.8 gpm/ft. This appendix includes the aquifer test results and the associated graphs for the test well and each observation well.

Figure 10, in the main report, was prepared using slug and aquifer test data. Hydraulic conductivities estimated using the Bouwer & Rice method were used in creating the map. For aquifer test well 02W56, the distance-drawdown data was used. For observation wells 02W59, 02W60, 02W61, and 02W22, hydraulic conductivities estimated from the recovery data were used for the map. Note that

the aquifer test on 02W56 gives a hydraulic conductivity of 8.3 x 10^{-2} cm/sec (Jacob's semi-log t/t' vs. residual drawdown) compared to the slug test data of 4.2 x 10^{-2} cm/sec (Bouwer & Rice).

For 02W56, the sieve analysis yielded a hydraulic conductivity of 1.7 x 10^{-2} cm/sec (Table 4 in the main report). The aquifer tests conducted on well TMW-1 and TMW-13 in September 2000 yielded a hydraulic conductivity of 1.0 to 2.1 x 10^{-5} cm/sec and 5.4 x 10^{-2} to 7.2 x 10^{-2} cm/sec, respectively compared to the slug test result of 6.35 x 10^{-5} cm/sec (Bouwer & Rice) and 6.99 x 10^{-2} cm/sec (Bouwer & Rice) cm/sec. In general, the slug test and aquifer test data are in the same order of magnitude.

The estimated storage coefficient, S, yielded a range of from 0.001 to 0.01 which is much lower than the literature values of 0.01 to 0.30 for typical unconfined aquifers (Cherry and Freeze, 1979). One plausible explanation is that the aquifer test was conducted during "high" water table conditions resulting in lower S values. The lower S values may reflect the fact that releases from storage in the aquifer represent the primary effects of water expansion and aquifer compaction caused by changes in the fluid pressure, where releases from the actual dewatering of the soil pores represent only the secondary effect. A similar case was identified in Bumb, et al (1997) showing the possibility of having low S values (i.e., 7.8 x 10^{-5} to 1.6 x 10^{-3}) during the "confined" conditions and high S (or specific yield) values (i.e., 0.1) during "unconfined" conditions due to direct recharge. Specific yields as determined from 23 selected aquifer tests conducted in the Cimarron River "groundwater basin" ranged from 0.0066 to 0.39, with a median value of 0.067 (United States Geological Survey, 1995). The Cimarron aquifer is deemed to be "transiently confined" due to the rise of the Cimarron River elevation.

Figure 5, in the main report, presents a map showing the B-B´ cross section with a silty clay layer on the top of the aquifer. The layer may have served as a confining layer when the water table was "high". During the period of "low" water elevation, a higher value of S in the range of 0.1 to 0.30 is expected.

References

Bouwer, H. and Rice, R.C., "A Slug Test for Determining Hydraulic Conductivity of Unconfined Aquifers with Completely or Partially Penetrating Wells", Water Resources Research, 12(3), 423, 1976.

Bumb, A.C., Mitchell, J.T., and Gifford, S.K., "Design of a Ground-Water Extraction/Reinjection System at a superfund Site Using MODFLOW", Ground Water, Vol. 35, No. 3, May-June, 1997, pp. 400-408.

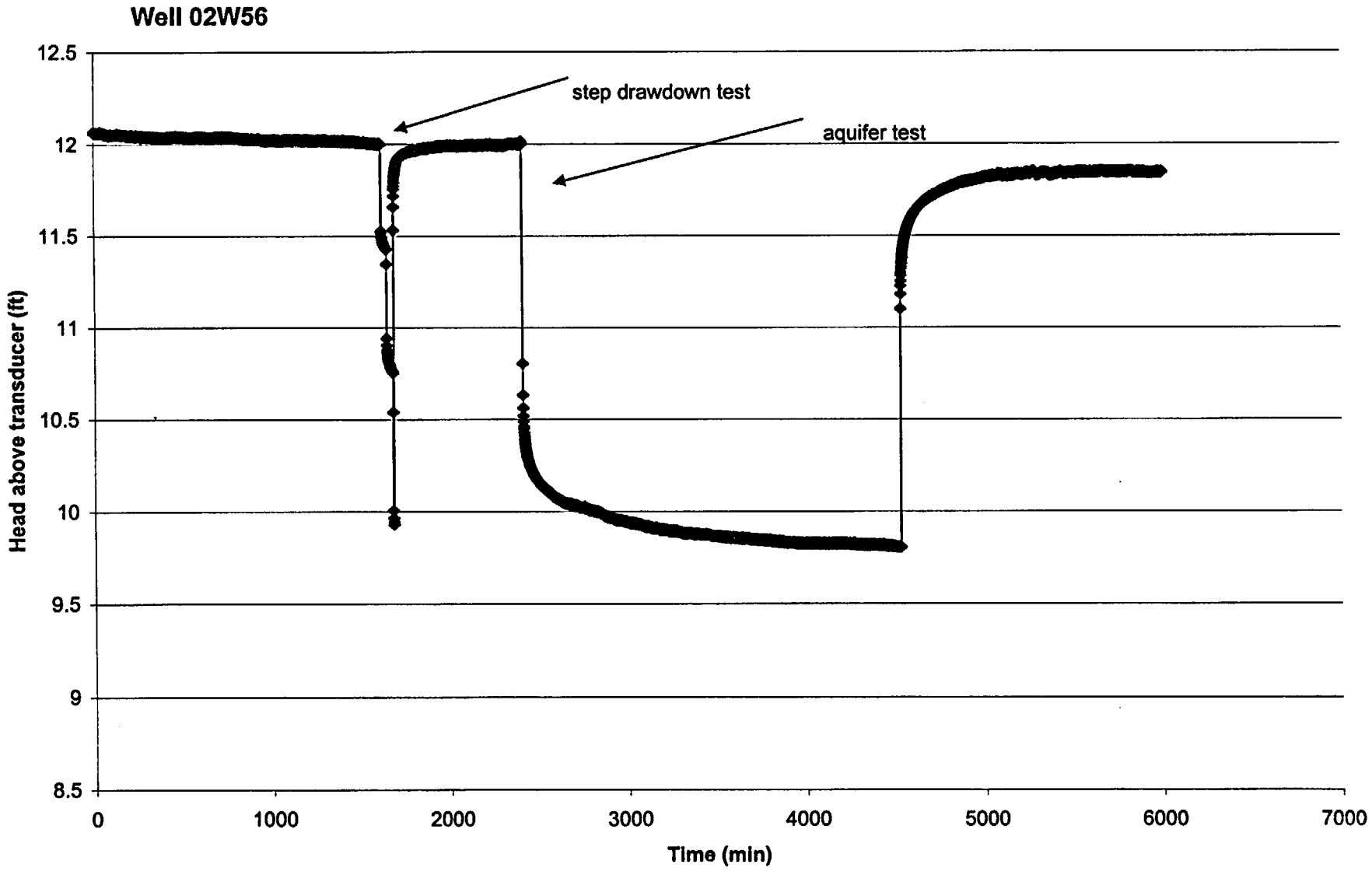
Cherry, J.A. and Freeze, R.A., Groundwater, Prentice Hall, Englewood Cliffs, New Jersey, 1979, p. 61.

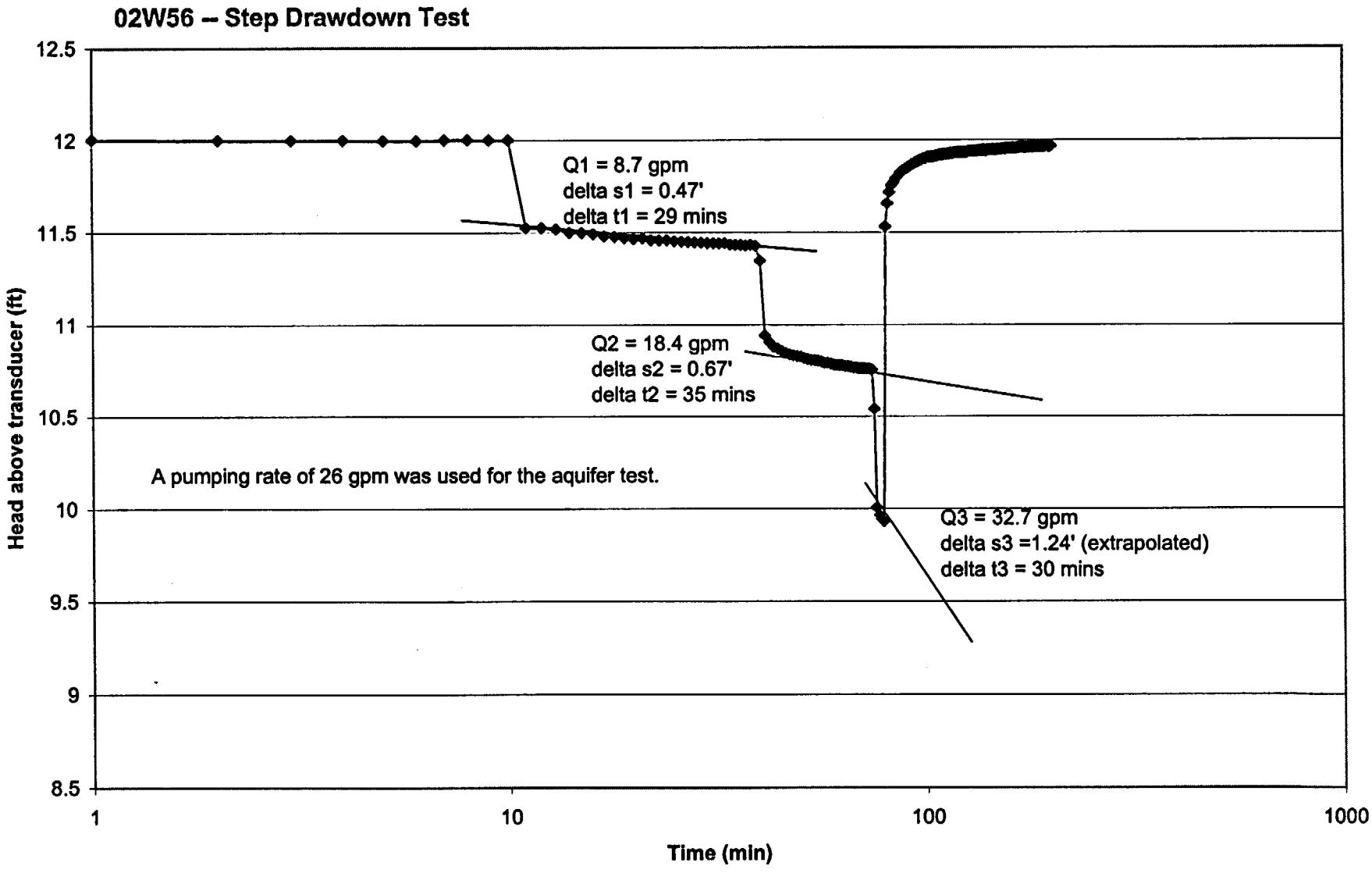
Driscoll, F.G., Groundwater and Wells, Johnson Filtration, Inc., Minnesota, 1986, pp. 218-221.

Kruseman, G.P. and de Ridder, N.A., Analysis and Evaluation of Pumping Test Data, 2nd edition, ILRL Publication 47, International Institute for Land Reclamation and Improvement, 2000, pp. 32-33.

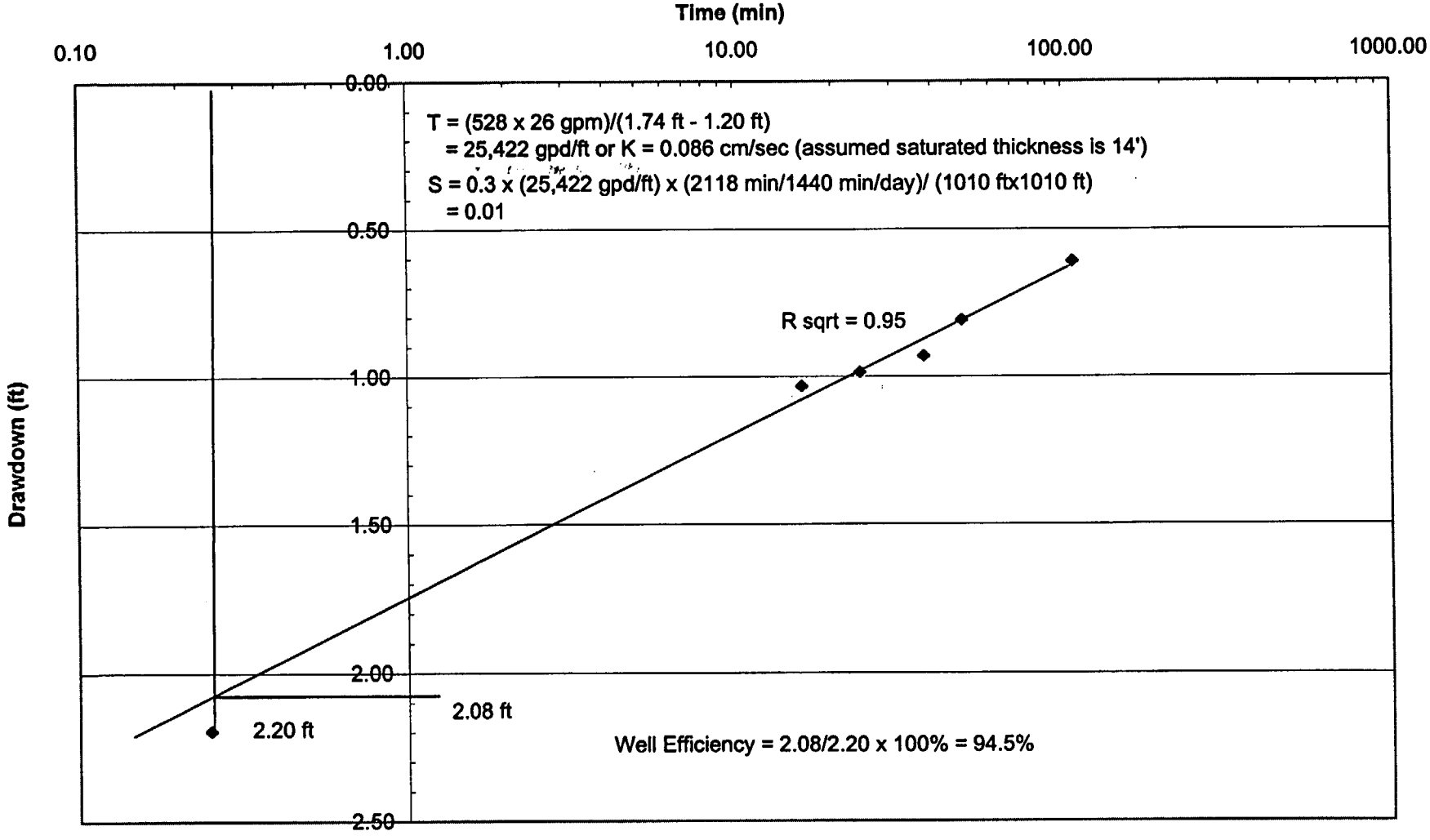
United States Geological Survey, "Geohydrology of Alluvium and Terrace Deposits of the Cimarron River from Freedom to Guthrie, Oklahoma", Water Resources Investigations Report 95-4066, 1995, p. 23.

WELL 02W56

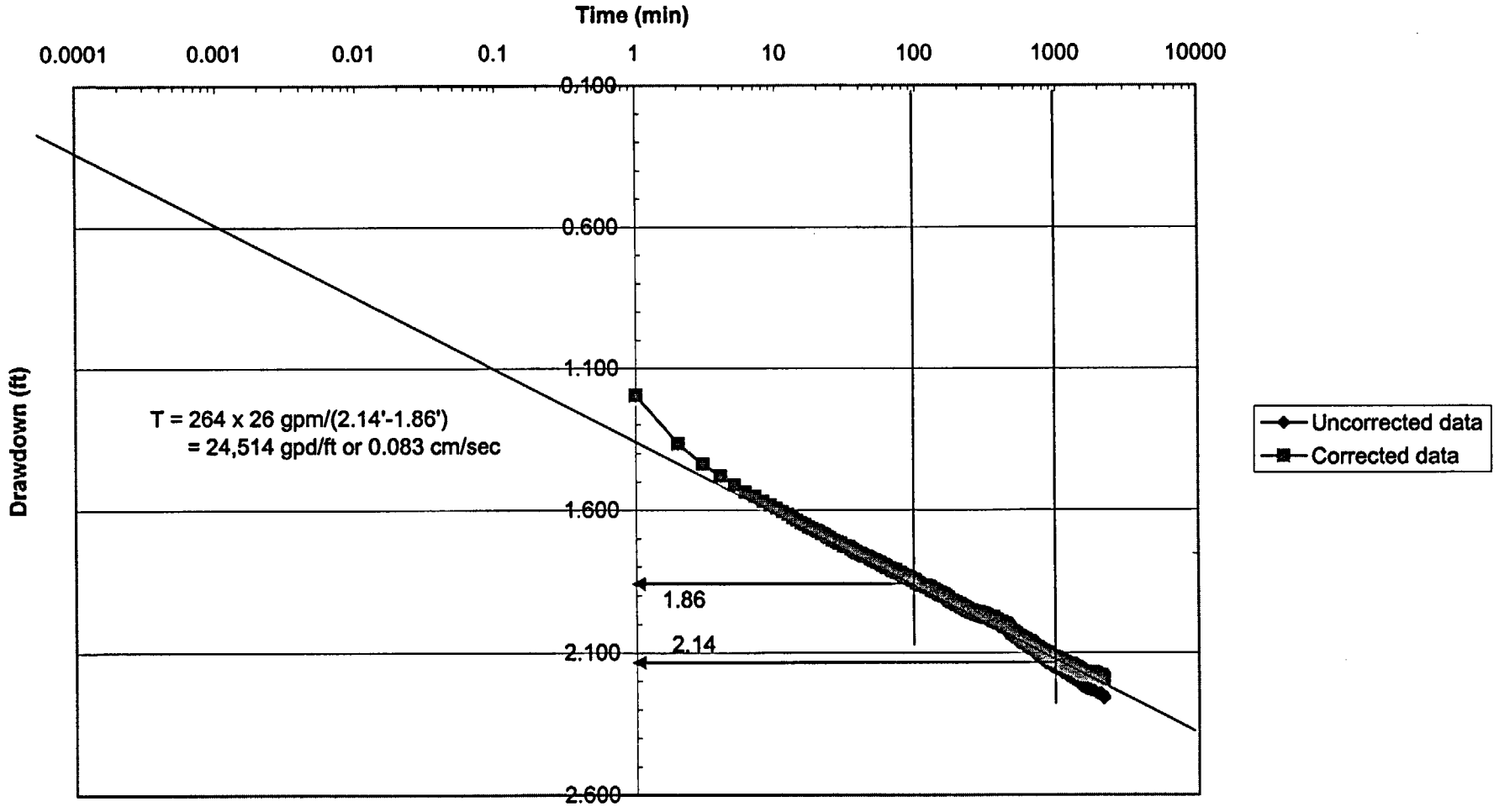

Well 02W56
step drawdown test
aquifer test
Head above transducer (ft)
12.5
12
11.5
11
10.5
10
9.5
9
8.5
0
1000
2000
3000
4000
5000
6000
7000
Time (min)

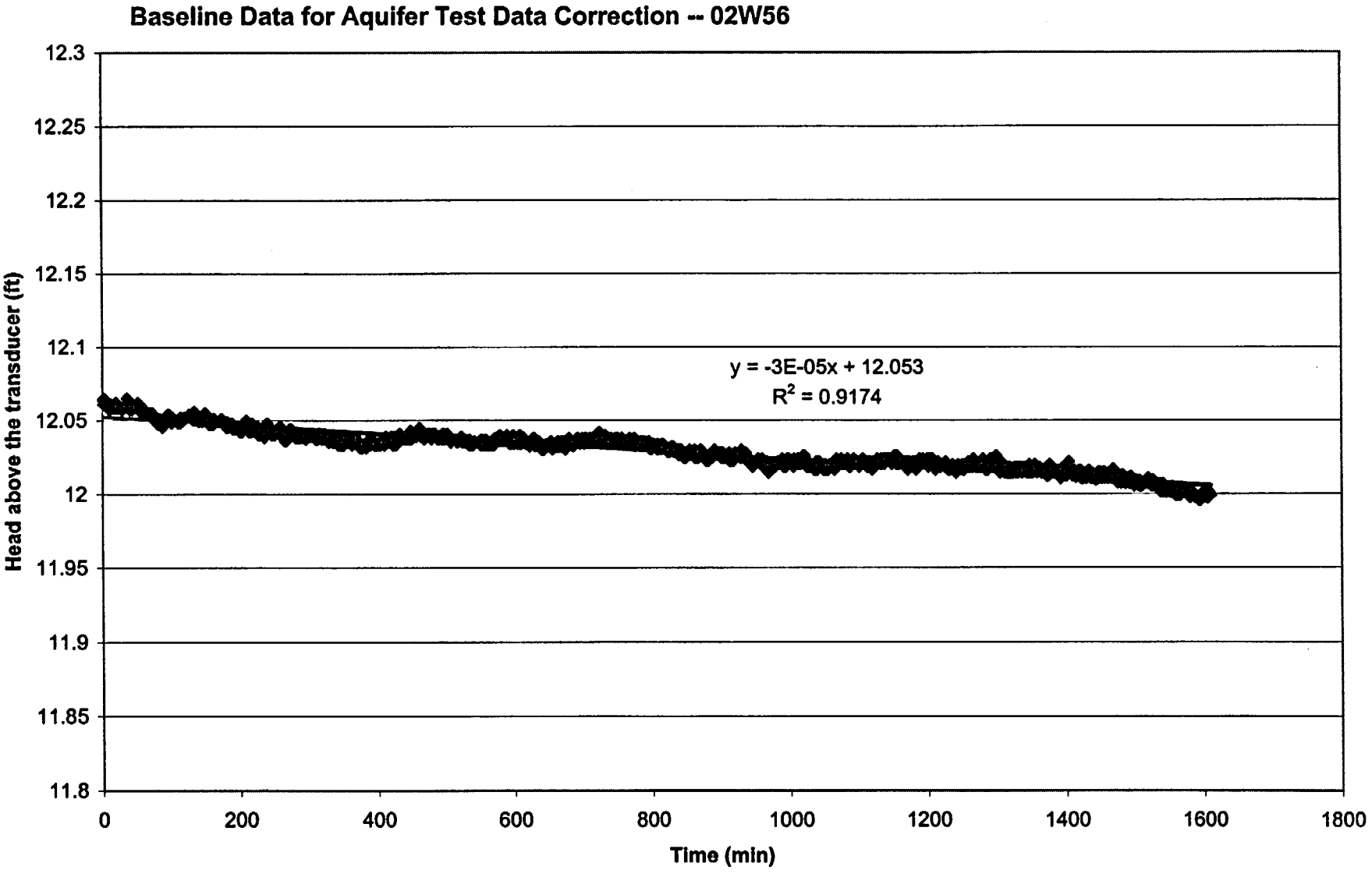

02W56 -- Step Drawdown Test
12.5
12
11.5
11
10.5
10
9.5
9
8.5
Head above transducer (ft)
1
10
100
1000
Time (min)
Q1 = 8.7 gpm
delta s1 = 0.47'
delta t1 = 29 mins
Q2 = 18.4 gpm
delta s2 = 0.67'
delta t2 = 35 mins
A pumping rate of 26 gpm was used for the aquifer test.
Q3 = 32.7 gpm
delta s3 =1.24' (extrapolated)
delta t3 = 30 mins

Distance-Drawdown Analysis
After 35.3 Hours of Pumping from Well 02W56

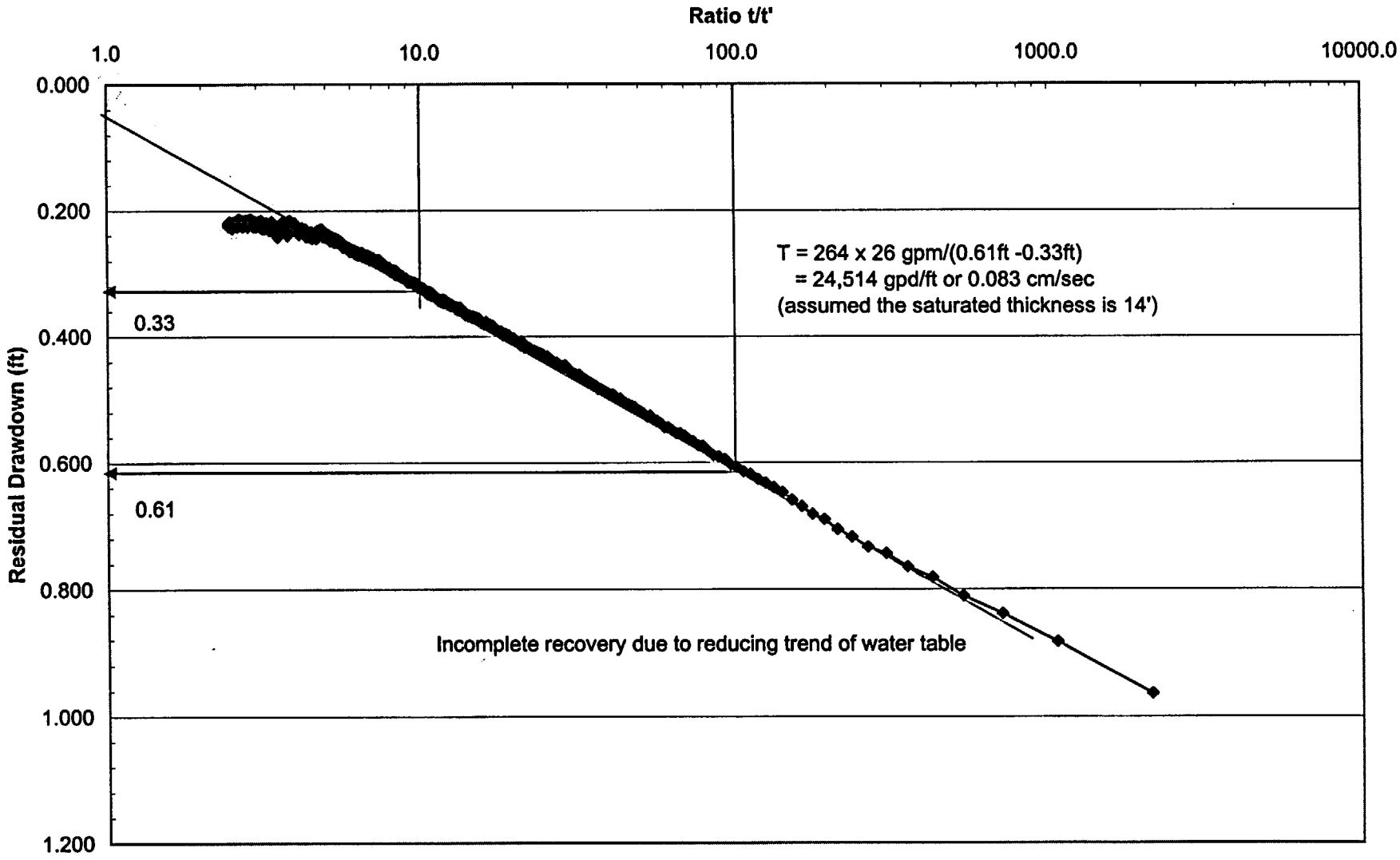


Jacobs Semi-Log Analysis of Time vs Drawdown for 02W56

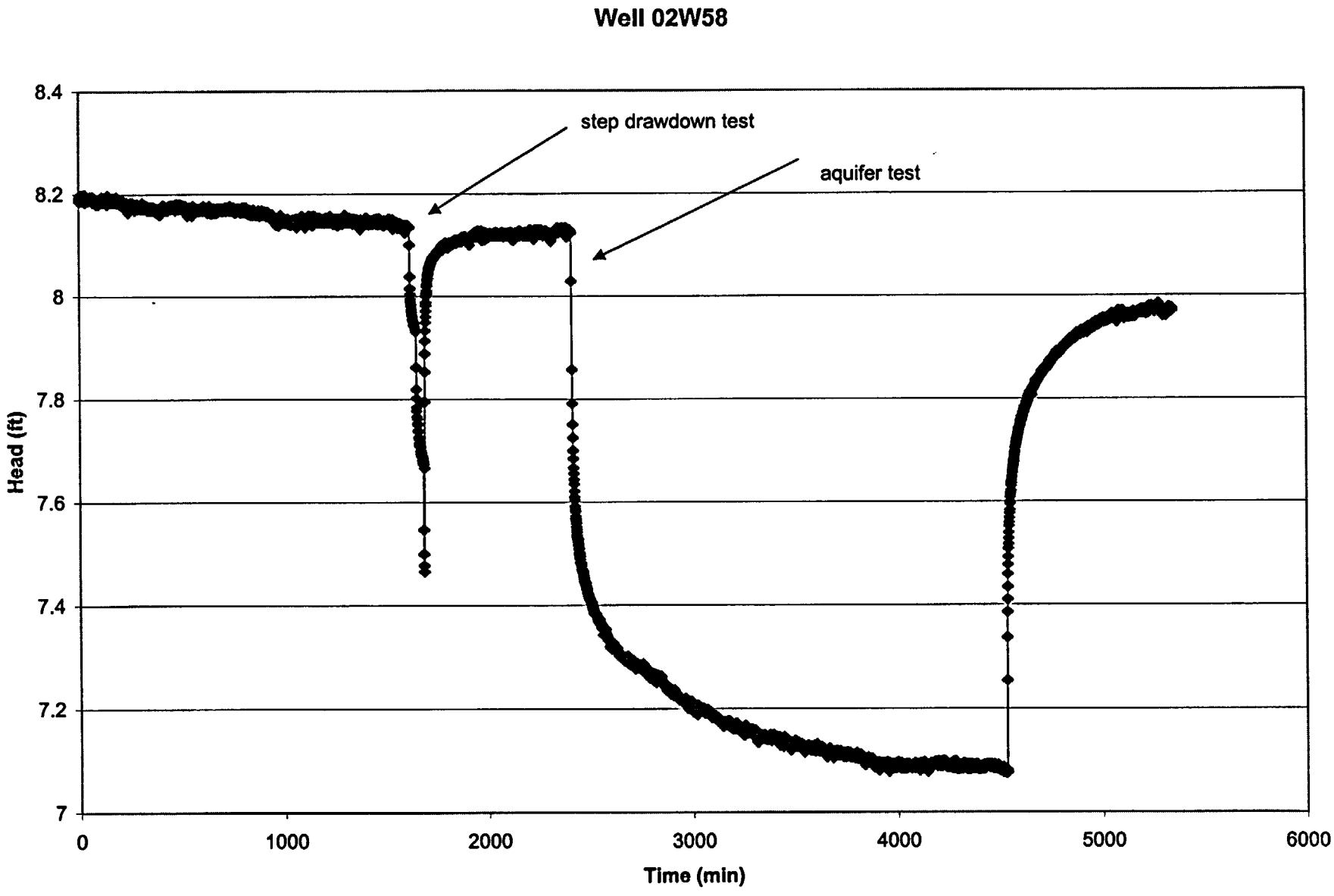


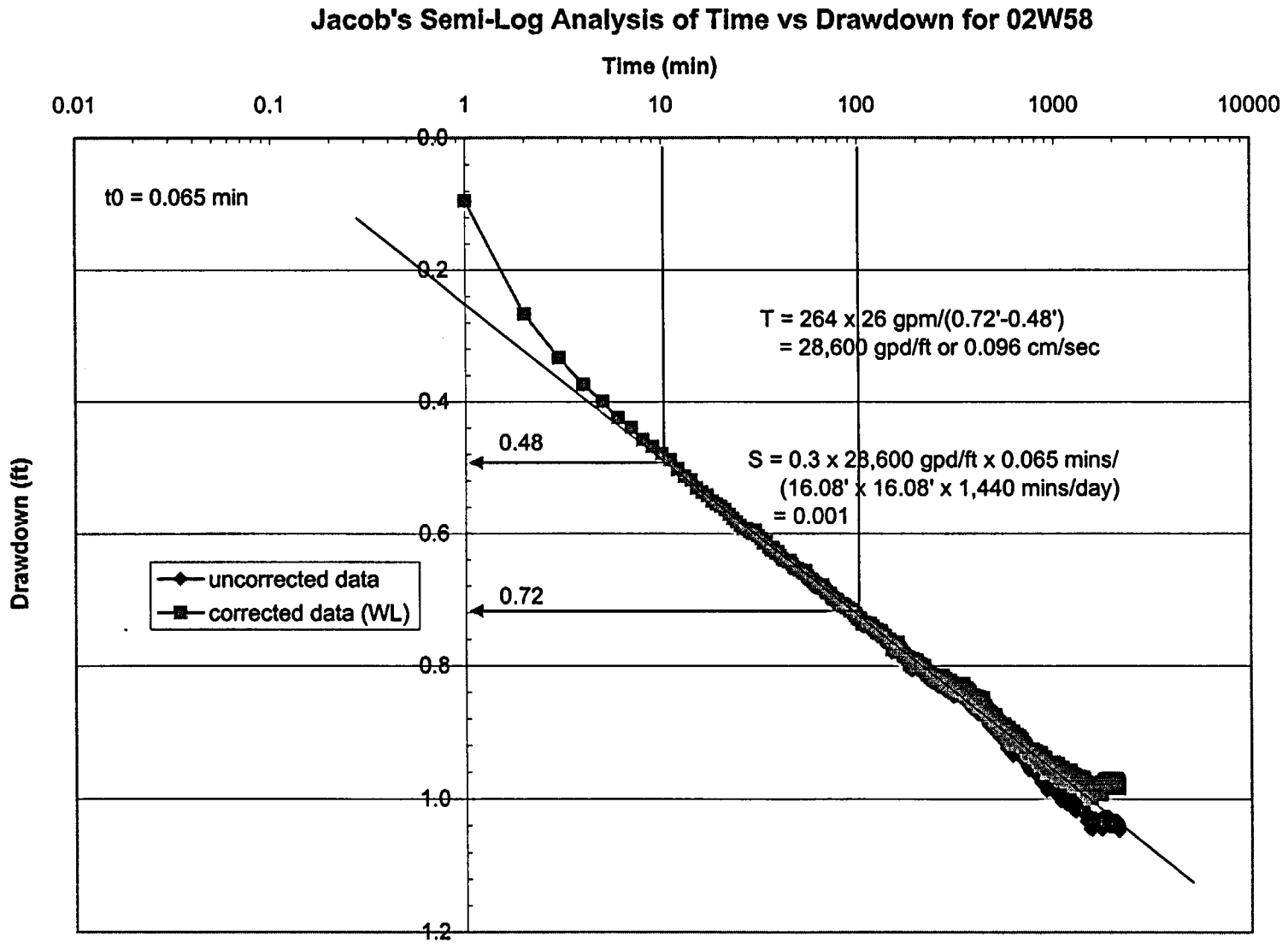

Baseline Data for Aquifer Test Data Correction -- 02W56
Head above the transducer (ft)
12.3
12.25
12.2
12.15
12.1
12.05
12
11.95
11.9
11.85
11.8
y = -3E-05x + 12.053
R2 = 0.9174
0
200
400
600
800
1000
1200
1400
1600
1800
Time (min)

Jacob's Semi-Log Analysis of t/t' vs Residual Drawdown Data for 02W56

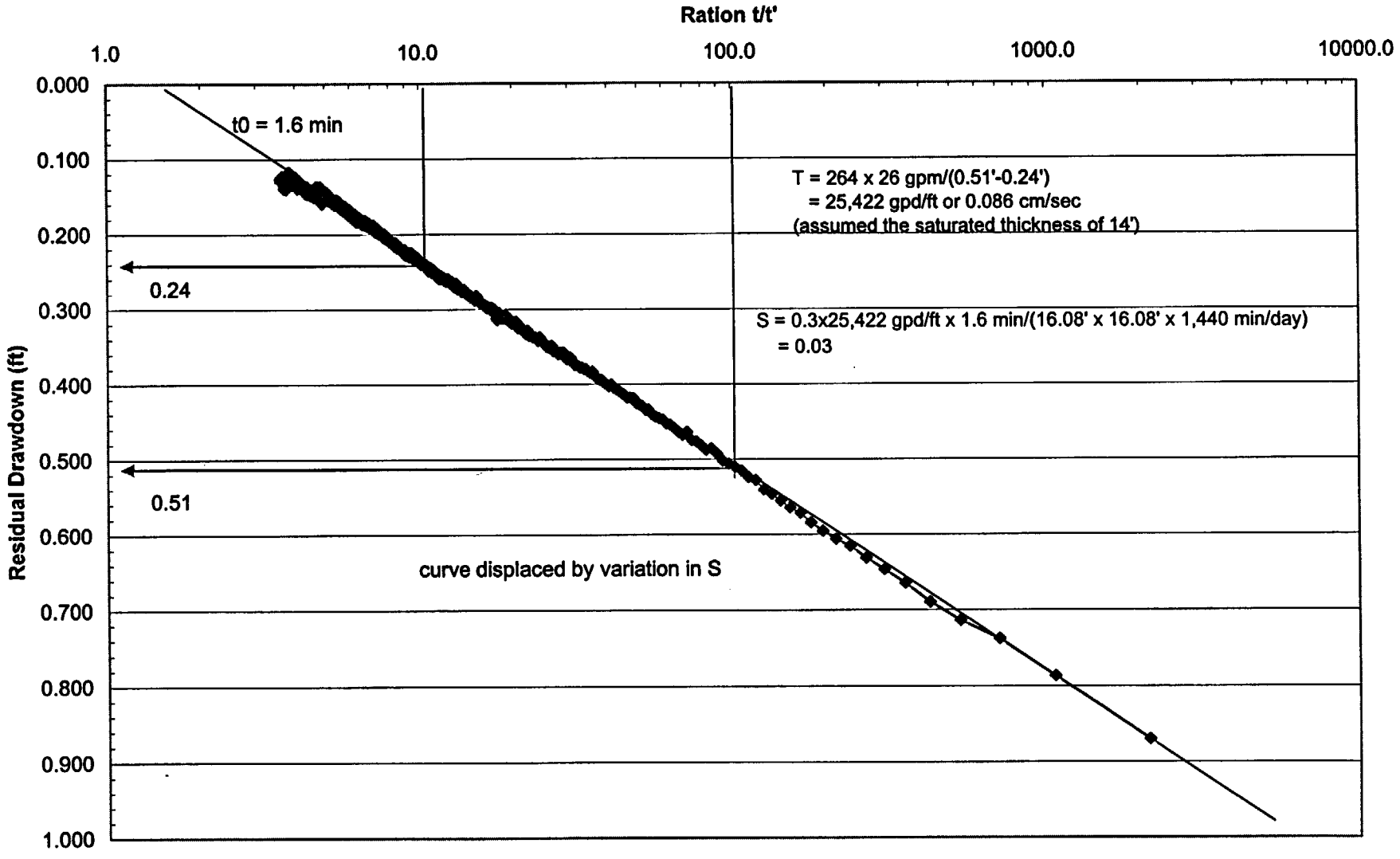


WELL 02W58

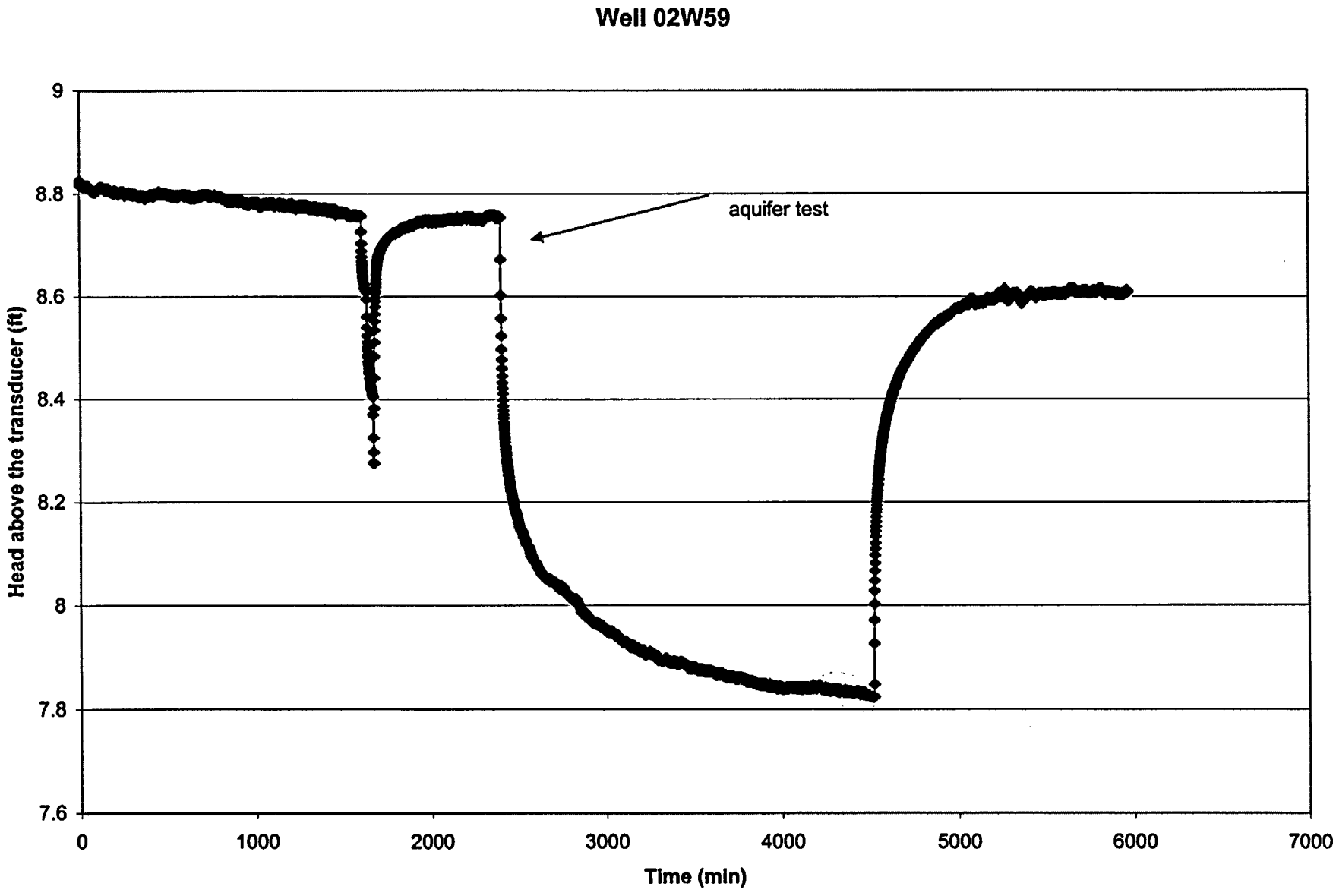

Well 02W58
step drawdown test
aquifer test
8.4
8.2
8
7.8
7.6
7.4
7.2
7
Head (ft)
0
1000
2000
3000
4000
5000
6000
Time (min)


Jacob's Semi-Log Analysis of Time vs Drawdown for 02W58
Time (min)
0.01
0.1
1
10
100
1000
10000
Drawdown (ft)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
t0 = 0.065 min
T = 264 x 26 gpm/(0.72'-0.48')
= 28,600 gpd/ft or 0.096 cm/sec
0.48
S = 0.3 x 28,600 gpd/ft x 0.065 mins/
(16.08' x 16.08' x 1,440 mins/day)
= 0.001
0.72
uncorrected data
corrected data (WL)

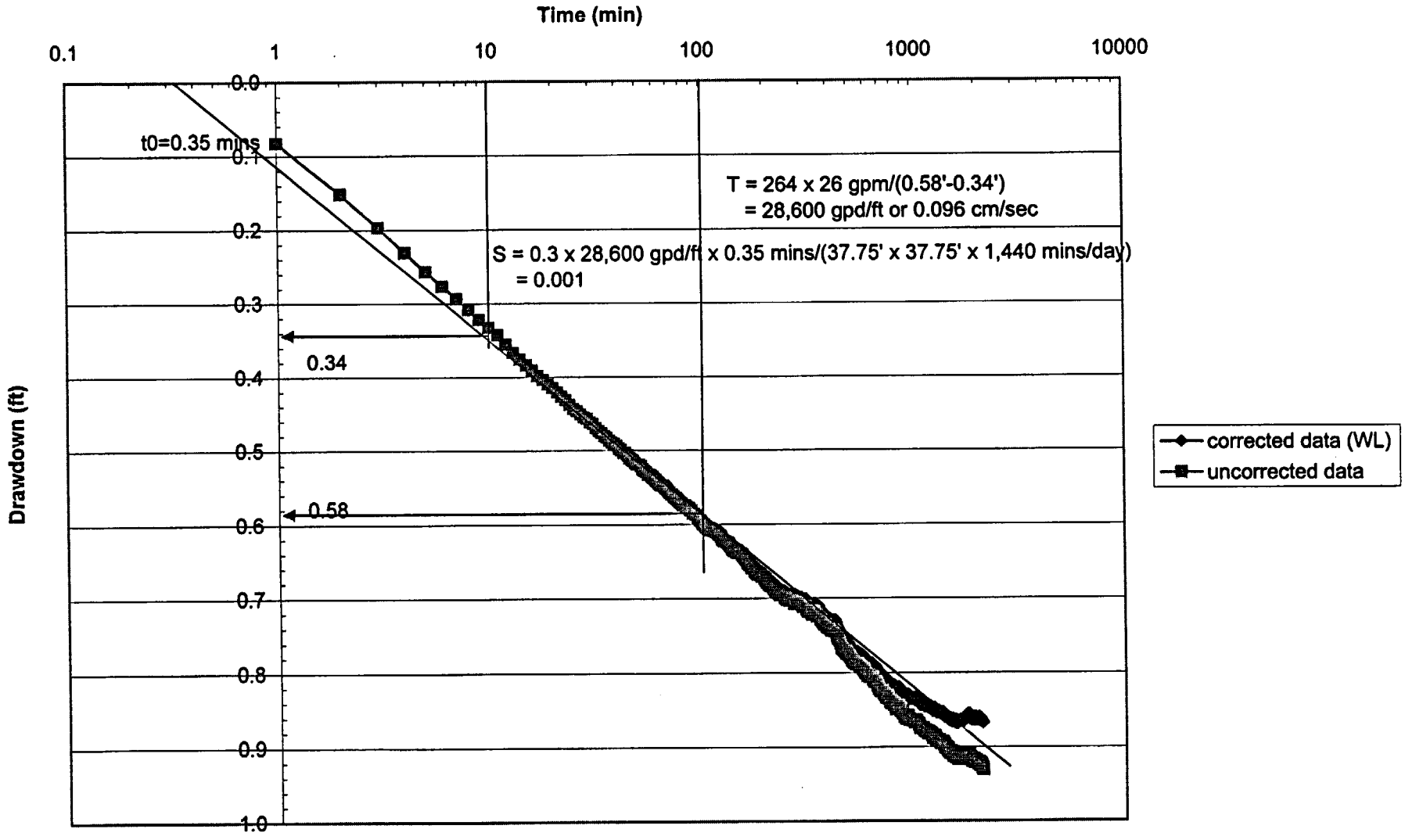
Jacob's Semi-Log Analysis of t/t' vs Residual Drawdown Data for 02W58



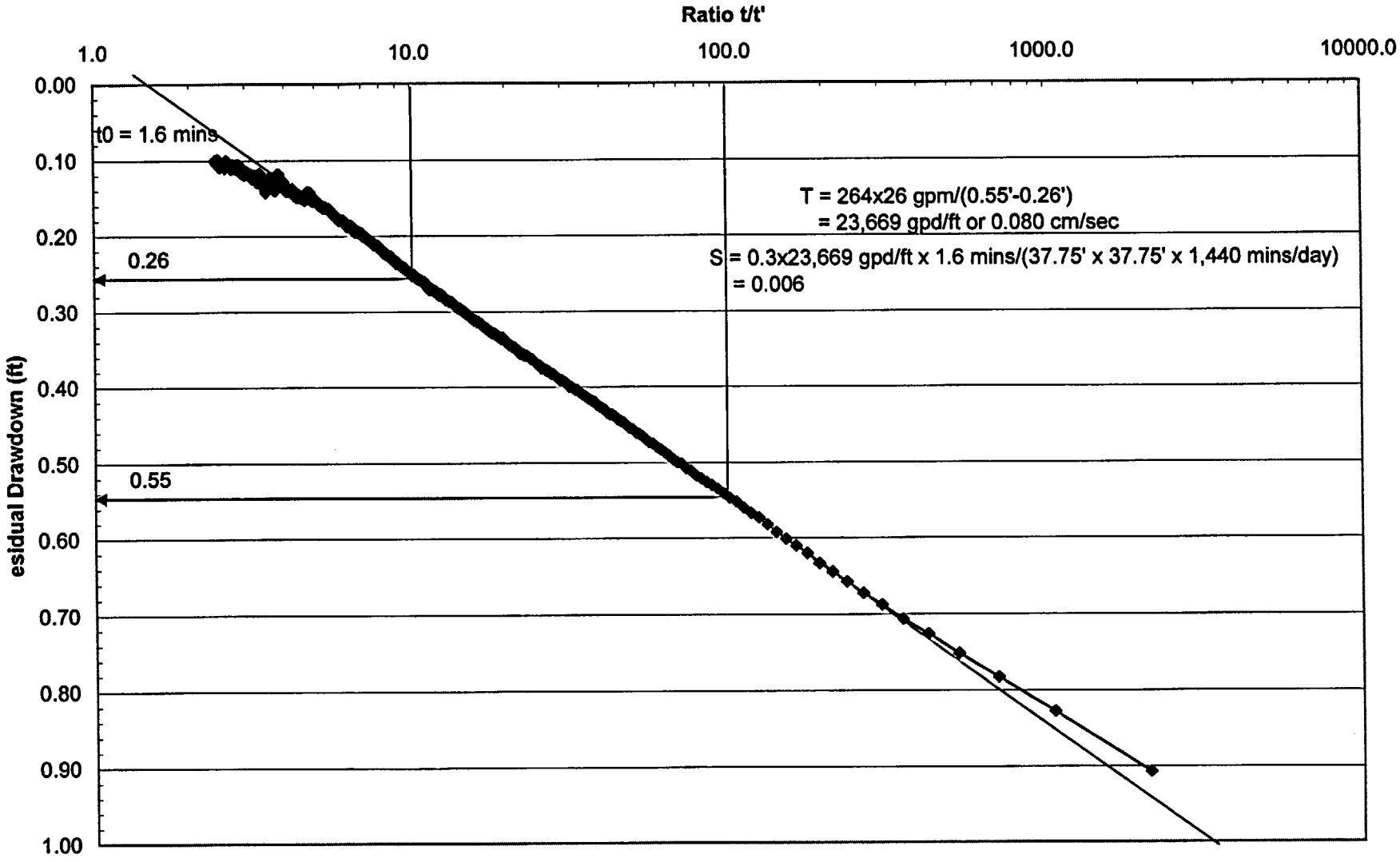
WELL 02W59


Well 02W59
aquifer test
Head above the transducer (ft)
9
8.8
8.6
8.4
8.2
8
7.8
7.6
0
1000
2000
3000
4000
5000
6000
7000
Time (min)

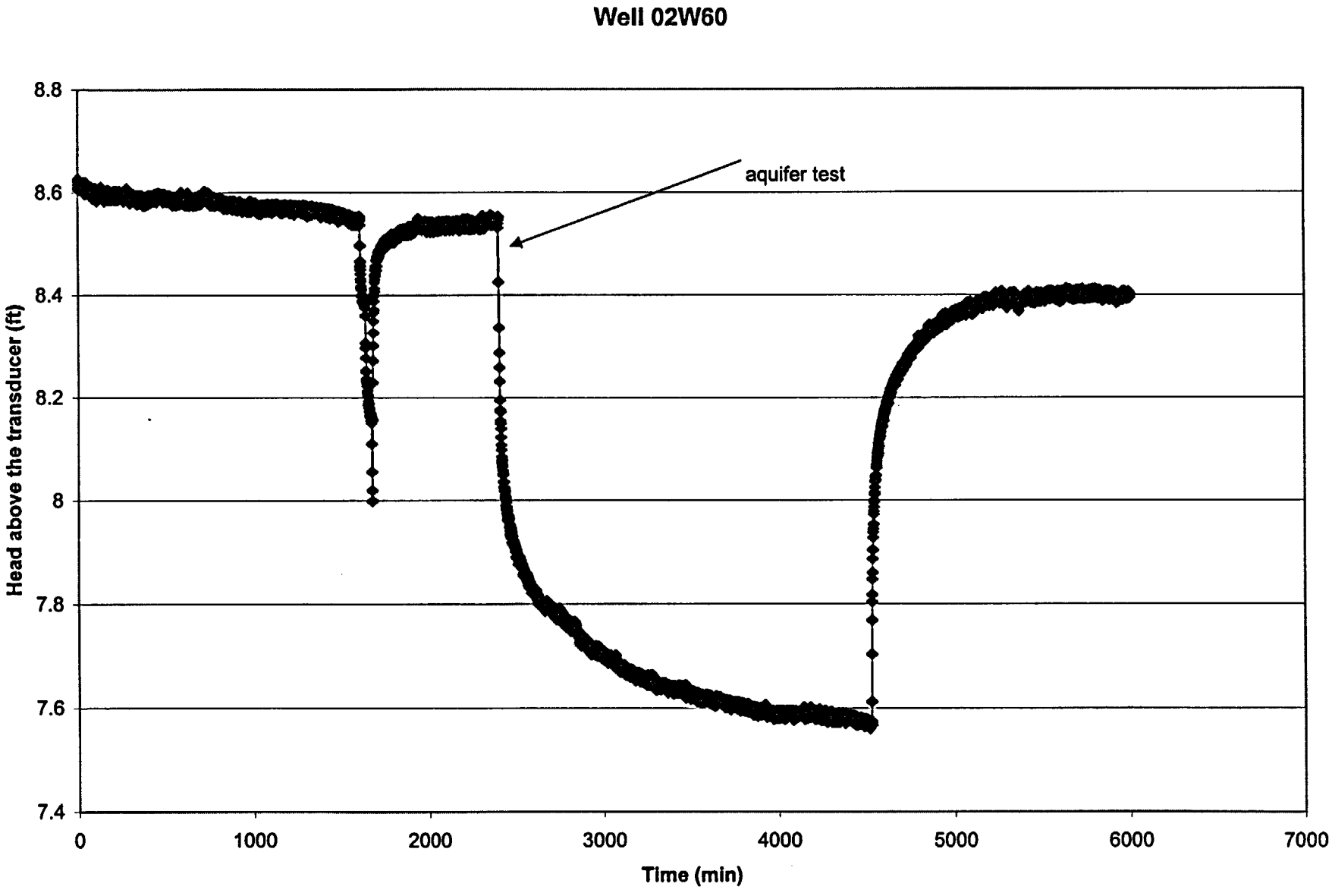
Jacob's Semi-Log Analysis of Time vs Drawdown for 02W59



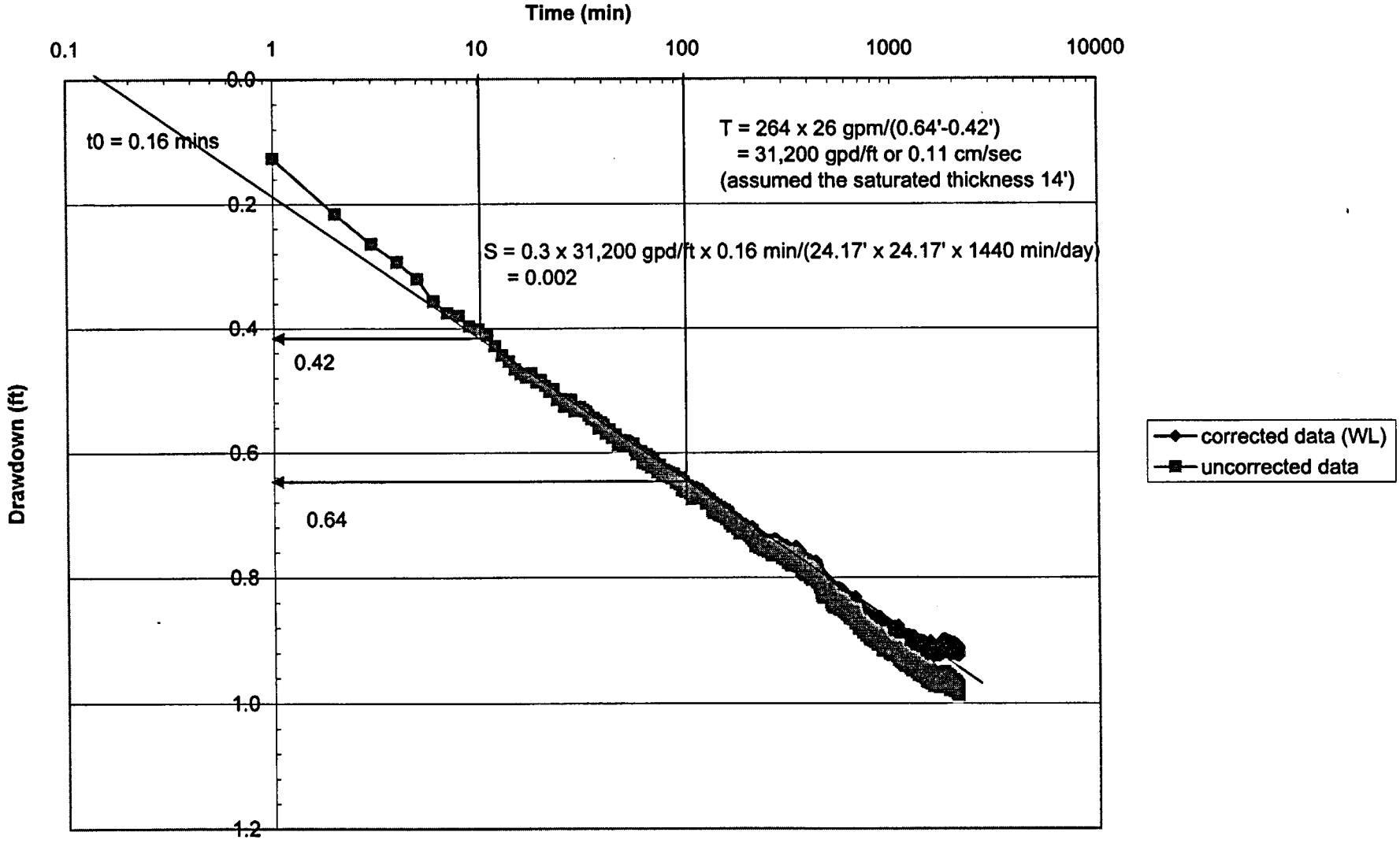
Jacob's Semi-Log Analysis of t/t' vs Residual Drawdown for 02W59



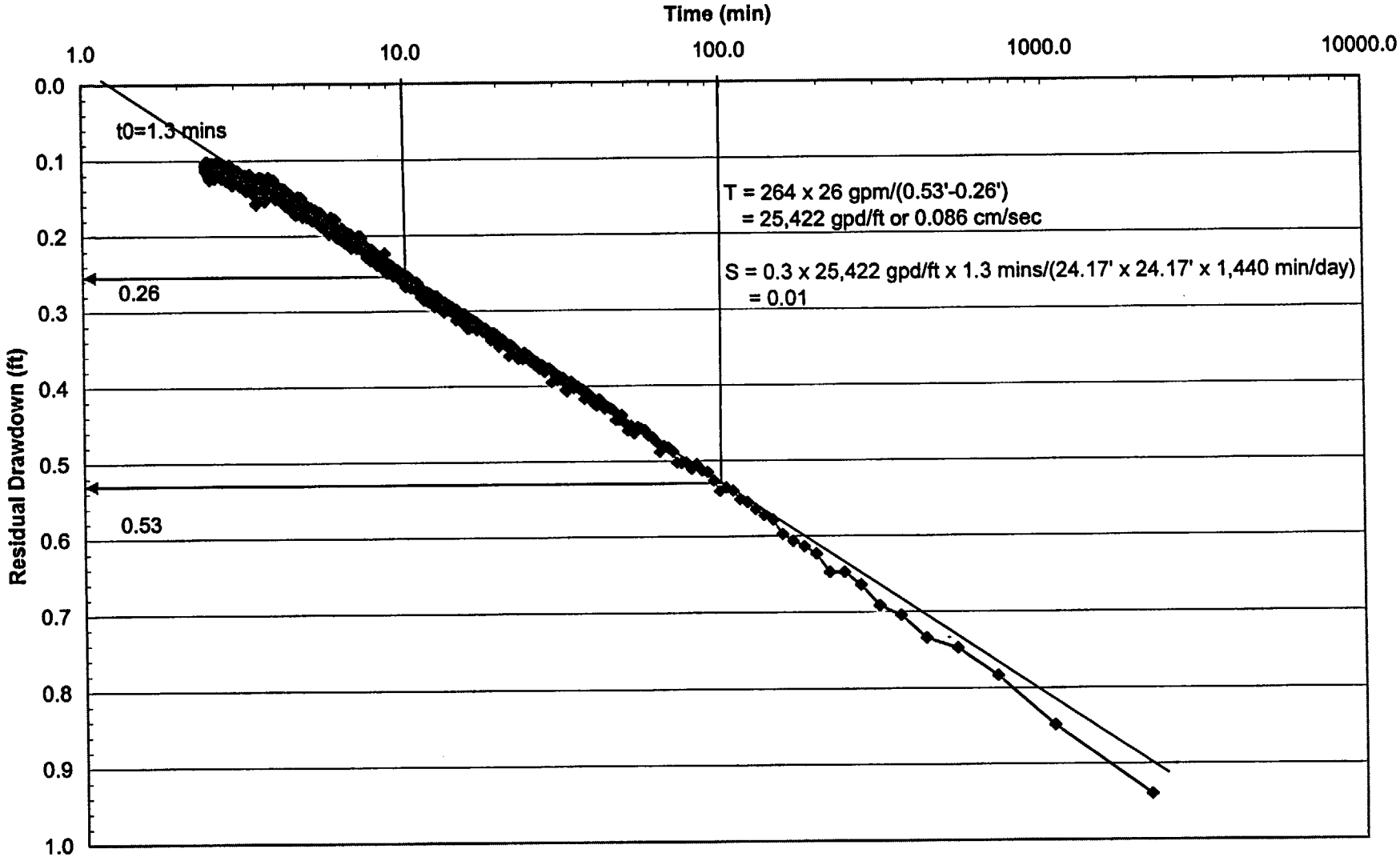
WELL 02W60


Well 02W60
aquifer test
Head above the transducer (ft)
8.8
8.6
8.4
8.2
8
7.8
7.6
7.4
0
1000
2000
3000
4000
5000
6000
7000
Time (min)

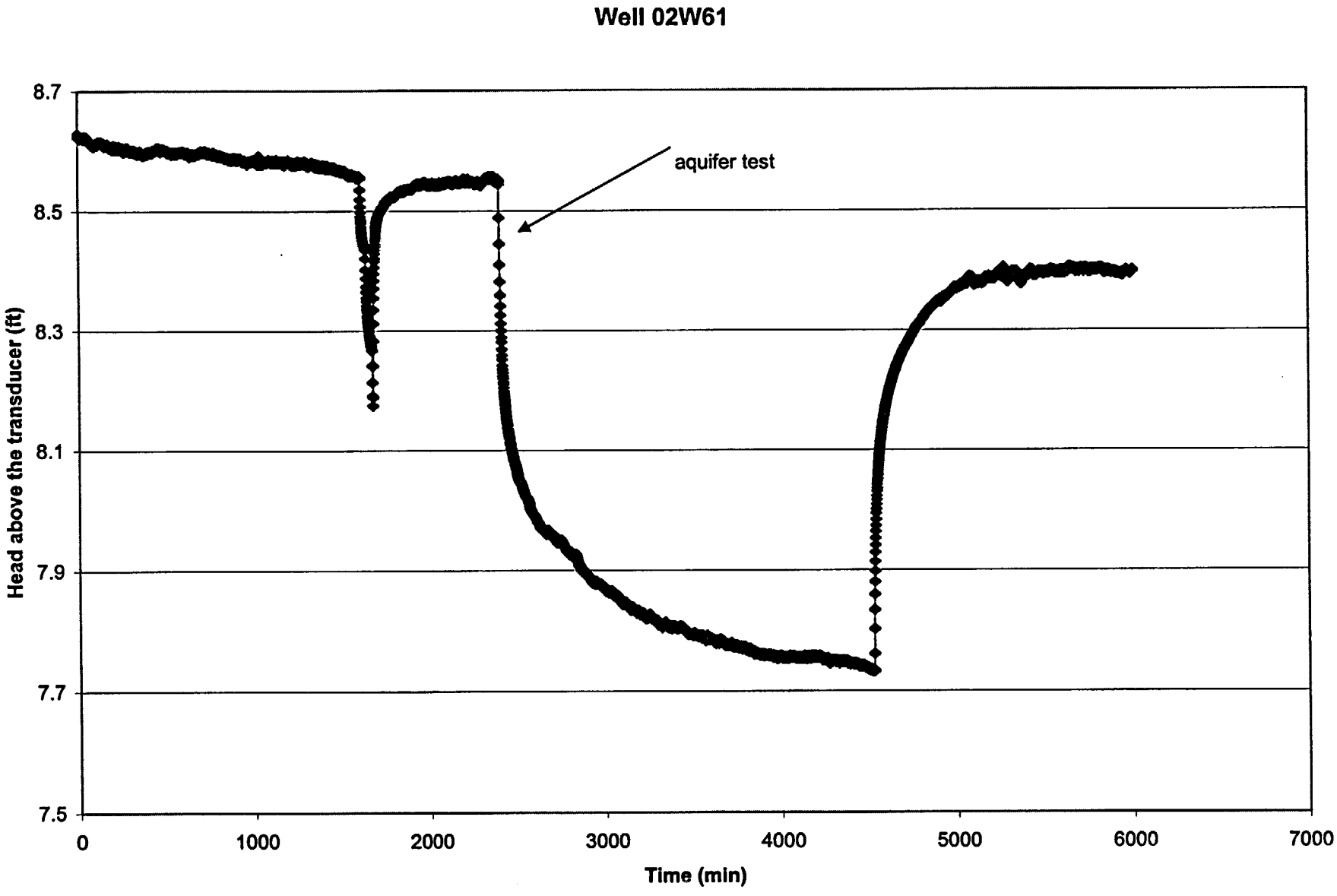
Jacob's Semi-Log Analysis of Time vs Drawdown for 02W60



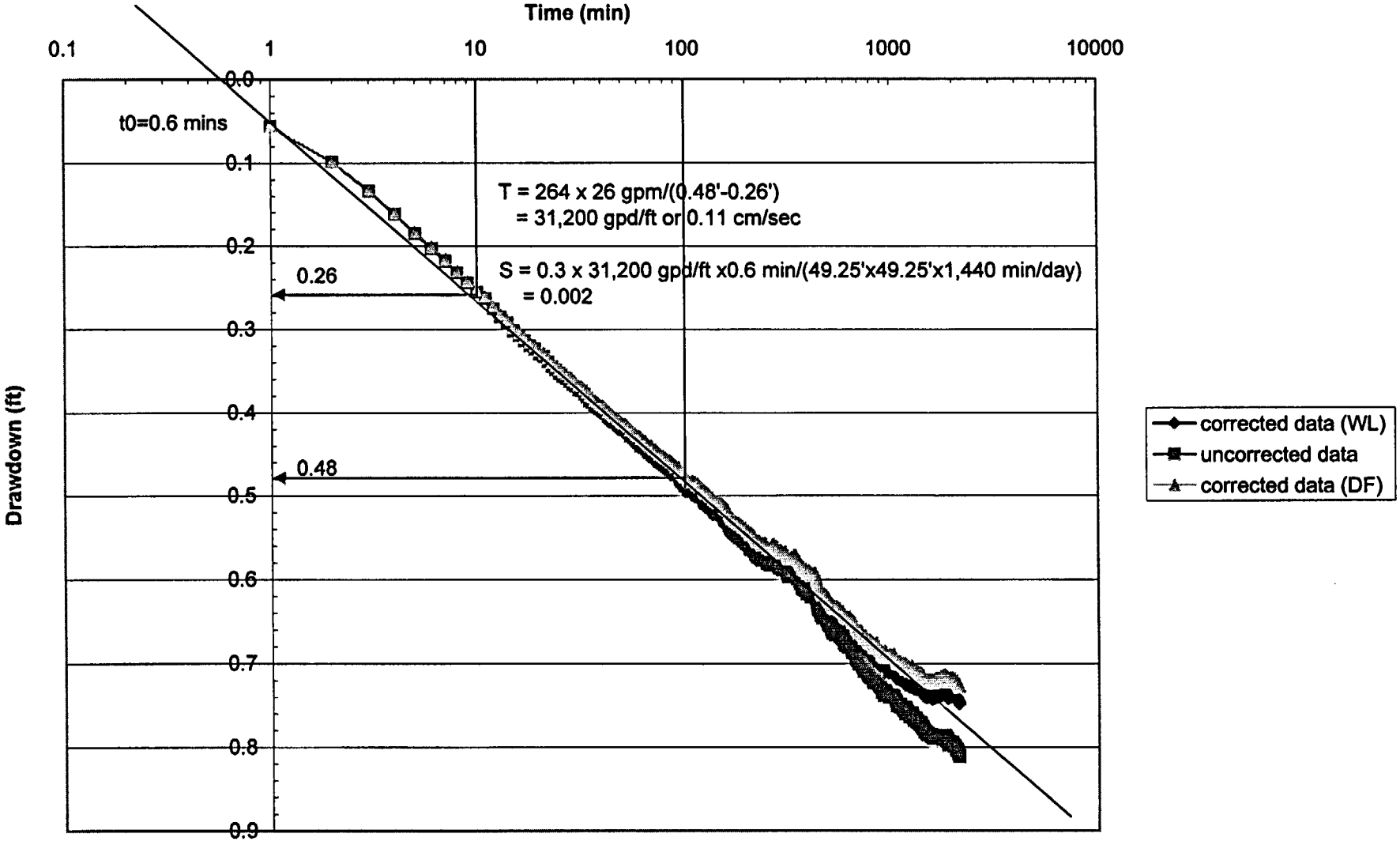
Jacob's Semi-Log Analysis of t/t' vs Residual Drawdown for 02W60



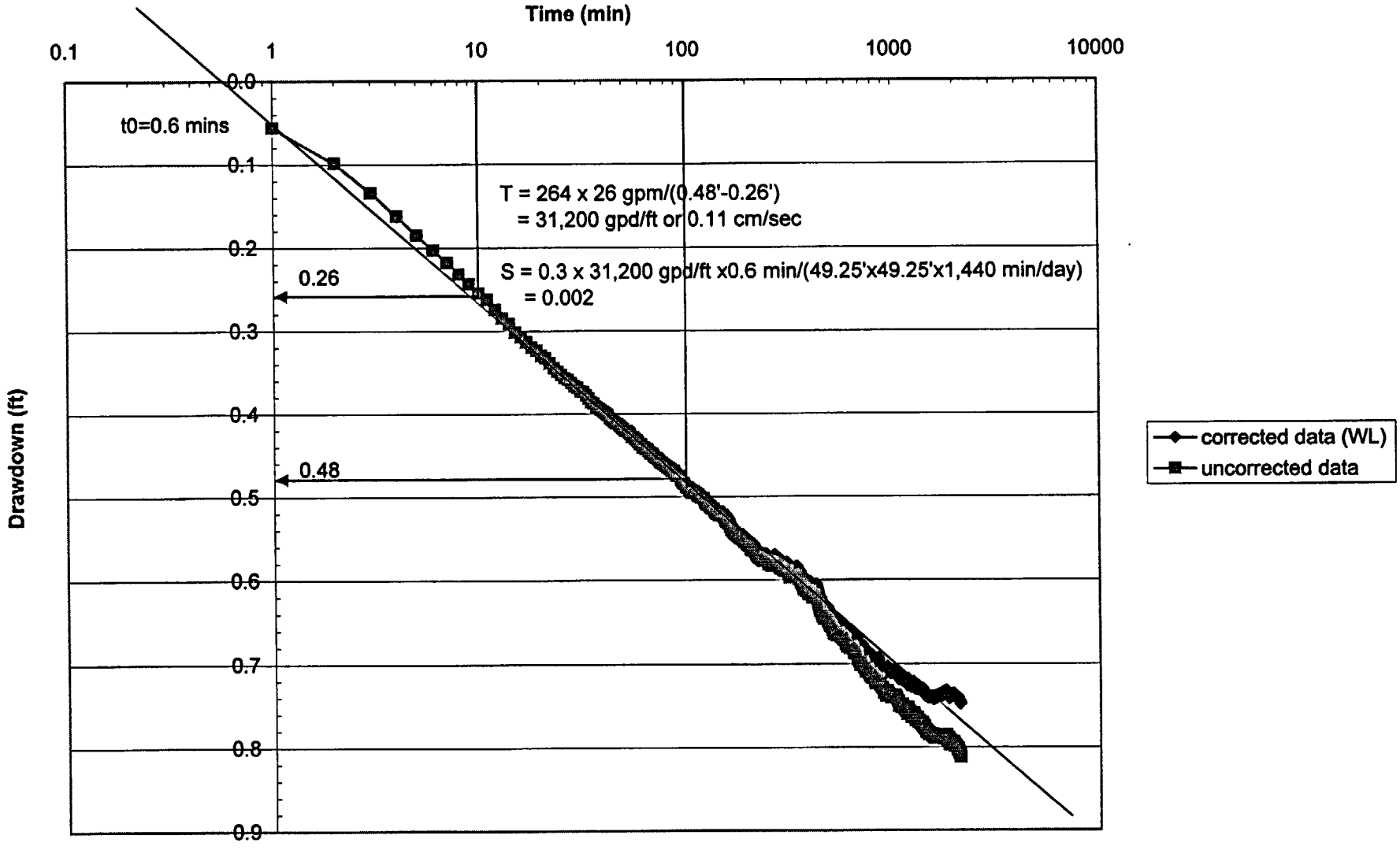
WELL 02W61


Well 02W61
aquifer test
Head above the transducer (ft)
8.7
8.5
8.3
8.1
7.9
7.7
7.5
0
1000
2000
3000
4000
5000
6000
7000
Time (min)

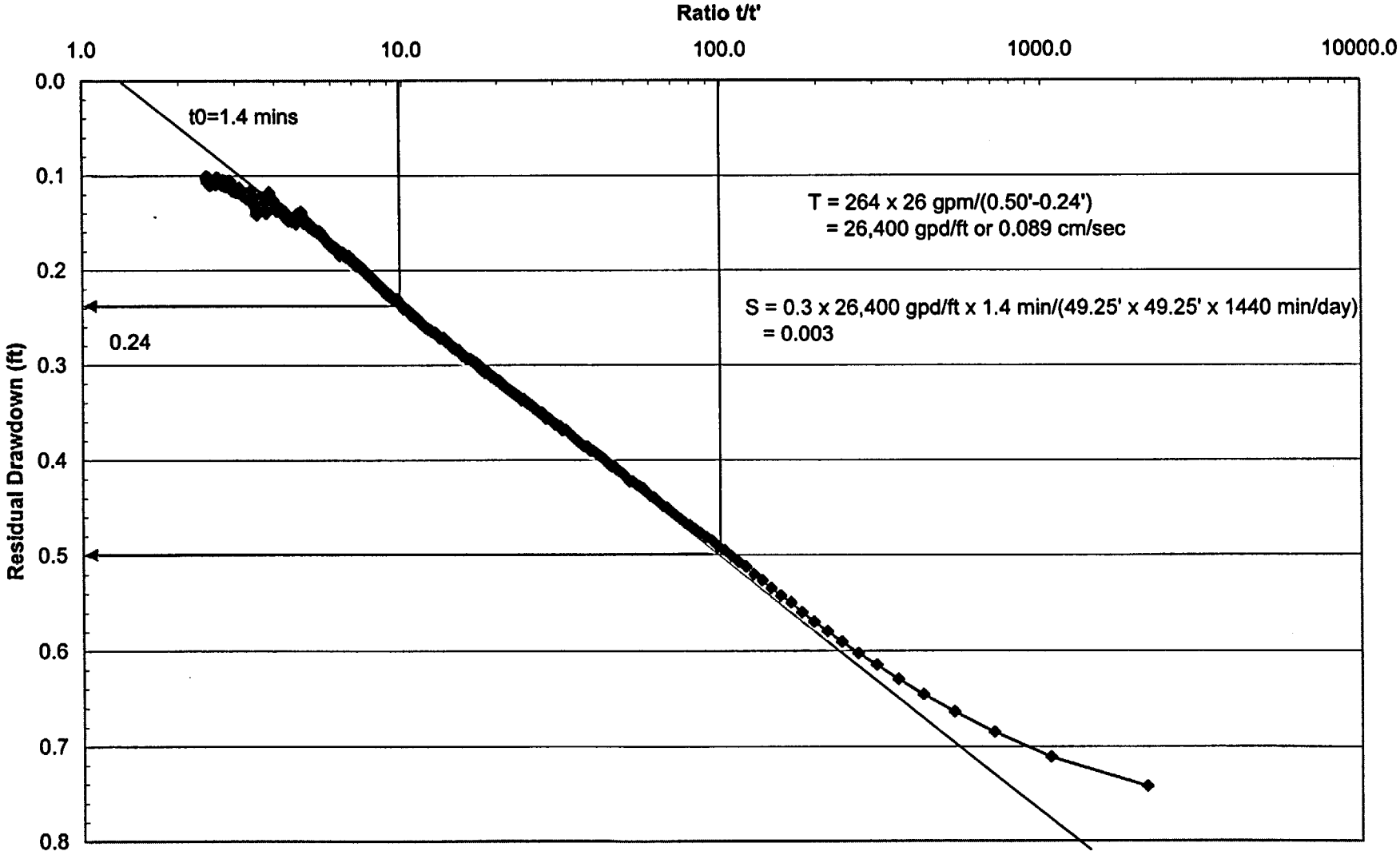
Jacob's Semi-Log Analysis of Time vs Drawdown for 02W61



Jacob's Semi-Log Analysis of Time vs Drawdown for 02W61

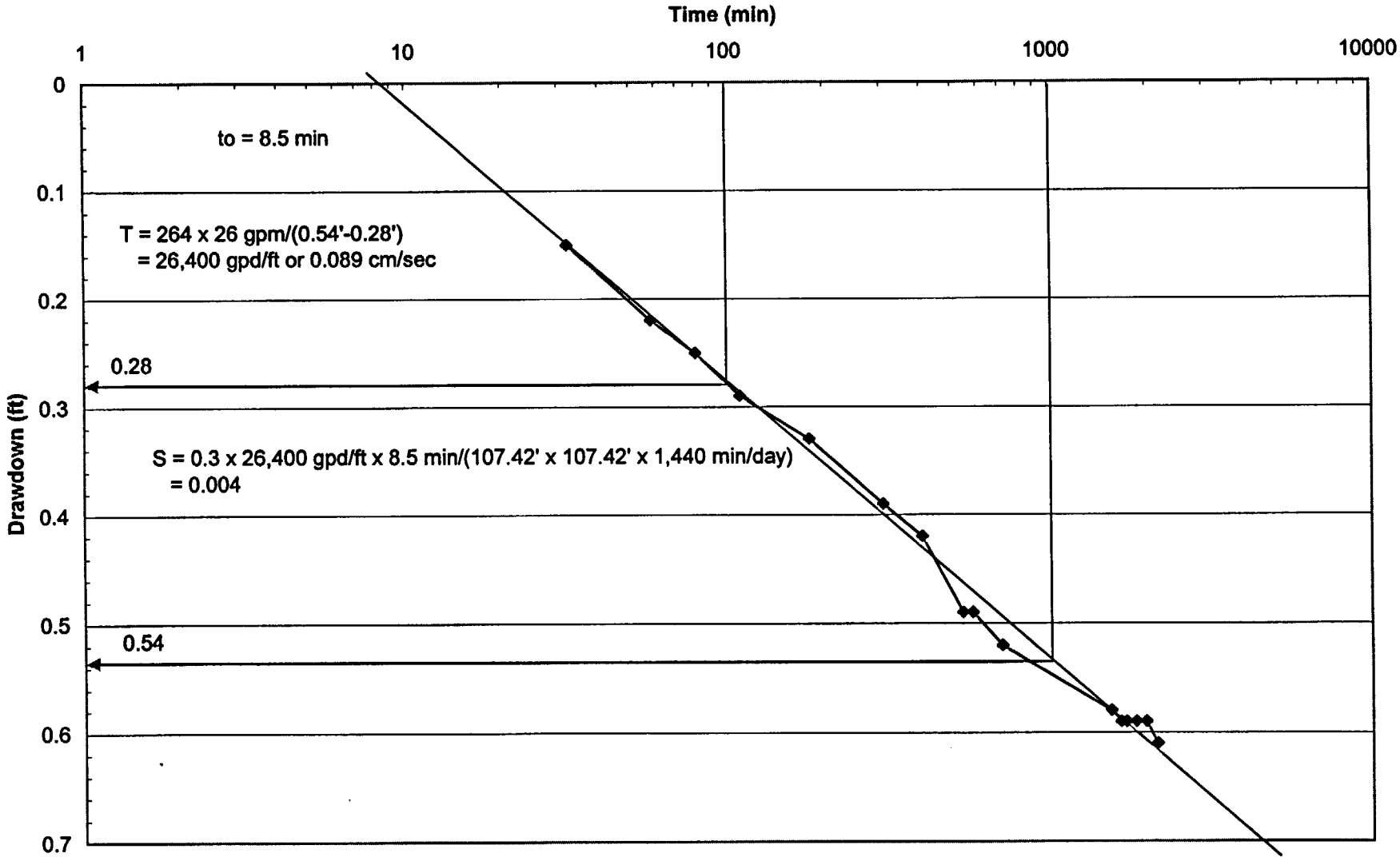


Jacob's Semi-Log Analysis t/t' vs Residual Drawdown for 02W61



WELL 02W22

Jacob's Semi-Log Analysis of Time vs Drawdown for 02W22



Time (min)	DTW (ft)	Drawdown (ft)
0	8.33	0
32	8.48	0.15
58	8.55	0.22
80	8.58	0.25
110	8.62	0.29
180	8.66	0.33
304	8.72	0.39
402	8.75	0.42
537	8.82	0.49
575	8.82	0.49
710	8.85	0.52
1534	8.91	0.58
1644	8.92	0.59
1710	8.92	0.59
1832	8.92	0.59
1970	8.92	0.59
2135	8.94	0.61

Appendix E

Slug Test Data

Detailed Evaluation of Slug Test Data

Slug tests are low cost, simple and relatively rapid tests to estimate localized hydraulic conductivity values. In addition to the aquifer test conducted on 02W56, a series of slug tests were conducted on select wells to provide information on spatial variations in hydraulic properties.

Slug tests were conducted on wells 02W02, 02W10, 02W11, 02W15, 02W16, 02W17, 02W33, 02W40, 02W42, 02W46, 02W48, 02W51, 02W56, 02W58, 02W59, 02W61, 02W62, TMW-01, TMW-09, TMW-13, TMW-20, and TMW-24. The tests were conducted using a solid steel slug with a dimension of 1.25-inch diameter x 23.9-inch length. The sole exceptions were the use of a PVC bailer (3.5 inch diameter x 3 ft length) on 02W56 (6-inch well) and a 2-inch PVC bailer (Geotech Environmental Equipment, Inc.) in wells 02W10, 02W40, 02W59, and 02W61. The following protocols were used for analysis of all slug test data (Butler, 1998):

- The normalized heads in the range of 0.20 to 0.30 were used to fit a straight line to obtain the estimated hydraulic conductivity when the Bouwer and Rice method was used.

- The normalized heads in the range of 0.15 to 0.25 was used to fit a straight line to obtain the estimated hydraulic conductivity when the Hvorslev method was used.

- When the "double straight line effect" was observed as a result of rapid drainage of the filter pack, always use the much slower response controlled by the hydraulic conductivity of the formation. In this case, determination of T_o at which a normalized of 0.37 was obtained by moving the fitted straight line in a parallel way to the normalized head of 1 to obtain T_o. An effective casing radius was estimated when the Bouwer and Rice method was used.

- In general, the slug test results were viewed as a lower bound on the conductivity of the formation in the vicinity of the well.

- Oscillatory slug test data were analyzed using a special technique per Butler and Garnett (2000)'s spreadsheets.

Table 2, in the main report, presents a summary table of the estimated hydraulic conductivities from aquifer and slug tests. Note that in general the slug test data are in the same order of magnitude and lower bound compared to the aquifer test data. Raw slug test data can be found in the following pages.

References

Bouwer, H. and Rice, R.C., "A Slug Test for Determining Hydraulic Conductivity of Unconfined Aquifers with Completely or Partially Penetrating Wells", Water Resources Research, 12(3), 423, 1976.

Butler, J.J., Jr., The Design, Performance, and Analysis of Slug Tests, Kansas Geological Survey and the University of Kansas, Lewis Publishers, New York, New York, 1998.

Butler, J.J., Jr., and Garnett, E.J., "Simple Procedure for Analysis of Slug Tests in Formation of High Hydraulic Conductivity Using Spreadsheet and Scientific Graphic Software", Kansas Geological Survey Open-File Report. 2000-40, Lawrence, Kansas, 2000.

SLUG TEST DATA AND

GRAPHS FOR:

Well 02W02
02W10
02W11
02W15
02W16
02W17
02W33
02W40
02W42
02W46
02W48
02W51
02W56
02W58
02W59
02W61
02W62
TMW-01
TMW-09
TMW-13
TMW-20
TMW-24

WELL 02W2

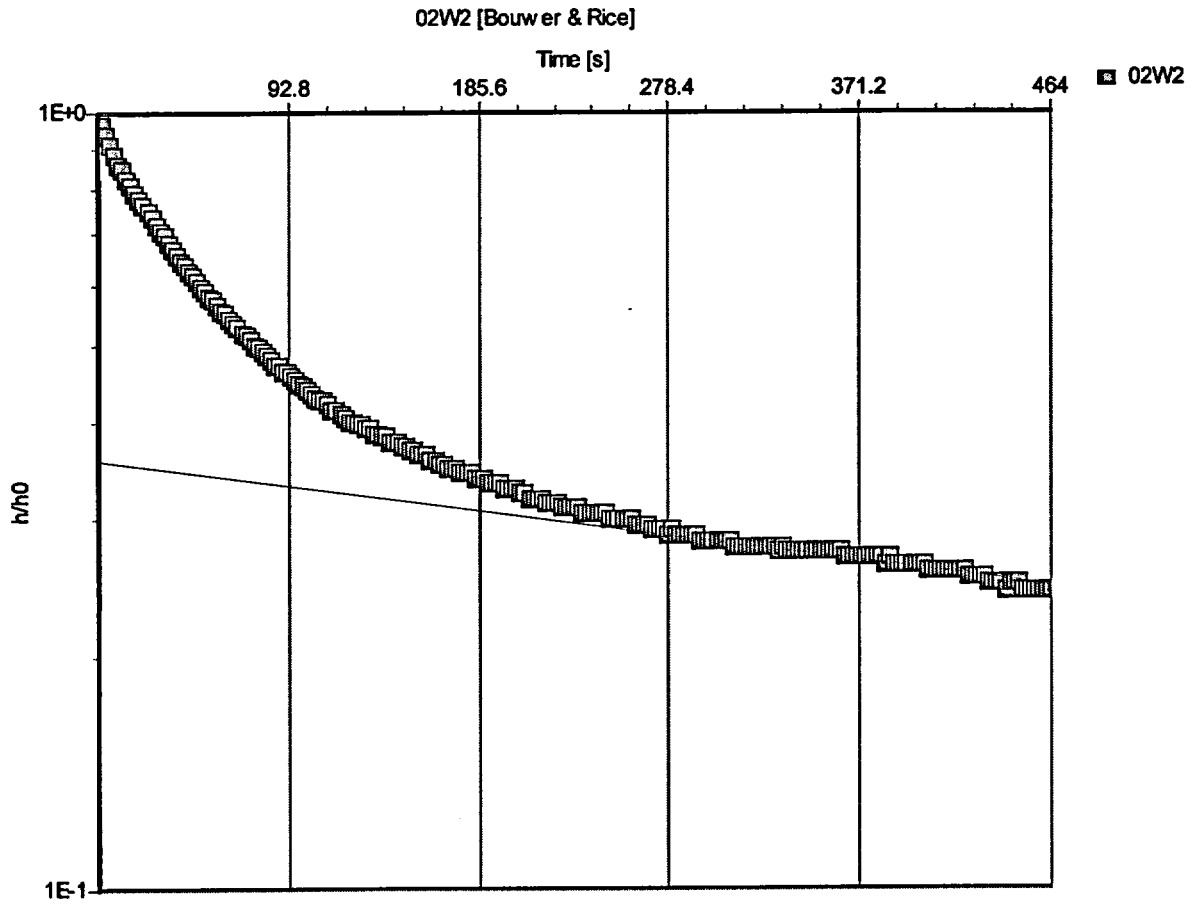
Kerr-McGee Corp.
123 Robert S. Kerr Ave.
Oklahoma City, Oklahoma 73102
Phone: (405) 270-2696

Slug Test Analysis Report

Project: Cimarron Facility Burial Area # 1

Number:

Client: Kerr-McGee



Slug Test: **02W2**

Analysis Method: **Bouwer & Rice**

Analysis Results:

Conductivity: 1.92E-5 [cm/s]

Test parameters:

Test Well:	02W2	Aquifer Thickness:	5.78 [ft]
Casing radius:	0.083 [ft]	Gravel Pack Porosity (%)	25
Screen length:	9.5 [ft]		
Boring radius:	0.365 [ft]		
r(eff):	0.196 [ft]		

Comments:

Evaluated by: Leon Chen

Evaluation Date: 11/13/2002

Kerr-McGee Corp.
123 Robert S. Kerr Ave.
Oklahoma City, Oklahoma 73102
Phone: (405) 270-2696

Slug Test Data Report

Project: Cimarron Facility Burial Area # 1

Number:

Client: Kerr-McGee

Test Well:	**02W2**	**Slug Test:**	**02W2**
		Test Well:	02W2
Depth to Static WL:	0 [ft]	Casing radius:	0.083 [ft]
Location:	Cimarron	Boring radius:	0.365 [ft]
Recorded by:	Leon Chen	Screen length:	9.5 [ft]
Date:	11/13/2002	Aquifer Thickness:	5.78 [ft]

	Time [s]	Depth to WL [ft]	Drawdown [ft]
1	0	1.00	1.00
2	2	0.97	0.97
3	4	0.94	0.94
4	6	0.91	0.91
5	8	0.89	0.89
6	10	0.86	0.86
7	12	0.85	0.85
8	14	0.82	0.82
9	16	0.81	0.81
10	18	0.79	0.79
11	20	0.78	0.78
12	22	0.76	0.76
13	24	0.75	0.75
14	26	0.73	0.73
15	28	0.72	0.72
16	30	0.70	0.70
17	32	0.69	0.69
18	34	0.68	0.68
19	36	0.67	0.67
20	38	0.66	0.66
21	40	0.65	0.65
22	42	0.64	0.64
23	44	0.63	0.63
24	46	0.62	0.62
25	48	0.61	0.61
26	50	0.60	0.60
27	52	0.59	0.59
28	54	0.58	0.58
29	56	0.57	0.57
30	58	0.56	0.56
31	60	0.55	0.55

Kerr-McGee Corp.
123 Robert S. Kerr Ave.
Oklahoma City, Oklahoma 73102
Phone: (405) 270-2696

Slug Test Data Report

Project: Cimarron Facility Burial Area # 1

Number:

Client: Kerr-McGee

Test Well:	**02W2**	**Slug Test:**	**02W2**
		Test Well:	02W2
Depth to Static WL:	0 [ft]	Casing radius:	0.083 [ft]
Location:	Cimarron	Boring radius:	0.365 [ft]
Recorded by:	Leon Chen	Screen length:	9.5 [ft]
Date:	11/13/2002	Aquifer Thickness:	5.78 [ft]

	Time [s]	Depth to WL [ft]	Drawdown [ft]
32	62	0.55	0.55
33	64	0.54	0.54
34	66	0.54	0.54
35	68	0.53	0.53
36	70	0.52	0.52
37	72	0.52	0.52
38	74	0.51	0.51
39	76	0.50	0.50
40	78	0.50	0.50
41	80	0.49	0.49
42	82	0.49	0.49
43	84	0.48	0.48
44	86	0.47	0.47
45	88	0.47	0.47
46	90	0.46	0.46
47	92	0.46	0.46
48	94	0.46	0.46
49	96	0.45	0.45
50	98	0.45	0.45
51	100	0.44	0.44
52	102	0.44	0.44
53	104	0.43	0.43
54	106	0.43	0.43
55	108	0.43	0.43
56	110	0.43	0.43
57	112	0.42	0.42
58	114	0.41	0.41
59	116	0.41	0.41
60	118	0.41	0.41
61	120	0.41	0.41
62	122	0.40	0.40

Kerr-McGee Corp.
123 Robert S. Kerr Ave.
Oklahoma City, Oklahoma 73102
Phone: (405) 270-2696

Slug Test Data Report

Project: Cimarron Facility Burial Area # 1

Number:

Client: Kerr-McGee

Test Well:	**02W2**	**Slug Test:**	**02W2**
		Test Well:	02W2
Depth to Static WL:	0 [ft]	Casing radius:	0.083 [ft]
Location:	Cimarron	Boring radius:	0.365 [ft]
Recorded by:	Leon Chen	Screen length:	9.5 [ft]
Date:	11/13/2002	Aquifer Thickness:	5.78 [ft]

	Time [s]	Depth to WL [ft]	Drawdown [ft]
63	124	0.40	0.40
64	126	0.40	0.40
65	128	0.40	0.40
66	130	0.39	0.39
67	132	0.39	0.39
68	134	0.39	0.39
69	136	0.39	0.39
70	138	0.38	0.38
71	140	0.38	0.38
72	142	0.38	0.38
73	144	0.38	0.38
74	146	0.38	0.38
75	148	0.37	0.37
76	150	0.37	0.37
77	152	0.37	0.37
78	154	0.37	0.37
79	156	0.36	0.36
80	158	0.36	0.36
81	160	0.36	0.36
82	162	0.36	0.36
83	164	0.36	0.36
84	166	0.35	0.35
85	168	0.35	0.35
86	170	0.35	0.35
87	172	0.35	0.35
88	174	0.35	0.35
89	176	0.34	0.34
90	178	0.34	0.34
91	180	0.34	0.34
92	182	0.34	0.34
93	184	0.34	0.34

Kerr-McGee Corp.
123 Robert S. Kerr Ave.
Oklahoma City, Oklahoma 73102
Phone: (405) 270-2696

Slug Test Data Report

Project: Cimarron Facility Burial Area # 1

Number:

Client: Kerr-McGee

Test Well:	**02W2**	**Slug Test:**	**02W2**
		Test Well:	02W2
Depth to Static WL:	0 [ft]	Casing radius:	0.083 [ft]
Location:	Cimarron	Boring radius:	0.365 [ft]
Recorded by:	Leon Chen	Screen length:	9.5 [ft]
Date:	11/13/2002	Aquifer Thickness:	5.78 [ft]

	Time [s]	Depth to WL [ft]	Drawdown [ft]
94	186	0.34	0.34
95	188	0.34	0.34
96	190	0.33	0.33
97	192	0.33	0.33
98	194	0.33	0.33
99	196	0.33	0.33
100	198	0.33	0.33
101	200	0.33	0.33
102	202	0.33	0.33
103	204	0.33	0.33
104	206	0.33	0.33
105	208	0.33	0.33
106	210	0.32	0.32
107	212	0.32	0.32
108	214	0.32	0.32
109	216	0.32	0.32
110	218	0.32	0.32
111	220	0.32	0.32
112	222	0.32	0.32
113	224	0.32	0.32
114	226	0.31	0.31
115	228	0.31	0.31
116	230	0.31	0.31
117	232	0.31	0.31
118	234	0.31	0.31
119	236	0.31	0.31
120	238	0.31	0.31
121	240	0.31	0.31
122	242	0.31	0.31
123	244	0.31	0.31
124	246	0.31	0.31

Kerr-McGee Corp.
123 Robert S. Kerr Ave.
Oklahoma City, Oklahoma 73102
Phone: (405) 270-2696

Slug Test Data Report

Project: Cimarron Facility Burial Area # 1

Number:

Client: Kerr-McGee

Test Well:	**02W2**	**Slug Test:**	**02W2**
		Test Well:	02W2
Depth to Static WL:	0 [ft]	Casing radius:	0.083 [ft]
Location:	Cimarron	Boring radius:	0.365 [ft]
Recorded by:	Leon Chen	Screen length:	9.5 [ft]
Date:	11/13/2002	Aquifer Thickness:	5.78 [ft]

	Time [s]	Depth to WL [ft]	Drawdown [ft]
125	248	0.31	0.31
126	250	0.30	0.30
127	252	0.30	0.30
128	254	0.30	0.30
129	256	0.30	0.30
130	258	0.30	0.30
131	260	0.30	0.30
132	262	0.30	0.30
133	264	0.30	0.30
134	266	0.30	0.30
135	268	0.30	0.30
136	270	0.29	0.29
137	272	0.29	0.29
138	274	0.29	0.29
139	276	0.29	0.29
140	278	0.29	0.29
141	280	0.29	0.29
142	282	0.29	0.29
143	284	0.29	0.29
144	286	0.29	0.29
145	288	0.29	0.29
146	290	0.29	0.29
147	292	0.29	0.29
148	294	0.28	0.28
149	296	0.28	0.28
150	298	0.28	0.28
151	300	0.28	0.28
152	302	0.28	0.28
153	304	0.28	0.28
154	306	0.28	0.28
155	308	0.28	0.28

Kerr-McGee Corp.
123 Robert S. Kerr Ave.
Oklahoma City, Oklahoma 73102
Phone: (405) 270-2696

Slug Test Data Report

Project: Cimarron Facility Burial Area # 1

Number:

Client: Kerr-McGee

Test Well:	**02W2**	**Slug Test:**	**02W2**
		Test Well:	02W2
Depth to Static WL:	0 [ft]	Casing radius:	0.083 [ft]
Location:	Cimarron	Boring radius:	0.365 [ft]
Recorded by:	Leon Chen	Screen length:	9.5 [ft]
Date:	11/13/2002	Aquifer Thickness:	5.78 [ft]

	Time [s]	Depth to WL [ft]	Drawdown [ft]
156	310	0.28	0.28
157	312	0.28	0.28
158	314	0.28	0.28
159	316	0.28	0.28
160	318	0.28	0.28
161	320	0.28	0.28
162	322	0.28	0.28
163	324	0.28	0.28
164	326	0.28	0.28
165	328	0.28	0.28
166	330	0.28	0.28
167	332	0.27	0.27
168	334	0.28	0.28
169	336	0.27	0.27
170	338	0.27	0.27
171	340	0.27	0.27
172	342	0.27	0.27
173	344	0.27	0.27
174	346	0.27	0.27
175	348	0.27	0.27
176	350	0.27	0.27
177	352	0.27	0.27
178	354	0.27	0.27
179	356	0.27	0.27
180	358	0.27	0.27
181	360	0.27	0.27
182	362	0.27	0.27
183	364	0.27	0.27
184	366	0.27	0.27
185	368	0.27	0.27
186	370	0.27	0.27

Kerr-McGee Corp.
123 Robert S. Kerr Ave.
Oklahoma City, Oklahoma 73102
Phone: (405) 270-2696

Slug Test Data Report

Project: Cimarron Facility Burial Area # 1

Number:

Client: Kerr-McGee

Test Well:	**02W2**	**Slug Test:**	**02W2**
		Test Well:	02W2
Depth to Static WL:	0 [ft]	Casing radius:	0.083 [ft]
Location:	Cimarron	Boring radius:	0.365 [ft]
Recorded by:	Leon Chen	Screen length:	9.5 [ft]
Date:	11/13/2002	Aquifer Thickness:	5.78 [ft]

	Time [s]	Depth to WL [ft]	Drawdown [ft]
187	372	0.27	0.27
188	374	0.27	0.27
189	376	0.27	0.27
190	378	0.27	0.27
191	380	0.27	0.27
192	382	0.27	0.27
193	384	0.26	0.26
194	386	0.27	0.27
195	388	0.26	0.26
196	390	0.26	0.26
197	392	0.26	0.26
198	394	0.26	0.26
199	396	0.26	0.26
200	398	0.26	0.26
201	400	0.26	0.26
202	402	0.26	0.26
203	404	0.26	0.26
204	406	0.26	0.26
205	408	0.26	0.26
206	410	0.26	0.26
207	412	0.26	0.26
208	414	0.26	0.26
209	416	0.26	0.26
210	418	0.26	0.26
211	420	0.26	0.26
212	422	0.26	0.26
213	424	0.25	0.25
214	426	0.25	0.25
215	428	0.25	0.25
216	430	0.25	0.25
217	432	0.25	0.25

Kerr-McGee Corp.
123 Robert S. Kerr Ave.
Oklahoma City, Oklahoma 73102
Phone: (405) 270-2696

Slug Test Data Report

Project: Cimarron Facility Burial Area # 1

Number:

Client: Kerr-McGee

Test Well:	**02W2**	**Slug Test:**	**02W2**
		Test Well:	02W2
Depth to Static WL:	0 [ft]	Casing radius:	0.083 [ft]
Location:	Cimarron	Boring radius:	0.365 [ft]
Recorded by:	Leon Chen	Screen length:	9.5 [ft]
Date:	11/13/2002	Aquifer Thickness:	5.78 [ft]

	Time [s]	Depth to WL [ft]	Drawdown [ft]
218	434	0.25	0.25
219	436	0.25	0.25
220	438	0.25	0.25
221	440	0.25	0.25
222	442	0.24	0.24
223	444	0.25	0.25
224	446	0.25	0.25
225	448	0.25	0.25
226	450	0.24	0.24
227	452	0.24	0.24
228	454	0.24	0.24
229	456	0.24	0.24
230	458	0.24	0.24
231	460	0.24	0.24
232	462	0.24	0.24
233	464	0.24	0.24

Kerr-McGee Corp.
123 Robert S. Kerr Ave.
Oklahoma City, Oklahoma 73102
Phone: (405) 270-2696

Slug Test Data Report

Project: Cimarron Facility Burial Area # 1

Number:

Client: Kerr-McGee

Test Well:	**02W2**	**Slug Test:**	**02W2**
		Test Well:	02W2
Depth to Static WL:	0 [ft]	Casing radius:	0.083 [ft]
Location:	Cimarron	Boring radius:	0.365 [ft]
Recorded by:	Leon Chen	Screen length:	9.5 [ft]
Date:	11/13/2002	Aquifer Thickness:	5.78 [ft]

	Time [s]	Depth to WL [ft]	Drawdown [ft]
1	0	1.00	1.00
2	2	0.97	0.97
3	4	0.94	0.94
4	6	0.91	0.91
5	8	0.89	0.89
6	10	0.86	0.86
7	12	0.85	0.85
8	14	0.82	0.82
9	16	0.81	0.81
10	18	0.79	0.79
11	20	0.78	0.78
12	22	0.76	0.76
13	24	0.75	0.75
14	26	0.73	0.73
15	28	0.72	0.72
16	30	0.70	0.70
17	32	0.69	0.69
18	34	0.68	0.68
19	36	0.67	0.67
20	38	0.66	0.66
21	40	0.65	0.65
22	42	0.64	0.64
23	44	0.63	0.63
24	46	0.62	0.62
25	48	0.61	0.61
26	50	0.60	0.60
27	52	0.59	0.59
28	54	0.58	0.58
29	56	0.57	0.57
30	58	0.56	0.56
31	60	0.55	0.55

Kerr-McGee Corp.
123 Robert S. Kerr Ave.
Oklahoma City, Oklahoma 73102
Phone: (405) 270-2696

Slug Test Data Report

Project: Cimarron Facility Burial Area # 1

Number:

Client: Kerr-McGee

Test Well:	**02W2**	**Slug Test:**	**02W2**
		Test Well:	02W2
Depth to Static WL:	0 [ft]	Casing radius:	0.083 [ft]
Location:	Cimarron	Boring radius:	0.365 [ft]
Recorded by:	Leon Chen	Screen length:	9.5 [ft]
Date:	11/13/2002	Aquifer Thickness:	5.78 [ft]

	Time [s]	Depth to WL [ft]	Drawdown [ft]
32	62	0.55	0.55
33	64	0.54	0.54
34	66	0.54	0.54
35	68	0.53	0.53
36	70	0.52	0.52
37	72	0.52	0.52
38	74	0.51	0.51
39	76	0.50	0.50
40	78	0.50	0.50
41	80	0.49	0.49
42	82	0.49	0.49
43	84	0.48	0.48
44	86	0.47	0.47
45	88	0.47	0.47
46	90	0.46	0.46
47	92	0.46	0.46
48	94	0.46	0.46
49	96	0.45	0.45
50	98	0.45	0.45
51	100	0.44	0.44
52	102	0.44	0.44
53	104	0.43	0.43
54	106	0.43	0.43
55	108	0.43	0.43
56	110	0.43	0.43
57	112	0.42	0.42
58	114	0.41	0.41
59	116	0.41	0.41
60	118	0.41	0.41
61	120	0.41	0.41
62	122	0.40	0.40

Kerr-McGee Corp.
123 Robert S. Kerr Ave.
Oklahoma City, Oklahoma 73102
Phone: (405) 270-2696

Slug Test Data Report

Project: Cimarron Facility Burial Area # 1

Number:

Client: Kerr-McGee

Test Well:	**02W2**	**Slug Test:**	**02W2**
		Test Well:	02W2
Depth to Static WL:	0 [ft]	Casing radius:	0.083 [ft]
Location:	Cimarron	Boring radius:	0.365 [ft]
Recorded by:	Leon Chen	Screen length:	9.5 [ft]
Date:	11/13/2002	Aquifer Thickness:	5.78 [ft]

	Time [s]	Depth to WL [ft]	Drawdown [ft]
63	124	0.40	0.40
64	126	0.40	0.40
65	128	0.40	0.40
66	130	0.39	0.39
67	132	0.39	0.39
68	134	0.39	0.39
69	136	0.39	0.39
70	138	0.38	0.38
71	140	0.38	0.38
72	142	0.38	0.38
73	144	0.38	0.38
74	146	0.38	0.38
75	148	0.37	0.37
76	150	0.37	0.37
77	152	0.37	0.37
78	154	0.37	0.37
79	156	0.36	0.36
80	158	0.36	0.36
81	160	0.36	0.36
82	162	0.36	0.36
83	164	0.36	0.36
84	166	0.35	0.35
85	168	0.35	0.35
86	170	0.35	0.35
87	172	0.35	0.35
88	174	0.35	0.35
89	176	0.34	0.34
90	178	0.34	0.34
91	180	0.34	0.34
92	182	0.34	0.34
93	184	0.34	0.34

Kerr-McGee Corp.
123 Robert S. Kerr Ave.
Oklahoma City, Oklahoma 73102
Phone: (405) 270-2696

Slug Test Data Report

Project: Cimarron Facility Burial Area # 1

Number:

Client: Kerr-McGee

Test Well:	**02W2**	**Slug Test:**	**02W2**
		Test Well:	02W2
Depth to Static WL:	0 [ft]	Casing radius:	0.083 [ft]
Location:	Cimarron	Boring radius:	0.365 [ft]
Recorded by:	Leon Chen	Screen length:	9.5 [ft]
Date:	11/13/2002	Aquifer Thickness:	5.78 [ft]

	Time [s]	Depth to WL [ft]	Drawdown [ft]
94	186	0.34	0.34
95	188	0.34	0.34
96	190	0.33	0.33
97	192	0.33	0.33
98	194	0.33	0.33
99	196	0.33	0.33
100	198	0.33	0.33
101	200	0.33	0.33
102	202	0.33	0.33
103	204	0.33	0.33
104	206	0.33	0.33
105	208	0.33	0.33
106	210	0.32	0.32
107	212	0.32	0.32
108	214	0.32	0.32
109	216	0.32	0.32
110	218	0.32	0.32
111	220	0.32	0.32
112	222	0.32	0.32
113	224	0.32	0.32
114	226	0.31	0.31
115	228	0.31	0.31
116	230	0.31	0.31
117	232	0.31	0.31
118	234	0.31	0.31
119	236	0.31	0.31
120	238	0.31	0.31
121	240	0.31	0.31
122	242	0.31	0.31
123	244	0.31	0.31
124	246	0.31	0.31

Kerr-McGee Corp.
123 Robert S. Kerr Ave.
Oklahoma City, Oklahoma 73102
Phone: (405) 270-2696

Slug Test Data Report

Project: Cimarron Facility Burial Area # 1

Number:

Client: Kerr-McGee

Test Well:	**02W2**	**Slug Test:**	**02W2**
		Test Well:	02W2
Depth to Static WL:	0 [ft]	Casing radius:	0.083 [ft]
Location:	Cimarron	Boring radius:	0.365 [ft]
Recorded by:	Leon Chen	Screen length:	9.5 [ft]
Date:	11/13/2002	Aquifer Thickness:	5.78 [ft]

	Time [s]	Depth to WL [ft]	Drawdown [ft]
125	248	0.31	0.31
126	250	0.30	0.30
127	252	0.30	0.30
128	254	0.30	0.30
129	256	0.30	0.30
130	258	0.30	0.30
131	260	0.30	0.30
132	262	0.30	0.30
133	264	0.30	0.30
134	266	0.30	0.30
135	268	0.30	0.30
136	270	0.29	0.29
137	272	0.29	0.29
138	274	0.29	0.29
139	276	0.29	0.29
140	278	0.29	0.29
141	280	0.29	0.29
142	282	0.29	0.29
143	284	0.29	0.29
144	286	0.29	0.29
145	288	0.29	0.29
146	290	0.29	0.29
147	292	0.29	0.29
148	294	0.28	0.28
149	296	0.28	0.28
150	298	0.28	0.28
151	300	0.28	0.28
152	302	0.28	0.28
153	304	0.28	0.28
154	306	0.28	0.28
155	308	0.28	0.28

Kerr-McGee Corp.
123 Robert S. Kerr Ave.
Oklahoma City, Oklahoma 73102
Phone: (405) 270-2696

Slug Test Data Report

Project: Cimarron Facility Burial Area # 1

Number:

Client: Kerr-McGee

Test Well:	**02W2**	**Slug Test:**	**02W2**
		Test Well:	02W2
Depth to Static WL:	0 [ft]	Casing radius:	0.083 [ft]
Location:	Cimarron	Boring radius:	0.365 [ft]
Recorded by:	Leon Chen	Screen length:	9.5 [ft]
Date:	11/13/2002	Aquifer Thickness:	5.78 [ft]

	Time [s]	Depth to WL [ft]	Drawdown [ft]
156	310	0.28	0.28
157	312	0.28	0.28
158	314	0.28	0.28
159	316	0.28	0.28
160	318	0.28	0.28
161	320	0.28	0.28
162	322	0.28	0.28
163	324	0.28	0.28
164	326	0.28	0.28
165	328	0.28	0.28
166	330	0.28	0.28
167	332	0.27	0.27
168	334	0.28	0.28
169	336	0.27	0.27
170	338	0.27	0.27
171	340	0.27	0.27
172	342	0.27	0.27
173	344	0.27	0.27
174	346	0.27	0.27
175	348	0.27	0.27
176	350	0.27	0.27
177	352	0.27	0.27
178	354	0.27	0.27
179	356	0.27	0.27
180	358	0.27	0.27
181	360	0.27	0.27
182	362	0.27	0.27
183	364	0.27	0.27
184	366	0.27	0.27
185	368	0.27	0.27
186	370	0.27	0.27

Kerr-McGee Corp.
123 Robert S. Kerr Ave.
Oklahoma City, Oklahoma 73102
Phone: (405) 270-2696

Slug Test Data Report

Project: Cimarron Facility Burial Area # 1

Number:

Client: Kerr-McGee

Test Well:	**02W2**	**Slug Test:**	**02W2**
		Test Well:	02W2
Depth to Static WL:	0 [ft]	Casing radius:	0.083 [ft]
Location:	Cimarron	Boring radius:	0.365 [ft]
Recorded by:	Leon Chen	Screen length:	9.5 [ft]
Date:	11/13/2002	Aquifer Thickness:	5.78 [ft]

	Time [s]	Depth to WL [ft]	Drawdown [ft]
187	372	0.27	0.27
188	374	0.27	0.27
189	376	0.27	0.27
190	378	0.27	0.27
191	380	0.27	0.27
192	382	0.27	0.27
193	384	0.26	0.26
194	386	0.27	0.27
195	388	0.26	0.26
196	390	0.26	0.26
197	392	0.26	0.26
198	394	0.26	0.26
199	396	0.26	0.26
200	398	0.26	0.26
201	400	0.26	0.26
202	402	0.26	0.26
203	404	0.26	0.26
204	406	0.26	0.26
205	408	0.26	0.26
206	410	0.26	0.26
207	412	0.26	0.26
208	414	0.26	0.26
209	416	0.26	0.26
210	418	0.26	0.26
211	420	0.26	0.26
212	422	0.26	0.26
213	424	0.25	0.25
214	426	0.25	0.25
215	428	0.25	0.25
216	430	0.25	0.25
217	432	0.25	0.25

Kerr-McGee Corp.
123 Robert S. Kerr Ave.
Oklahoma City, Oklahoma 73102
Phone: (405) 270-2696

Slug Test Data Report

Project: Cimarron Facility Burial Area # 1

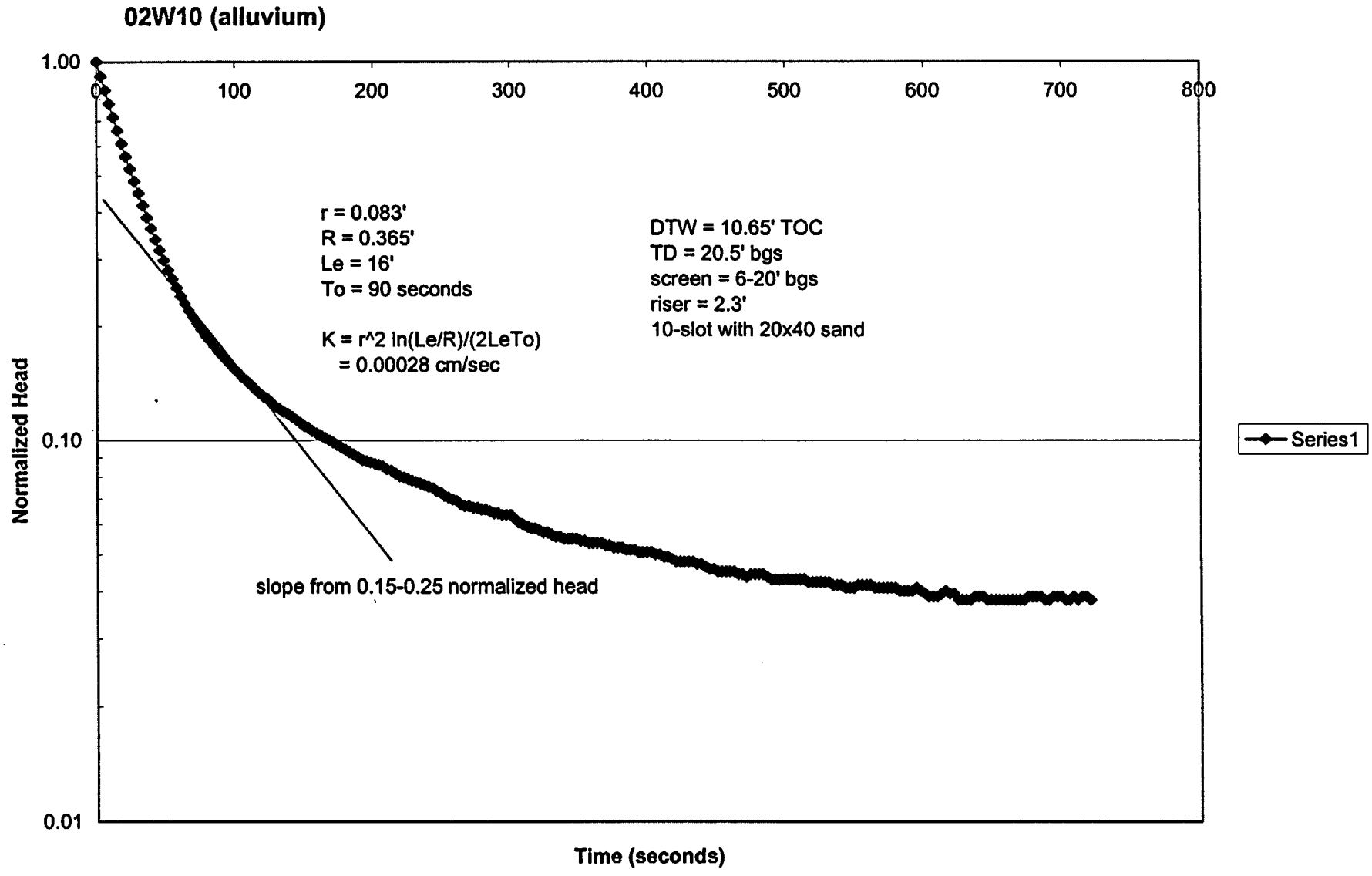
Number:

Client: Kerr-McGee

Test Well:	**02W2**	**Slug Test:**	**02W2**
		Test Well:	02W2
Depth to Static WL:	0 [ft]	Casing radius:	0.083 [ft]
Location:	Cimarron	Boring radius:	0.365 [ft]
Recorded by:	Leon Chen	Screen length:	9.5 [ft]
Date:	11/13/2002	Aquifer Thickness:	5.78 [ft]

	Time [s]	Depth to WL [ft]	Drawdown [ft]
218	434	0.25	0.25
219	436	0.25	0.25
220	438	0.25	0.25
221	440	0.25	0.25
222	442	0.24	0.24
223	444	0.25	0.25
224	446	0.25	0.25
225	448	0.25	0.25
226	450	0.24	0.24
227	452	0.24	0.24
228	454	0.24	0.24
229	456	0.24	0.24
230	458	0.24	0.24
231	460	0.24	0.24
232	462	0.24	0.24
233	464	0.24	0.24

WELL 02W10


02W10 (alluvium)
1.00
0.10
0.01
0
100
200
300
400
500
600
700
800
Normalized Head
Time (seconds)
r = 0.083'
R = 0.365'
Le = 16'
To = 90 seconds
K = r^2 ln(Le/R)/(2LeTo)
= 0.00028 cm/sec
DTW = 10.65' TOC
TD = 20.5' bgs
screen = 6-20' bgs
riser = 2.3'
10-slot with 20x40 sand
slope from 0.15-0.25 normalized head
Series1

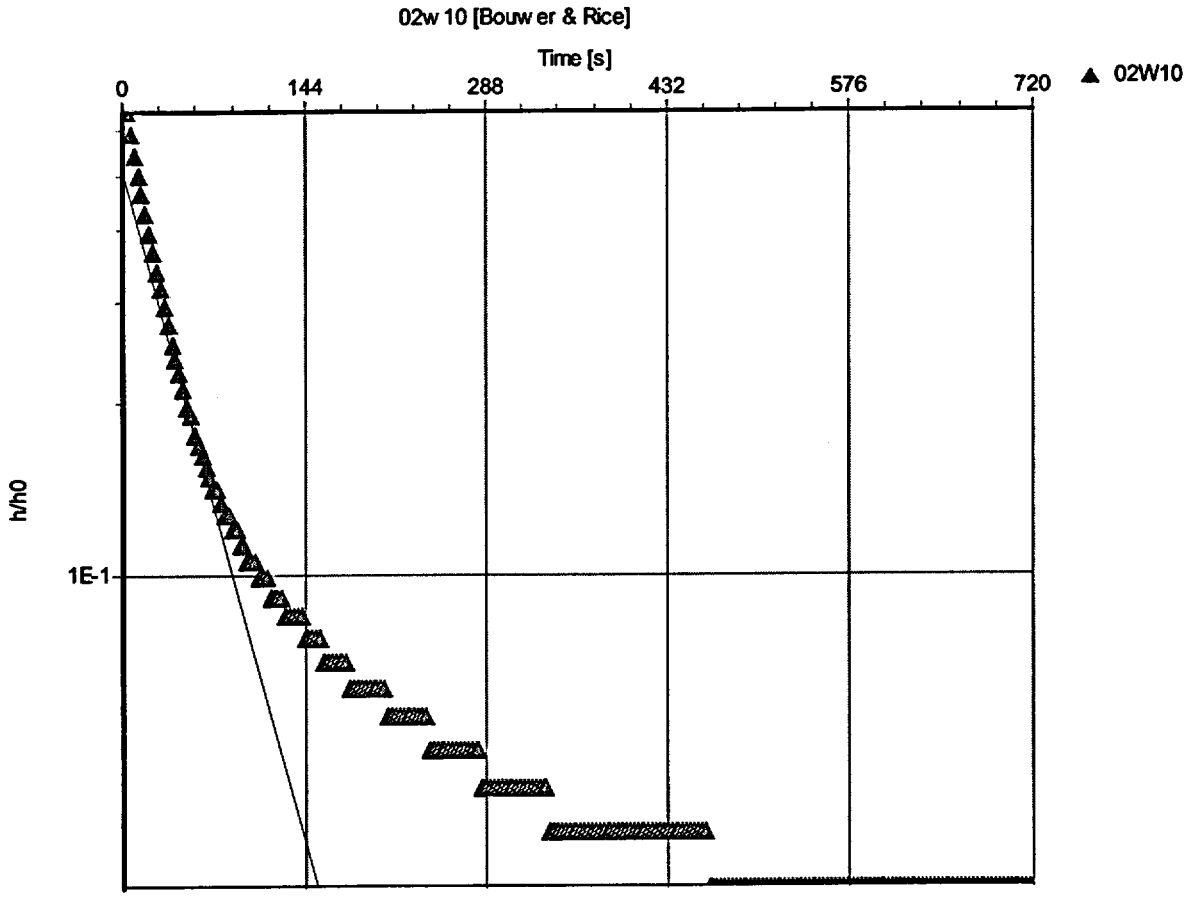
Kerr-McGee Corp.
123 Robert S. Kerr Ave.
Oklahoma City, Oklahoma 73102
Phone: (405) 270-2696

Slug Test Analysis Report

Project: Cimarron Facility Burial Area # 1

Number:

Client: Kerr-McGee



Slug Test: **02W10 (alluvium/clayey)**

Analysis Method: **Bouwer & Rice**

Analysis Results:

Conductivity: 3.36E-4 [cm/s]

Test parameters:				
	Test Well:	02W10	Aquifer Thickness:	7.55 [ft]
	Casing radius:	0.083 [ft]	Gravel Pack Porosity (%)	25
	Screen length:	14 [ft]		
	Boring radius:	0.365 [ft]		
	r(eff):	0.196 [ft]		

Comments:

Evaluated by: Leon Chen

Evaluation Date: 10/9/2002

Slug Test Data for 02W10
9/30/2002

Time	Time (sec)	Water Head (ft)	Head (ft)	Normalized Head
Initial Head		12.090		
13:53:36	0	10.669	1.421	1.000
13:53:39	3	10.789	1.301	0.916
13:53:42	6	10.895	1.195	0.841
13:53:45	9	10.989	1.101	0.775
13:53:48	12	11.075	1.015	0.714
13:53:51	15	11.153	0.937	0.659
13:53:54	18	11.225	0.865	0.609
13:53:57	21	11.290	0.800	0.563
13:54:00	24	11.349	0.741	0.521
13:54:03	27	11.402	0.688	0.484
13:54:06	30	11.451	0.639	0.450
13:54:09	33	11.497	0.593	0.417
13:54:12	36	11.539	0.551	0.388
13:54:15	39	11.575	0.515	0.362
13:54:18	42	11.609	0.481	0.338
13:54:21	45	11.639	0.451	0.317
13:54:24	48	11.666	0.424	0.298
13:54:27	51	11.690	0.400	0.281
13:54:30	54	11.711	0.379	0.267
13:54:33	57	11.730	0.360	0.253
13:54:36	60	11.748	0.342	0.241
13:54:39	63	11.763	0.327	0.230
13:54:42	66	11.777	0.313	0.220
13:54:45	69	11.789	0.301	0.212
13:54:48	72	11.801	0.289	0.203
13:54:51	75	11.811	0.279	0.196
13:54:54	78	11.821	0.269	0.189
13:54:57	81	11.829	0.261	0.184
13:55:00	84	11.838	0.252	0.177
13:55:03	87	11.846	0.244	0.172
13:55:06	90	11.853	0.237	0.167
13:55:09	93	11.859	0.231	0.163
13:55:12	96	11.865	0.225	0.158
13:55:15	99	11.871	0.219	0.154
13:55:18	102	11.876	0.214	0.151
13:55:21	105	11.882	0.208	0.146
13:55:24	108	11.886	0.204	0.144
13:55:27	111	11.891	0.199	0.140
13:55:30	114	11.896	0.194	0.137
13:55:33	117	11.900	0.190	0.134
13:55:36	120	11.904	0.186	0.131
13:55:39	123	11.907	0.183	0.129
13:55:42	126	11.911	0.179	0.126
13:55:45	129	11.915	0.175	0.123
13:55:48	132	11.918	0.172	0.121
13:55:51	135	11.921	0.169	0.119

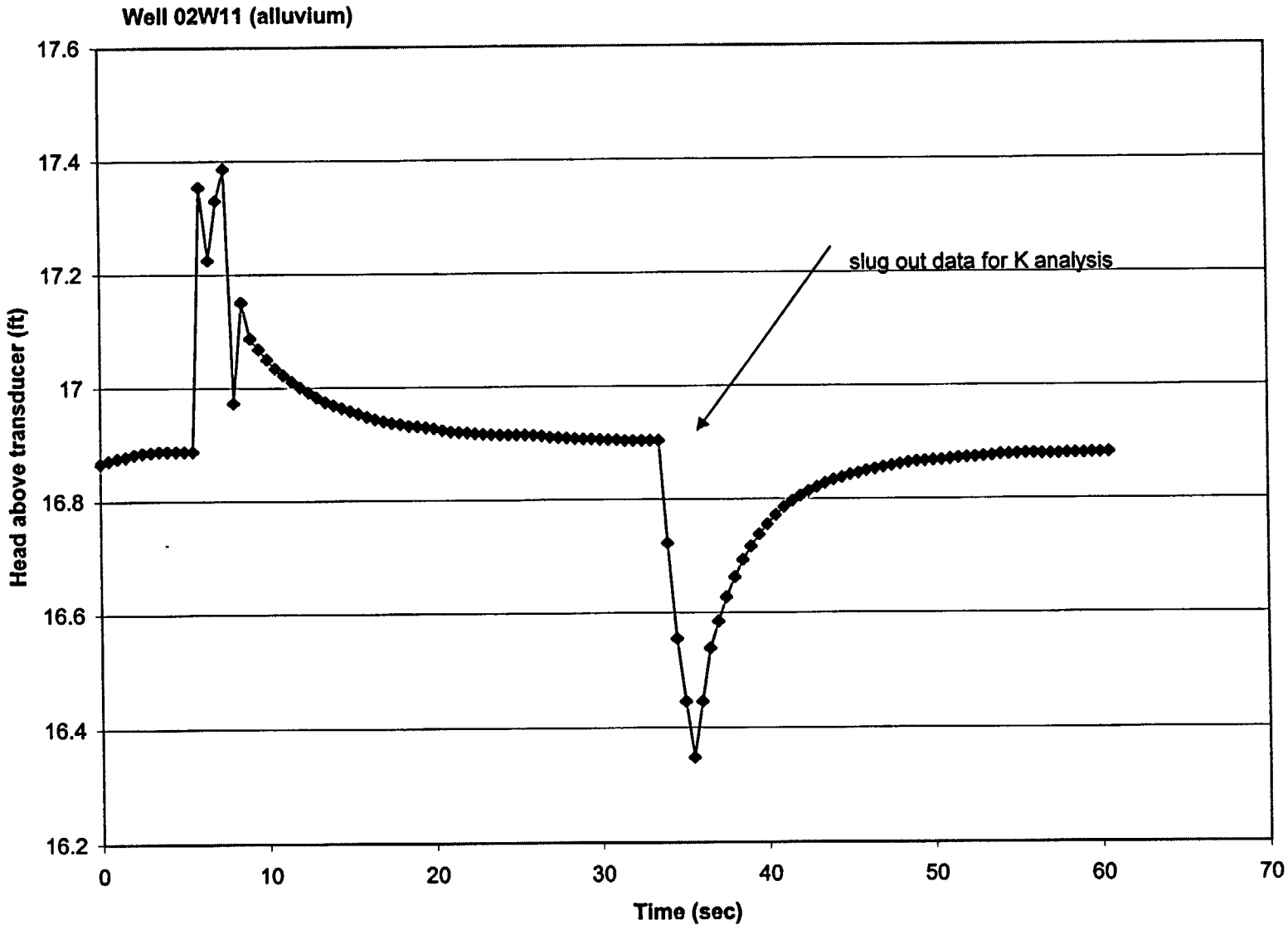
13:55:54	138	11.923	0.167	0.118
13:55:57	141	11.926	0.164	0.115
13:56:00	144	11.929	0.161	0.113
13:56:03	147	11.932	0.158	0.111
13:56:06	150	11.935	0.155	0.109
13:56:09	153	11.937	0.153	0.108
13:56:12	156	11.940	0.150	0.106
13:56:15	159	11.942	0.148	0.104
13:56:18	162	11.944	0.146	0.103
13:56:21	165	11.946	0.144	0.101
13:56:24	168	11.948	0.142	0.100
13:56:27	171	11.950	0.140	0.099
13:56:30	174	11.952	0.138	0.097
13:56:33	177	11.954	0.136	0.096
13:56:36	180	11.956	0.134	0.094
13:56:39	183	11.958	0.132	0.093
13:56:42	186	11.960	0.130	0.091
13:56:45	189	11.962	0.128	0.090
13:56:48	192	11.964	0.126	0.089
13:56:51	195	11.965	0.125	0.088
13:56:54	198	11.966	0.124	0.087
13:56:57	201	11.967	0.123	0.087
13:57:00	204	11.968	0.122	0.086
13:57:03	207	11.969	0.121	0.085
13:57:06	210	11.971	0.119	0.084
13:57:09	213	11.972	0.118	0.083
13:57:12	216	11.974	0.116	0.082
13:57:15	219	11.976	0.114	0.080
13:57:18	222	11.977	0.113	0.080
13:57:21	225	11.978	0.112	0.079
13:57:24	228	11.979	0.111	0.078
13:57:27	231	11.980	0.110	0.077
13:57:30	234	11.981	0.109	0.077
13:57:33	237	11.982	0.108	0.076
13:57:36	240	11.983	0.107	0.075
13:57:39	243	11.984	0.106	0.075
13:57:42	246	11.986	0.104	0.073
13:57:45	249	11.987	0.103	0.072
13:57:48	252	11.989	0.101	0.071
13:57:51	255	11.990	0.100	0.070
13:57:54	258	11.991	0.099	0.070
13:57:57	261	11.992	0.098	0.069
13:58:00	264	11.994	0.096	0.068
13:58:03	267	11.995	0.095	0.067
13:58:06	270	11.995	0.095	0.067
13:58:09	273	11.996	0.094	0.066
13:58:12	276	11.996	0.094	0.066
13:58:15	279	11.997	0.093	0.065
13:58:18	282	11.997	0.093	0.065
13:58:21	285	11.998	0.092	0.065
13:58:24	288	11.999	0.091	0.064
13:58:27	291	11.999	0.091	0.064

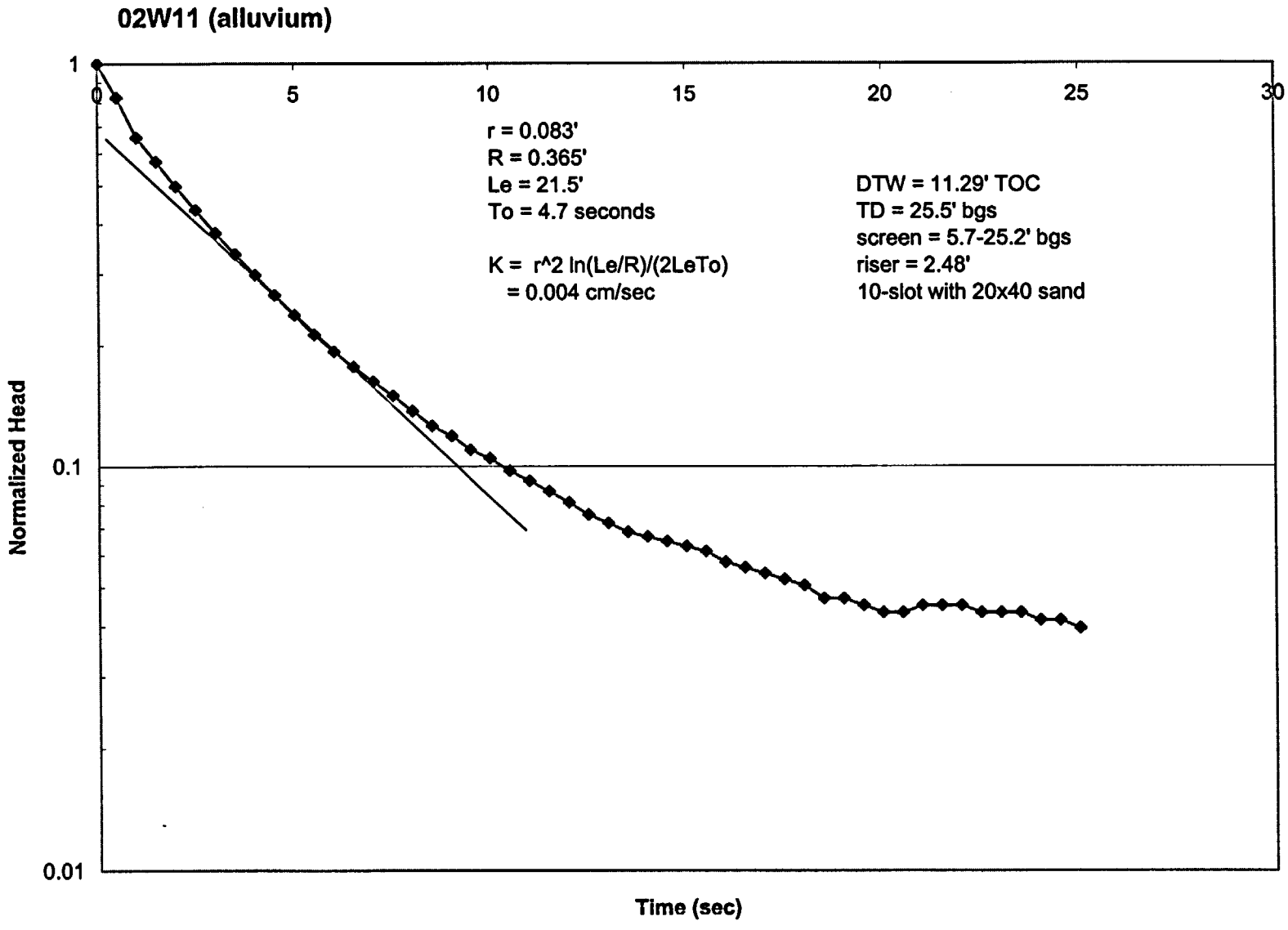
13:58:30	294	12.000	0.090	0.063
13:58:33	297	12.000	0.090	0.063
13:58:36	300	12.000	0.090	0.063
13:58:39	303	12.002	0.088	0.062
13:58:42	306	12.004	0.086	0.061
13:58:45	309	12.005	0.085	0.060
13:58:48	312	12.006	0.084	0.059
13:58:51	315	12.007	0.083	0.058
13:58:54	318	12.007	0.083	0.058
13:58:57	321	12.008	0.082	0.058
13:59:00	324	12.009	0.081	0.057
13:59:03	327	12.009	0.081	0.057
13:59:06	330	12.010	0.080	0.056
13:59:09	333	12.011	0.079	0.056
13:59:12	336	12.011	0.079	0.056
13:59:15	339	12.012	0.078	0.055
13:59:18	342	12.012	0.078	0.055
13:59:21	345	12.012	0.078	0.055
13:59:24	348	12.012	0.078	0.055
13:59:27	351	12.013	0.077	0.054
13:59:30	354	12.013	0.077	0.054
13:59:33	357	12.014	0.076	0.053
13:59:36	360	12.014	0.076	0.053
13:59:39	363	12.014	0.076	0.053
13:59:42	366	12.014	0.076	0.053
13:59:45	369	12.015	0.075	0.053
13:59:48	372	12.015	0.075	0.053
13:59:51	375	12.016	0.074	0.052
13:59:54	378	12.016	0.074	0.052
13:59:57	381	12.016	0.074	0.052
14:00:00	384	12.017	0.073	0.051
14:00:03	387	12.017	0.073	0.051
14:00:06	390	12.017	0.073	0.051
14:00:09	393	12.018	0.072	0.051
14:00:12	396	12.018	0.072	0.051
14:00:15	399	12.018	0.072	0.051
14:00:18	402	12.018	0.072	0.051
14:00:21	405	12.019	0.071	0.050
14:00:24	408	12.019	0.071	0.050
14:00:27	411	12.020	0.070	0.049
14:00:30	414	12.020	0.070	0.049
14:00:33	417	12.021	0.069	0.049
14:00:36	420	12.022	0.068	0.048
14:00:39	423	12.022	0.068	0.048
14:00:42	426	12.022	0.068	0.048
14:00:45	429	12.022	0.068	0.048
14:00:48	432	12.022	0.068	0.048
14:00:51	435	12.023	0.067	0.047
14:00:54	438	12.023	0.067	0.047
14:00:57	441	12.024	0.066	0.046
14:01:00	444	12.025	0.065	0.046
14:01:03	447	12.025	0.065	0.046

14:01:06	450	12.026	0.064	0.045
14:01:09	453	12.026	0.064	0.045
14:01:12	456	12.026	0.064	0.045
14:01:15	459	12.026	0.064	0.045
14:01:18	462	12.026	0.064	0.045
14:01:21	465	12.027	0.063	0.044
14:01:24	468	12.027	0.063	0.044
14:01:27	471	12.028	0.062	0.044
14:01:30	474	12.027	0.063	0.044
14:01:33	477	12.027	0.063	0.044
14:01:36	480	12.027	0.063	0.044
14:01:39	483	12.027	0.063	0.044
14:01:42	486	12.028	0.062	0.044
14:01:45	489	12.029	0.061	0.043
14:01:48	492	12.029	0.061	0.043
14:01:51	495	12.029	0.061	0.043
14:01:54	498	12.029	0.061	0.043
14:01:57	501	12.029	0.061	0.043
14:02:00	504	12.029	0.061	0.043
14:02:03	507	12.029	0.061	0.043
14:02:06	510	12.029	0.061	0.043
14:02:09	513	12.029	0.061	0.043
14:02:12	516	12.030	0.060	0.042
14:02:15	519	12.030	0.060	0.042
14:02:18	522	12.030	0.060	0.042
14:02:21	525	12.030	0.060	0.042
14:02:24	528	12.030	0.060	0.042
14:02:27	531	12.030	0.060	0.042
14:02:30	534	12.031	0.059	0.042
14:02:33	537	12.031	0.059	0.042
14:02:36	540	12.031	0.059	0.042
14:02:39	543	12.032	0.058	0.041
14:02:42	546	12.032	0.058	0.041
14:02:45	549	12.032	0.058	0.041
14:02:48	552	12.031	0.059	0.042
14:02:51	555	12.031	0.059	0.042
14:02:54	558	12.031	0.059	0.042
14:02:57	561	12.031	0.059	0.042
14:03:00	564	12.032	0.058	0.041
14:03:03	567	12.032	0.058	0.041
14:03:06	570	12.032	0.058	0.041
14:03:09	573	12.032	0.058	0.041
14:03:12	576	12.032	0.058	0.041
14:03:15	579	12.032	0.058	0.041
14:03:18	582	12.033	0.057	0.040
14:03:21	585	12.033	0.057	0.040
14:03:24	588	12.033	0.057	0.040
14:03:27	591	12.033	0.057	0.040
14:03:30	594	12.032	0.058	0.041
14:03:33	597	12.033	0.057	0.040
14:03:36	600	12.034	0.056	0.039
14:03:39	603	12.035	0.055	0.039

14:03:42	606	12.035	0.055	0.039
14:03:45	609	12.035	0.055	0.039
14:03:48	612	12.034	0.056	0.039
14:03:51	615	12.033	0.057	0.040
14:03:54	618	12.034	0.056	0.039
14:03:57	621	12.034	0.056	0.039
14:04:00	624	12.036	0.054	0.038
14:04:03	627	12.036	0.054	0.038
14:04:06	630	12.036	0.054	0.038
14:04:09	633	12.036	0.054	0.038
14:04:12	636	12.035	0.055	0.039
14:04:15	639	12.035	0.055	0.039
14:04:18	642	12.035	0.055	0.039
14:04:21	645	12.036	0.054	0.038
14:04:24	648	12.036	0.054	0.038
14:04:27	651	12.036	0.054	0.038
14:04:30	654	12.036	0.054	0.038
14:04:33	657	12.036	0.054	0.038
14:04:36	660	12.036	0.054	0.038
14:04:39	663	12.036	0.054	0.038
14:04:42	666	12.036	0.054	0.038
14:04:45	669	12.036	0.054	0.038
14:04:48	672	12.036	0.054	0.038
14:04:51	675	12.035	0.055	0.039
14:04:54	678	12.035	0.055	0.039
14:04:57	681	12.035	0.055	0.039
14:05:00	684	12.035	0.055	0.039
14:05:03	687	12.036	0.054	0.038
14:05:06	690	12.036	0.054	0.038
14:05:09	693	12.035	0.055	0.039
14:05:12	696	12.035	0.055	0.039
14:05:15	699	12.035	0.055	0.039
14:05:18	702	12.036	0.054	0.038
14:05:21	705	12.036	0.054	0.038
14:05:24	708	12.035	0.055	0.039
14:05:27	711	12.036	0.054	0.038
14:05:30	714	12.035	0.055	0.039
14:05:33	717	12.035	0.055	0.039
14:05:36	720	12.036	0.054	0.038

WELL 02W11


Well 02W11 (alluvium)
17.6
17.4
17.2
17
16.8
16.6
16.4
16.2
Head above transducer (ft)
slug out data for K analysis
0
10
20
30
40
50
60
70
Time (sec)


02W11 (alluvium)
1
0.1
0.01
0
5
10
15
20
25
30
r = 0.083'
R = 0.365'
Le = 21.5'
To = 4.7 seconds
K = r^2 ln(Le/R)/(2LeTo)
= 0.004 cm/sec
DTW = 11.29' TOC
TD = 25.5' bgs
screen = 5.7-25.2' bgs
riser = 2.48'
10-slot with 20x40 sand
Normalized Head
Time (sec)

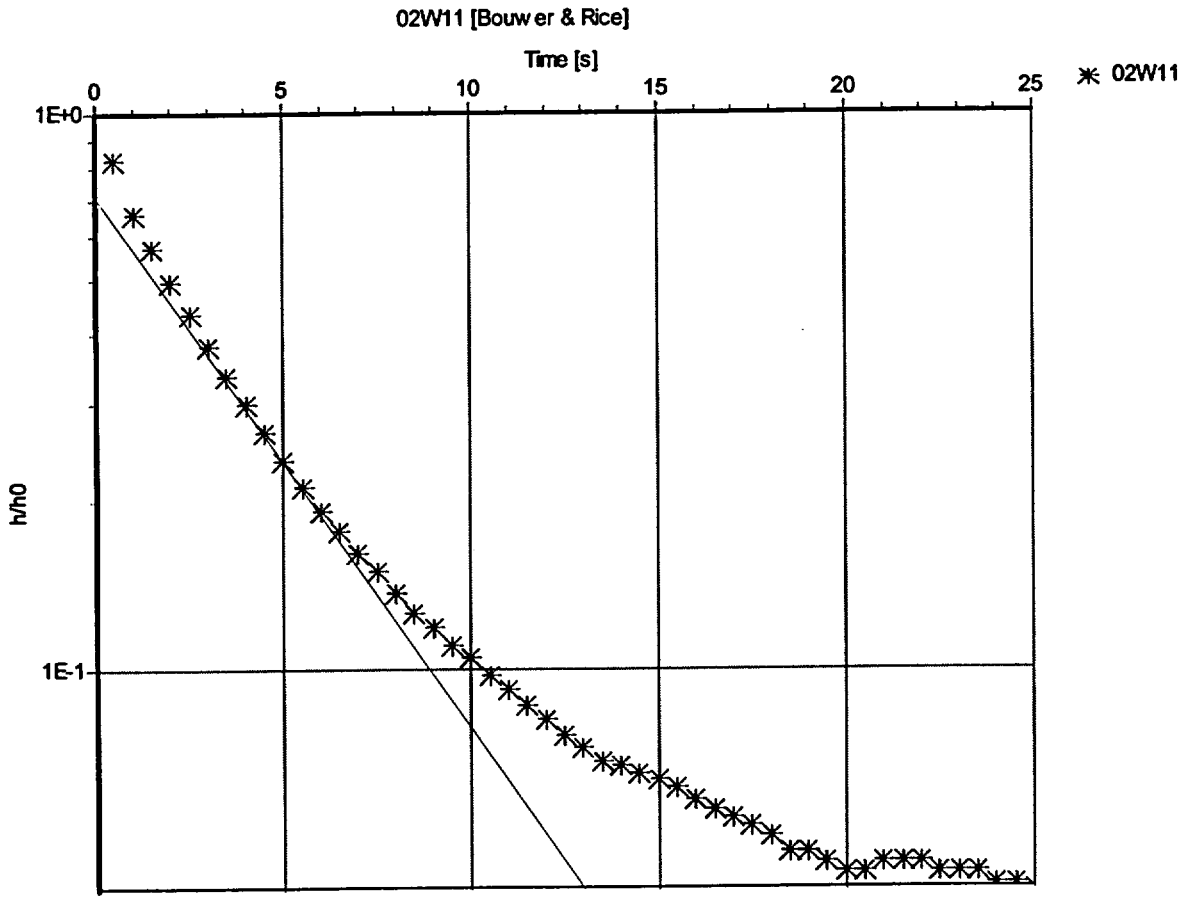
Kerr-McGee Corp.
123 Robert S. Kerr Ave.
Oklahoma City, Oklahoma 73102
Phone: (405) 270-2696

Slug Test Analysis Report

Project: Cimarron Facility Burial Area # 1

Number:

Client: Kerr-McGee



Slug Test: **02W11 (alluvium/clayey)**

Analysis Method: **Bouwer & Rice**

Analysis Results:

Conductivity: 3.24E-3 [cm/s]

Test parameters:				
	Test Well:	02W11	Aquifer Thickness:	11.73 [ft]
	Casing radius:	0.083 [ft]	Gravel Pack Porosity (%)	25
	Screen length:	19.5 [ft]		
	Boring radius:	0.365 [ft]		
	r(eff):	0.196 [ft]		

Comments: The concave-upward curcature was interpreted to be a product of a large alpha, and not drainage of the filter pack. No correction required. The large alpha is due to the storage of water in the clayey zones interbedded with sand layers. Please see the well log for vertical

Evaluated by: Leon Chen

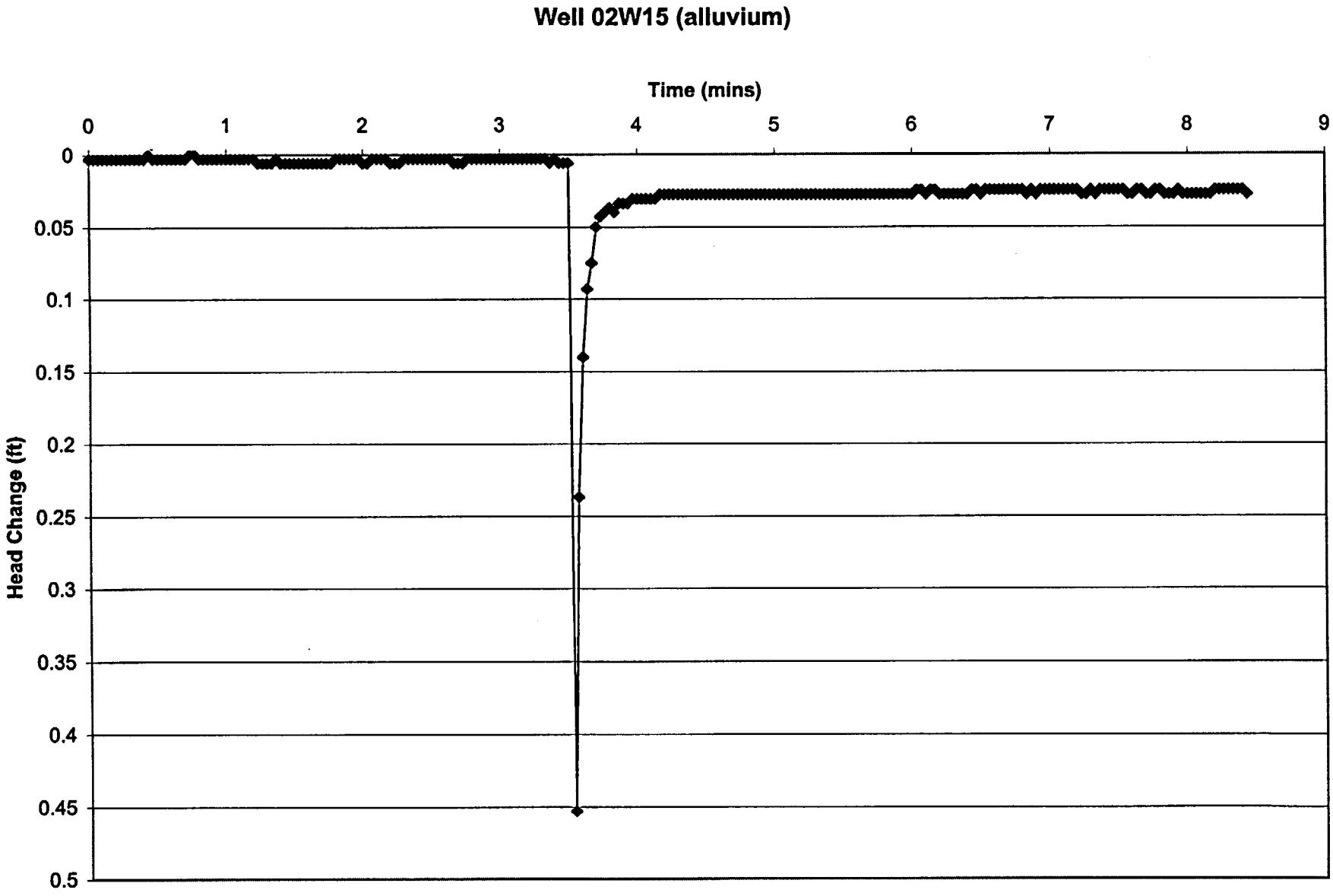
Evaluation Date: 10/10/2002

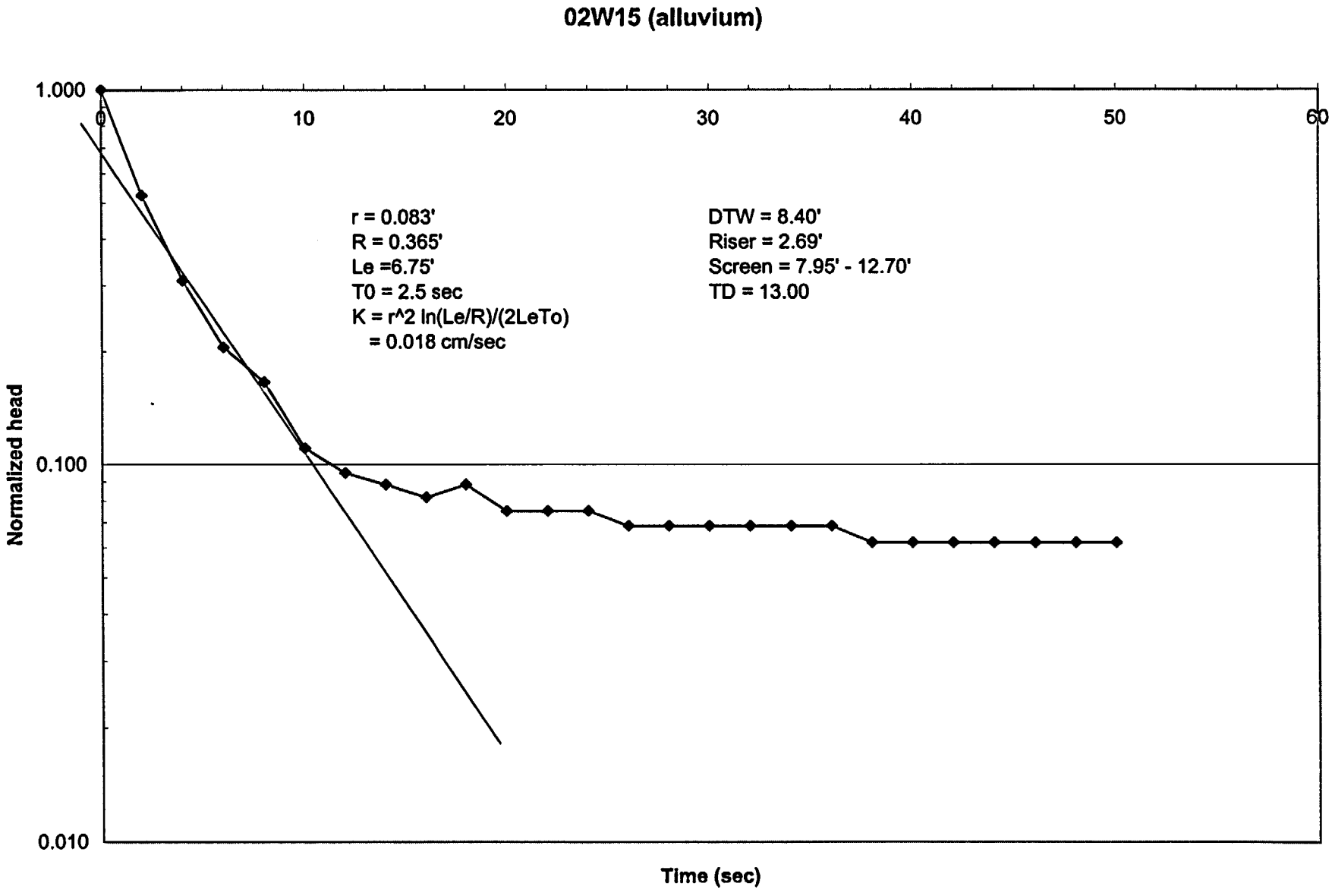
Slug Test Data for 02W11
10/4/2002

Time	Time (sec)	Water Head (ft)	Head (ft)	Normalized Head
Initial Head		16.903		
23:46:20	0	16.348	0.555	1.000
23:46:20	0.5	16.445	0.458	0.825
23:46:21	1	16.538	0.365	0.658
23:46:21	1.5	16.585	0.318	0.573
23:46:22	2	16.627	0.276	0.497
23:46:22	2.5	16.662	0.241	0.434
23:46:23	3	16.692	0.211	0.380
23:46:23	3.5	16.716	0.187	0.337
23:46:24	4	16.737	0.166	0.299
23:46:24	4.5	16.755	0.148	0.267
23:46:25	5	16.771	0.132	0.238
23:46:25	5.5	16.785	0.118	0.213
23:46:26	6	16.796	0.107	0.193
23:46:26	6.5	16.805	0.098	0.177
23:46:27	7	16.813	0.090	0.162
23:46:27	7.5	16.820	0.083	0.150
23:46:28	8	16.827	0.076	0.137
23:46:28	8.5	16.833	0.070	0.126
23:46:29	9	16.837	0.066	0.119
23:46:29	9.5	16.842	0.061	0.110
23:46:30	10	16.845	0.058	0.105
23:46:30	10.5	16.849	0.054	0.097
23:46:31	11	16.852	0.051	0.092
23:46:31	11.5	16.855	0.048	0.086
23:46:32	12	16.858	0.045	0.081
23:46:32	12.5	16.861	0.042	0.076
23:46:33	13	16.863	0.040	0.072
23:46:33	13.5	16.865	0.038	0.068
23:46:34	14	16.866	0.037	0.067
23:46:34	14.5	16.867	0.036	0.065
23:46:35	15	16.868	0.035	0.063
23:46:35	15.5	16.869	0.034	0.061
23:46:36	16	16.871	0.032	0.058
23:46:36	16.5	16.872	0.031	0.056
23:46:37	17	16.873	0.030	0.054
23:46:37	17.5	16.874	0.029	0.052
23:46:38	18	16.875	0.028	0.050
23:46:38	18.5	16.877	0.026	0.047
23:46:39	19	16.877	0.026	0.047
23:46:39	19.5	16.878	0.025	0.045
23:46:40	20	16.879	0.024	0.043
23:46:40	20.5	16.879	0.024	0.043
23:46:41	21	16.878	0.025	0.045
23:46:41	21.5	16.878	0.025	0.045
23:46:42	22	16.878	0.025	0.045
23:46:42	22.5	16.879	0.024	0.043

23:46:43	23	16.879	0.024	0.043
23:46:43	23.5	16.879	0.024	0.043
23:46:44	24	16.880	0.023	0.041
23:46:44	24.5	16.880	0.023	0.041
23:46:45	25	16.881	0.022	0.040

WELL 02W15


Well 02W15 (alluvium)
Time (mins)
0
1
2
3
4
5
6
7
8
9
Head Change (ft)
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5


02W15 (alluvium)
1.000
0.100
0.010
0
10
20
30
40
50
60
Normalized head
Time (sec)
r = 0.083'
R = 0.365'
Le =6.75'
T0 = 2.5 sec
K = r^2 ln(Le/R)/(2LeTo)
= 0.018 cm/sec
DTW = 8.40'
Riser = 2.69'
Screen = 7.95' - 12.70'
TD = 13.00

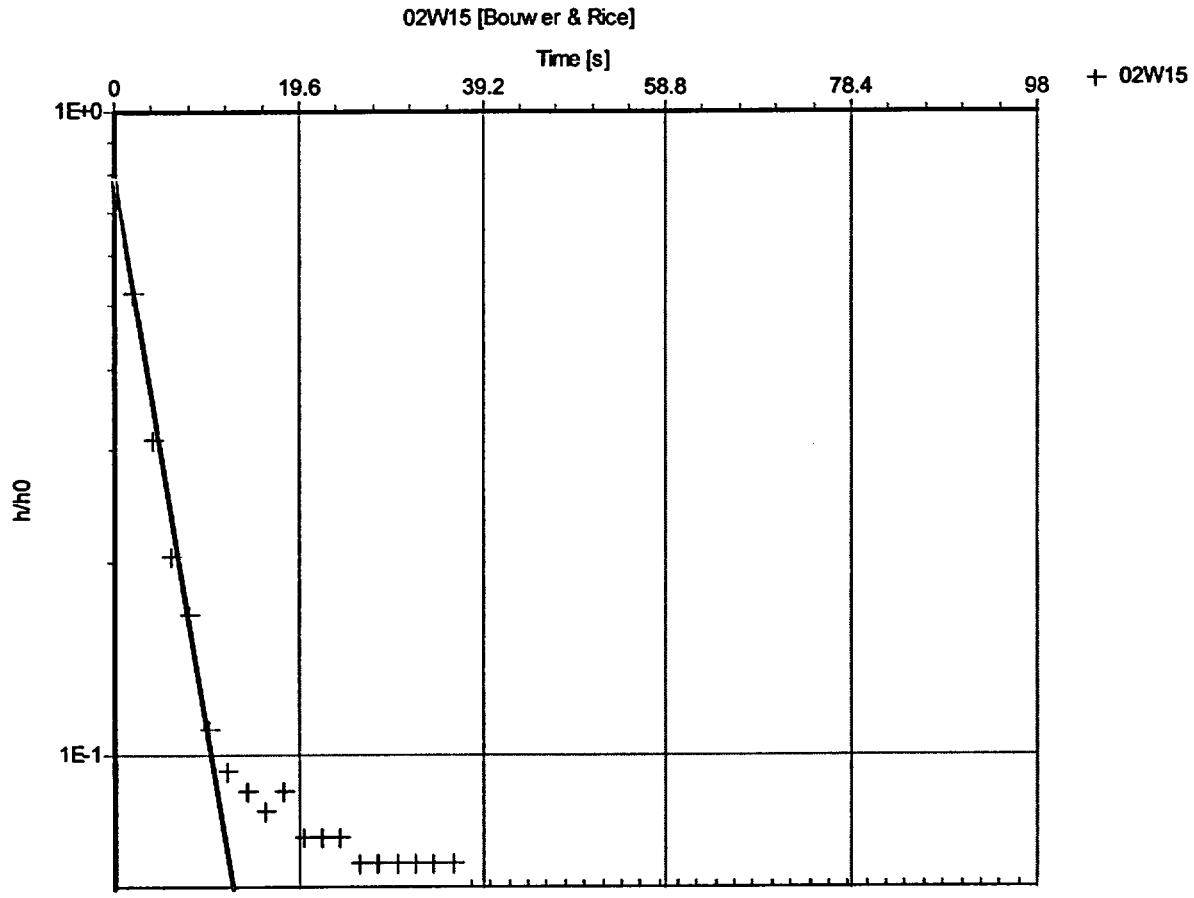
Kerr-McGee Corp.
123 Robert S. Kerr Ave.
Oklahoma City, Oklahoma 73102
Phone: (405) 270-2696

Slug Test Analysis Report

Project: Cimarron Facility Burial Area # 1

Number:

Client: Kerr-McGee



Slug Test: **02W15**

Analysis Method: **Bouwer & Rice**

Analysis Results:

Conductivity: 1.09E-2 [cm/s]

Test parameters:				
	Test Well:	02W15	Aquifer Thickness:	11.6 [ft]
	Casing radius:	0.083 [ft]	Gravel Pack Porosity (%)	25
	Screen length:	4.75 [ft]		
	Boring radius:	0.365 [ft]		
	r(eff):	0.196 [ft]		

Comments:

Evaluated by: Leon Chen

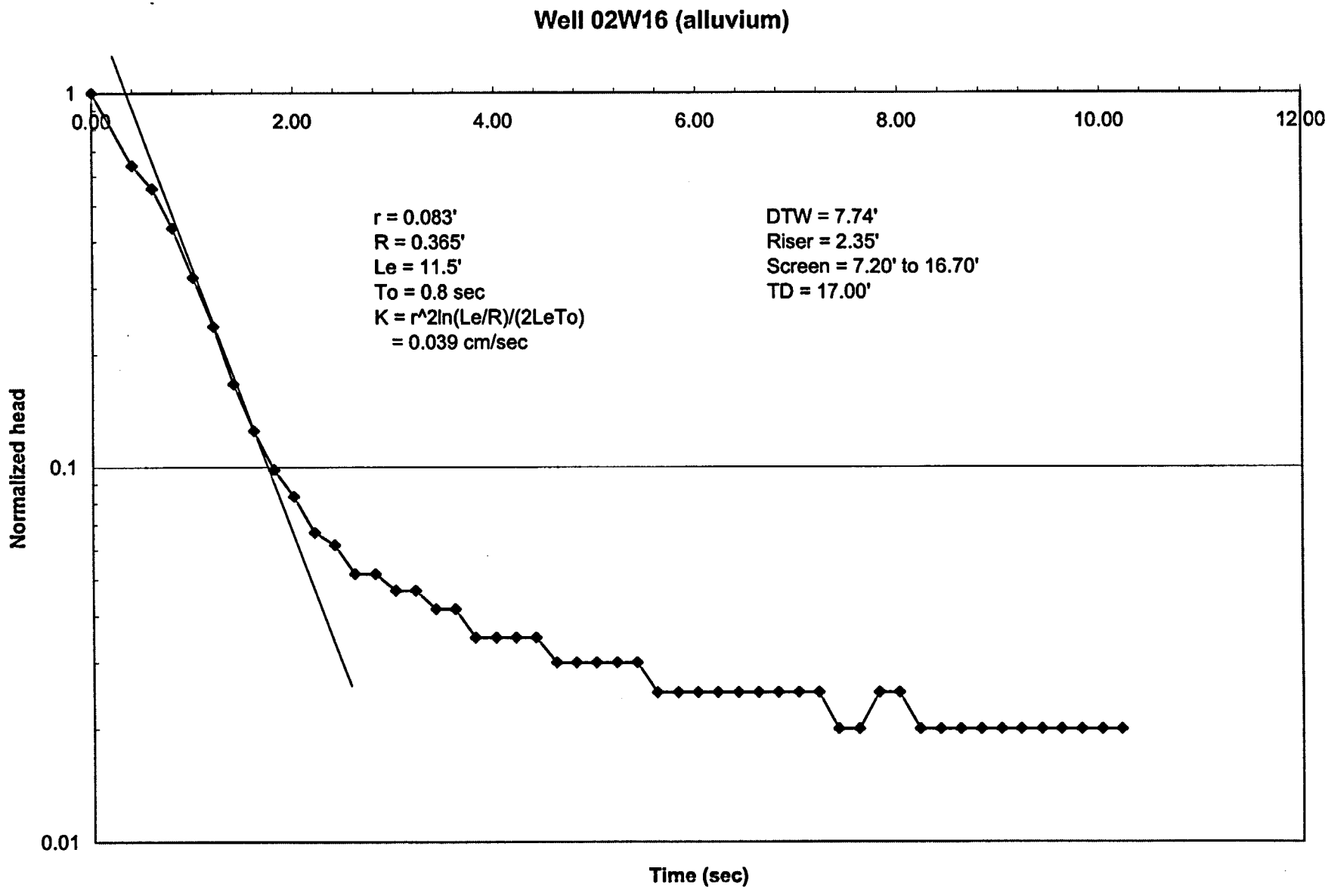
Evaluation Date: 11/13/2002

Slug Test Data for 02W15			
10/12/2002			
Time (mins	Time (sec)	Head Change (ft)	Normalized Head
3.5333	0	0.453	1.000
3.5666	2	0.237	0.523
3.6	4	0.14	0.309
3.6333	6	0.093	0.205
3.6666	8	0.075	0.166
3.7	10	0.05	0.110
3.7333	12	0.043	0.095
3.7666	14	0.04	0.088
3.8	16	0.037	0.082
3.8333	18	0.04	0.088
3.8666	20	0.034	0.075
3.9	22	0.034	0.075
3.9333	24	0.034	0.075
3.9666	26	0.031	0.068
4	28	0.031	0.068
4.0333	30	0.031	0.068
4.0666	32	0.031	0.068
4.1	34	0.031	0.068
4.1333	36	0.031	0.068
4.1666	38	0.028	0.062
4.2	40	0.028	0.062
4.2333	42	0.028	0.062
4.2666	44	0.028	0.062
4.3	46	0.028	0.062
4.3333	48	0.028	0.062
4.3666	50	0.028	0.062
4.4	52	0.028	0.062
4.4333	54	0.028	0.062
4.4666	56	0.028	0.062
4.5	58	0.028	0.062
4.5333	60	0.028	0.062
4.5666	62	0.028	0.062
4.6	64	0.028	0.062
4.6333	66	0.028	0.062
4.6666	68	0.028	0.062
4.7	70	0.028	0.062
4.7333	72	0.028	0.062
4.7666	74	0.028	0.062
4.8	76	0.028	0.062
4.8333	78	0.028	0.062
4.8666	80	0.028	0.062
4.9	82	0.028	0.062
4.9333	84	0.028	0.062
4.9666	86	0.028	0.062
5	88	0.028	0.062
5.0333	90	0.028	0.062
5.0666	92	0.028	0.062
5.1	94	0.028	0.062

5.1333	96	0.028	0.062
5.1666	98	0.028	0.062
5.2	100	0.028	0.062
5.2333	102	0.028	0.062
5.2666	104	0.028	0.062
5.3	106	0.028	0.062
5.3333	108	0.028	0.062
5.3666	110	0.028	0.062
5.4	112	0.028	0.062
5.4333	114	0.028	0.062
5.4666	116	0.028	0.062
5.5	118	0.028	0.062
5.5333	120	0.028	0.062
5.5666	122	0.028	0.062
5.6	124	0.028	0.062
5.6333	126	0.028	0.062
5.6666	128	0.028	0.062
5.7	130	0.028	0.062
5.7333	132	0.028	0.062
5.7666	134	0.028	0.062
5.8	136	0.028	0.062
5.8333	138	0.028	0.062
5.8666	140	0.028	0.062
5.9	142	0.028	0.062
5.9333	144	0.028	0.062
5.9666	146	0.028	0.062
6	148	0.028	0.062
6.0333	150	0.025	0.055
6.0666	152	0.025	0.055
6.1	154	0.028	0.062
6.1333	156	0.025	0.055
6.1666	158	0.025	0.055
6.2	160	0.028	0.062
6.2333	162	0.028	0.062
6.2666	164	0.028	0.062
6.3	166	0.028	0.062
6.3333	168	0.028	0.062
6.3666	170	0.028	0.062
6.4	172	0.028	0.062
6.4333	174	0.025	0.055
6.4666	176	0.025	0.055
6.5	178	0.028	0.062
6.5333	180	0.025	0.055
6.5666	182	0.025	0.055
6.6	184	0.025	0.055
6.6333	186	0.025	0.055
6.6666	188	0.025	0.055
6.7	190	0.025	0.055
6.7333	192	0.025	0.055
6.7666	194	0.025	0.055
6.8	196	0.025	0.055
6.8333	198	0.028	0.062

6.8666	200	0.025	0.055
6.9	202	0.028	0.062
6.9333	204	0.025	0.055
6.9666	206	0.025	0.055
7	208	0.025	0.055
7.0333	210	0.025	0.055
7.0666	212	0.025	0.055
7.1	214	0.025	0.055
7.1333	216	0.025	0.055
7.1666	218	0.025	0.055
7.2	220	0.025	0.055
7.2333	222	0.028	0.062
7.2666	224	0.028	0.062
7.3	226	0.025	0.055
7.3333	228	0.028	0.062
7.3666	230	0.025	0.055
7.4	232	0.025	0.055
7.4333	234	0.025	0.055
7.4666	236	0.025	0.055
7.5	238	0.025	0.055
7.5333	240	0.025	0.055
7.5666	242	0.028	0.062
7.6	244	0.028	0.062
7.6333	246	0.025	0.055
7.6666	248	0.025	0.055
7.7	250	0.028	0.062
7.7333	252	0.028	0.062
7.7666	254	0.025	0.055
7.8	256	0.025	0.055
7.8333	258	0.028	0.062
7.8666	260	0.028	0.062
7.9	262	0.028	0.062
7.9333	264	0.025	0.055
7.9666	266	0.028	0.062
8	268	0.028	0.062
8.0333	270	0.028	0.062
8.0666	272	0.028	0.062
8.1	274	0.028	0.062
8.1333	276	0.028	0.062
8.1666	278	0.028	0.062
8.2	280	0.025	0.055
8.2333	282	0.025	0.055
8.2666	284	0.025	0.055
8.3	286	0.025	0.055
8.3333	288	0.025	0.055
8.3666	290	0.025	0.055
8.4	292	0.025	0.055
8.4333	294	0.028	0.062

WELL 02W16


Well 02W16 (alluvium)
1
0.1
0.01
0.00
2.00
4.00
6.00
8.00
10.00
12.00
Normalized head
Time (sec)
r = 0.083'
R = 0.365'
Le = 11.5'
To = 0.8 sec
K = r^2ln(Le/R)/(2LeTo)
= 0.039 cm/sec
DTW = 7.74'
Riser = 2.35'
Screen = 7.20' to 16.70'
TD = 17.00'

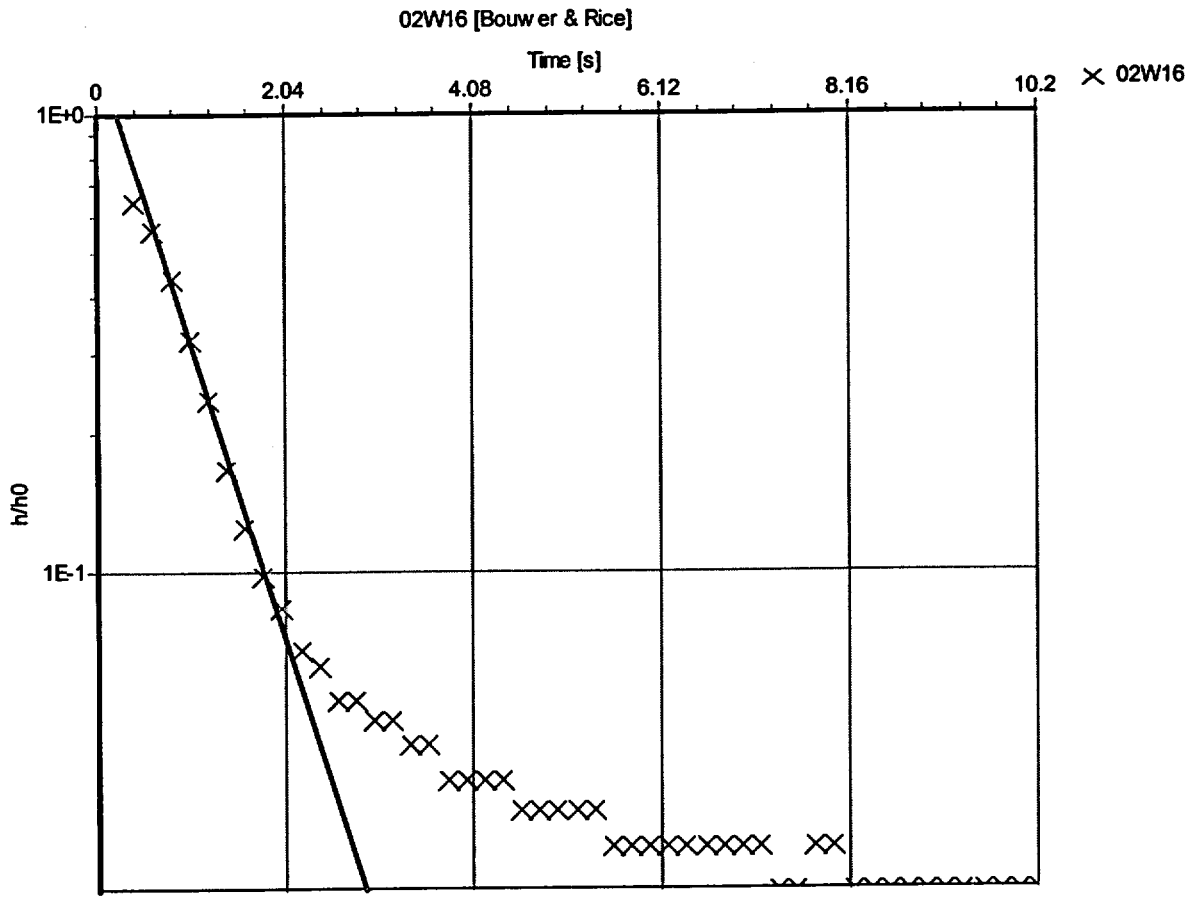
Kerr-McGee Corp.
123 Robert S. Kerr Ave.
Oklahoma City, Oklahoma 73102
Phone: (405) 270-2696

Slug Test Analysis Report

Project: Cimarron Facility Burial Area # 1

Number:

Client: Kerr-McGee



Slug Test: **02W16**

Analysis Method: **Bouwer & Rice**

Analysis Results:

Conductivity: 3.66E-2 [cm/s]

Test parameters:				
	Test Well:	02W16	Aquifer Thickness:	6.91 [ft]
	Casing radius:	0.083 [ft]	Gravel Pack Porosity (%)	25
	Screen length:	9.5 [ft]		
	Boring radius:	0.365 [ft]		
	r(eff):	0.196 [ft]		

Comments:

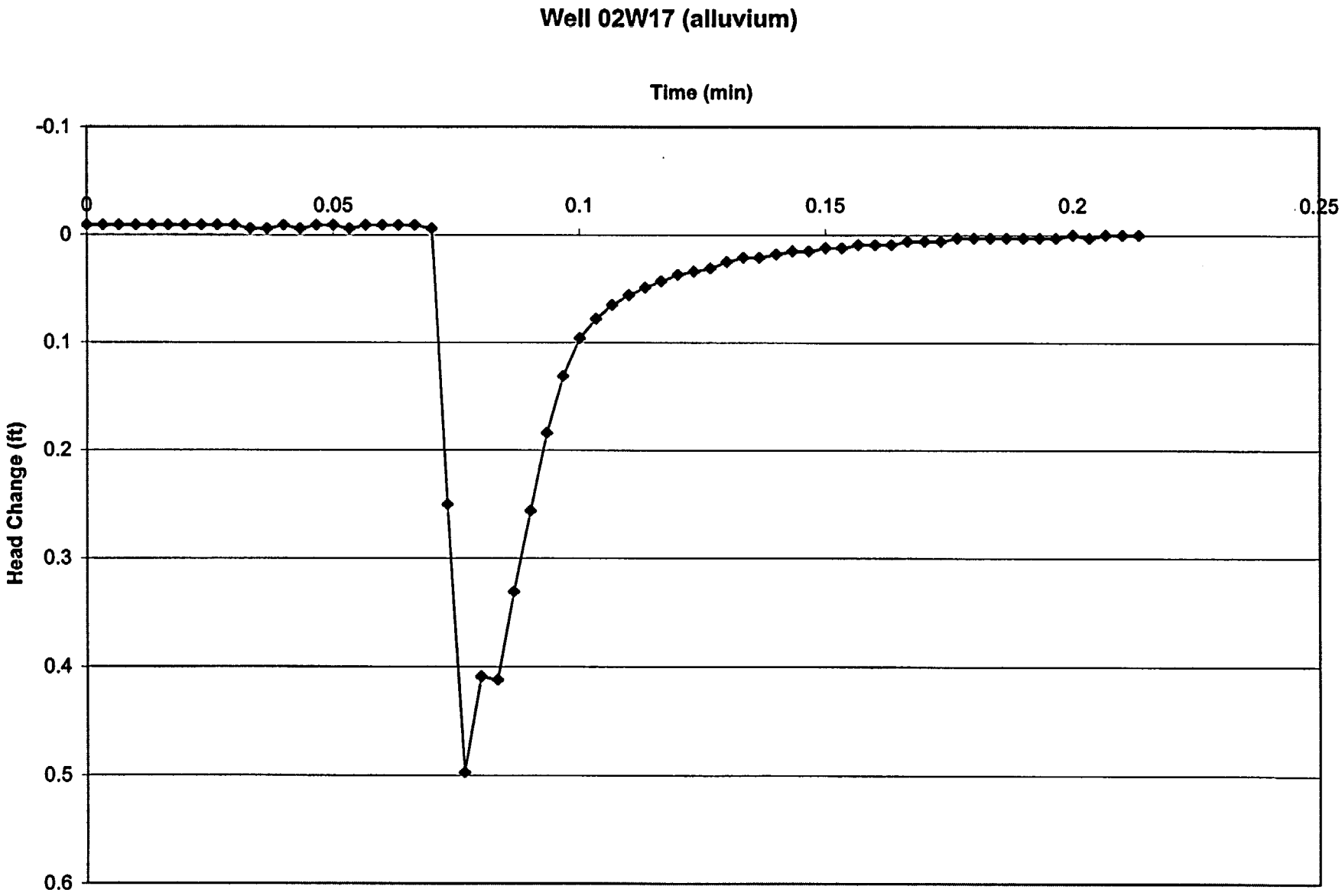
Evaluated by: Leon Chen

Evaluation Date: 11/13/2002

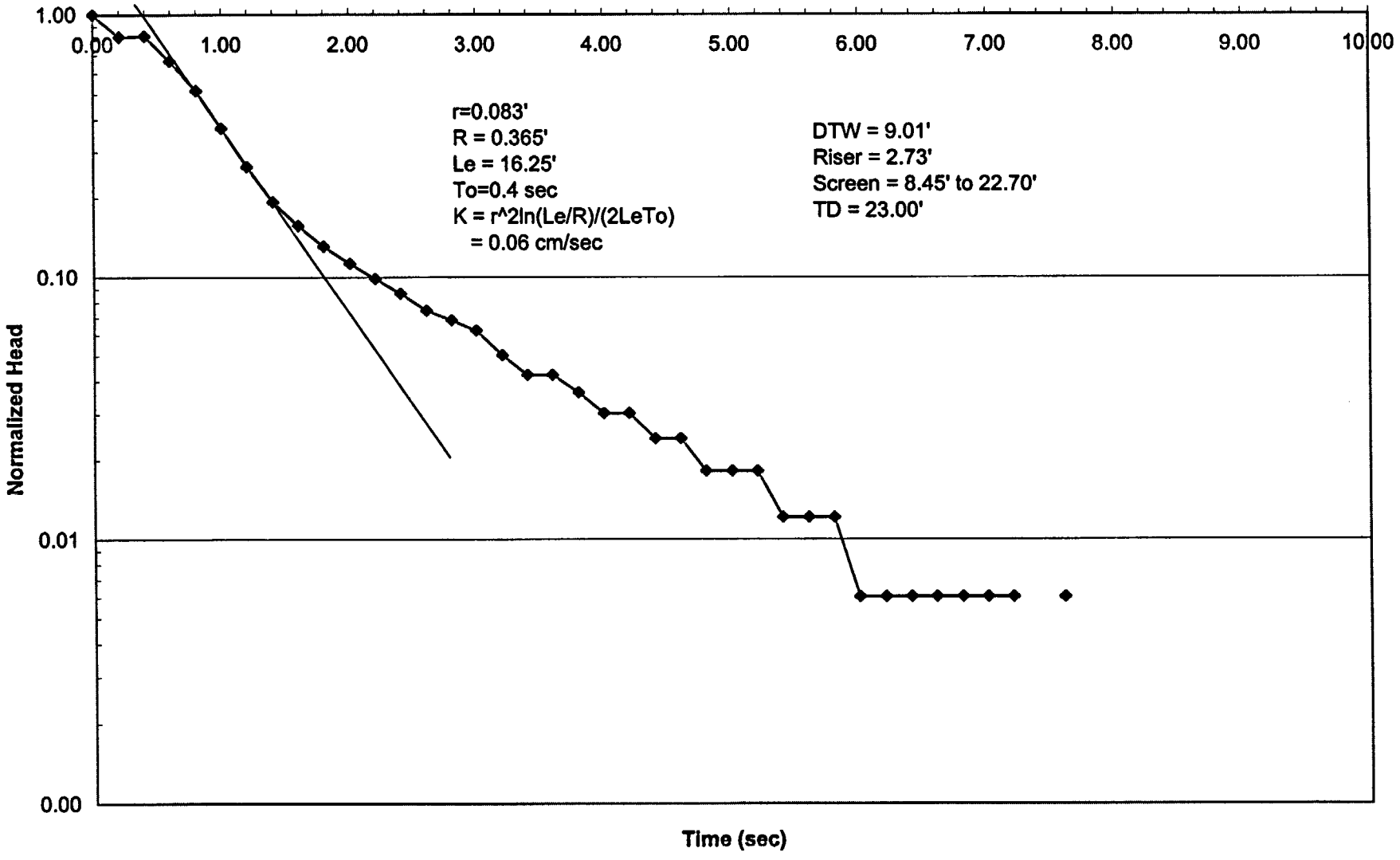
Slug Test Data for 02W16				
10/12/2002				
Time (min)	Time (sec)	Head Change (ft)	Normalized Head	Time (sec)
0.0733	0.00	0.6	1	0.00
0.08	0.40	0.384	0.640	0.40
0.0833	0.60	0.334	0.557	0.60
0.0866	0.80	0.262	0.437	0.80
0.09	1.00	0.193	0.322	1.00
0.0933	1.20	0.143	0.238	1.20
0.0966	1.40	0.1	0.167	1.40
0.1	1.60	0.075	0.125	1.60
0.1033	1.80	0.059	0.098	1.80
0.1066	2.00	0.05	0.083	2.00
0.11	2.20	0.04	0.067	2.20
0.1133	2.40	0.037	0.062	2.40
0.1166	2.60	0.031	0.052	2.60
0.12	2.80	0.031	0.052	2.80
0.1233	3.00	0.028	0.047	3.00
0.1266	3.20	0.028	0.047	3.20
0.13	3.40	0.025	0.042	3.40
0.1333	3.60	0.025	0.042	3.60
0.1366	3.80	0.021	0.035	3.80
0.14	4.00	0.021	0.035	4.00
0.1433	4.20	0.021	0.035	4.20
0.1466	4.40	0.021	0.035	4.40
0.15	4.60	0.018	0.030	4.60
0.1533	4.80	0.018	0.030	4.80
0.1566	5.00	0.018	0.030	5.00
0.16	5.20	0.018	0.030	5.20
0.1633	5.40	0.018	0.030	5.40
0.1666	5.60	0.015	0.025	5.60
0.17	5.80	0.015	0.025	5.80
0.1733	6.00	0.015	0.025	6.00
0.1766	6.20	0.015	0.025	6.20
0.18	6.40	0.015	0.025	6.40
0.1833	6.60	0.015	0.025	6.60
0.1866	6.80	0.015	0.025	6.80
0.19	7.00	0.015	0.025	7.00
0.1933	7.20	0.015	0.025	7.20
0.1966	7.40	0.012	0.020	7.40
0.2	7.60	0.012	0.020	7.60
0.2033	7.80	0.015	0.025	7.80
0.2066	8.00	0.015	0.025	8.00
0.21	8.20	0.012	0.020	8.20
0.2133	8.40	0.012	0.020	8.40
0.2166	8.60	0,012	0.020	8.60
0.22	8.80	0.012	0.020	8.80
0.2233	9.00	0.012	0.020	9.00
0.2266	9.20	0.012	0.020	9.20
0.23	9.40	0.012	0.020	9.40
0.2333	9.60	0.012	0.020	9.60

0.2366	9.80	0.012	0.020	9.80
0.24	10.00	0.012	0.020	10.00
0.2433	10.20	0.012	0.020	10.20

WELL 02W17


Well 02W17 (alluvium)
Time (min)
Head Change (ft)
-0.1
0
0.1
0.2
0.3
0.4
0.5
0.6
0
0.05
0.1
0.15
0.2
0.25

Well 02W17 (alluvium)



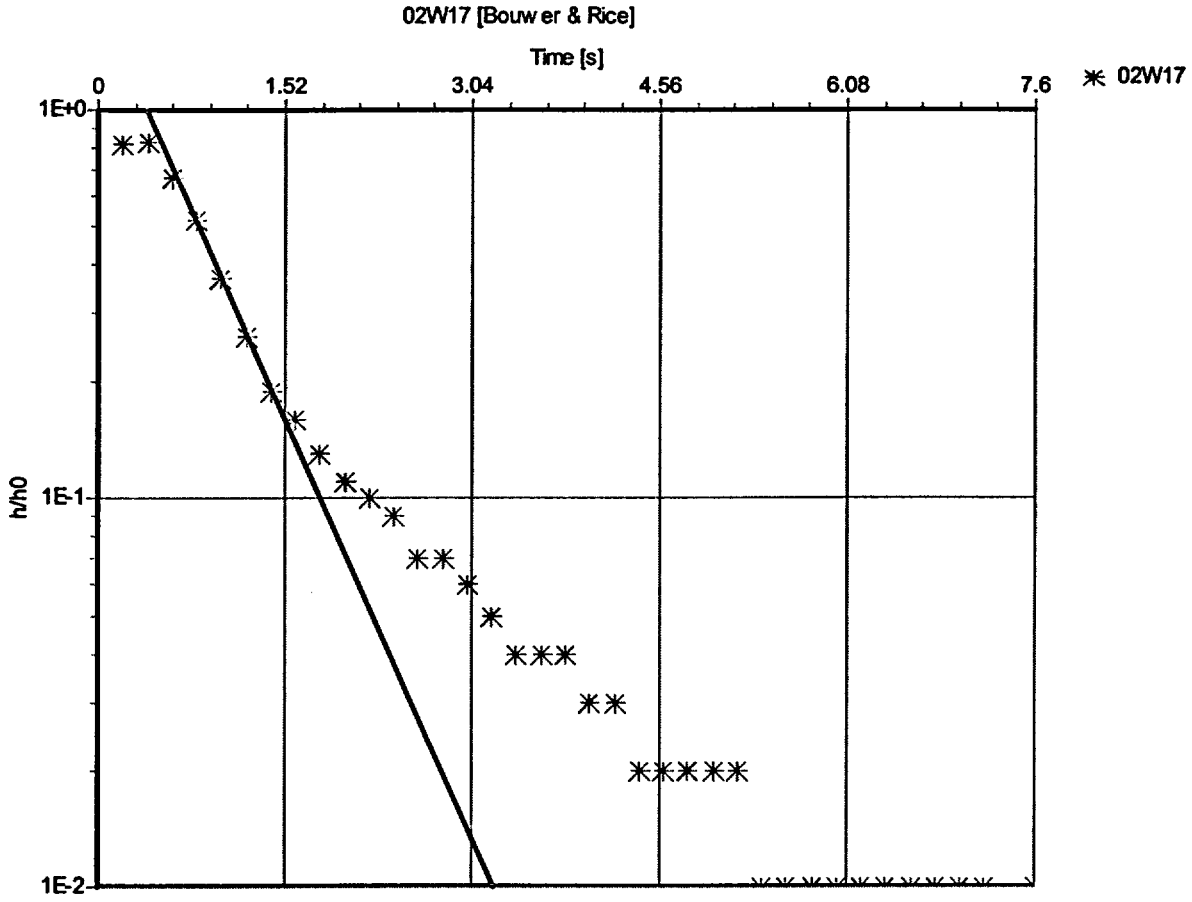
Kerr-McGee Corp.
123 Robert S. Kerr Ave.
Oklahoma City, Oklahoma 73102
Phone: (405) 270-2696

Slug Test Analysis Report

Project: Cimarron Facility Burial Area # 1

Number:

Client: Kerr-McGee



Slug Test: **02W17**

Analysis Method: **Bouwer & Rice**

Analysis Results:

Conductivity: 3.25E-2 [cm/s]

Test parameters:				
	Test Well:	02W17	Aquifer Thickness:	11.91 [ft]
	Casing radius:	0.083 [ft]	Gravel Pack Porosity (%)	25
	Screen length:	14.25 [ft]		
	Boring radius:	0.365 [ft]		
	r(eff):	0.196 [ft]		

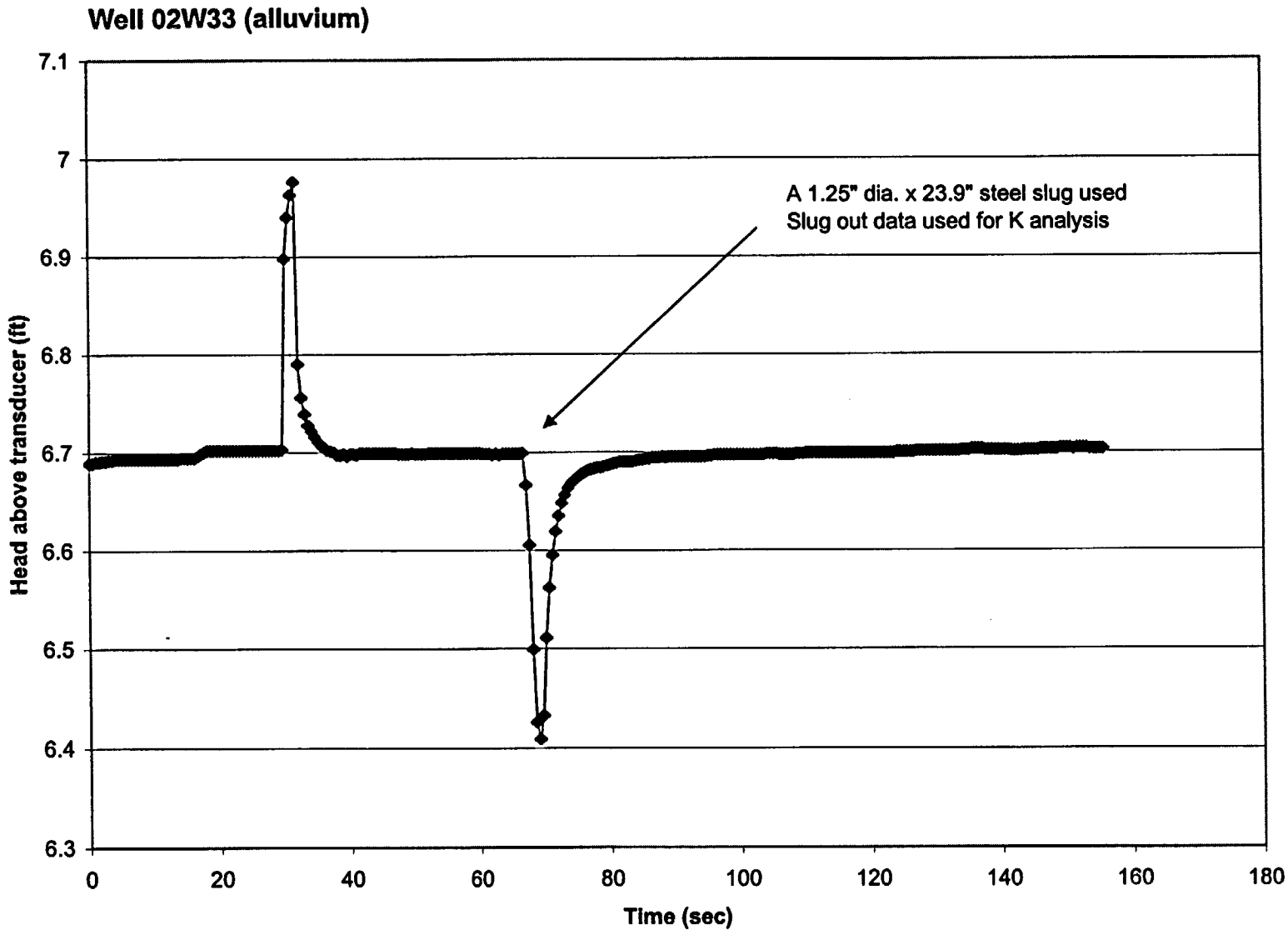
Comments:

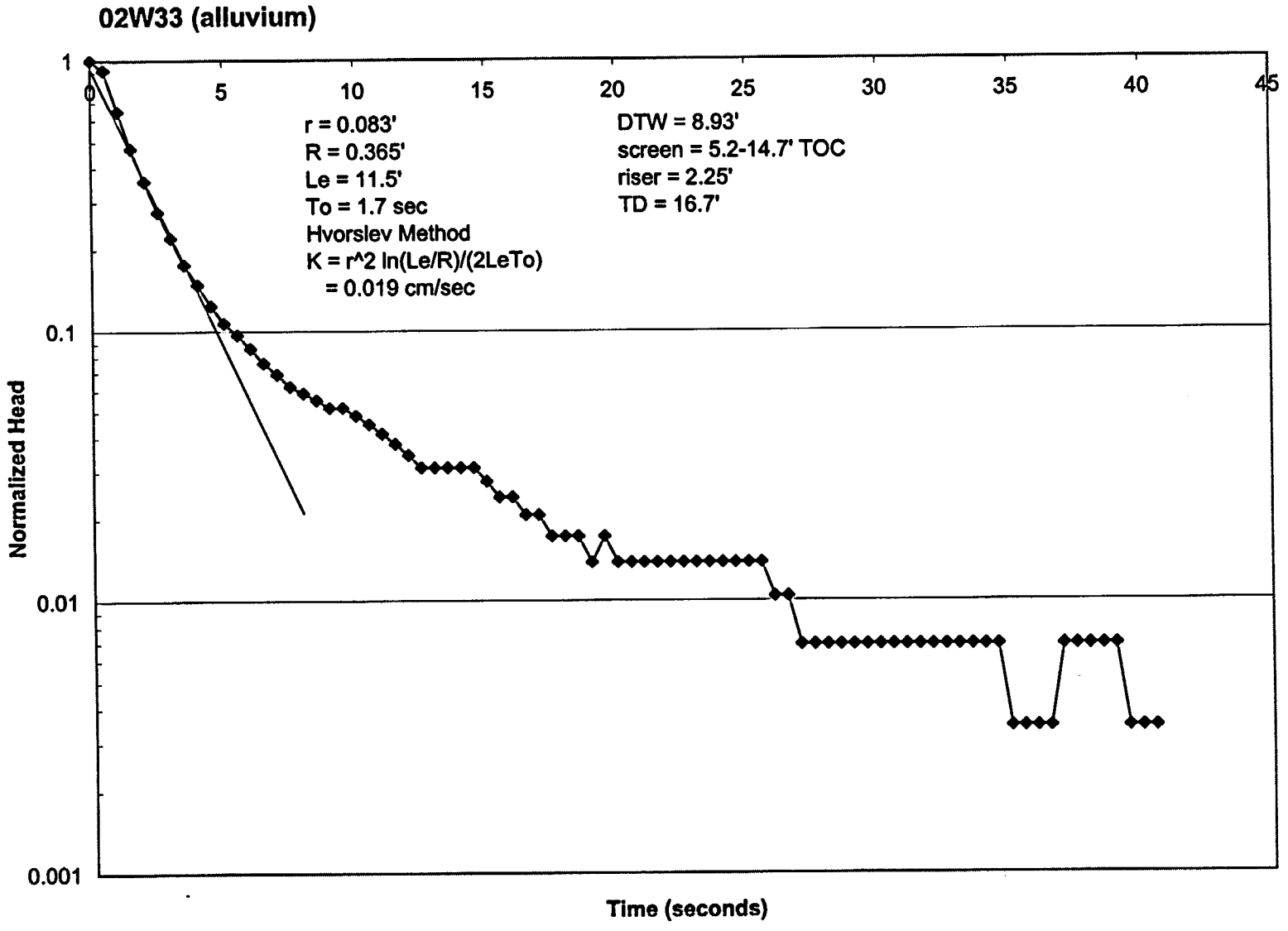
Evaluated by: Leon Chen

Evaluation Date: 11/13/2002

Slug Test Data for 02W17 10/12/2002			
Time (mins)	**Time (sec)**	**Head Change (ft)**	**Normalized Head**
0.0766	0.00	0.497	1.00
0.08	0.20	0.409	0.82
0.0833	0.40	0.412	0.83
0.0866	0.60	0.331	0.67
0.09	0.80	0.256	0.52
0.0933	1.00	0.184	0.37
0.0966	1.20	0.131	0.26
0.1	1.40	0.096	0.19
0.1033	1.60	0.078	0.16
0.1066	1.80	0.065	0.13
0.11	2.00	0.056	0.11
0.1133	2.20	0.049	0.10
0.1166	2.40	0.043	0.09
0.12	2.60	0.037	0.07
0.1233	2.80	0.034	0.07
0.1266	3.00	0.031	0.06
0.13	3.20	0.025	0.05
0.1333	3.40	0.021	0.04
0.1366	3.60	0.021	0.04
0.14	3.80	0.018	0.04
0.1433	4.00	0.015	0.03
0.1466	4.20	0.015	0.03
0.15	4.40	0.012	0.02
0.1533	4.60	0.012	0.02
0.1566	4.80	0.009	0.02
0.16	5.00	0.009	0.02
0.1633	5.20	0.009	0.02
0.1666	5.40	0.006	0.01
0.17	5.60	0.006	0.01
0.1733	5.80	0.006	0.01
0.1766	6.00	0.003	0.01
0.18	6.20	0.003	0.01
0.1833	6.40	0.003	0.01
0.1866	6.60	0.003	0.01
0.19	6.80	0.003	0.01
0.1933	7.00	0.003	0.01
0.1966	7.20	0.003	0.01
0.2	7.40	0	0.00
0.2033	7.60	0.003	0.01
0.2066	7.80	0	0.00
0.21	8.00	0	0.00
0.2133	8.20	0	0.00
0.2166	8.40	0	0.00
0.22	8.60	0	0.00

WELL 02W33


Well 02W33 (alluvium)
A 1.25" dia. x 23.9" steel slug used
Slug out data used for K analysis
Head above transducer (ft)
7.1
7
6.9
6.8
6.7
6.6
6.5
6.4
6.3
0
20
40
60
80
100
120
140
160
180
Time (sec)


02W33 (alluvium)
1
0.1
0.01
0.001
0
5
10
15
20
25
30
35
40
45
r = 0.083'
R = 0.365'
Le = 11.5'
To = 1.7 sec
Hvorslev Method
K = r^2 ln(Le/R)/(2LeTo)
= 0.019 cm/sec
DTW = 8.93'
screen = 5.2-14.7' TOC
riser = 2.25'
TD = 16.7'
Normalized Head
Time (seconds)

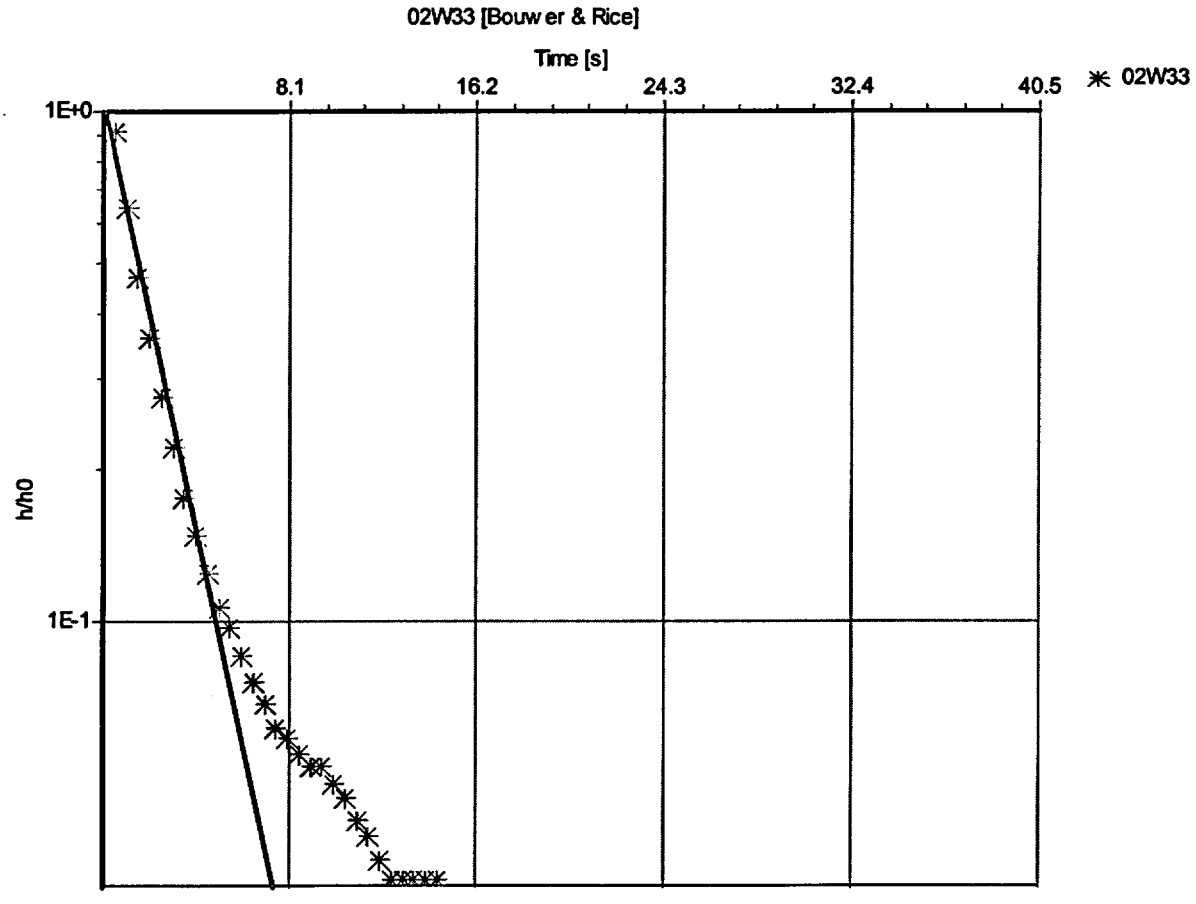
Kerr-McGee Corp.
123 Robert S. Kerr Ave.
Oklahoma City, Oklahoma 73102
Phone: (405) 270-2696

Slug Test Analysis Report

Project: Cimarron Facility Burial Area # 1

Number:

Client: Kerr-McGee



Slug Test: **02W33**

Analysis Method: **Bouwer & Rice**

Analysis Results:

Conductivity: 1.13E-2 [cm/s]

Test parameters:				
	Test Well:	02W33	Aquifer Thickness:	5.52 [ft]
	Casing radius:	0.083 [ft]	Gravel Pack Porosity (%)	25
	Screen length:	9.5 [ft]		
	Boring radius:	0.365 [ft]		
	r(eff):	0.196 [ft]		

Comments:

Evaluated by: Leon Chen

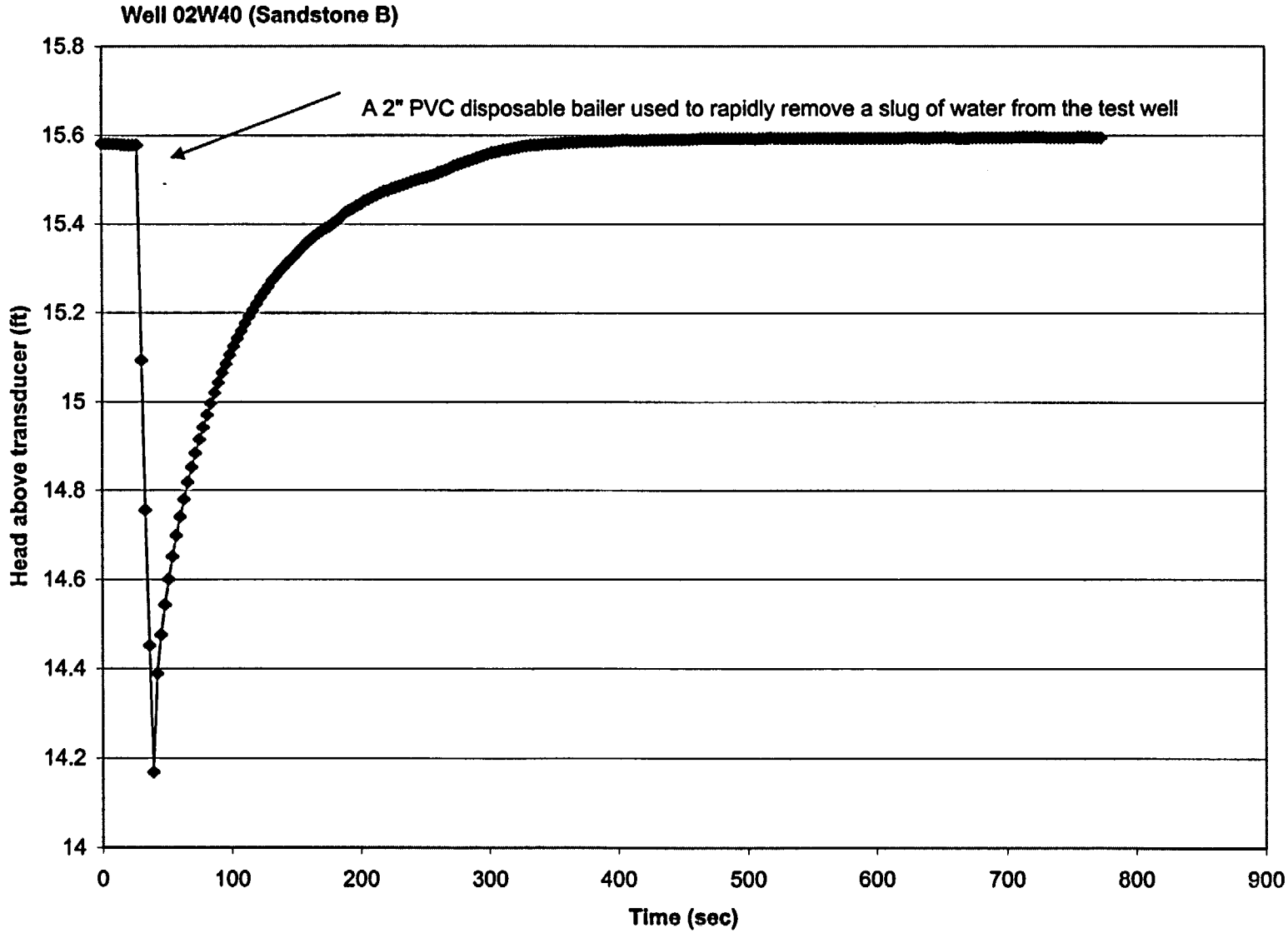
Evaluation Date: 10/23/2002

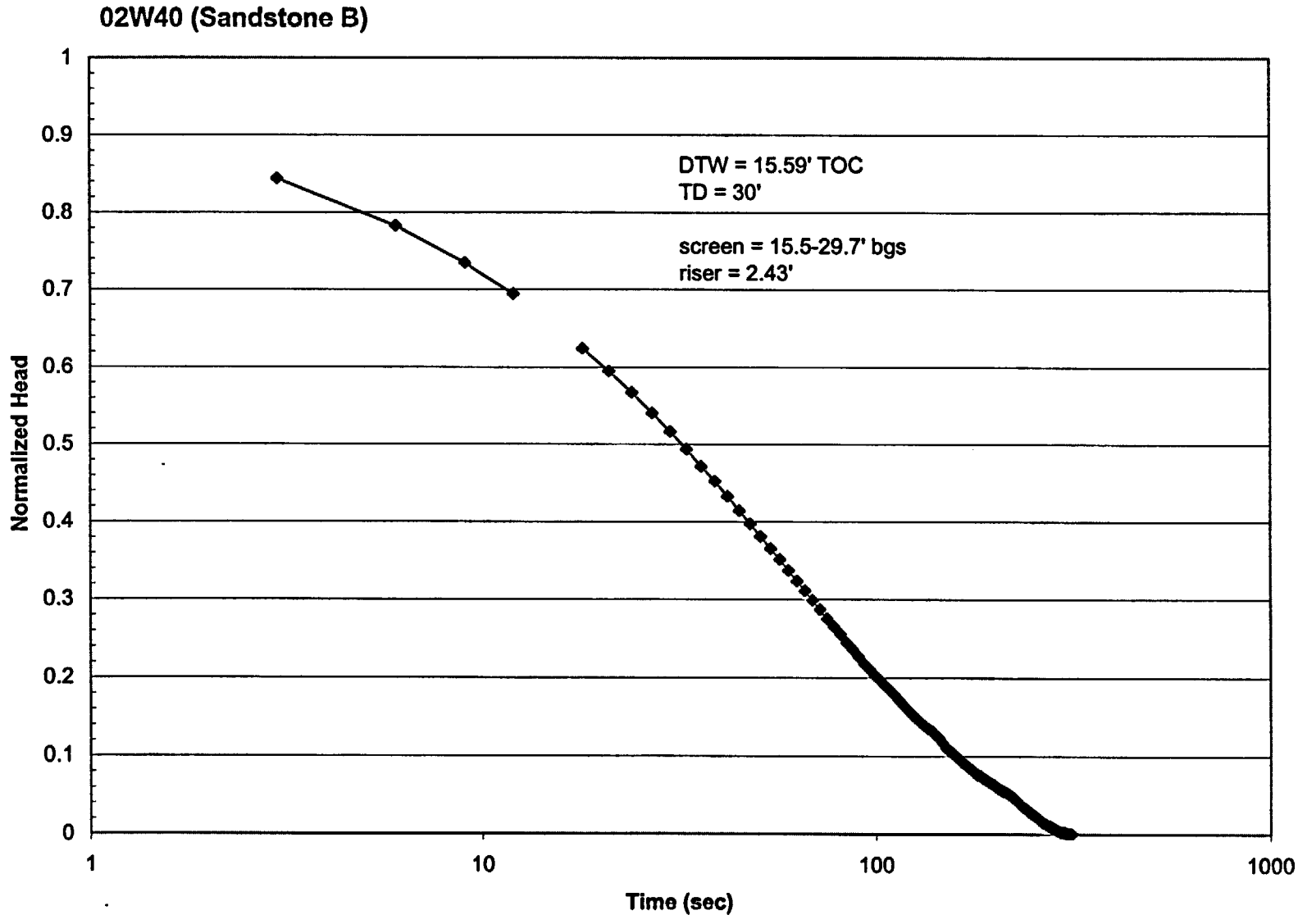
Slug Test Data for 02W33
10/1/2002

Time	Time (sec)	Water Head (ft)	Head (ft)	Normalized Head
Initial Head		6.699		
10:31:58	0	6.409	0.290	1.000
10:31:59	0.5	6.433	0.266	0.917
10:31:59	1	6.511	0.188	0.648
10:32:00	1.5	6.562	0.137	0.472
10:32:00	2	6.595	0.104	0.359
10:32:01	2.5	6.619	0.080	0.276
10:32:01	3	6.635	0.064	0.221
10:32:02	3.5	6.648	0.051	0.176
10:32:02	4	6.656	0.043	0.148
10:32:03	4.5	6.663	0.036	0.124
10:32:03	5	6.668	0.031	0.107
10:32:04	5.5	6.671	0.028	0.097
10:32:04	6	6.674	0.025	0.086
10:32:05	6.5	6.677	0.022	0.076
10:32:05	7	6.679	0.020	0.069
10:32:06	7.5	6.681	0.018	0.062
10:32:06	8	6.682	0.017	0.059
10:32:07	8.5	6.683	0.016	0.055
10:32:07	9	6.684	0.015	0.052
10:32:08	9.5	6.684	0.015	0.052
10:32:08	10	6.685	0.014	0.048
10:32:09	10.5	6.686	0.013	0.045
10:32:09	11	6.687	0.012	0.041
10:32:10	11.5	6.688	0.011	0.038
10:32:10	12	6.689	0.010	0.034
10:32:11	12.5	6.690	0.009	0.031
10:32:11	13	6.690	0.009	0.031
10:32:12	13.5	6.690	0.009	0.031
10:32:12	14	6.690	0.009	0.031
10:32:13	14.5	6.690	0.009	0.031
10:32:13	15	6.691	0.008	0.028
10:32:14	15.5	6.692	0.007	0.024
10:32:14	16	6.692	0.007	0.024
10:32:15	16.5	6.693	0.006	0.021
10:32:15	17	6.693	0.006	0.021
10:32:16	17.5	6.694	0.005	0.017
10:32:16	18	6.694	0.005	0.017
10:32:17	18.5	6.694	0.005	0.017
10:32:17	19	6.695	0.004	0.014
10:32:18	19.5	6.694	0.005	0.017
10:32:18	20	6.695	0.004	0.014
10:32:19	20.5	6.695	0.004	0.014
10:32:19	21	6.695	0.004	0.014
10:32:20	21.5	6.695	0.004	0.014
10:32:20	22	6.695	0.004	0.014
10:32:21	22.5	6.695	0.004	0.014
10:32:21	23	6.695	0.004	0.014

10:32:22	23.5	6.695	0.004	0.014
10:32:22	24	6.695	0.004	0.014
10:32:23	24.5	6.695	0.004	0.014
10:32:23	25	6.695	0.004	0.014
10:32:24	25.5	6.695	0.004	0.014
10:32:24	26	6.696	0.003	0.010
10:32:25	26.5	6.696	0.003	0.010
10:32:25	27	6.697	0.002	0.007
10:32:26	27.5	6.697	0.002	0.007
10:32:26	28	6.697	0.002	0.007
10:32:27	28.5	6.697	0.002	0.007
10:32:27	29	6.697	0.002	0.007
10:32:28	29.5	6.697	0.002	0.007
10:32:28	30	6.697	0.002	0.007
10:32:29	30.5	6.697	0.002	0.007
10:32:29	31	6.697	0.002	0.007
10:32:30	31.5	6.697	0.002	0.007
10:32:30	32	6.697	0.002	0.007
10:32:31	32.5	6.697	0.002	0.007
10:32:31	33	6.697	0.002	0.007
10:32:32	33.5	6.697	0.002	0.007
10:32:32	34	6.697	0.002	0.007
10:32:33	34.5	6.697	0.002	0.007
10:32:33	35	6.698	0.001	0.003
10:32:34	35.5	6.698	0.001	0.003
10:32:34	36	6.698	0.001	0.003
10:32:35	36.5	6.698	0.001	0.003
10:32:35	37	6.697	0.002	0.007
10:32:36	37.5	6.697	0.002	0.007
10:32:36	38	6.697	0.002	0.007
10:32:37	38.5	6.697	0.002	0.007
10:32:37	39	6.697	0.002	0.007
10:32:38	39.5	6.698	0.001	0.003
10:32:38	40	6.698	0.001	0.003
10:32:39	40.5	6.698	0.001	0.003
10:32:39	41	6.699	0.000	0.000

WELL 02W40


Well 02W40 (Sandstone B)
A 2" PVC disposable bailer used to rapidly remove a slug of water from the test well
Head above transducer (ft)
15.8
15.6
15.4
15.2
15
14.8
14.6
14.4
14.2
14
0
100
200
300
400
500
600
700
800
900
Time (sec)


02W40 (Sandstone B)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Normalized Head
DTW = 15.59' TOC
TD = 30'
screen = 15.5-29.7' bgs
riser = 2.43'
1
10
100
1000
Time (sec)

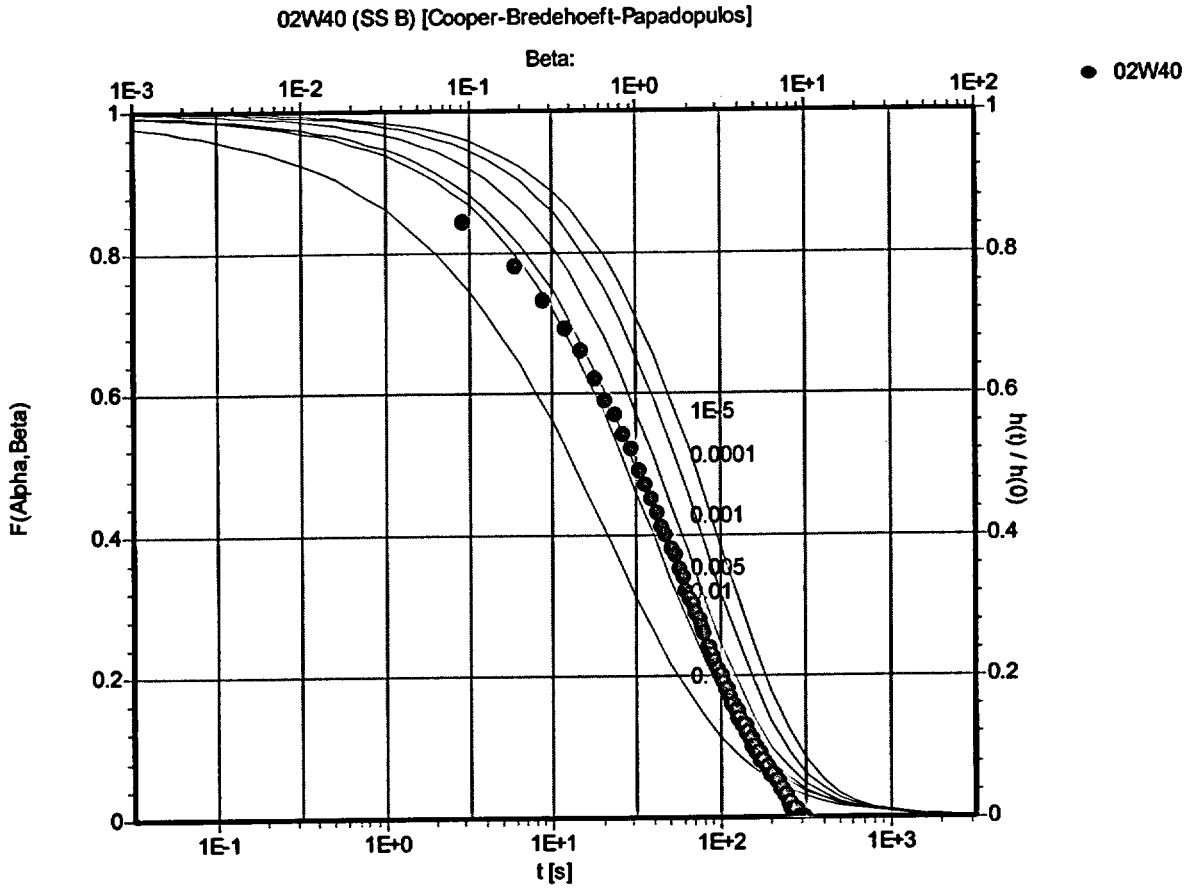
Kerr-McGee Corp.
123 Robert S. Kerr Ave.
Oklahoma City, Oklahoma 73102
Phone: (405) 270-2696

Slug Test Analysis Report

Project: Cimarron Facility Burial Area # 1

Number:

Client: Kerr-McGee



Slug Test: **02W40 (SS B)**

Analysis Method: **Cooper-Bredehoeft-Papadopulos**

Analysis Results:	Transmissivity:	2.01E-5 [m²/s]	Conductivity:	5.50E-6 [m/s]
	Storativity:	5.51E-6		
Test parameters:	Test Well:	02W40	Aquifer Thickness:	12 [ft]
	Casing radius:	0.083 [ft]	Alpha:	0.005
	Screen length:	14.2 [ft]		
	Boring radius:	0.365 [ft]		
	r(c):	2.5 [ft]		

Comments:

Evaluated by: Leon Chen

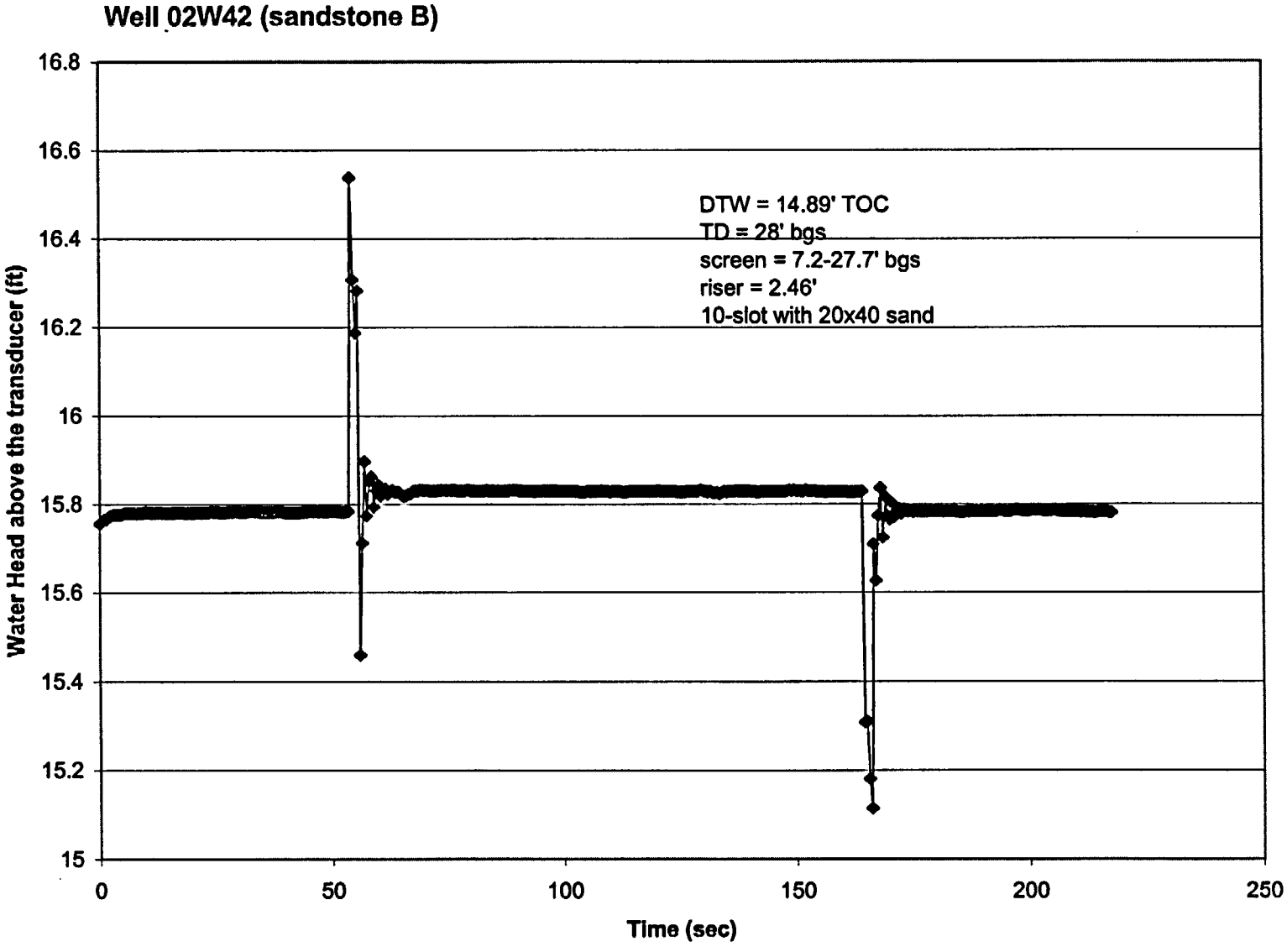
Evaluation Date: 10/23/2002

Slug Test Data for 02W40 9/30/2002				
Time	Time (sec)	Water Head (ft)	Head (ft)	Normalized Head
Initial Head		15.581		
15:26:04	0	14.168	1.413	1
15:26:07	3	14.389	1.192	0.84
15:26:10	6	14.475	1.106	0.78
15:26:13	9	14.543	1.038	0.73
15:26:16	12	14.6	0.981	0.69
15:26:19	15	14.652	0.929	0.66
15:26:22	18	14.699	0.882	0.62
15:26:25	21	14.741	0.84	0.59
15:26:28	24	14.78	0.801	0.57
15:26:31	27	14.818	0.763	0.54
15:26:34	30	14.852	0.729	0.52
15:26:37	33	14.884	0.697	0.49
15:26:40	36	14.915	0.666	0.47
15:26:43	39	14.942	0.639	0.45
15:26:46	42	14.97	0.611	0.43
15:26:49	45	14.996	0.585	0.41
15:26:52	48	15.02	0.561	0.40
15:26:55	51	15.043	0.538	0.38
15:26:58	54	15.065	0.516	0.37
15:27:01	57	15.085	0.496	0.35
15:27:04	60	15.105	0.476	0.34
15:27:07	63	15.124	0.457	0.32
15:27:10	66	15.142	0.439	0.31
15:27:13	69	15.159	0.422	0.30
15:27:16	72	15.176	0.405	0.29
15:27:19	75	15.192	0.389	0.28
15:27:22	78	15.206	0.375	0.27
15:27:25	81	15.22	0.361	0.26
15:27:28	84	15.235	0.346	0.24
15:27:31	87	15.247	0.334	0.24
15:27:34	90	15.26	0.321	0.23
15:27:37	93	15.273	0.308	0.22
15:27:40	96	15.283	0.298	0.21
15:27:43	99	15.294	0.287	0.20
15:27:46	102	15.303	0.278	0.20
15:27:49	105	15.313	0.268	0.19
15:27:52	108	15.321	0.26	0.18
15:27:55	111	15.33	0.251	0.18
15:27:58	114	15.339	0.242	0.17
15:28:01	117	15.348	0.233	0.16
15:28:04	120	15.357	0.224	0.16
15:28:07	123	15.365	0.216	0.15
15:28:10	126	15.372	0.209	0.15
15:28:13	129	15.379	0.202	0.14
15:28:16	132	15.385	0.196	0.14
15:28:19	135	15.391	0.19	0.13
15:28:22	138	15.395	0.186	0.13

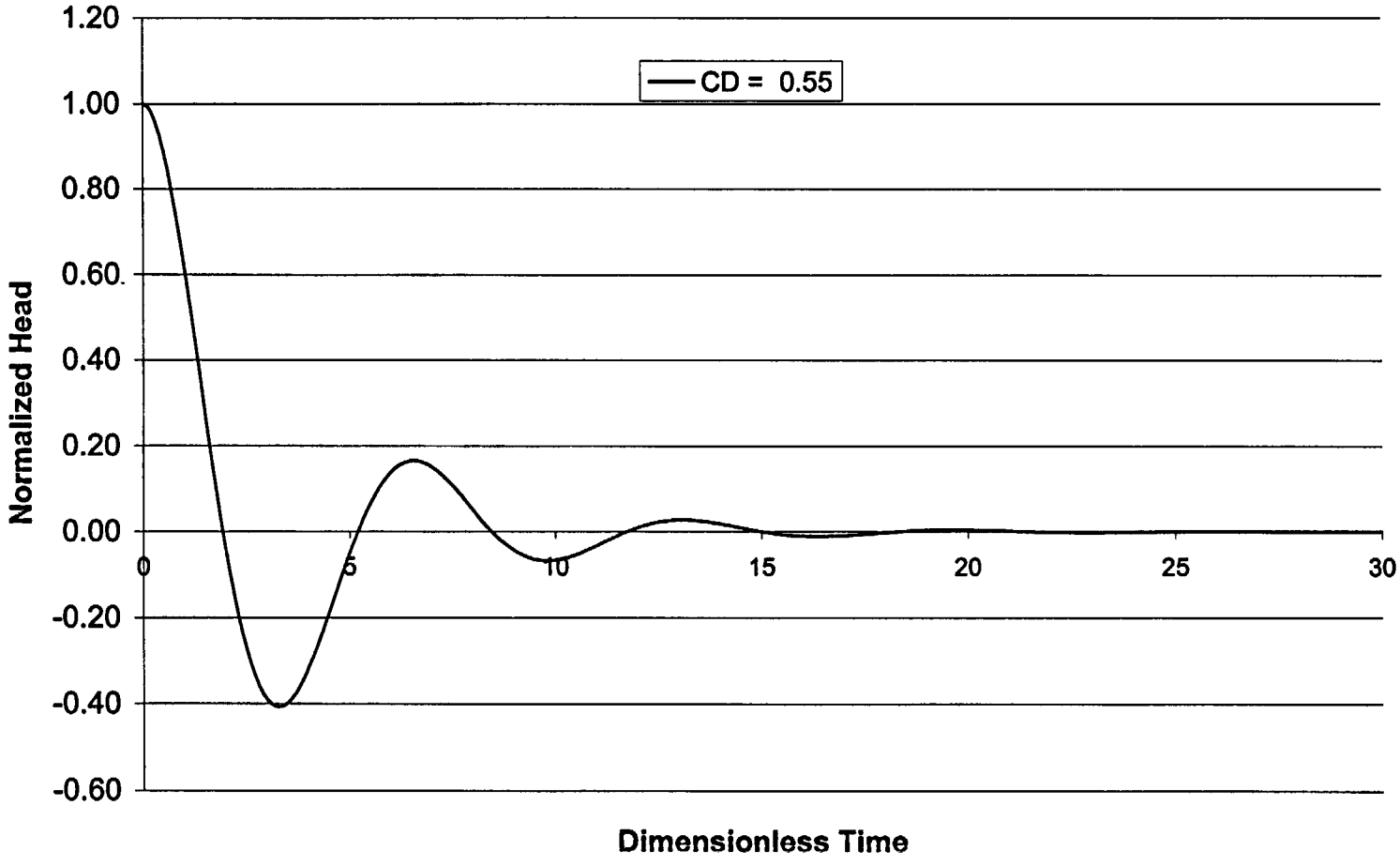
15:28:25	141	15.402	0.179	0.13
15:28:28	144	15.408	0.173	0.12
15:28:31	147	15.416	0.165	0.12
15:28:34	150	15.425	0.156	0.11
15:28:37	153	15.43	0.151	0.11
15:28:40	156	15.435	0.146	0.10
15:28:43	159	15.44	0.141	0.10
15:28:46	162	15.445	0.136	0.10
15:28:49	165	15.451	0.13	0.09
15:28:52	168	15.455	0.126	0.09
15:28:55	171	15.46	0.121	0.09
15:28:58	174	15.464	0.117	0.08
15:29:01	177	15.469	0.112	0.08
15:29:04	180	15.473	0.108	0.08
15:29:07	183	15.475	0.106	0.08
15:29:10	186	15.479	0.102	0.07
15:29:13	189	15.482	0.099	0.07
15:29:16	192	15.485	0.096	0.07
15:29:19	195	15.488	0.093	0.07
15:29:22	198	15.491	0.09	0.06
15:29:25	201	15.495	0.086	0.06
15:29:28	204	15.498	0.083	0.06
15:29:31	207	15.501	0.08	0.06
15:29:34	210	15.503	0.078	0.06
15:29:37	213	15.505	0.076	0.05
15:29:40	216	15.508	0.073	0.05
15:29:43	219	15.511	0.07	0.05
15:29:46	222	15.515	0.066	0.05
15:29:49	225	15.518	0.063	0.04
15:29:52	228	15.522	0.059	0.04
15:29:55	231	15.526	0.055	0.04
15:29:58	234	15.53	0.051	0.04
15:30:01	237	15.533	0.048	0.03
15:30:04	240	15.536	0.045	0.03
15:30:07	243	15.54	0.041	0.03
15:30:10	246	15.542	0.039	0.03
15:30:13	249	15.545	0.036	0.03
15:30:16	252	15.548	0.033	0.02
15:30:19	255	15.551	0.03	0.02
15:30:22	258	15.554	0.027	0.02
15:30:25	261	15.557	0.024	0.02
15:30:28	264	15.56	0.021	0.01
15:30:31	267	15.562	0.019	0.01
15:30:34	270	15.564	0.017	0.01
15:30:37	273	15.566	0.015	0.01
15:30:40	276	15.567	0.014	0.01
15:30:43	279	15.569	0.012	0.01
15:30:46	282	15.571	0.01	0.01
15:30:49	285	15.573	0.008	0.01
15:30:52	288	15.575	0.006	0.00
15:30:55	291	15.576	0.005	0.00
15:30:58	294	15.577	0.004	0.00

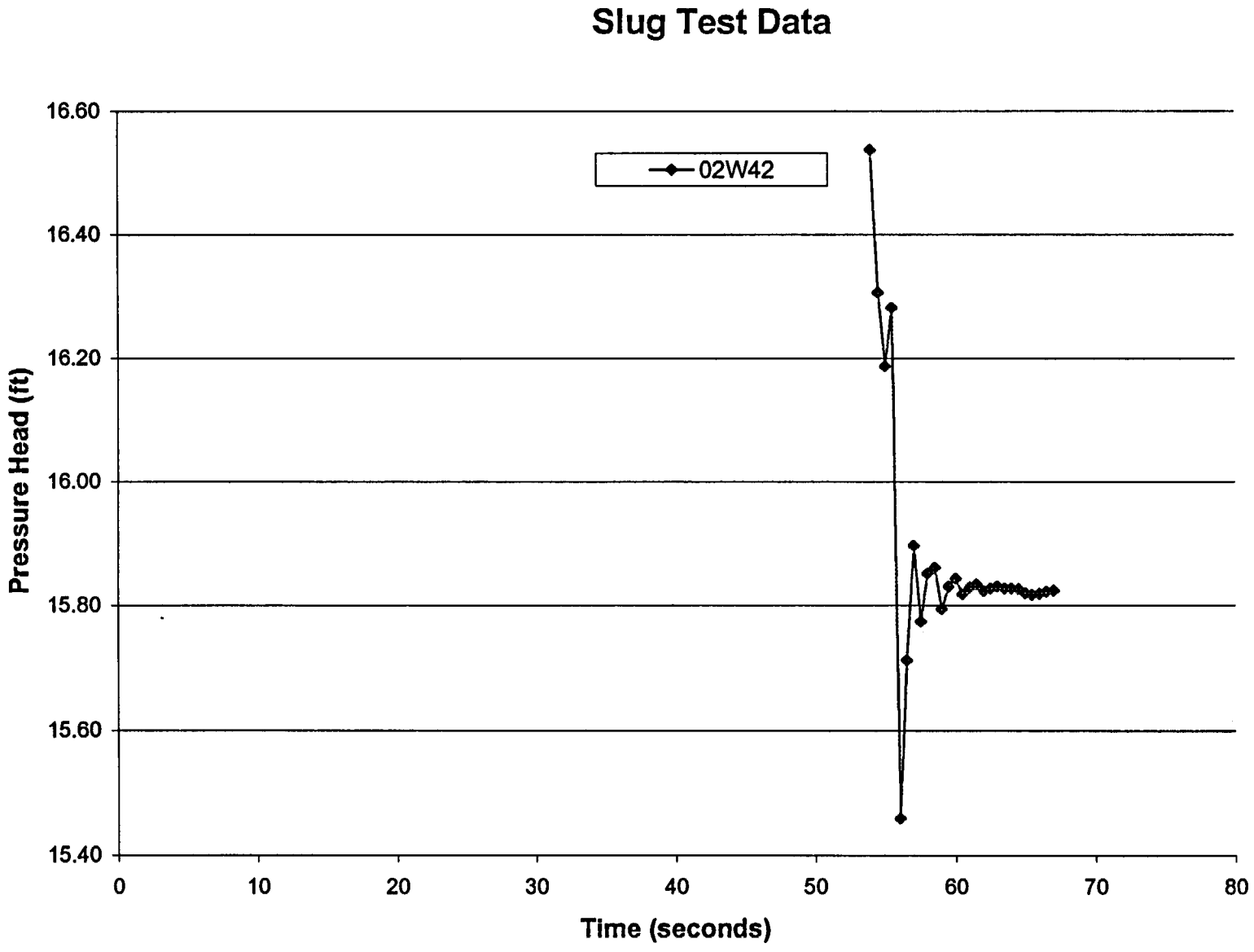
15:31:01	297	15.578	0.003	0.00
15:31:04	300	15.578	0.003	0.00
15:31:07	303	15.579	0.002	0.00
15:31:10	306	15.58	0.001	0.00
15:31:13	309	15.58	0.001	0.00
15:31:16	312	15.581	0	0.00

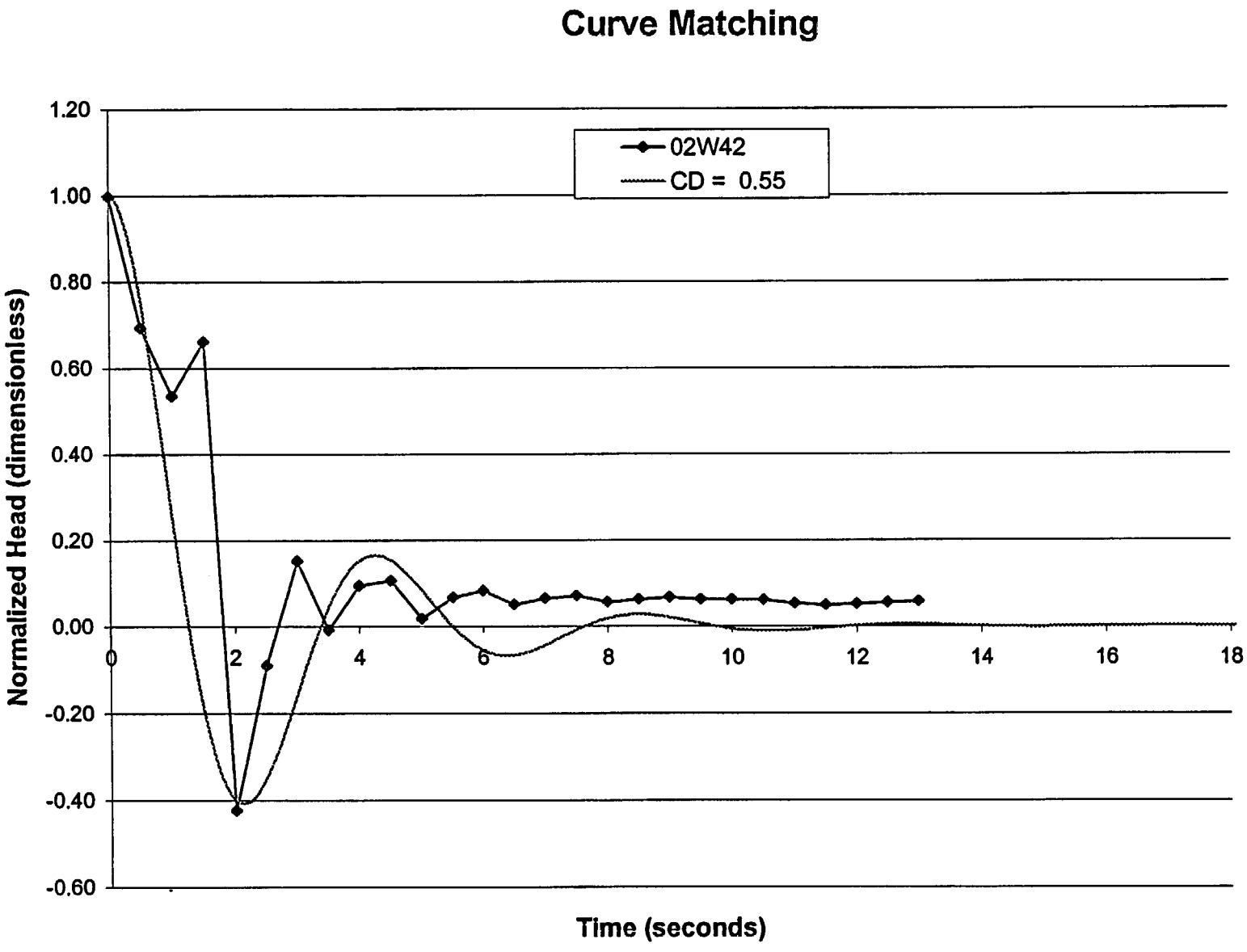
WELL 02W42


Well 02W42 (sandstone B)
DTW = 14.89' TOC
TD = 28' bgs
screen = 7.2-27.7' bgs
riser = 2.46'
10-slot with 20x40 sand
Water Head above the transducer (ft)
16.8
16.6
16.4
16.2
16
15.8
15.6
15.4
15.2
15
0
50
100
150
200
250
Time (sec)

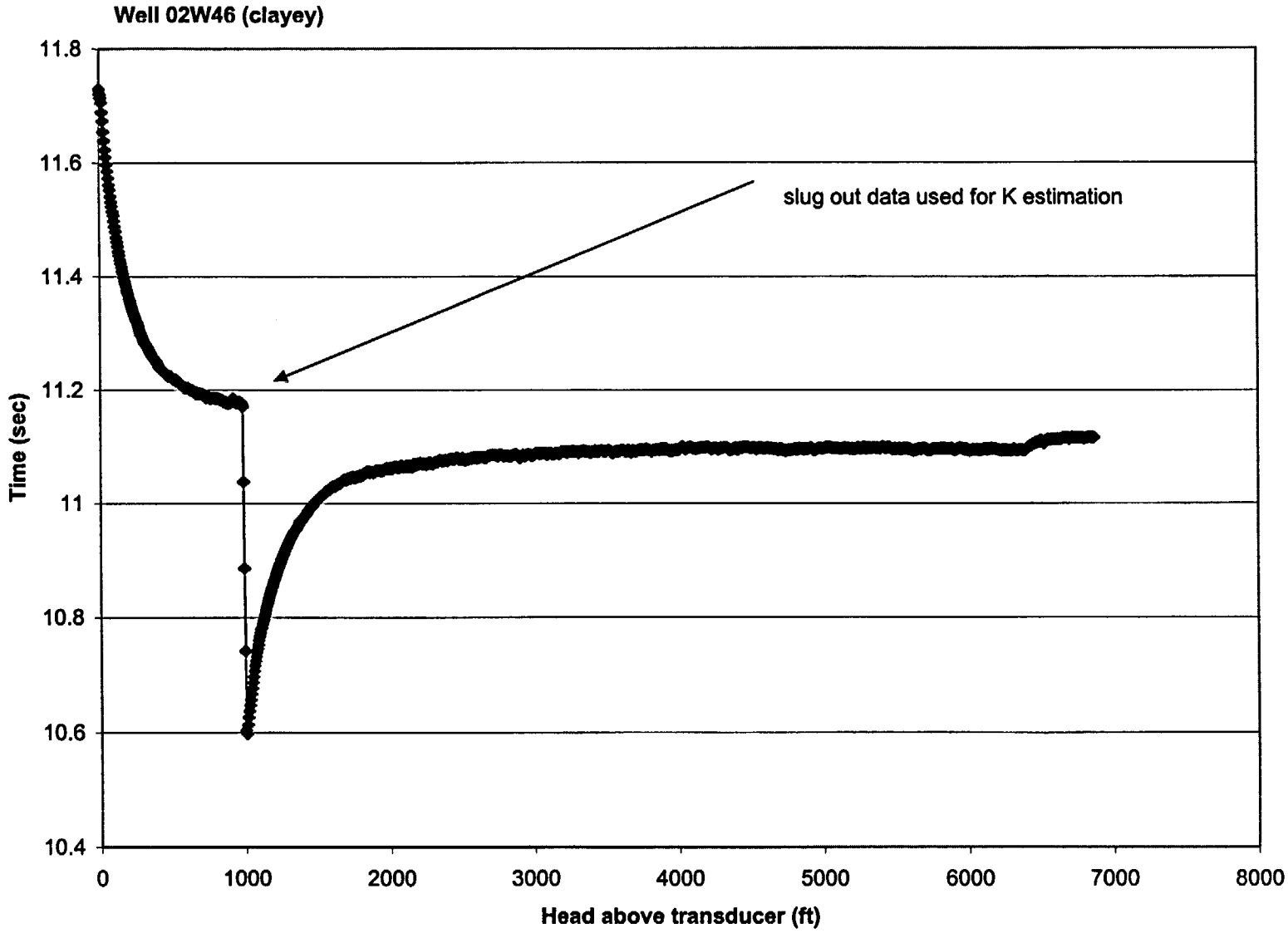
CD Type Curve

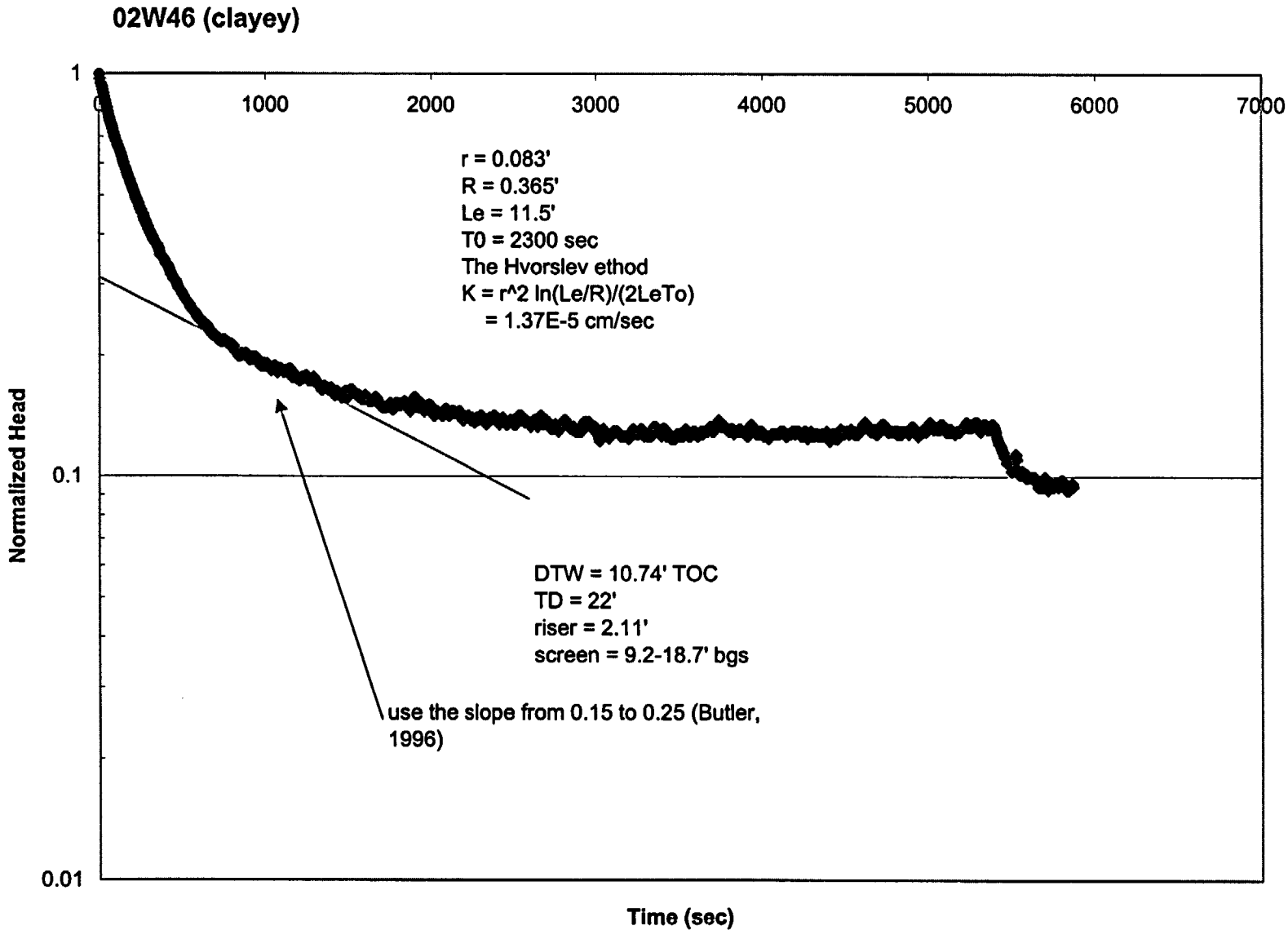



Slug Test Data
02W42
Pressure Head (ft)
16.60
16.40
16.20
16.00
15.80
15.60
15.40
0
10
20
30
40
50
60
70
80
Time (seconds)


Curve Matching
02W42
CD = 0.55
Normalized Head (dimensionless)
Time (seconds)
1.20
1.00
0.80
0.60
0.40
0.20
0.00
-0.20
-0.40
-0.60
0
2
4
6
8
10
12
14
16
18

WELL 02W46


Well 02W46 (clayey)
11.8
11.6
11.4
11.2
11
10.8
10.6
10.4
Time (sec)
slug out data used for K estimation
0
1000
2000
3000
4000
5000
6000
7000
8000
Head above transducer (ft)


02W46 (clayey)
1
0.1
0.01
0
1000
2000
3000
4000
5000
6000
7000
Normalized Head
Time (sec)
r = 0.083'
R = 0.365'
Le = 11.5'
T0 = 2300 sec
The Hvorslev ethod
K = r^2 ln(Le/R)/(2LeTo)
= 1.37E-5 cm/sec
DTW = 10.74' TOC
TD = 22'
riser = 2.11'
screen = 9.2-18.7' bgs
use the slope from 0.15 to 0.25 (Butler, 1996)

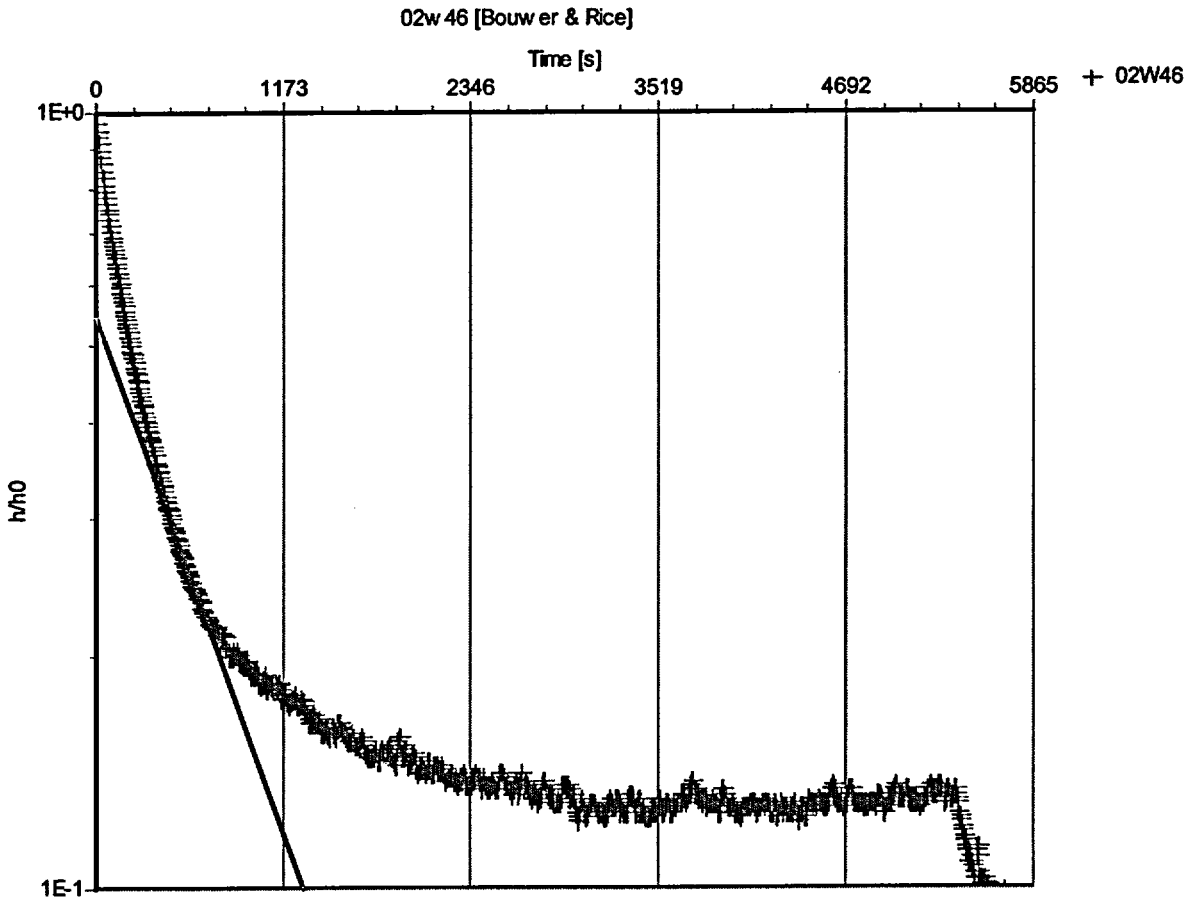
Kerr-McGee Corp.
123 Robert S. Kerr Ave.
Oklahoma City, Oklahoma 73102
Phone: (405) 270-2696

Slug Test Analysis Report

Project: Cimarron Facility Burial Area # 1

Number:

Client: Kerr-McGee



Slug Test: **02W46 (alluvium/clayey)**

Analysis Method: **Bouwer & Rice**

Analysis Results:

Conductivity: 3.56E-5 [cm/s]

Test parameters:				
	Test Well:	02W46	Aquifer Thickness:	9.15 [ft]
	Casing radius:	0.083 [ft]	Gravel Pack Porosity (%)	20
	Screen length:	9.5 [ft]		
	Boring radius:	0.365 [ft]		
	r(eff):	0.179 [ft]		

Comments: No correction performed on this set of data as the concave-upward was interpreted to be a product of a large alpha, and not the filter pack drainage.

Evaluated by: Leon Chen

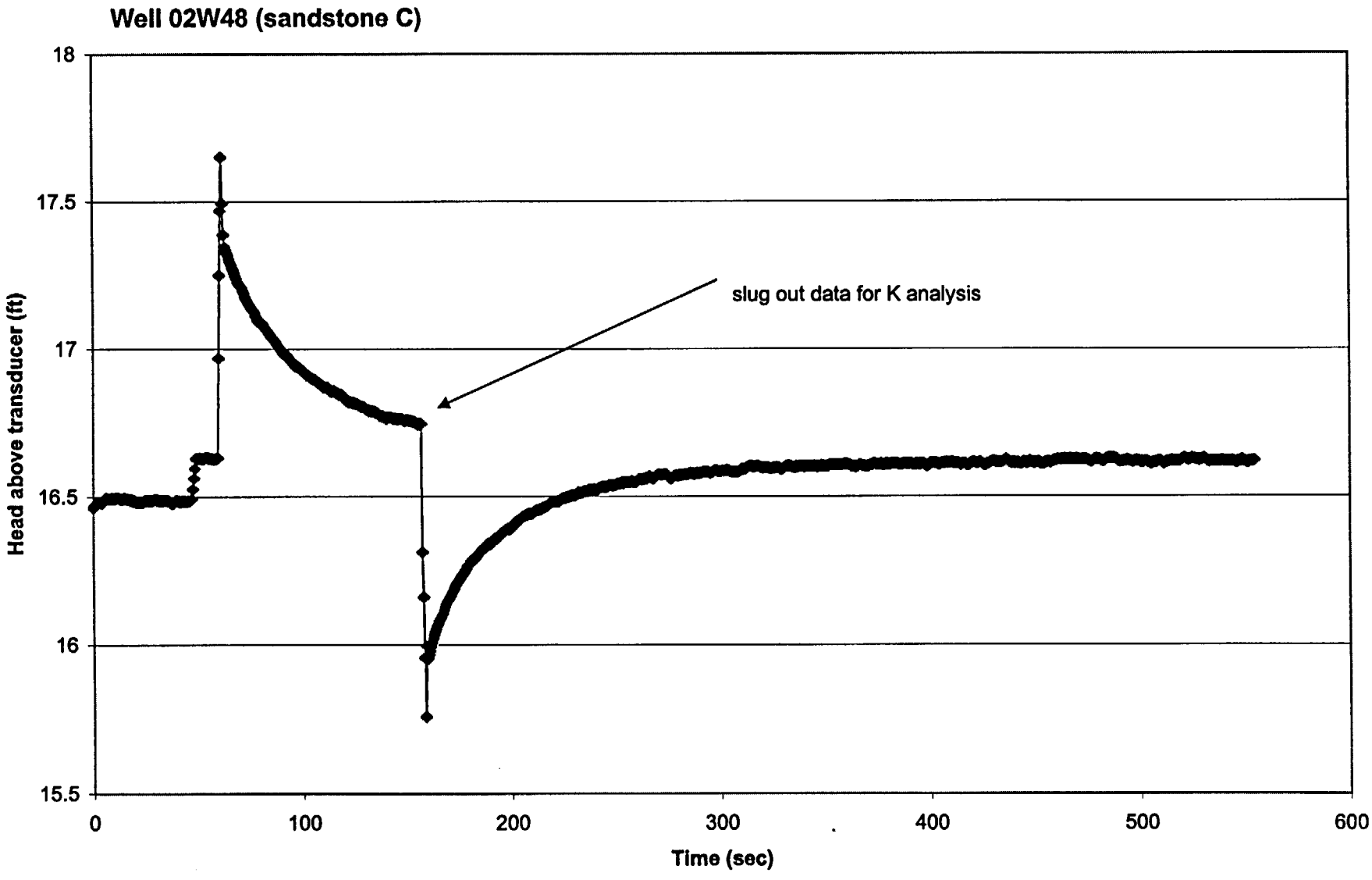
Evaluation Date: 10/9/2002

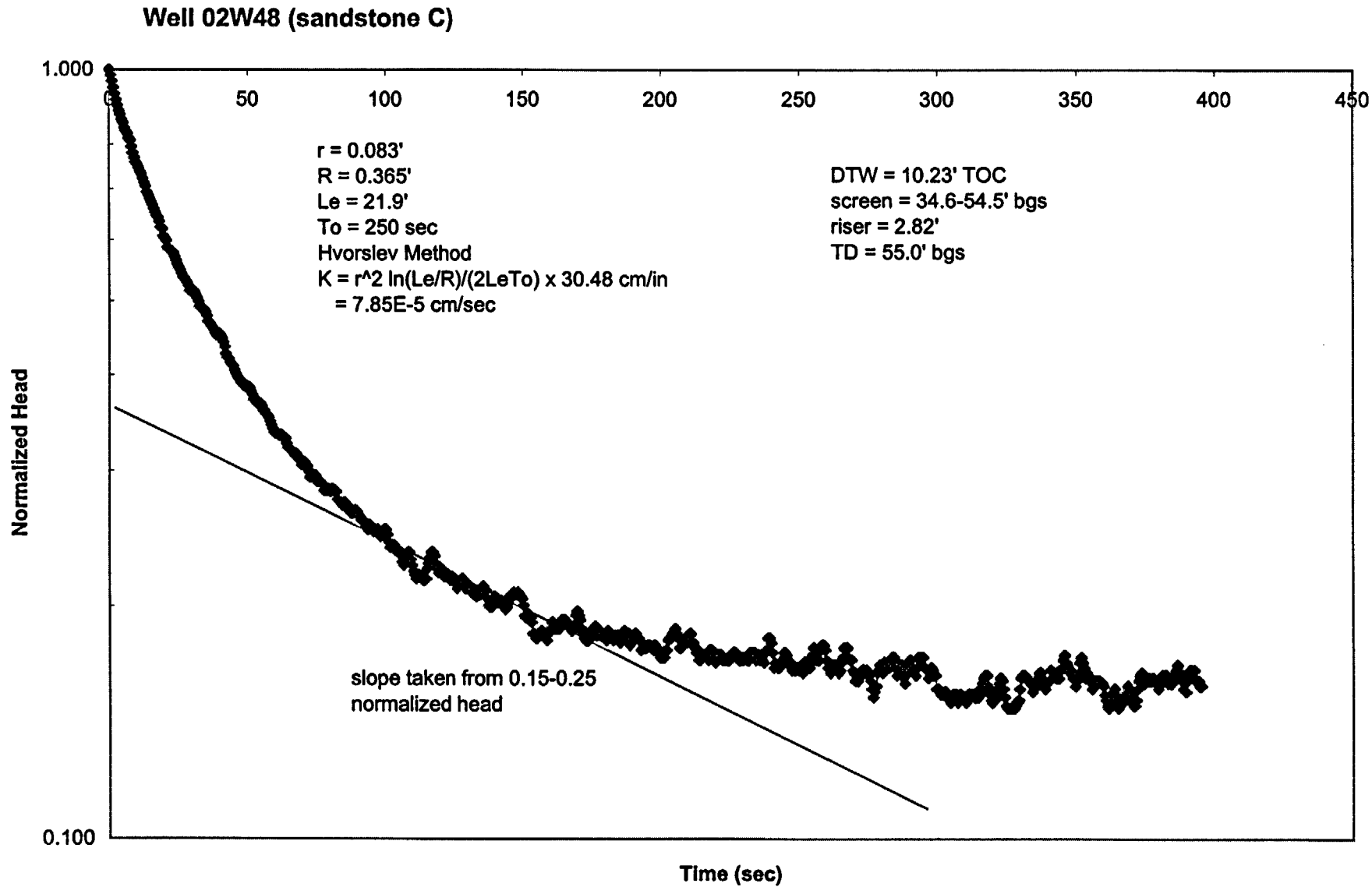
Slug Test Data for Well 02W46 10/4/2002				
Time	Time (sec)	Water Head (ft)	Head (ft)	Normalized Head
Initial Head		11.17		
0:30:05	0	10.597	0.573	1.000
0:30:15	10	10.626	0.544	0.949
0:30:20	15	10.637	0.533	0.930
0:30:25	20	10.647	0.523	0.913
0:30:30	25	10.657	0.513	0.895
0:30:35	30	10.667	0.503	0.878
0:30:40	35	10.677	0.493	0.860
0:30:45	40	10.687	0.483	0.843
0:30:50	45	10.697	0.473	0.825
0:30:55	50	10.707	0.463	0.808
0:31:00	55	10.716	0.454	0.792
0:31:05	60	10.724	0.446	0.778
0:31:10	65	10.732	0.438	0.764
0:31:15	70	10.739	0.431	0.752
0:31:20	75	10.745	0.425	0.742
0:31:25	80	10.752	0.418	0.729
0:31:30	85	10.760	0.410	0.716
0:31:35	90	10.767	0.403	0.703
0:31:40	95	10.773	0.397	0.693
0:31:45	100	10.779	0.391	0.682
0:31:50	105	10.782	0.388	0.677
0:31:55	110	10.788	0.382	0.667
0:32:00	115	10.793	0.377	0.658
0:32:05	120	10.797	0.373	0.651
0:32:10	125	10.803	0.367	0.640
0:32:15	130	10.807	0.363	0.634
0:32:20	135	10.813	0.357	0.623
0:32:25	140	10.819	0.351	0.613
0:32:30	145	10.824	0.346	0.604
0:32:35	150	10.829	0.341	0.595
0:32:40	155	10.834	0.336	0.586
0:32:45	160	10.839	0.331	0.578
0:32:50	165	10.843	0.327	0.571
0:32:55	170	10.847	0.323	0.564
0:33:00	175	10.852	0.318	0.555
0:33:05	180	10.855	0.315	0.550
0:33:10	185	10.860	0.310	0.541
0:33:15	190	10.864	0.306	0.534
0:33:20	195	10.867	0.303	0.529
0:33:25	200	10.871	0.299	0.522
0:33:30	205	10.875	0.295	0.515
0:33:35	210	10.879	0.291	0.508
0:33:40	215	10.883	0.287	0.501
0:33:45	220	10.887	0.283	0.494
0:33:50	225	10.890	0.280	0.489
0:33:55	230	10.893	0.277	0.483
0:34:00	235	10.896	0.274	0.478

0:34:05	240	10.901	0.269	0.469
0:34:10	245	10.904	0.266	0.464
0:34:15	250	10.906	0.264	0.461
0:34:20	255	10.910	0.260	0.454
0:34:25	260	10.912	0.258	0.450
0:34:30	265	10.916	0.254	0.443
0:34:35	270	10.920	0.250	0.436
0:34:40	275	10.922	0.248	0.433
0:34:45	280	10.925	0.245	0.428
0:34:50	285	10.928	0.242	0.422
0:34:55	290	10.930	0.240	0.419
0:35:00	295	10.934	0.236	0.412
0:35:05	300	10.936	0.234	0.408
0:35:10	305	10.939	0.231	0.403
0:35:15	310	10.941	0.229	0.400
0:35:20	315	10.943	0.227	0.396
0:35:25	320	10.946	0.224	0.391
0:35:30	325	10.948	0.222	0.387
0:35:35	330	10.950	0.220	0.384
0:35:45	340	10.953	0.217	0.379
0:35:55	350	10.957	0.213	0.372
0:36:05	360	10.962	0.208	0.363
0:36:15	370	10.968	0.202	0.353
0:36:25	380	10.969	0.201	0.351
0:36:35	390	10.972	0.198	0.346
0:36:45	400	10.977	0.193	0.337
0:36:55	410	10.979	0.191	0.333
0:37:05	420	10.983	0.187	0.326
0:37:15	430	10.988	0.182	0.318
0:37:25	440	10.991	0.179	0.312
0:37:35	450	10.993	0.177	0.309
0:37:45	460	10.996	0.174	0.304
0:37:55	470	11.000	0.170	0.297
0:38:05	480	11.003	0.167	0.291
0:38:15	490	11.005	0.165	0.288
0:38:25	500	11.008	0.162	0.283
0:38:35	510	11.011	0.159	0.277
0:38:45	520	11.013	0.157	0.274
0:38:55	530	11.015	0.155	0.271
0:39:05	540	11.017	0.153	0.267
0:39:15	550	11.020	0.150	0.262
0:39:25	560	11.022	0.148	0.258
0:39:35	570	11.023	0.147	0.257
0:39:45	580	11.025	0.145	0.253
0:39:55	590	11.028	0.142	0.248
0:40:05	600	11.030	0.140	0.244
0:40:15	610	11.030	0.140	0.244
0:40:25	620	11.031	0.139	0.243
0:40:35	630	11.033	0.137	0.239
0:40:45	640	11.034	0.136	0.237
0:40:55	650	11.035	0.135	0.236
0:41:05	660	11.038	0.132	0.230

0:41:15	670	11.040	0.130	0.227
0:41:25	680	11.041	0.129	0.225
0:41:35	690	11.041	0.129	0.225
0:41:45	700	11.043	0.127	0.222
0:41:55	710	11.044	0.126	0.220
0:42:05	720	11.044	0.126	0.220
0:42:15	730	11.046	0.124	0.216
0:42:25	740	11.046	0.124	0.216
0:42:35	750	11.045	0.125	0.218
0:42:45	760	11.046	0.124	0.216
0:42:55	770	11.047	0.123	0.215
0:43:05	780	11.048	0.122	0.213
0:43:15	790	11.048	0.122	0.213
0:43:25	800	11.049	0.121	0.211
0:44:15	850	11.056	0.114	0.199
0:45:05	900	11.058	0.112	0.195
0:45:55	950	11.058	0.112	0.195
0:46:45	1000	11.062	0.108	0.188
0:48:25	1100	11.065	0.105	0.183
0:50:05	1200	11.070	0.100	0.175
0:51:45	1300	11.071	0.099	0.173
0:53:25	1400	11.076	0.094	0.164
0:55:05	1500	11.079	0.091	0.159
0:56:45	1600	11.079	0.091	0.159
0:58:25	1700	11.085	0.085	0.148
1:00:05	1800	11.084	0.086	0.150
1:01:45	1900	11.080	0.090	0.157
1:03:25	2000	11.086	0.084	0.147
1:05:05	2100	11.089	0.081	0.141
1:06:45	2200	11.090	0.080	0.140
1:08:25	2300	11.089	0.081	0.141
1:10:05	2400	11.090	0.080	0.140
1:11:45	2500	11.093	0.077	0.134
1:13:25	2600	11.093	0.077	0.134
1:15:05	2700	11.092	0.078	0.136
1:16:45	2800	11.092	0.078	0.136
1:18:25	2900	11.095	0.075	0.131
1:20:05	3000	11.095	0.075	0.131

WELL 02W48


Well 02W48 (sandstone C)
18
17.5
17
16.5
16
15.5
Head above transducer (ft)
slug out data for K analysis
0
100
200
300
400
500
600
Time (sec)


Well 02W48 (sandstone C)
1.000
0.100
0
50
100
150
200
250
300
350
400
450
r = 0.083'
R = 0.365'
Le = 21.9'
To = 250 sec
Hvorslev Method
K = r^2 ln(Le/R)/(2LeTo) x 30.48 cm/in
= 7.85E-5 cm/sec
DTW = 10.23' TOC
screen = 34.6-54.5' bgs
riser = 2.82'
TD = 55.0' bgs
slope taken from 0.15-0.25
normalized head
Normalized Head
Time (sec)

Slug Test Data for 02W48
10/22/2002

Time	Time (sec)	Water Head (ft)	Head (ft)	Normalized Head
Initial Head		16.746		
12:24:33	0	15.953	0.793	1.000
12:24:33	0.5	15.966	0.78	0.984
12:24:34	1	15.979	0.767	0.967
12:24:34	1.5	15.994	0.752	0.948
12:24:35	2	16.008	0.738	0.931
12:24:35	2.5	16.021	0.725	0.914
12:24:36	3	16.033	0.713	0.899
12:24:36	3.5	16.044	0.702	0.885
12:24:37	4	16.052	0.694	0.875
12:24:37	4.5	16.062	0.684	0.863
12:24:38	5	16.069	0.677	0.854
12:24:38	5.5	16.079	0.667	0.841
12:24:39	6	16.085	0.661	0.834
12:24:39	6.5	16.09	0.656	0.827
12:24:40	7	16.099	0.647	0.816
12:24:40	7.5	16.104	0.642	0.810
12:24:41	8	16.116	0.63	0.794
12:24:41	8.5	16.127	0.619	0.781
12:24:42	9	16.136	0.61	0.769
12:24:42	9.5	16.144	0.602	0.759
12:24:43	10	16.149	0.597	0.753
12:24:43	10.5	16.154	0.592	0.747
12:24:44	11	16.161	0.585	0.738
12:24:44	11.5	16.165	0.581	0.733
12:24:45	12	16.173	0.573	0.723
12:24:45	12.5	16.18	0.566	0.714
12:24:46	13	16.186	0.56	0.706
12:24:46	13.5	16.196	0.55	0.694
12:24:47	14	16.201	0.545	0.687
12:24:47	14.5	16.207	0.539	0.680
12:24:48	15	16.212	0.534	0.673
12:24:48	15.5	16.217	0.529	0.667
12:24:49	16	16.223	0.523	0.660
12:24:49	16.5	16.229	0.517	0.652
12:24:50	17	16.234	0.512	0.646
12:24:50	17.5	16.237	0.509	0.642
12:24:51	18	16.243	0.503	0.634
12:24:51	18.5	16.251	0.495	0.624
12:24:52	19	16.254	0.492	0.620
12:24:52	19.5	16.264	0.482	0.608
12:24:53	20	16.268	0.478	0.603
12:24:53	20.5	16.271	0.475	0.599
12:24:54	21	16.28	0.466	0.588
12:24:54	21.5	16.283	0.463	0.584
12:24:55	22	16.285	0.461	0.581

12:24:55	22.5	16.286	0.46	0.580
12:24:56	23	16.288	0.458	0.578
12:24:56	23.5	16.293	0.453	0.571
12:24:57	24	16.298	0.448	0.565
12:24:57	24.5	16.303	0.443	0.559
12:24:58	25	16.307	0.439	0.554
12:24:58	25.5	16.311	0.435	0.549
12:24:59	26	16.315	0.431	0.544
12:24:59	26.5	16.32	0.426	0.537
12:25:00	27	16.321	0.425	0.536
12:25:00	27.5	16.324	0.422	0.532
12:25:01	28	16.327	0.419	0.528
12:25:01	28.5	16.331	0.415	0.523
12:25:02	29	16.337	0.409	0.516
12:25:02	29.5	16.338	0.408	0.515
12:25:03	30	16.339	0.407	0.513
12:25:03	30.5	16.338	0.408	0.515
12:25:04	31	16.342	0.404	0.509
12:25:04	31.5	16.346	0.4	0.504
12:25:05	32	16.35	0.396	0.499
12:25:05	32.5	16.356	0.39	0.492
12:25:06	33	16.358	0.388	0.489
12:25:06	33.5	16.358	0.388	0.489
12:25:07	34	16.36	0.386	0.487
12:25:07	34.5	16.363	0.383	0.483
12:25:08	35	16.367	0.379	0.478
12:25:08	35.5	16.373	0.373	0.470
12:25:09	36	16.375	0.371	0.468
12:25:09	36.5	16.378	0.368	0.464
12:25:10	37	16.38	0.366	0.462
12:25:10	37.5	16.383	0.363	0.458
12:25:11	38	16.386	0.36	0.454
12:25:11	38.5	16.389	0.357	0.450
12:25:12	39	16.389	0.357	0.450
12:25:12	39.5	16.387	0.359	0.453
12:25:13	40	16.389	0.357	0.450
12:25:13	40.5	16.392	0.354	0.446
12:25:14	41	16.396	0.35	0.441
12:25:14	41.5	16.401	0.345	0.435
12:25:15	42	16.408	0.338	0.426
12:25:15	42.5	16.412	0.334	0.421
12:25:16	43	16.413	0.333	0.420
12:25:16	43.5	16.417	0.329	0.415
12:25:17	44	16.419	0.327	0.412
12:25:17	44.5	16.42	0.326	0.411
12:25:18	45	16.424	0.322	0.406
12:25:18	45.5	16.427	0.319	0.402
12:25:19	46	16.43	0.316	0.398
12:25:19	46.5	16.432	0.314	0.396
12:25:20	47	16.434	0.312	0.393
12:25:20	47.5	16.436	0.31	0.391
12:25:21	48	16.436	0.31	0.391

12:25:21	48.5	16.439	0.307	0.387
12:25:22	49	16.44	0.306	0.386
12:25:22	49.5	16.44	0.306	0.386
12:25:23	50	16.44	0.306	0.386
12:25:23	50.5	16.441	0.305	0.385
12:25:24	51	16.444	0.302	0.381
12:25:24	51.5	16.447	0.299	0.377
12:25:25	52	16.451	0.295	0.372
12:25:25	52.5	16.452	0.294	0.371
12:25:26	53	16.454	0.292	0.368
12:25:26	53.5	16.453	0.293	0.369
12:25:27	54	16.456	0.29	0.366
12:25:27	54.5	16.455	0.291	0.367
12:25:28	55	16.457	0.289	0.364
12:25:28	55.5	16.461	0.285	0.359
12:25:29	56	16.461	0.285	0.359
12:25:29	56.5	16.464	0.282	0.356
12:25:30	57	16.465	0.281	0.354
12:25:30	57.5	16.467	0.279	0.352
12:25:31	58	16.47	0.276	0.348
12:25:31	58.5	16.473	0.273	0.344
12:25:32	59	16.476	0.27	0.340
12:25:32	59.5	16.479	0.267	0.337
12:25:33	60	16.48	0.266	0.335
12:25:33	60.5	16.48	0.266	0.335
12:25:34	61	16.481	0.265	0.334
12:25:34	61.5	16.482	0.264	0.333
12:25:35	62	16.481	0.265	0.334
12:25:35	62.5	16.483	0.263	0.332
12:25:36	63	16.484	0.262	0.330
12:25:36	63.5	16.484	0.262	0.330
12:25:37	64	16.488	0.258	0.325
12:25:37	64.5	16.491	0.255	0.322
12:25:38	65	16.492	0.254	0.320
12:25:38	65.5	16.493	0.253	0.319
12:25:39	66	16.494	0.252	0.318
12:25:39	66.5	16.495	0.251	0.317
12:25:40	67	16.497	0.249	0.314
12:25:40	67.5	16.496	0.25	0.315
12:25:41	68	16.499	0.247	0.311
12:25:41	68.5	16.5	0.246	0.310
12:25:42	69	16.5	0.246	0.310
12:25:42	69.5	16.504	0.242	0.305
12:25:43	70	16.503	0.243	0.306
12:25:43	70.5	16.502	0.244	0.308
12:25:44	71	16.504	0.242	0.305
12:25:44	71.5	16.505	0.241	0.304
12:25:45	72	16.509	0.237	0.299
12:25:45	72.5	16.513	0.233	0.294
12:25:46	73	16.511	0.235	0.296
12:25:46	73.5	16.511	0.235	0.296
12:25:47	74	16.512	0.234	0.295

12:25:47	74.5	16.512	0.234	0.295
12:25:48	75	16.516	0.23	0.290
12:25:48	75.5	16.516	0.23	0.290
12:25:49	76	16.516	0.23	0.290
12:25:49	76.5	16.517	0.229	0.289
12:25:50	77	16.518	0.228	0.288
12:25:50	77.5	16.522	0.224	0.282
12:25:51	78	16.521	0.225	0.284
12:25:51	78.5	16.522	0.224	0.282
12:25:52	79	16.521	0.225	0.284
12:25:52	79.5	16.522	0.224	0.282
12:25:53	80	16.523	0.223	0.281
12:25:53	80.5	16.521	0.225	0.284
12:25:54	81	16.522	0.224	0.282
12:25:54	81.5	16.522	0.224	0.282
12:25:55	82	16.523	0.223	0.281
12:25:55	82.5	16.528	0.218	0.275
12:25:56	83	16.529	0.217	0.274
12:25:56	83.5	16.53	0.216	0.272
12:25:57	84	16.531	0.215	0.271
12:25:57	84.5	16.532	0.214	0.270
12:25:58	85	16.53	0.216	0.272
12:25:58	85.5	16.533	0.213	0.269
12:25:59	86	16.532	0.214	0.270
12:25:59	86.5	16.533	0.213	0.269
12:26:00	87	16.536	0.21	0.265
12:26:00	87.5	16.537	0.209	0.264
12:26:01	88	16.537	0.209	0.264
12:26:01	88.5	16.536	0.21	0.265
12:26:02	89	16.535	0.211	0.266
12:26:02	89.5	16.536	0.21	0.265
12:26:03	90	16.538	0.208	0.262
12:26:03	90.5	16.539	0.207	0.261
12:26:04	91	16.541	0.205	0.259
12:26:04	91.5	16.541	0.205	0.259
12:26:05	92	16.542	0.204	0.257
12:26:05	92.5	16.543	0.203	0.256
12:26:06	93	16.545	0.201	0.253
12:26:06	93.5	16.547	0.199	0.251
12:26:07	94	16.544	0.202	0.255
12:26:07	94.5	16.546	0.2	0.252
12:26:08	95	16.547	0.199	0.251
12:26:08	95.5	16.548	0.198	0.250
12:26:09	96	16.547	0.199	0.251
12:26:09	96.5	16.548	0.198	0.250
12:26:10	97	16.547	0.199	0.251
12:26:10	97.5	16.548	0.198	0.250
12:26:11	98	16.551	0.195	0.246
12:26:11	98.5	16.549	0.197	0.248
12:26:12	99	16.548	0.198	0.250
12:26:12	99.5	16.547	0.199	0.251
12:26:13	100	16.547	0.199	0.251

12:26:13	100.5	16.55	0.196	0.247
12:26:14	101	16.554	0.192	0.242
12:26:14	101.5	16.557	0.189	0.238
12:26:15	102	16.557	0.189	0.238
12:26:15	102.5	16.557	0.189	0.238
12:26:16	103	16.556	0.19	0.240
12:26:16	103.5	16.559	0.187	0.236
12:26:17	104	16.559	0.187	0.236
12:26:17	104.5	16.56	0.186	0.235
12:26:18	105	16.561	0.185	0.233
12:26:18	105.5	16.56	0.186	0.235
12:26:19	106	16.565	0.181	0.228
12:26:19	106.5	16.567	0.179	0.226
12:26:20	107	16.565	0.181	0.228
12:26:20	107.5	16.563	0.183	0.231
12:26:21	108	16.56	0.186	0.235
12:26:21	108.5	16.56	0.186	0.235
12:26:22	109	16.564	0.182	0.230
12:26:22	109.5	16.567	0.179	0.226
12:26:23	110	16.57	0.176	0.222
12:26:23	110.5	16.572	0.174	0.219
12:26:24	111	16.574	0.172	0.217
12:26:24	111.5	16.573	0.173	0.218
12:26:25	112	16.572	0.174	0.219
12:26:25	112.5	16.573	0.173	0.218
12:26:26	113	16.573	0.173	0.218
12:26:26	113.5	16.575	0.171	0.216
12:26:27	114	16.575	0.171	0.216
12:26:27	114.5	16.574	0.172	0.217
12:26:28	115	16.569	0.177	0.223
12:26:28	115.5	16.566	0.18	0.227
12:26:29	116	16.563	0.183	0.231
12:26:29	116.5	16.56	0.186	0.235
12:26:30	117	16.56	0.186	0.235
12:26:30	117.5	16.562	0.184	0.232
12:26:31	118	16.566	0.18	0.227
12:26:31	118.5	16.569	0.177	0.223
12:26:32	119	16.571	0.175	0.221
12:26:32	119.5	16.571	0.175	0.221
12:26:33	120	16.569	0.177	0.223
12:26:33	120.5	16.57	0.176	0.222
12:26:34	121	16.573	0.173	0.218
12:26:34	121.5	16.571	0.175	0.221
12:26:35	122	16.573	0.173	0.218
12:26:35	122.5	16.572	0.174	0.219
12:26:36	123	16.573	0.173	0.218
12:26:36	123.5	16.575	0.171	0.216
12:26:37	124	16.573	0.173	0.218
12:26:37	124.5	16.575	0.171	0.216
12:26:38	125	16.574	0.172	0.217
12:26:38	125.5	16.576	0.17	0.214
12:26:39	126	16.579	0.167	0.211

12:26:39	126.5	16.577	0.169	0.213
12:26:40	127	16.576	0.17	0.214
12:26:40	127.5	16.576	0.17	0.214
12:26:41	128	16.574	0.172	0.217
12:26:41	128.5	16.577	0.169	0.213
12:26:42	129	16.579	0.167	0.211
12:26:42	129.5	16.579	0.167	0.211
12:26:43	130	16.577	0.169	0.213
12:26:43	130.5	16.578	0.168	0.212
12:26:44	131	16.579	0.167	0.211
12:26:44	131.5	16.579	0.167	0.211
12:26:45	132	16.582	0.164	0.207
12:26:45	132.5	16.582	0.164	0.207
12:26:46	133	16.583	0.163	0.206
12:26:46	133.5	16.582	0.164	0.207
12:26:47	134	16.582	0.164	0.207
12:26:47	134.5	16.582	0.164	0.207
12:26:48	135	16.58	0.166	0.209
12:26:48	135.5	16.578	0.168	0.212
12:26:49	136	16.58	0.166	0.209
12:26:49	136.5	16.58	0.166	0.209
12:26:50	137	16.584	0.162	0.204
12:26:50	137.5	16.587	0.159	0.201
12:26:51	138	16.588	0.158	0.199
12:26:51	138.5	16.588	0.158	0.199
12:26:52	139	16.584	0.162	0.204
12:26:52	139.5	16.583	0.163	0.206
12:26:53	140	16.584	0.162	0.204
12:26:53	140.5	16.584	0.162	0.204
12:26:54	141	16.586	0.16	0.202
12:26:54	141.5	16.586	0.16	0.202
12:26:55	142	16.585	0.161	0.203
12:26:55	142.5	16.586	0.16	0.202
12:26:56	143	16.587	0.159	0.201
12:26:56	143.5	16.589	0.157	0.198
12:26:57	144	16.588	0.158	0.199
12:26:57	144.5	16.586	0.16	0.202
12:26:58	145	16.583	0.163	0.206
12:26:58	145.5	16.583	0.163	0.206
12:26:59	146	16.583	0.163	0.206
12:26:59	146.5	16.581	0.165	0.208
12:27:00	147	16.582	0.164	0.207
12:27:00	147.5	16.582	0.164	0.207
12:27:01	148	16.581	0.165	0.208
12:27:01	148.5	16.582	0.164	0.207
12:27:02	149	16.583	0.163	0.206
12:27:02	149.5	16.584	0.162	0.204
12:27:03	150	16.587	0.159	0.201
12:27:03	150.5	16.592	0.154	0.194
12:27:04	151	16.593	0.153	0.193
12:27:04	151.5	16.591	0.155	0.195
12:27:05	152	16.593	0.153	0.193

12:27:05	152.5	16.593	0.153	0.193
12:27:06	153	16.595	0.151	0.190
12:27:06	153.5	16.6	0.146	0.184
12:27:07	154	16.6	0.146	0.184
12:27:07	154.5	16.602	0.144	0.182
12:27:08	155	16.602	0.144	0.182
12:27:08	155.5	16.6	0.146	0.184
12:27:09	156	16.601	0.145	0.183
12:27:09	156.5	16.599	0.147	0.185
12:27:10	157	16.601	0.145	0.183
12:27:10	157.5	16.6	0.146	0.184
12:27:11	158	16.601	0.145	0.183
12:27:11	158.5	16.603	0.143	0.180
12:27:12	159	16.6	0.146	0.184
12:27:12	159.5	16.599	0.147	0.185
12:27:13	160	16.598	0.148	0.187
12:27:13	160.5	16.595	0.151	0.190
12:27:14	161	16.596	0.15	0.189
12:27:14	161.5	16.598	0.148	0.187
12:27:15	162	16.598	0.148	0.187
12:27:15	162.5	16.598	0.148	0.187
12:27:16	163	16.598	0.148	0.187
12:27:16	163.5	16.595	0.151	0.190
12:27:17	164	16.594	0.152	0.192
12:27:17	164.5	16.594	0.152	0.192
12:27:18	165	16.594	0.152	0.192
12:27:18	165.5	16.596	0.15	0.189
12:27:19	166	16.595	0.151	0.190
12:27:19	166.5	16.596	0.15	0.189
12:27:20	167	16.596	0.15	0.189
12:27:20	167.5	16.599	0.147	0.185
12:27:21	168	16.597	0.149	0.188
12:27:21	168.5	16.596	0.15	0.189
12:27:22	169	16.592	0.154	0.194
12:27:22	169.5	16.59	0.156	0.197
12:27:23	170	16.592	0.154	0.194
12:27:23	170.5	16.594	0.152	0.192
12:27:24	171	16.598	0.148	0.187
12:27:24	171.5	16.6	0.146	0.184
12:27:25	172	16.602	0.144	0.182
12:27:25	172.5	16.603	0.143	0.180
12:27:26	173	16.603	0.143	0.180
12:27:26	173.5	16.603	0.143	0.180
12:27:27	174	16.602	0.144	0.182
12:27:27	174.5	16.599	0.147	0.185
12:27:28	175	16.599	0.147	0.185
12:27:28	175.5	16.599	0.147	0.185
12:27:29	176	16.597	0.149	0.188
12:27:29	176.5	16.601	0.145	0.183
12:27:30	177	16.6	0.146	0.184
12:27:30	177.5	16.599	0.147	0.185
12:27:31	178	16.601	0.145	0.183

12:27:31	178.5	16.601	0.145	0.183
12:27:32	179	16.601	0.145	0.183
12:27:32	179.5	16.602	0.144	0.182
12:27:33	180	16.603	0.143	0.180
12:27:33	180.5	16.599	0.147	0.185
12:27:34	181	16.601	0.145	0.183
12:27:34	181.5	16.601	0.145	0.183
12:27:35	182	16.601	0.145	0.183
12:27:35	182.5	16.603	0.143	0.180
12:27:36	183	16.601	0.145	0.183
12:27:36	183.5	16.601	0.145	0.183
12:27:37	184	16.601	0.145	0.183
12:27:37	184.5	16.602	0.144	0.182
12:27:38	185	16.604	0.142	0.179
12:27:38	185.5	16.603	0.143	0.180
12:27:39	186	16.602	0.144	0.182
12:27:39	186.5	16.599	0.147	0.185
12:27:40	187	16.6	0.146	0.184
12:27:40	187.5	16.6	0.146	0.184
12:27:41	188	16.6	0.146	0.184
12:27:41	188.5	16.605	0.141	0.178
12:27:42	189	16.603	0.143	0.180
12:27:42	189.5	16.603	0.143	0.180
12:27:43	190	16.603	0.143	0.180
12:27:43	190.5	16.6	0.146	0.184
12:27:44	191	16.602	0.144	0.182
12:27:44	191.5	16.602	0.144	0.182
12:27:45	192	16.603	0.143	0.180
12:27:45	192.5	16.607	0.139	0.175
12:27:46	193	16.606	0.14	0.177
12:27:46	193.5	16.606	0.14	0.177
12:27:47	194	16.606	0.14	0.177
12:27:47	194.5	16.606	0.14	0.177
12:27:48	195	16.605	0.141	0.178
12:27:48	195.5	16.605	0.141	0.178
12:27:49	196	16.606	0.14	0.177
12:27:49	196.5	16.606	0.14	0.177
12:27:50	197	16.607	0.139	0.175
12:27:50	197.5	16.605	0.141	0.178
12:27:51	198	16.606	0.14	0.177
12:27:51	198.5	16.607	0.139	0.175
12:27:52	199	16.608	0.138	0.174
12:27:52	199.5	16.61	0.136	0.172
12:27:53	200	16.61	0.136	0.172
12:27:53	200.5	16.61	0.136	0.172
12:27:54	201	16.61	0.136	0.172
12:27:54	201.5	16.607	0.139	0.175
12:27:55	202	16.607	0.139	0.175
12:27:55	202.5	16.603	0.143	0.180
12:27:56	203	16.602	0.144	0.182
12:27:56	203.5	16.602	0.144	0.182
12:27:57	204	16.6	0.146	0.184

12:27:57	204.5	16.6	0.146	0.184
12:27:58	205	16.598	0.148	0.187
12:27:58	205.5	16.6	0.146	0.184
12:27:59	206	16.602	0.144	0.182
12:27:59	206.5	16.606	0.14	0.177
12:28:00	207	16.606	0.14	0.177
12:28:00	207.5	16.605	0.141	0.178
12:28:01	208	16.604	0.142	0.179
12:28:01	208.5	16.604	0.142	0.179
12:28:02	209	16.604	0.142	0.179
12:28:02	209.5	16.601	0.145	0.183
12:28:03	210	16.601	0.145	0.183
12:28:03	210.5	16.6	0.146	0.184
12:28:04	211	16.604	0.142	0.179
12:28:04	211.5	16.604	0.142	0.179
12:28:05	212	16.606	0.14	0.177
12:28:05	212.5	16.608	0.138	0.174
12:28:06	213	16.607	0.139	0.175
12:28:06	213.5	16.611	0.135	0.170
12:28:07	214	16.611	0.135	0.170
12:28:07	214.5	16.609	0.137	0.173
12:28:08	215	16.609	0.137	0.173
12:28:08	215.5	16.609	0.137	0.173
12:28:09	216	16.609	0.137	0.173
12:28:09	216.5	16.61	0.136	0.172
12:28:10	217	16.611	0.135	0.170
12:28:10	217.5	16.607	0.139	0.175
12:28:11	218	16.607	0.139	0.175
12:28:11	218.5	16.608	0.138	0.174
12:28:12	219	16.608	0.138	0.174
12:28:12	219.5	16.612	0.134	0.169
12:28:13	220	16.61	0.136	0.172
12:28:13	220.5	16.609	0.137	0.173
12:28:14	221	16.61	0.136	0.172
12:28:14	221.5	16.609	0.137	0.173
12:28:15	222	16.611	0.135	0.170
12:28:15	222.5	16.611	0.135	0.170
12:28:16	223	16.611	0.135	0.170
12:28:16	223.5	16.611	0.135	0.170
12:28:17	224	16.611	0.135	0.170
12:28:17	224.5	16.611	0.135	0.170
12:28:18	225	16.609	0.137	0.173
12:28:18	225.5	16.61	0.136	0.172
12:28:19	226	16.608	0.138	0.174
12:28:19	226.5	16.608	0.138	0.174
12:28:20	227	16.61	0.136	0.172
12:28:20	227.5	16.61	0.136	0.172
12:28:21	228	16.611	0.135	0.170
12:28:21	228.5	16.611	0.135	0.170
12:28:22	229	16.61	0.136	0.172
12:28:22	229.5	16.611	0.135	0.170
12:28:23	230	16.61	0.136	0.172

12:28:23	230.5	16.61	0.136	0.172
12:28:24	231	16.611	0.135	0.170
12:28:24	231.5	16.611	0.135	0.170
12:28:25	232	16.608	0.138	0.174
12:28:25	232.5	16.608	0.138	0.174
12:28:26	233	16.61	0.136	0.172
12:28:26	233.5	16.608	0.138	0.174
12:28:27	234	16.611	0.135	0.170
12:28:27	234.5	16.61	0.136	0.172
12:28:28	235	16.609	0.137	0.173
12:28:28	235.5	16.611	0.135	0.170
12:28:29	236	16.609	0.137	0.173
12:28:29	236.5	16.611	0.135	0.170
12:28:30	237	16.612	0.134	0.169
12:28:30	237.5	16.608	0.138	0.174
12:28:31	238	16.607	0.139	0.175
12:28:31	238.5	16.602	0.144	0.182
12:28:32	239	16.602	0.144	0.182
12:28:32	239.5	16.604	0.142	0.179
12:28:33	240	16.608	0.138	0.174
12:28:33	240.5	16.614	0.132	0.166
12:28:34	241	16.612	0.134	0.169
12:28:34	241.5	16.613	0.133	0.168
12:28:35	242	16.614	0.132	0.166
12:28:35	242.5	16.614	0.132	0.166
12:28:36	243	16.613	0.133	0.168
12:28:36	243.5	16.611	0.135	0.170
12:28:37	244	16.61	0.136	0.172
12:28:37	244.5	16.608	0.138	0.174
12:28:38	245	16.609	0.137	0.173
12:28:38	245.5	16.612	0.134	0.169
12:28:39	246	16.613	0.133	0.168
12:28:39	246.5	16.612	0.134	0.169
12:28:40	247	16.615	0.131	0.165
12:28:40	247.5	16.614	0.132	0.166
12:28:41	248	16.615	0.131	0.165
12:28:41	248.5	16.615	0.131	0.165
12:28:42	249	16.614	0.132	0.166
12:28:42	249.5	16.615	0.131	0.165
12:28:43	250	16.615	0.131	0.165
12:28:43	250.5	16.615	0.131	0.165
12:28:44	251	16.616	0.13	0.164
12:28:44	251.5	16.612	0.134	0.169
12:28:45	252	16.612	0.134	0.169
12:28:45	252.5	16.612	0.134	0.169
12:28:46	253	16.613	0.133	0.168
12:28:46	253.5	16.614	0.132	0.166
12:28:47	254	16.611	0.135	0.170
12:28:47	254.5	16.609	0.137	0.173
12:28:48	255	16.606	0.14	0.177
12:28:48	255.5	16.609	0.137	0.173
12:28:49	256	16.611	0.135	0.170

12:28:49	256.5	16.611	0.135	0.170
12:28:50	257	16.611	0.135	0.170
12:28:50	257.5	16.607	0.139	0.175
12:28:51	258	16.605	0.141	0.178
12:28:51	258.5	16.605	0.141	0.178
12:28:52	259	16.607	0.139	0.175
12:28:52	259.5	16.611	0.135	0.170
12:28:53	260	16.614	0.132	0.166
12:28:53	260.5	16.614	0.132	0.166
12:28:54	261	16.616	0.13	0.164
12:28:54	261.5	16.615	0.131	0.165
12:28:55	262	16.613	0.133	0.168
12:28:55	262.5	16.613	0.133	0.168
12:28:56	263	16.613	0.133	0.168
12:28:56	263.5	16.613	0.133	0.168
12:28:57	264	16.616	0.13	0.164
12:28:57	264.5	16.615	0.131	0.165
12:28:58	265	16.612	0.134	0.169
12:28:58	265.5	16.61	0.136	0.172
12:28:59	266	16.606	0.14	0.177
12:28:59	266.5	16.607	0.139	0.175
12:29:00	267	16.606	0.14	0.177
12:29:00	267.5	16.61	0.136	0.172
12:29:01	268	16.611	0.135	0.170
12:29:01	268.5	16.611	0.135	0.170
12:29:02	269	16.615	0.131	0.165
12:29:02	269.5	16.616	0.13	0.164
12:29:03	270	16.619	0.127	0.160
12:29:03	270.5	16.618	0.128	0.161
12:29:04	271	16.619	0.127	0.160
12:29:04	271.5	16.617	0.129	0.163
12:29:05	272	16.617	0.129	0.163
12:29:05	272.5	16.615	0.131	0.165
12:29:06	273	16.615	0.131	0.165
12:29:06	273.5	16.616	0.13	0.164
12:29:07	274	16.615	0.131	0.165
12:29:07	274.5	16.616	0.13	0.164
12:29:08	275	16.617	0.129	0.163
12:29:08	275.5	16.619	0.127	0.160
12:29:09	276	16.622	0.124	0.156
12:29:09	276.5	16.625	0.121	0.153
12:29:10	277	16.623	0.123	0.155
12:29:10	277.5	16.621	0.125	0.158
12:29:11	278	16.616	0.13	0.164
12:29:11	278.5	16.615	0.131	0.165
12:29:12	279	16.613	0.133	0.168
12:29:12	279.5	16.613	0.133	0.168
12:29:13	280	16.616	0.13	0.164
12:29:13	280.5	16.612	0.134	0.169
12:29:14	281	16.613	0.133	0.168
12:29:14	281.5	16.613	0.133	0.168
12:29:15	282	16.613	0.133	0.168

12:29:15	282.5	16.614	0.132	0.166
12:29:16	283	16.611	0.135	0.170
12:29:16	283.5	16.61	0.136	0.172
12:29:17	284	16.61	0.136	0.172
12:29:17	284.5	16.612	0.134	0.169
12:29:18	285	16.617	0.129	0.163
12:29:18	285.5	16.615	0.131	0.165
12:29:19	286	16.613	0.133	0.168
12:29:19	286.5	16.613	0.133	0.168
12:29:20	287	16.613	0.133	0.168
12:29:20	287.5	16.618	0.128	0.161
12:29:21	288	16.62	0.126	0.159
12:29:21	288.5	16.616	0.13	0.164
12:29:22	289	16.616	0.13	0.164
12:29:22	289.5	16.614	0.132	0.166
12:29:23	290	16.611	0.135	0.170
12:29:23	290.5	16.614	0.132	0.166
12:29:24	291	16.614	0.132	0.166
12:29:24	291.5	16.615	0.131	0.165
12:29:25	292	16.617	0.129	0.163
12:29:25	292.5	16.614	0.132	0.166
12:29:26	293	16.61	0.136	0.172
12:29:26	293.5	16.611	0.135	0.170
12:29:27	294	16.61	0.136	0.172
12:29:27	294.5	16.61	0.136	0.172
12:29:28	295	16.614	0.132	0.166
12:29:28	295.5	16.614	0.132	0.166
12:29:29	296	16.615	0.131	0.165
12:29:29	296.5	16.618	0.128	0.161
12:29:30	297	16.617	0.129	0.163
12:29:30	297.5	16.614	0.132	0.166
12:29:31	298	16.615	0.131	0.165
12:29:31	298.5	16.617	0.129	0.163
12:29:32	299	16.617	0.129	0.163
12:29:32	299.5	16.622	0.124	0.156
12:29:33	300	16.622	0.124	0.156
12:29:33	300.5	16.623	0.123	0.155
12:29:34	301	16.624	0.122	0.154
12:29:34	301.5	16.624	0.122	0.154
12:29:35	302	16.624	0.122	0.154
12:29:35	302.5	16.623	0.123	0.155
12:29:36	303	16.625	0.121	0.153
12:29:36	303.5	16.625	0.121	0.153
12:29:37	304	16.626	0.12	0.151
12:29:37	304.5	16.627	0.119	0.150
12:29:38	305	16.625	0.121	0.153
12:29:38	305.5	16.624	0.122	0.154
12:29:39	306	16.625	0.121	0.153
12:29:39	306.5	16.624	0.122	0.154
12:29:40	307	16.627	0.119	0.150
12:29:40	307.5	16.626	0.12	0.151
12:29:41	308	16.624	0.122	0.154

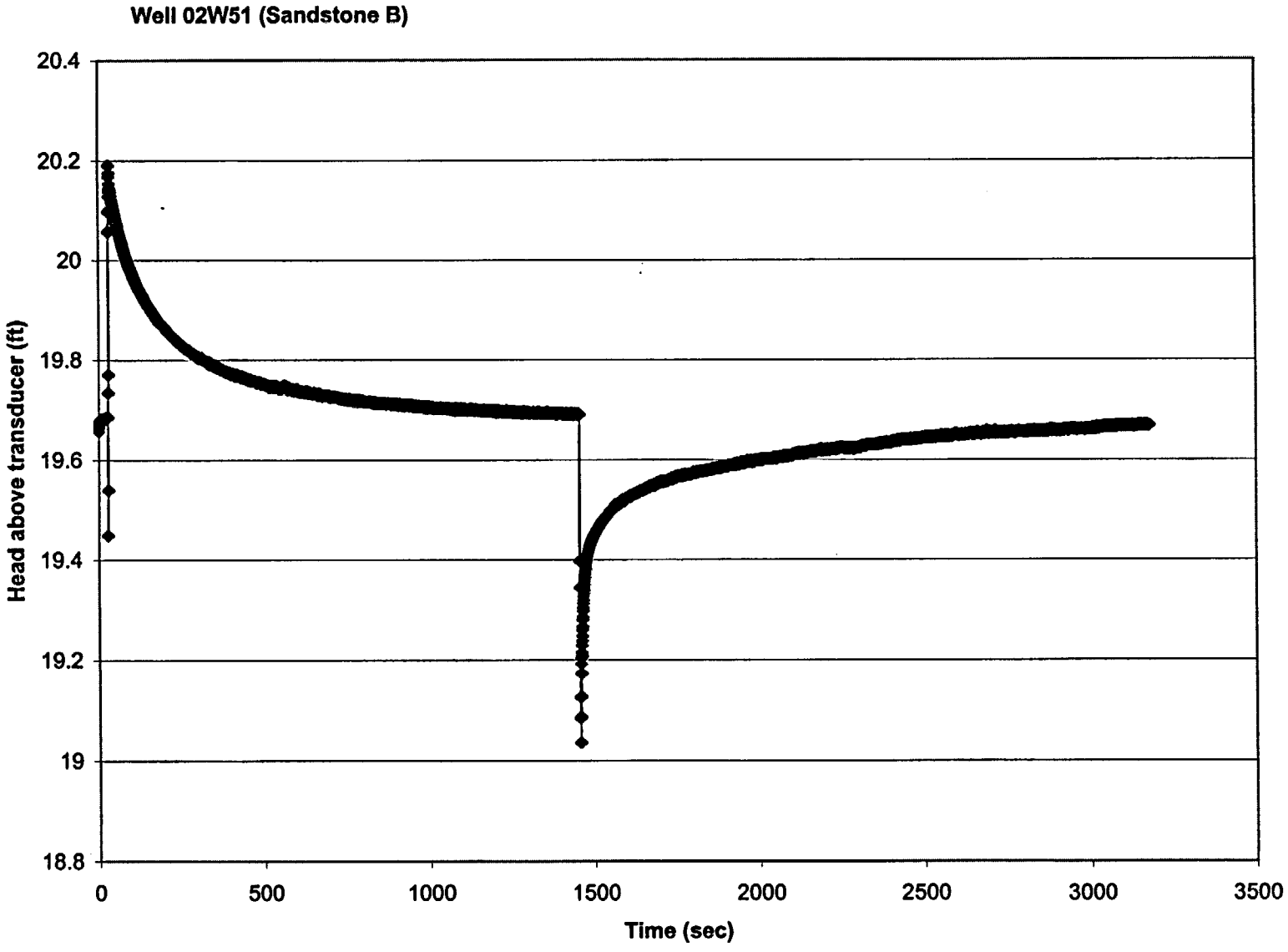
12:29:41	308.5	16.625	0.121	0.153
12:29:42	309	16.625	0.121	0.153
12:29:42	309.5	16.625	0.121	0.153
12:29:43	310	16.627	0.119	0.150
12:29:43	310.5	16.625	0.121	0.153
12:29:44	311	16.624	0.122	0.154
12:29:44	311.5	16.624	0.122	0.154
12:29:45	312	16.624	0.122	0.154
12:29:45	312.5	16.624	0.122	0.154
12:29:46	313	16.625	0.121	0.153
12:29:46	313.5	16.625	0.121	0.153
12:29:47	314	16.623	0.123	0.155
12:29:47	314.5	16.625	0.121	0.153
12:29:48	315	16.623	0.123	0.155
12:29:48	315.5	16.622	0.124	0.156
12:29:49	316	16.62	0.126	0.159
12:29:49	316.5	16.618	0.128	0.161
12:29:50	317	16.617	0.129	0.163
12:29:50	317.5	16.617	0.129	0.163
12:29:51	318	16.621	0.125	0.158
12:29:51	318.5	16.624	0.122	0.154
12:29:52	319	16.626	0.12	0.151
12:29:52	319.5	16.627	0.119	0.150
12:29:53	320	16.625	0.121	0.153
12:29:53	320.5	16.626	0.12	0.151
12:29:54	321	16.624	0.122	0.154
12:29:54	321.5	16.622	0.124	0.156
12:29:55	322	16.62	0.126	0.159
12:29:55	322.5	16.618	0.128	0.161
12:29:56	323	16.619	0.127	0.160
12:29:56	323.5	16.622	0.124	0.156
12:29:57	324	16.625	0.121	0.153
12:29:57	324.5	16.628	0.118	0.149
12:29:58	325	16.629	0.117	0.148
12:29:58	325.5	16.629	0.117	0.148
12:29:59	326	16.629	0.117	0.148
12:29:59	326.5	16.629	0.117	0.148
12:30:00	327	16.628	0.118	0.149
12:30:00	327.5	16.629	0.117	0.148
12:30:01	328	16.628	0.118	0.149
12:30:01	328.5	16.627	0.119	0.150
12:30:02	329	16.626	0.12	0.151
12:30:02	329.5	16.622	0.124	0.156
12:30:03	330	16.618	0.128	0.161
12:30:03	330.5	16.617	0.129	0.163
12:30:04	331	16.617	0.129	0.163
12:30:04	331.5	16.618	0.128	0.161
12:30:05	332	16.618	0.128	0.161
12:30:05	332.5	16.619	0.127	0.160
12:30:06	333	16.62	0.126	0.159
12:30:06	333.5	16.62	0.126	0.159
12:30:07	334	16.623	0.123	0.155

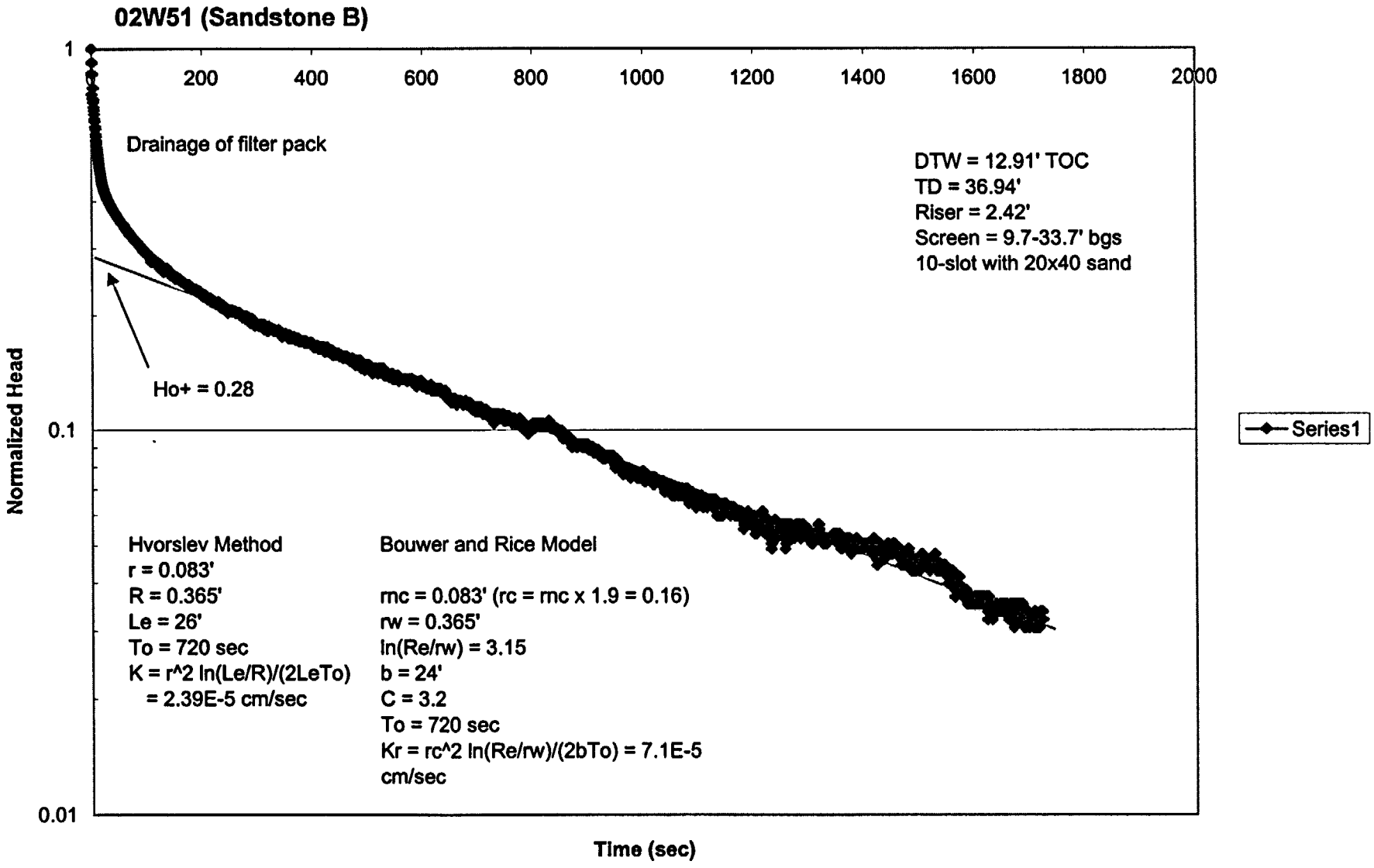
12:30:07	334.5	16.622	0.124	0.156
12:30:08	335	16.621	0.125	0.158
12:30:08	335.5	16.619	0.127	0.160
12:30:09	336	16.618	0.128	0.161
12:30:09	336.5	16.616	0.13	0.164
12:30:10	337	16.616	0.13	0.164
12:30:10	337.5	16.618	0.128	0.161
12:30:11	338	16.62	0.126	0.159
12:30:11	338.5	16.622	0.124	0.156
12:30:12	339	16.62	0.126	0.159
12:30:12	339.5	16.619	0.127	0.160
12:30:13	340	16.619	0.127	0.160
12:30:13	340.5	16.615	0.131	0.165
12:30:14	341	16.618	0.128	0.161
12:30:14	341.5	16.616	0.13	0.164
12:30:15	342	16.616	0.13	0.164
12:30:15	342.5	16.618	0.128	0.161
12:30:16	343	16.618	0.128	0.161
12:30:16	343.5	16.618	0.128	0.161
12:30:17	344	16.615	0.131	0.165
12:30:17	344.5	16.614	0.132	0.166
12:30:18	345	16.611	0.135	0.170
12:30:18	345.5	16.609	0.137	0.173
12:30:19	346	16.612	0.134	0.169
12:30:19	346.5	16.613	0.133	0.168
12:30:20	347	16.615	0.131	0.165
12:30:20	347.5	16.616	0.13	0.164
12:30:21	348	16.615	0.131	0.165
12:30:21	348.5	16.618	0.128	0.161
12:30:22	349	16.618	0.128	0.161
12:30:22	349.5	16.621	0.125	0.158
12:30:23	350	16.619	0.127	0.160
12:30:23	350.5	16.616	0.13	0.164
12:30:24	351	16.612	0.134	0.169
12:30:24	351.5	16.61	0.136	0.172
12:30:25	352	16.612	0.134	0.169
12:30:25	352.5	16.614	0.132	0.166
12:30:26	353	16.618	0.128	0.161
12:30:26	353.5	16.616	0.13	0.164
12:30:27	354	16.617	0.129	0.163
12:30:27	354.5	16.619	0.127	0.160
12:30:28	355	16.619	0.127	0.160
12:30:28	355.5	16.622	0.124	0.156
12:30:29	356	16.621	0.125	0.158
12:30:29	356.5	16.619	0.127	0.160
12:30:30	357	16.619	0.127	0.160
12:30:30	357.5	16.619	0.127	0.160
12:30:31	358	16.619	0.127	0.160
12:30:31	358.5	16.62	0.126	0.159
12:30:32	359	16.62	0.126	0.159
12:30:32	359.5	16.621	0.125	0.158
12:30:33	360	16.624	0.122	0.154

12:30:33	360.5	16.626	0.12	0.151
12:30:34	361	16.628	0.118	0.149
12:30:34	361.5	16.629	0.117	0.148
12:30:35	362	16.627	0.119	0.150
12:30:35	362.5	16.625	0.121	0.153
12:30:36	363	16.623	0.123	0.155
12:30:36	363.5	16.622	0.124	0.156
12:30:37	364	16.624	0.122	0.154
12:30:37	364.5	16.627	0.119	0.150
12:30:38	365	16.629	0.117	0.148
12:30:38	365.5	16.627	0.119	0.150
12:30:39	366	16.627	0.119	0.150
12:30:39	366.5	16.627	0.119	0.150
12:30:40	367	16.625	0.121	0.153
12:30:40	367.5	16.624	0.122	0.154
12:30:41	368	16.625	0.121	0.153
12:30:41	368.5	16.621	0.125	0.158
12:30:42	369	16.623	0.123	0.155
12:30:42	369.5	16.626	0.12	0.151
12:30:43	370	16.625	0.121	0.153
12:30:43	370.5	16.628	0.118	0.149
12:30:44	371	16.628	0.118	0.149
12:30:44	371.5	16.626	0.12	0.151
12:30:45	372	16.622	0.124	0.156
12:30:45	372.5	16.619	0.127	0.160
12:30:46	373	16.617	0.129	0.163
12:30:46	373.5	16.616	0.13	0.164
12:30:47	374	16.619	0.127	0.160
12:30:47	374.5	16.62	0.126	0.159
12:30:48	375	16.619	0.127	0.160
12:30:48	375.5	16.619	0.127	0.160
12:30:49	376	16.618	0.128	0.161
12:30:49	376.5	16.619	0.127	0.160
12:30:50	377	16.619	0.127	0.160
12:30:50	377.5	16.618	0.128	0.161
12:30:51	378	16.619	0.127	0.160
12:30:51	378.5	16.619	0.127	0.160
12:30:52	379	16.62	0.126	0.159
12:30:52	379.5	16.622	0.124	0.156
12:30:53	380	16.62	0.126	0.159
12:30:53	380.5	16.62	0.126	0.159
12:30:54	381	16.617	0.129	0.163
12:30:54	381.5	16.618	0.128	0.161
12:30:55	382	16.617	0.129	0.163
12:30:55	382.5	16.617	0.129	0.163
12:30:56	383	16.62	0.126	0.159
12:30:56	383.5	16.618	0.128	0.161
12:30:57	384	16.62	0.126	0.159
12:30:57	384.5	16.62	0.126	0.159
12:30:58	385	16.617	0.129	0.163
12:30:58	385.5	16.617	0.129	0.163
12:30:59	386	16.615	0.131	0.165

12:30:59	386.5	16.613	0.133	0.168
12:31:00	387	16.618	0.128	0.161
12:31:00	387.5	16.616	0.13	0.164
12:31:01	388	16.619	0.127	0.160
12:31:01	388.5	16.622	0.124	0.156
12:31:02	389	16.62	0.126	0.159
12:31:02	389.5	16.623	0.123	0.155
12:31:03	390	16.619	0.127	0.160
12:31:03	390.5	16.618	0.128	0.161
12:31:04	391	16.615	0.131	0.165
12:31:04	391.5	16.615	0.131	0.165
12:31:05	392	16.617	0.129	0.163
12:31:05	392.5	16.615	0.131	0.165
12:31:06	393	16.619	0.127	0.160
12:31:06	393.5	16.619	0.127	0.160
12:31:07	394	16.619	0.127	0.160
12:31:07	394.5	16.621	0.125	0.158
12:31:08	395	16.621	0.125	0.158

WELL 02W51


Well 02W51 (Sandstone B)
Head above transducer (ft)
20.4
20.2
20
19.8
19.6
19.4
19.2
19
18.8
0
500
1000
1500
2000
2500
3000
3500
Time (sec)


02W51 (Sandstone B)
1
0.1
0.01
200
400
600
800
1000
1200
1400
1600
1800
2000
Drainage of filter pack
DTW = 12.91' TOC
TD = 36.94'
Riser = 2.42'
Screen = 9.7-33.7' bgs
10-slot with 20x40 sand
Ho+ = 0.28
Normalized Head
Time (sec)
Series1
Hvorslev Method
r = 0.083'
R = 0.365'
Le = 26'
To = 720 sec
K = r^2 ln(Le/R)/(2LeTo)
= 2.39E-5 cm/sec
Bouwer and Rice Model
rnc = 0.083' (rc = rnc x 1.9 = 0.16)
rw = 0.365'
ln(Re/rw) = 3.15
b = 24'
C = 3.2
To = 720 sec
Kr = rc^2 ln(Re/rw)/(2bTo) = 7.1E-5
cm/sec

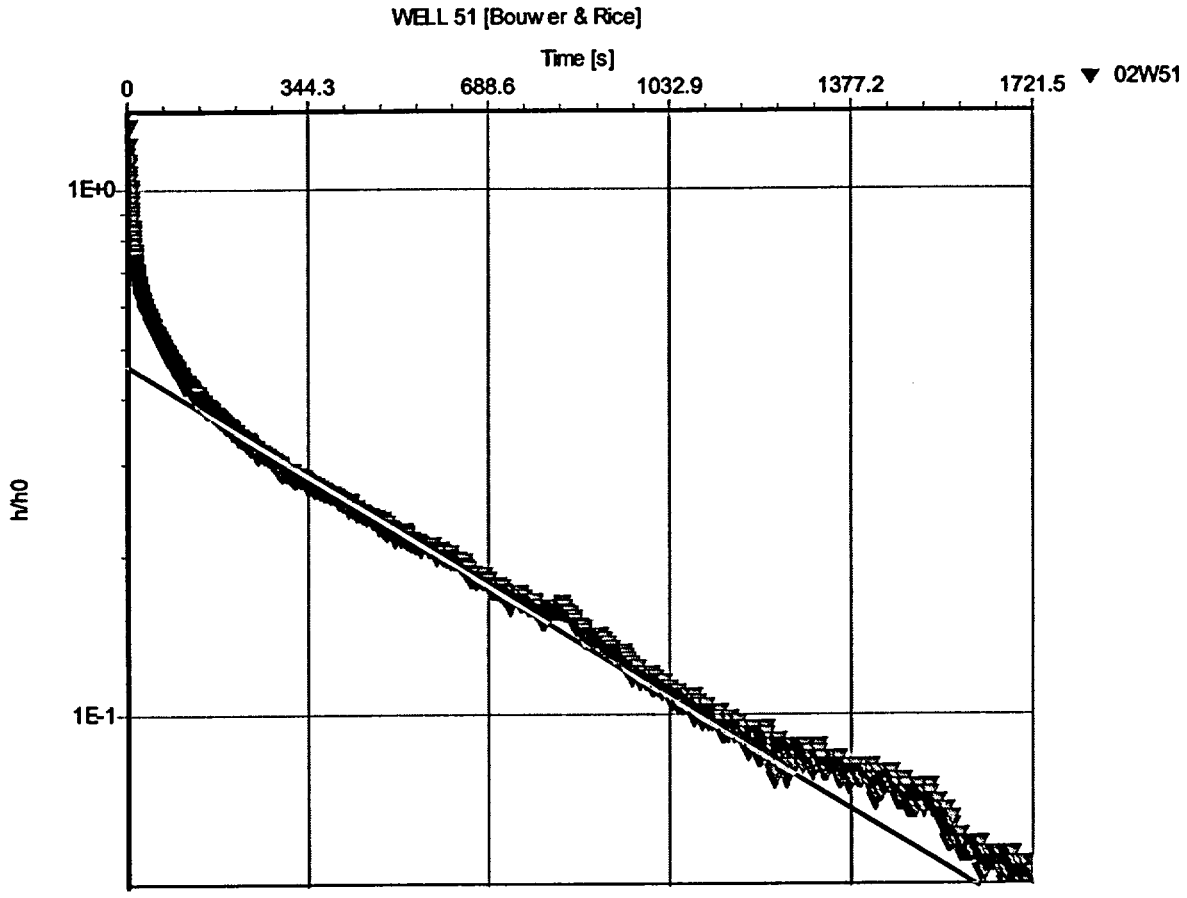
Kerr-McGee Corp.
123 Robert S. Kerr Ave.
Oklahoma City, Oklahoma 73102
Phone: (405) 270-2696

Slug Test Analysis Report

Project: Cimarron Facility Burial Area # 1

Number:

Client: Kerr-McGee



Slug Test: **02W51 (SS B)**

Analysis Method: **Bouwer & Rice**

Analysis Results:

Conductivity: 7.72E-5 [cm/s]

Test parameters:

Test Well:	02W51	Aquifer Thickness:	21.61 [ft]
Casing radius:	0.083 [ft]	Gravel Pack Porosity (%)	16
Screen length:	24 [ft]		
Boring radius:	0.365 [ft]		
r(eff):	0.165 [ft]		

Comments: The double straight line effect observed due to filter pack drainage.

Evaluated by: Leon Chen

Evaluation Date: 10/10/2002

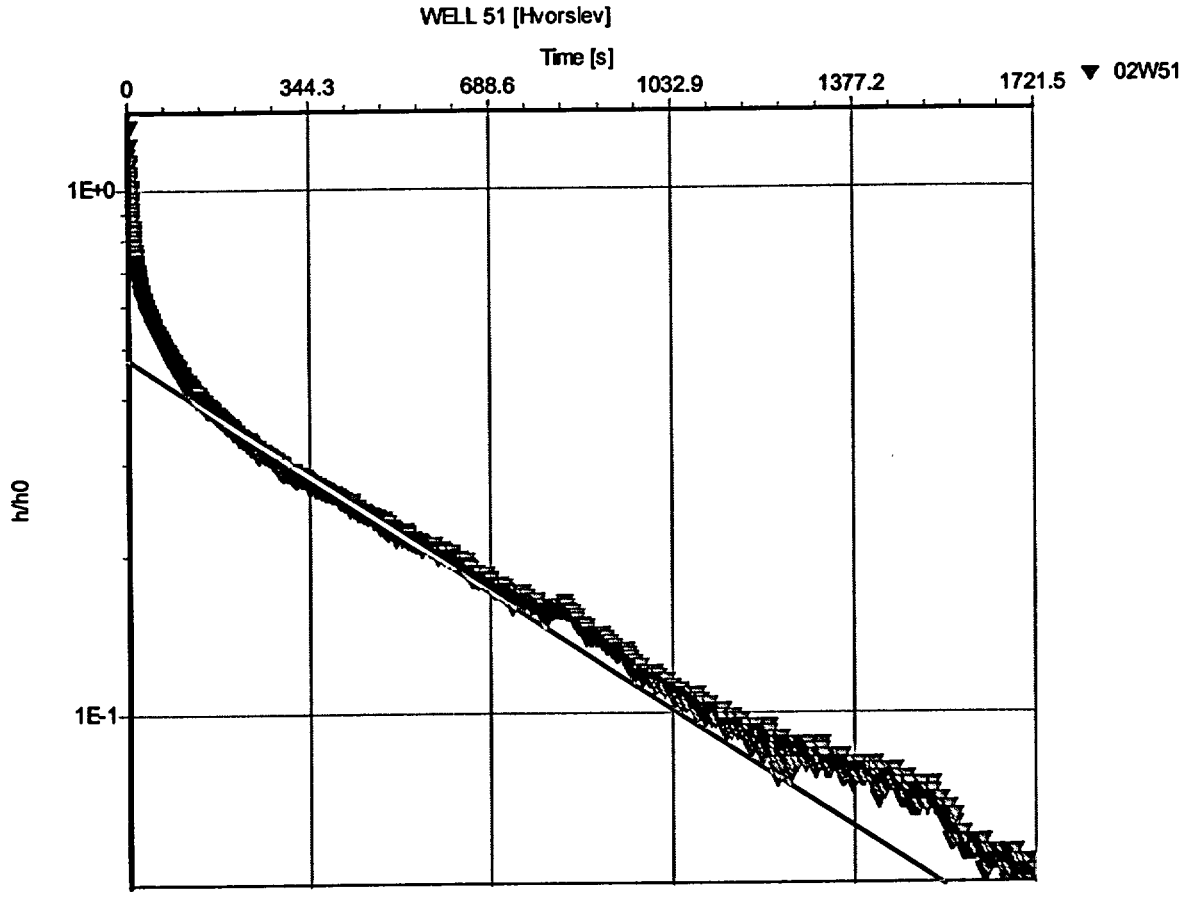
Kerr-McGee Corp.
123 Robert S. Kerr Ave.
Oklahoma City, Oklahoma 73102
Phone: (405) 270-2696

Slug Test Analysis Report

Project: Cimarron Facility Burial Area # 1

Number:

Client: Kerr-McGee



Slug Test: **02W51 (SS B)**

Analysis Method: **Hvorslev**

Analysis Results:

Conductivity: 2.75E-5 [cm/s]

Test parameters:

Test Well:	02W51	Aquifer Thickness:	21.61 [ft]
Casing radius:	0.083 [ft]		
Screen length:	24 [ft]		
Boring radius:	0.365 [ft]		

Comments:

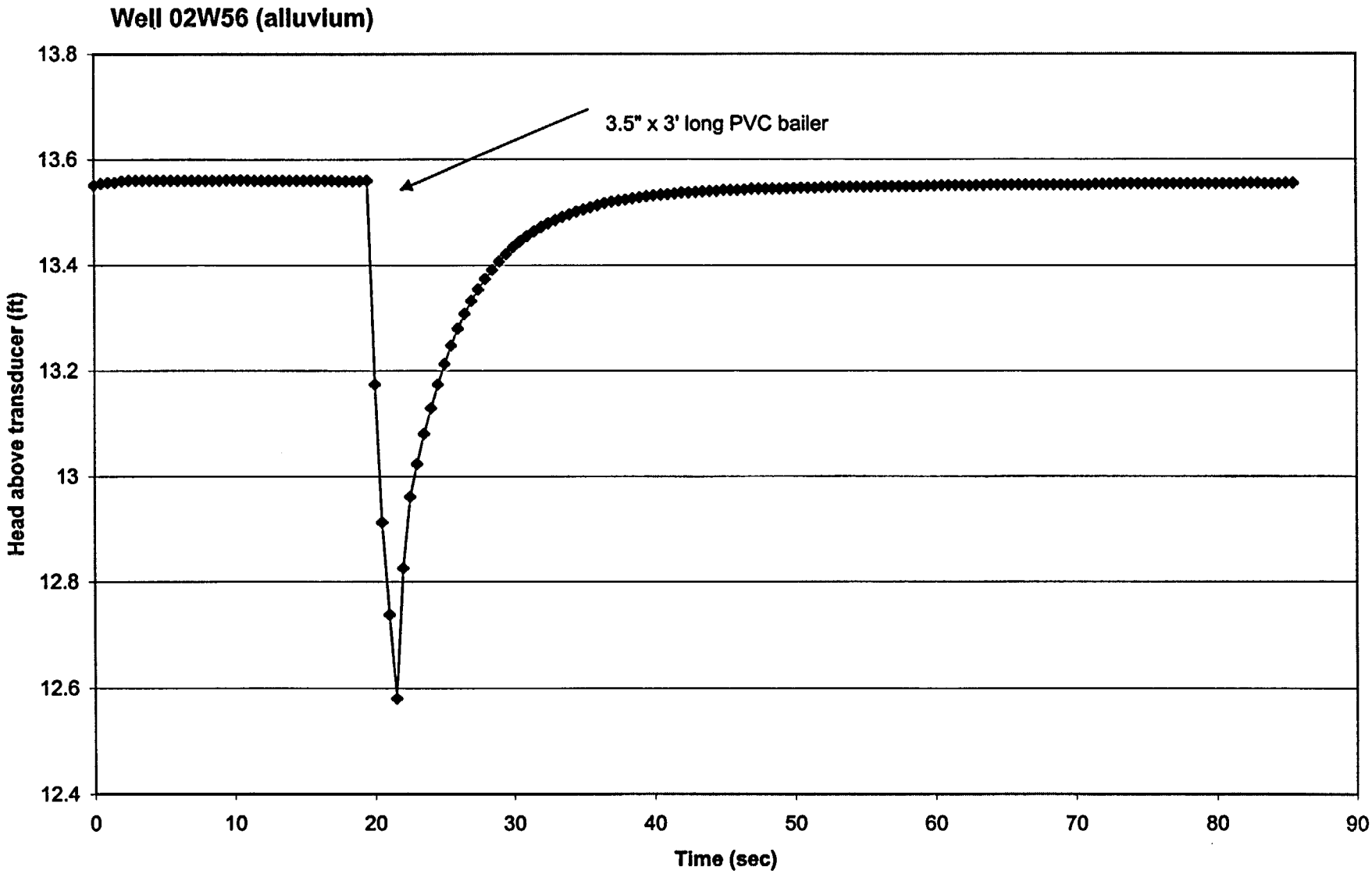
Evaluated by: Leon Chen

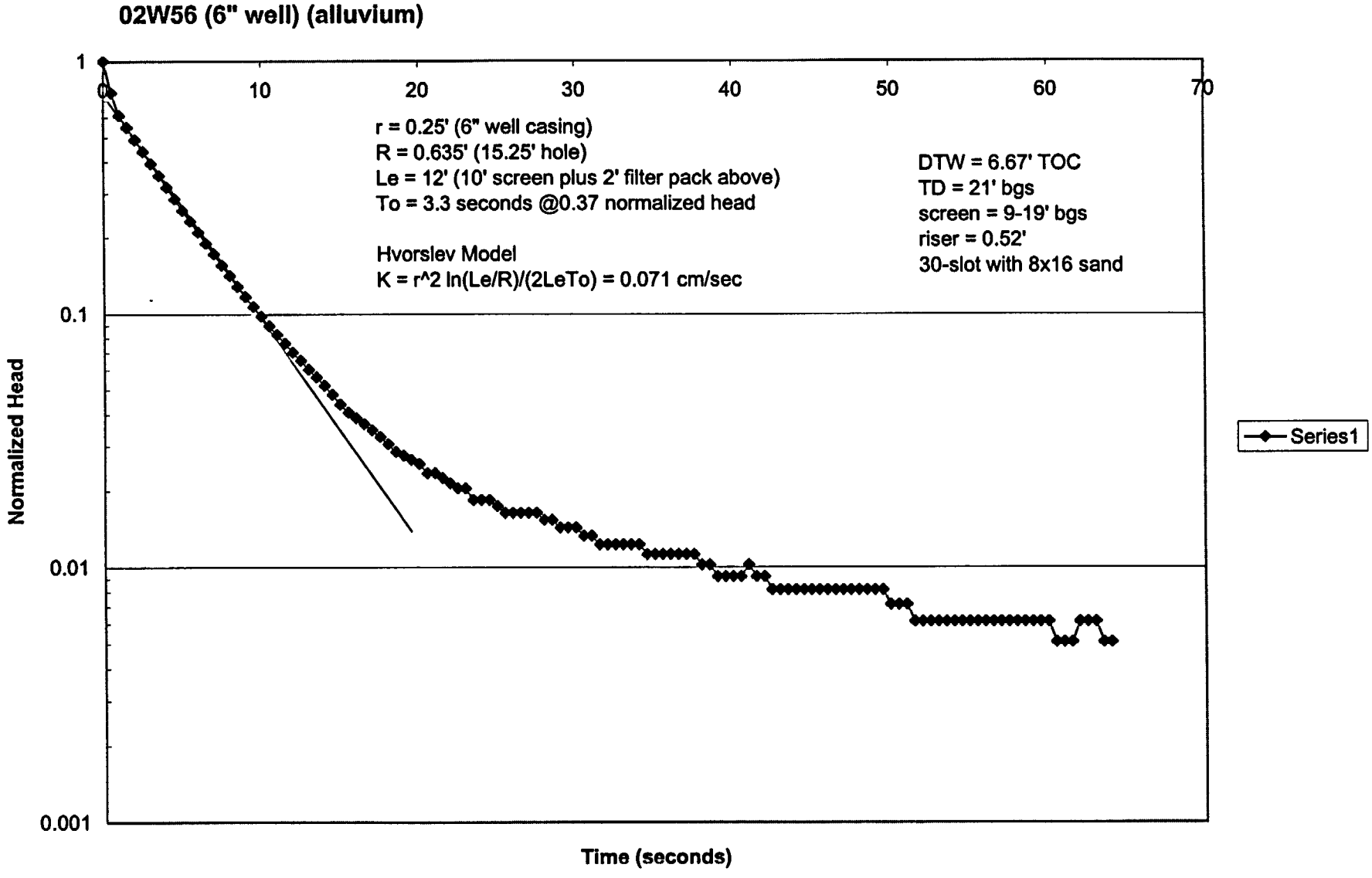
Evaluation Date: 10/9/2002

Slug Test Data for 02W51 (Sandstone B) 10/1/2002				
Time	**Time (sec)**	**Head (ft)**	**Head (ft)**	**Normalized Head**
Initial Head		19.690		
13:15:33	0	19.036	0.654	1.000
13:15:34	1	19.087	0.603	0.922
13:15:35	2	19.127	0.563	0.861
13:15:36	3	19.173	0.517	0.791
13:15:37	4	19.208	0.482	0.737
13:15:38	5	19.238	0.452	0.691
13:15:39	6	19.260	0.430	0.657
13:15:40	7	19.280	0.410	0.627
13:15:41	8	19.298	0.392	0.599
13:15:42	9	19.313	0.377	0.576
13:15:43	10	19.327	0.363	0.555
13:15:44	11	19.339	0.351	0.537
13:15:45	12	19.350	0.340	0.520
13:15:46	13	19.360	0.330	0.505
13:15:47	14	19.369	0.321	0.491
13:15:48	15	19.377	0.313	0.479
13:15:49	16	19.383	0.307	0.469
13:15:50	17	19.390	0.300	0.459
13:15:51	18	19.395	0.295	0.451
13:15:52	19	19.400	0.290	0.443
13:15:53	20	19.404	0.286	0.437
13:16:03	30	19.428	0.262	0.401
13:16:13	40	19.444	0.246	0.376
13:16:23	50	19.457	0.233	0.356
13:16:33	60	19.468	0.222	0.339
13:16:43	70	19.478	0.212	0.324
13:16:53	80	19.486	0.204	0.312
13:17:03	90	19.493	0.197	0.301
13:17:13	100	19.500	0.190	0.291
13:17:23	110	19.509	0.181	0.277
13:17:33	120	19.511	0.179	0.274
13:17:43	130	19.518	0.172	0.263
13:17:53	140	19.521	0.169	0.258
13:18:03	150	19.526	0.164	0.251
13:18:13	160	19.529	0.161	0.246
13:18:23	170	19.532	0.158	0.242
13:18:33	180	19.535	0.155	0.237
13:18:43	190	19.538	0.152	0.232
13:18:53	200	19.543	0.147	0.225
13:20:33	300	19.566	0.124	0.190
13:22:13	400	19.581	0.109	0.167
13:23:53	500	19.594	0.096	0.147
13:25:33	600	19.605	0.085	0.130
13:27:13	700	19.616	0.074	0.113
13:28:53	800	19.623	0.067	0.102
13:30:33	900	19.631	0.059	0.090
13:32:13	1000	19.640	0.050	0.076

13:33:53	1100	19.647	0.043	0.066
13:35:33	1200	19.652	0.038	0.058
13:37:13	1300	19.655	0.035	0.054
13:38:53	1400	19.657	0.033	0.050
13:40:33	1500	19.660	0.030	0.046
13:42:13	1600	19.666	0.024	0.037
13:43:53	1700	19.669	0.021	0.032
13:44:14	1721.5	19.669	0.021	0.032

WELL 02W56


Well 02W56 (alluvium)
3.5" x 3' long PVC bailer
Head above transducer (ft)
13.8
13.6
13.4
13.2
13
12.8
12.6
12.4
0
10
20
30
40
50
60
70
80
90
Time (sec)


02W56 (6" well) (alluvium)
1
0.1
0.01
0.001
0
10
20
30
40
50
60
70
r = 0.25' (6" well casing)
R = 0.635' (15.25' hole)
Le = 12' (10' screen plus 2' filter pack above)
To = 3.3 seconds @0.37 normalized head
Hvorslev Model
K = r^2 ln(Le/R)/(2LeTo) = 0.071 cm/sec
DTW = 6.67' TOC
TD = 21' bgs
screen = 9-19' bgs
riser = 0.52'
30-slot with 8x16 sand
Normalized Head
Time (seconds)
Series1

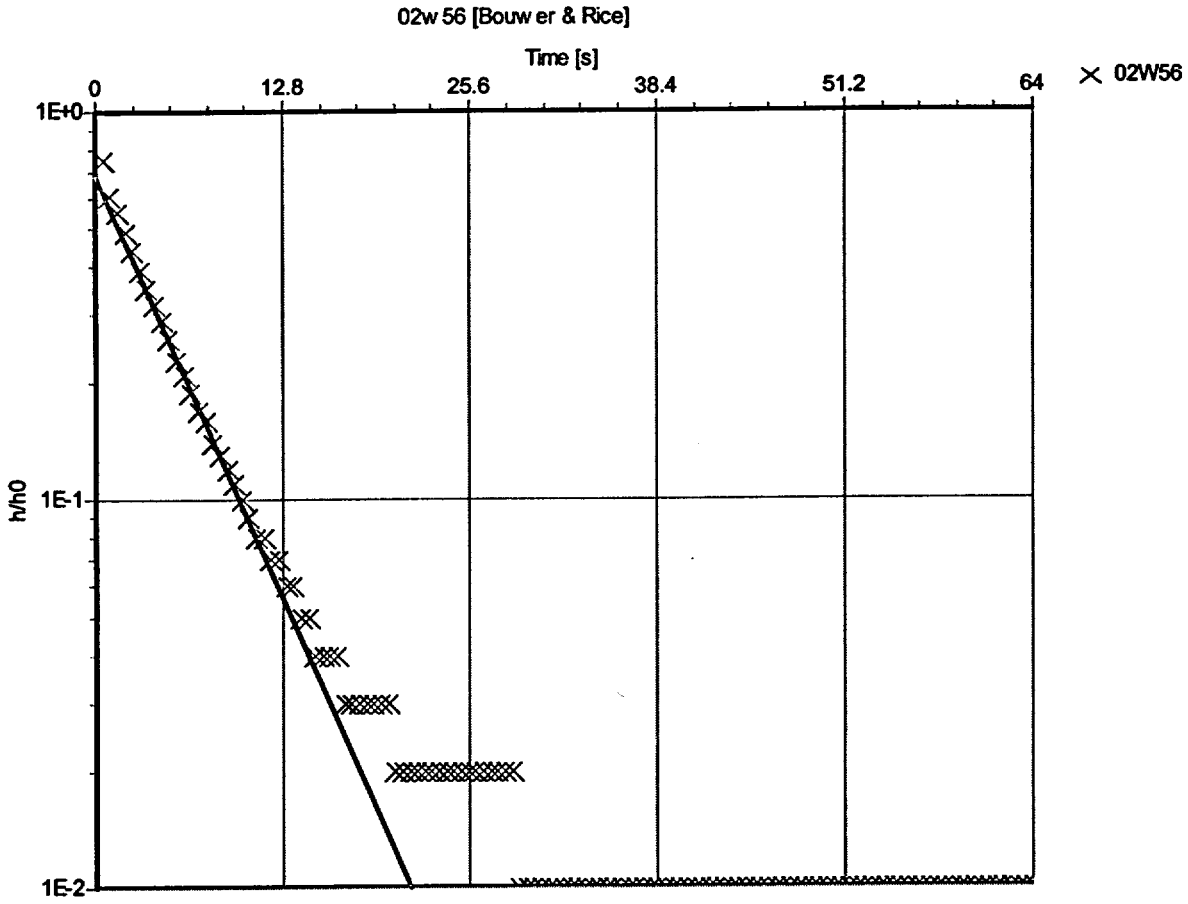
Kerr-McGee Corp.
123 Robert S. Kerr Ave.
Oklahoma City, Oklahoma 73102
Phone: (405) 270-2696

Slug Test Analysis Report

Project: Cimarron Facility Burial Area # 1

Number:

Client: Kerr-McGee



Slug Test: **02W56 (alluvium)**

Analysis Method: **Bouwer & Rice**

Analysis Results:

Conductivity: 4.22E-2 [cm/s]

Test parameters:

Test Well:	02W56	Aquifer Thickness:	13.81 [ft]
Casing radius:	0.25 [ft]	Gravel Pack Porosity (%)	25
Screen length:	10 [ft]		
Boring radius:	0.635 [ft]		
r(eff):	0.384 [ft]		

Comments:

Evaluated by: Leon Chen

Evaluation Date: 10/10/2002

Slug Test Data for 02W56 9/30/2002				
Time	Time (sec)	Water Head (ft)	Head (ft)	Normalized Head
Initial Head		13.560		
11:21:08	0	12.580	0.980	1.000
11:21:09	0.5	12.825	0.735	0.750
11:21:09	1	12.961	0.599	0.611
11:21:10	1.5	13.023	0.537	0.548
11:21:10	2	13.080	0.480	0.490
11:21:11	2.5	13.129	0.431	0.440
11:21:11	3	13.174	0.386	0.394
11:21:12	3.5	13.213	0.347	0.354
11:21:12	4	13.248	0.312	0.318
11:21:13	4.5	13.280	0.280	0.286
11:21:13	5	13.308	0.252	0.257
11:21:14	5.5	13.332	0.228	0.233
11:21:14	6	13.354	0.206	0.210
11:21:15	6.5	13.374	0.186	0.190
11:21:15	7	13.391	0.169	0.172
11:21:16	7.5	13.407	0.153	0.156
11:21:16	8	13.421	0.139	0.142
11:21:17	8.5	13.434	0.126	0.129
11:21:17	9	13.445	0.115	0.117
11:21:18	9.5	13.455	0.105	0.107
11:21:18	10	13.464	0.096	0.098
11:21:19	10.5	13.472	0.088	0.090
11:21:19	11	13.479	0.081	0.083
11:21:20	11.5	13.485	0.075	0.077
11:21:20	12	13.491	0.069	0.070
11:21:21	12.5	13.496	0.064	0.065
11:21:21	13	13.501	0.059	0.060
11:21:22	13.5	13.505	0.055	0.056
11:21:22	14	13.509	0.051	0.052
11:21:23	14.5	13.513	0.047	0.048
11:21:23	15	13.517	0.043	0.044
11:21:24	15.5	13.520	0.040	0.041
11:21:24	16	13.522	0.038	0.039
11:21:25	16.5	13.524	0.036	0.037
11:21:25	17	13.526	0.034	0.035
11:21:26	17.5	13.528	0.032	0.033
11:21:26	18	13.530	0.030	0.031
11:21:27	18.5	13.532	0.028	0.029
11:21:27	19	13.533	0.027	0.028
11:21:28	19.5	13.534	0.026	0.027
11:21:28	20	13.535	0.025	0.026
11:21:29	20.5	13.537	0.023	0.023
11:21:29	21	13.537	0.023	0.023
11:21:30	21.5	13.538	0.022	0.022
11:21:30	22	13.539	0.021	0.021
11:21:31	22.5	13.540	0.020	0.020

11:21:31	23	13.540	0.020	0.020
11:21:32	23.5	13.542	0.018	0.018
11:21:32	24	13.542	0.018	0.018
11:21:33	24.5	13.542	0.018	0.018
11:21:33	25	13.543	0.017	0.017
11:21:34	25.5	13.544	0.016	0.016
11:21:34	26	13.544	0.016	0.016
11:21:35	26.5	13.544	0.016	0.016
11:21:35	27	13.544	0.016	0.016
11:21:36	27.5	13.544	0.016	0.016
11:21:36	28	13.545	0.015	0.015
11:21:37	28.5	13.545	0.015	0.015
11:21:37	29	13.546	0.014	0.014
11:21:38	29.5	13.546	0.014	0.014
11:21:38	30	13.546	0.014	0.014
11:21:39	30.5	13.547	0.013	0.013
11:21:39	31	13.547	0.013	0.013
11:21:40	31.5	13.548	0.012	0.012
11:21:40	32	13.548	0.012	0.012
11:21:41	32.5	13.548	0.012	0.012
11:21:41	33	13.548	0.012	0.012
11:21:42	33.5	13.548	0.012	0.012
11:21:42	34	13.548	0.012	0.012
11:21:43	34.5	13.549	0.011	0.011
11:21:43	35	13.549	0.011	0.011
11:21:44	35.5	13.549	0.011	0.011
11:21:44	36	13.549	0.011	0.011
11:21:45	36.5	13.549	0.011	0.011
11:21:45	37	13.549	0.011	0.011
11:21:46	37.5	13.549	0.011	0.011
11:21:46	38	13.550	0.010	0.010
11:21:47	38.5	13.550	0.010	0.010
11:21:47	39	13.551	0.009	0.009
11:21:48	39.5	13.551	0.009	0.009
11:21:48	40	13.551	0.009	0.009
11:21:49	40.5	13.551	0.009	0.009
11:21:49	41	13.550	0.010	0.010
11:21:50	41.5	13.551	0.009	0.009
11:21:50	42	13.551	0.009	0.009
11:21:51	42.5	13.552	0.008	0.008
11:21:51	43	13.552	0.008	0.008
11:21:52	43.5	13.552	0.008	0.008
11:21:52	44	13.552	0.008	0.008
11:21:53	44.5	13.552	0.008	0.008
11:21:53	45	13.552	0.008	0.008
11:21:54	45.5	13.552	0.008	0.008
11:21:54	46	13.552	0.008	0.008
11:21:55	46.5	13.552	0.008	0.008
11:21:55	47	13.552	0.008	0.008
11:21:56	47.5	13.552	0.008	0.008
11:21:56	48	13.552	0.008	0.008
11:21:57	48.5	13.552	0.008	0.008

11:21:57	49	13.552	0.008	0.008
11:21:58	49.5	13.552	0.008	0.008
11:21:58	50	13.553	0.007	0.007
11:21:59	50.5	13.553	0.007	0.007
11:21:59	51	13.553	0.007	0.007
11:22:00	51.5	13.554	0.006	0.006
11:22:00	52	13.554	0.006	0.006
11:22:01	52.5	13.554	0.006	0.006
11:22:01	53	13.554	0.006	0.006
11:22:02	53.5	13.554	0.006	0.006
11:22:02	54	13.554	0.006	0.006
11:22:03	54.5	13.554	0.006	0.006
11:22:03	55	13.554	0.006	0.006
11:22:04	55.5	13.554	0.006	0.006
11:22:04	56	13.554	0.006	0.006
11:22:05	56.5	13.554	0.006	0.006
11:22:05	57	13.554	0.006	0.006
11:22:06	57.5	13.554	0.006	0.006
11:22:06	58	13.554	0.006	0.006
11:22:07	58.5	13.554	0.006	0.006
11:22:07	59	13.554	0.006	0.006
11:22:08	59.5	13.554	0.006	0.006
11:22:08	60	13.554	0.006	0.006
11:22:09	60.5	13.555	0.005	0.005
11:22:09	61	13.555	0.005	0.005
11:22:10	61.5	13.555	0.005	0.005
11:22:10	62	13.554	0.006	0.006
11:22:11	62.5	13.554	0.006	0.006
11:22:11	63	13.554	0.006	0.006
11:22:12	63.5	13.555	0.005	0.005
11:22:12	64	13.555	0.005	0.005