APPENDIX D

LABORATORY DATA

- Consolidation Test
- Consolidation Time Test
- Moisture-Density Test
- Particle Size Distribution Test
- Liquid and Plastic Limits Test
- Specific Gravity Test
- Organic Content Test
- Unconsolidated-Undrained Triaxial Shear Strength Test
- Consolidated-Undrained Triaxial Shear Strength Test
- Radiocarbon Dating Analyses

LABORATORY DATA

- **Consolidation Test**

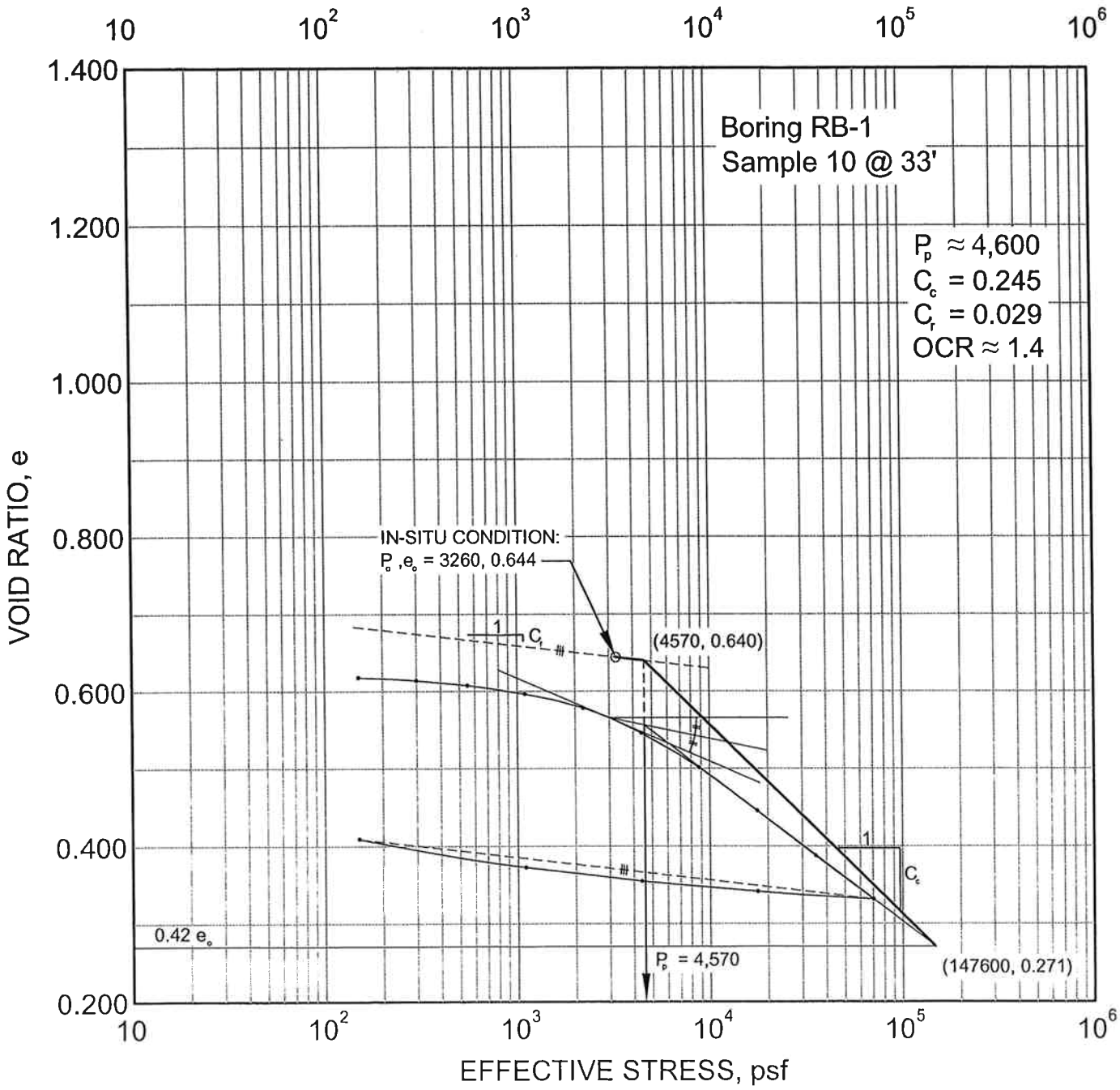
2004-049 Newby Island Landfill
12/22/2005 RMW

Soil Consolidation Summary

Boring	Sample	Sample Depth (ft)	Station Location	Boring Elevation (ft)	Sample Elevation (ft)	Material	Preconsol-idation Pressure P_p (psf)	Virgin Compr. Index C_c	Recompr. Index C_r	Mod. Cam-Clay $\Lambda = 1-C_r/C_c$	In-Situ Condition: Eff. Stress P_o (psf)	In-Situ Condition: Void Ratio e_o	In-Situ Condition: Overcon-solidation Ratio OCR	Stress Condition
LPZ-2	1	120	129+30	106	-14	OBA	9,100	0.217	0.074	0.66	7,800	0.659	1.2	full
LPZ-1	1	94.5	106+50	80	-14.5	OBA	11,700	0.230	0.070	0.70	5,700	0.627	2.1	full
RB-1	10	33	50+00	15.5	-17.5	OBA	4,600	0.244	0.029	0.88	3,080	0.644	1.5	dike
RB-10	3	33	30+00	13.5	-19.5	OBA	9,500	0.308	0.072	0.77	2,440	0.761	3.9	dike
RB-6	4	41	120+00	21	-20.0	OBA	4,400	0.249	0.044	0.82	3,680	0.738	1.2	full
RB-13V	2	31	40+00	11	-20	OBA	13,300	0.166	0.035	0.79	2,560	0.538	5.2	dike
RB-12Va	4	38.5	125+00	18	-20.5	OBA	5,400	0.216	0.034	0.84	2,800	0.689	1.9	full
RB-2	8	35	30+00	13.5	-21.5	OBA	6,500	0.238	0.054	0.77	2,500	0.717	2.6	dike
RB-4	5	48	140+00	19	-29.0	OBA	7,250	0.230	0.052	0.77	3,940	0.690	1.8	full
RB-11V	1	45	60+00	15	-30	OBA	6,500	0.226	0.065	0.71	3,900	0.683	1.7	dike
RB-10	4	44	30+00	13.5	-30.5	OBA	7,700	0.382	0.071	0.81	2,860	0.828	2.7	dike
RB-2	9	45	30+00	13.5	-31.5	OBA	3,900	0.225	0.050	0.78	2,960	0.673	1.3	dike
RB-12Va	5	50	125+00	18	-32	OBA	4,300	0.270	0.066	0.76	3,540	0.767	1.2	full
RB-10	5	53	30+00	13.5	-39.5	OBA	15,600	0.431	0.056	0.87	3,220	0.779	4.8	dike
RB-10Va	1	61	30+00	13.5	-47.5	OBA	7,600	0.268	0.024	0.91	3,600	0.662	2.1	dike
RB-6	9	69	120+00	21	-48.0	OBA	14,000	0.279	0.046	0.84	5,480	0.691	2.6	full
RB-12V	1	70	125+00	18	-52	OBA	10,900	0.223	0.029	0.87	5,260	0.682	2.1	full
RB-11V	2	71.5	60+00	15	-56.5	OBA	8,600	0.395	0.085	0.78	5,100	0.942	1.7	dike
RB-7	9	59	33+71	0.5	-58.5	OBA	15,700	0.298	0.036	0.88	4,660	0.778	3.4	terrace
RB-2	13	75	30+00	13.5	-61.5	OBA	8,600	0.318	0.059	0.81	4,520	0.752	1.9	dike
RB-11V	3	85	60+00	15	-70	OBA	8,700	0.363	0.072	0.80	5,840	0.889	1.5	dike
RB-12V	2	88	125+00	18	-70	OBA	23,300	0.313	0.030	0.90	5,920	0.66	3.9	full
RB-10Va	2	95	30+00	13.5	-81.5	OBA	11,600	0.282	0.060	0.79	5,340	0.714	2.2	dike
							Average	**0.277**	**0.053**	**0.805**			**2.4**	
							Std. Dev.	**0.066**	**0.018**	**0.065**			**1.1**	
RB-8	4	20	60+00	15	-5	YBM	2,400	0.437	0.063	0.856	2,160	1.174	1.1	dike
RB-2A	1	23	30+00	13.5	-9.5	YBM	1,700	0.407	0.057	0.860	1,640	1.162	1.0	dike
RB-12Va	1	29	125+00	18	-11	YBM	2,260	0.983	0.155	0.84	2,260	1.837	1.0	full
RB-12Va	2	31.5	125+00	18	-13.5	YBM	2,380	0.841	0.141	0.83	2,380	1.691	1.0	full
RB-13V	1	22.5	40+00	11	-11.5	YBM	3,400	0.440	0.094	0.79	2,200	1.100	1.5	dike
							Average	**0.622**	**0.102**	**0.835**			**1.1**	
							Std. Dev.	**0.270**	**0.045**	**0.030**			**0.2**	
RB-5	1	24	90+00	18.5	-5.5	YBM/OBA/Fill?	7,100	0.255	0.079	0.690	3,000	0.776	2.4	full

2004-049 NEWBY ISLAND LANDFILL
2/15/05 RMW

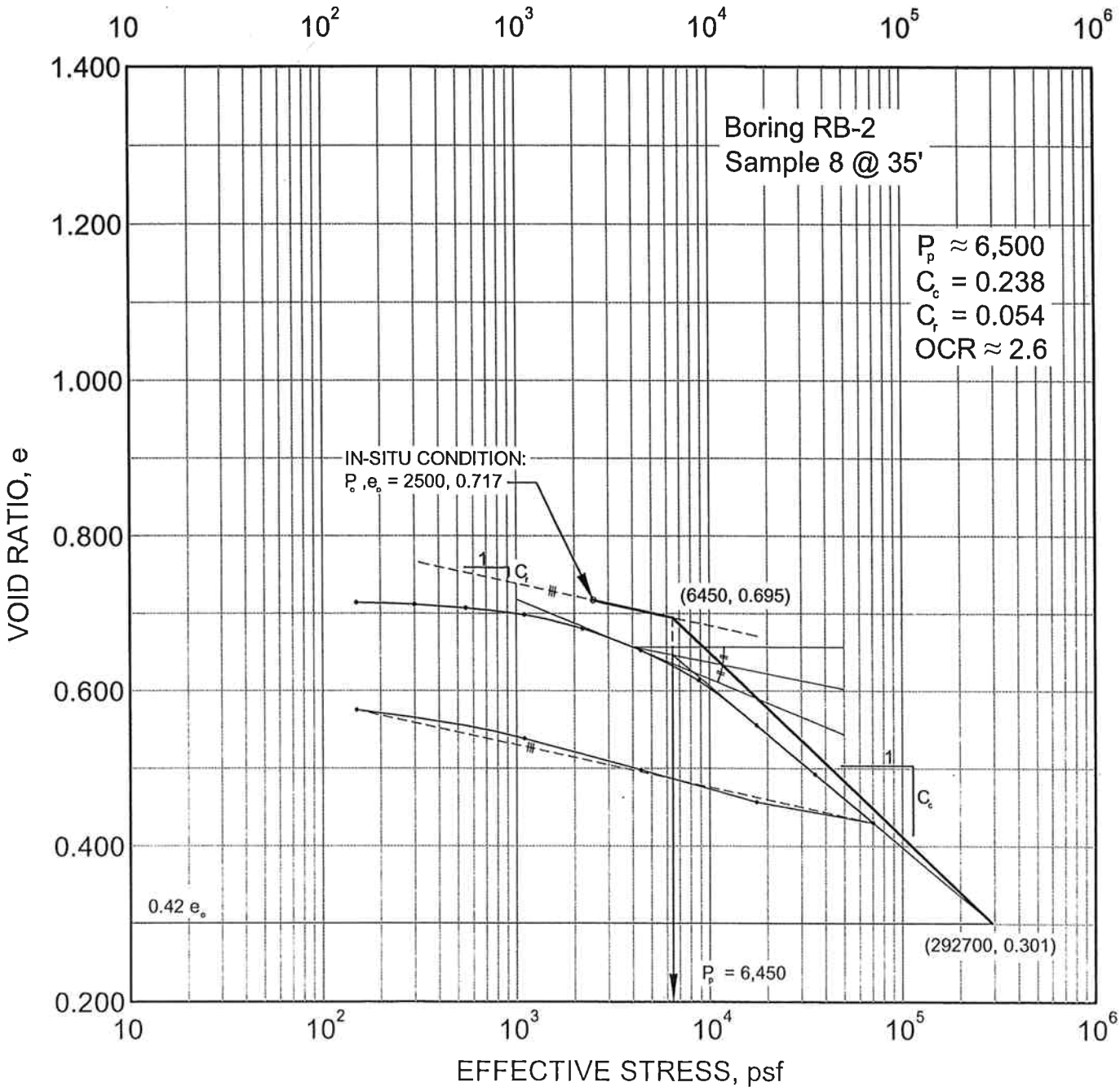
CONSOLIDATION TEST: CASAGRANDE/SCHMERTMANN CONSTRUCTION



Note: P_o based on dike stress condition (i.e. not level ground)
Groundwater at Elev. -8

2004-049 NEWBY ISLAND LANDFILL
1/18/05 RMW

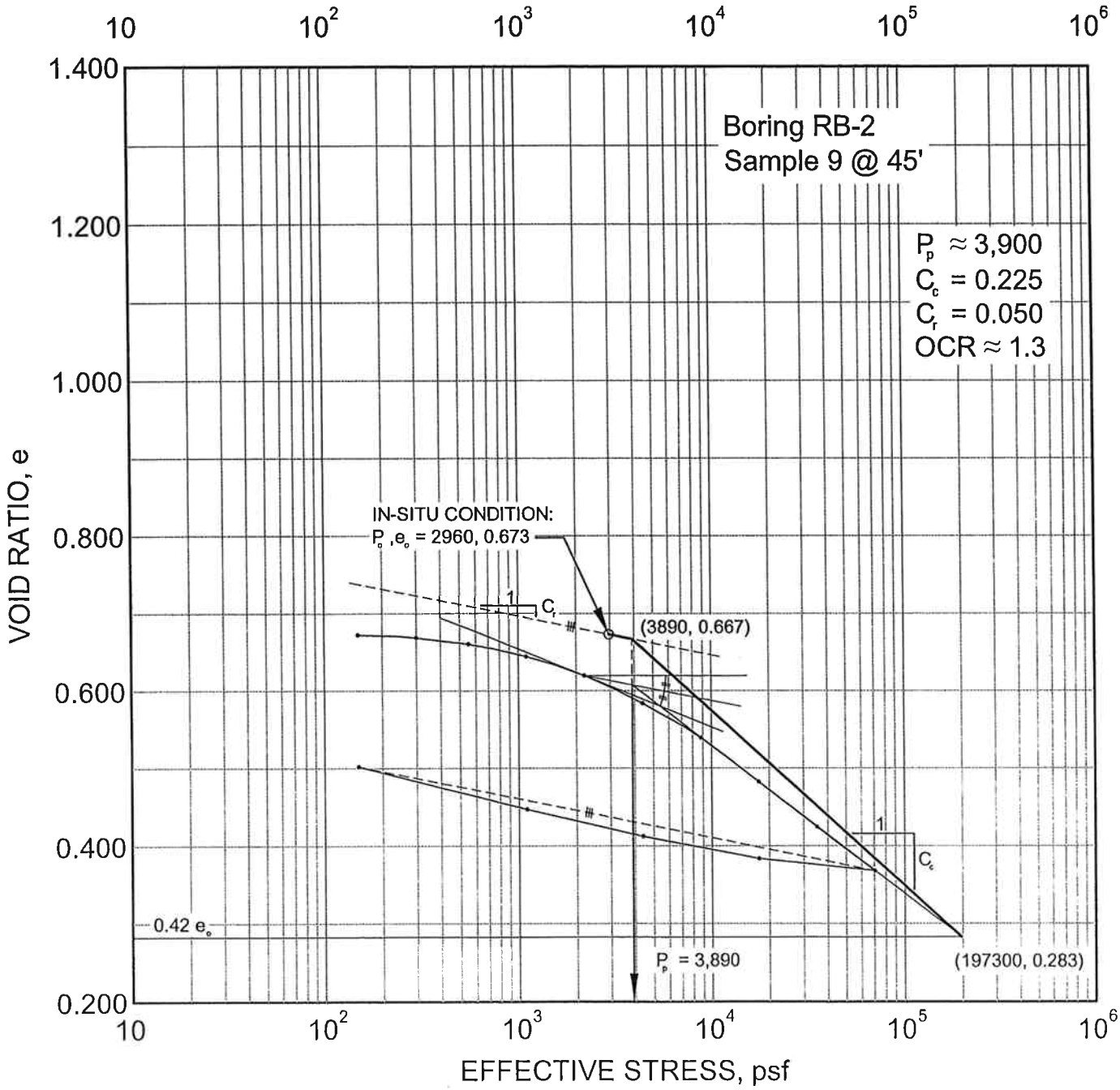
CONSOLIDATION TEST: CASAGRANDE/SCHMERTMANN CONSTRUCTION



Note: P_o based on dike stress condition (i.e. not level ground)
Groundwater at Elev. 2

2004-049 NEWBY ISLAND LANDFILL
2/15/05 RMW

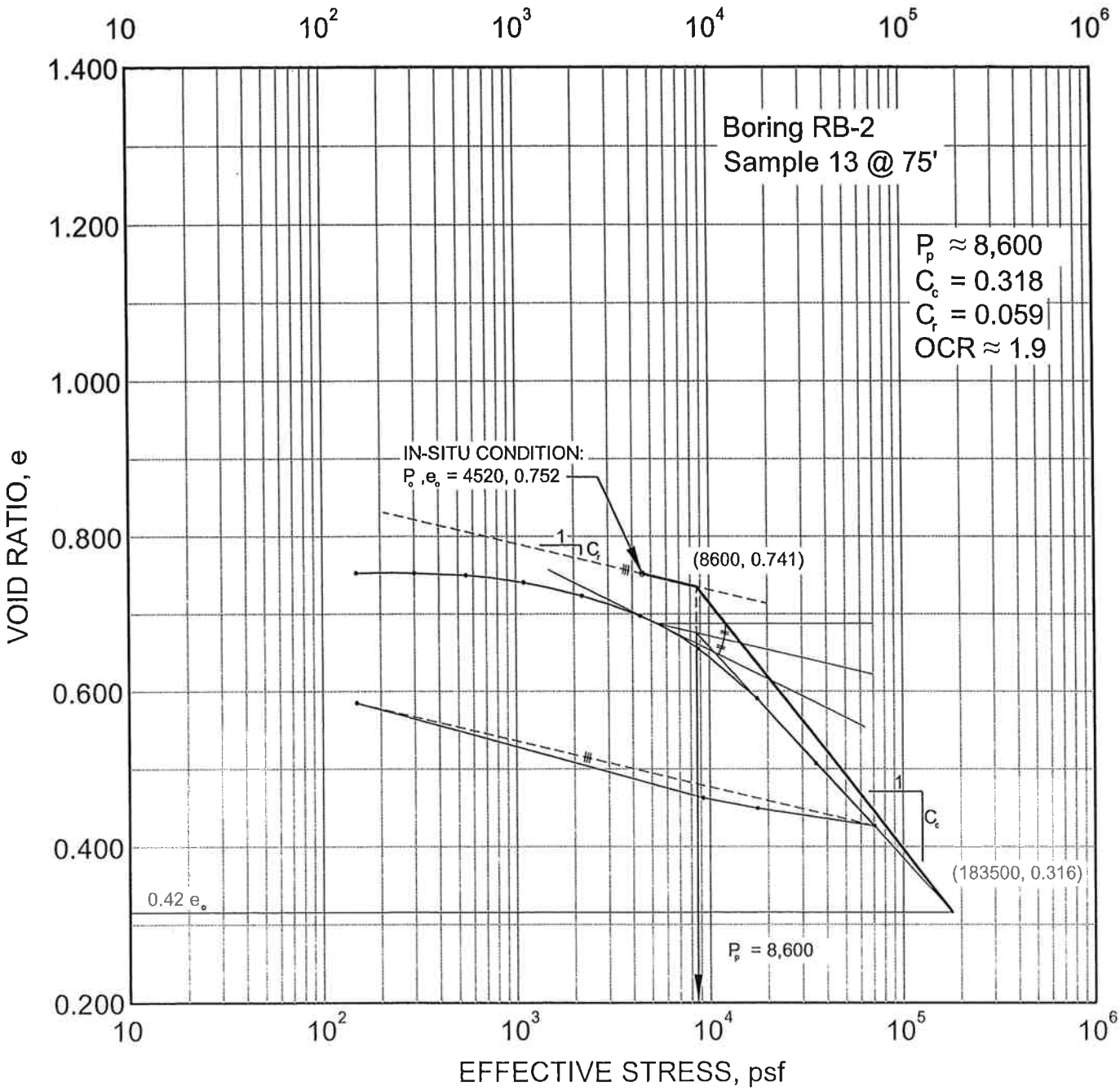
CONSOLIDATION TEST: CASAGRANDE/SCHMERTMANN CONSTRUCTION



Note: P_o based on dike stress condition (i.e. not level ground)
Groundwater at Elev. 2

2004-049 NEWBY ISLAND LANDFILL
2/15/05 RMW

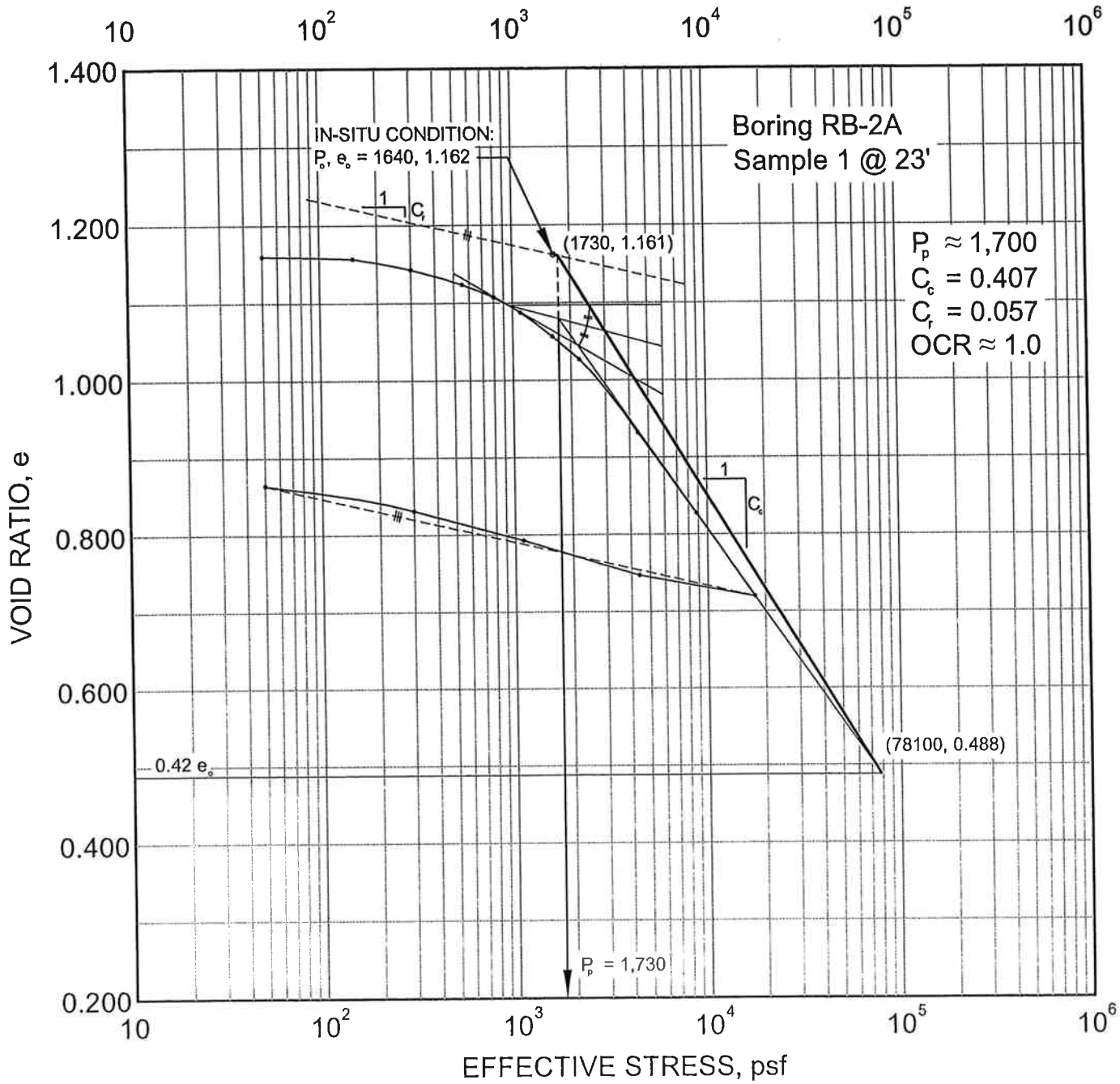
CONSOLIDATION TEST: CASAGRANDE/SCHMERTMANN CONSTRUCTION



Note: P_o based on dike stress condition (i.e. not level ground)
Groundwater at Elev. 2

2004-049 NEWBY ISLAND LANDFILL
1/18/05 RMW

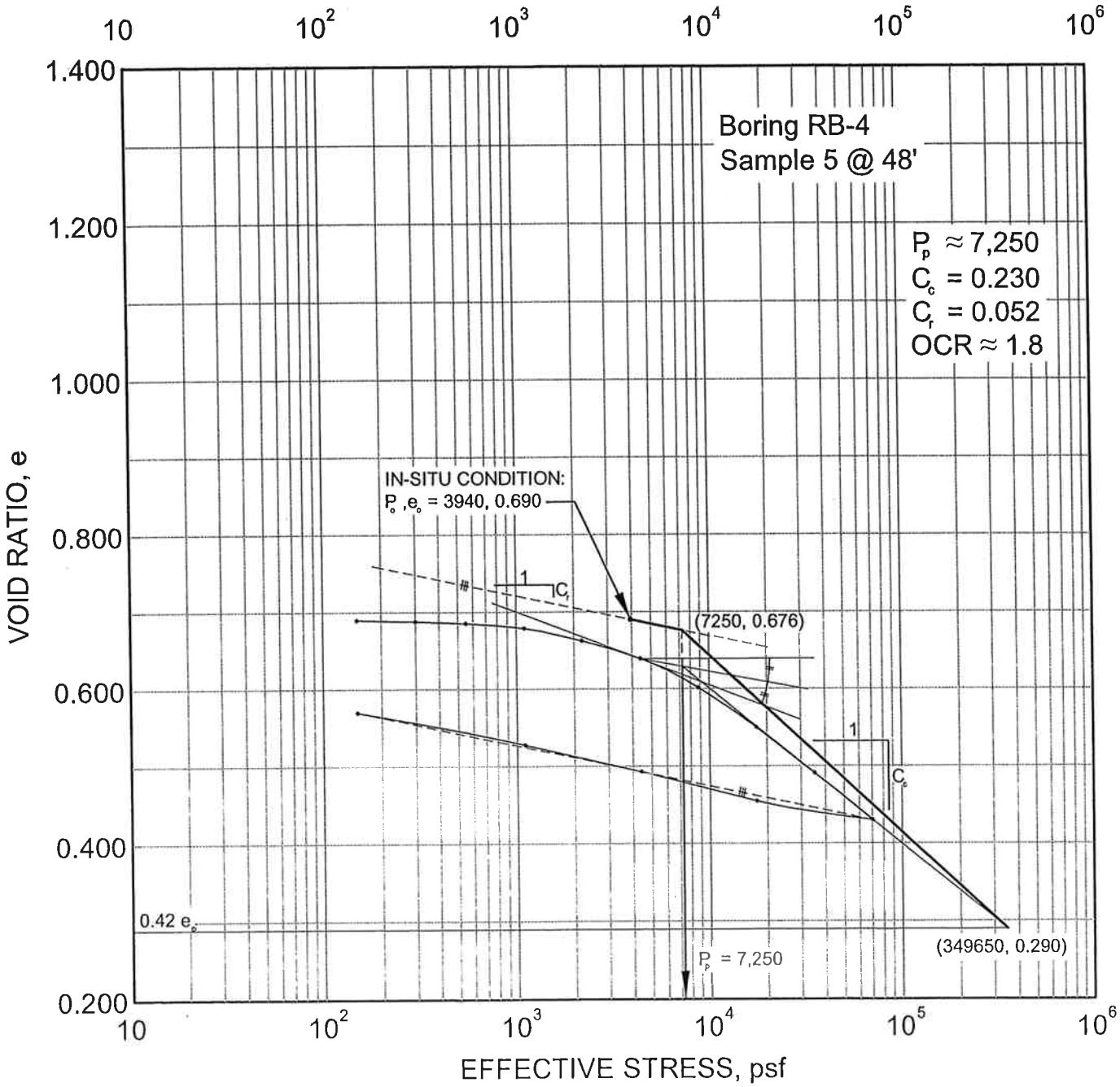
CONSOLIDATION TEST: CASAGRANDE/SCHMERTMANN CONSTRUCTION



Note: P_o based on dike stress condition (i.e. not level ground)
Groundwater at Elev. 2

2004-049 NEWBY ISLAND LANDFILL
1/18/05 RMW

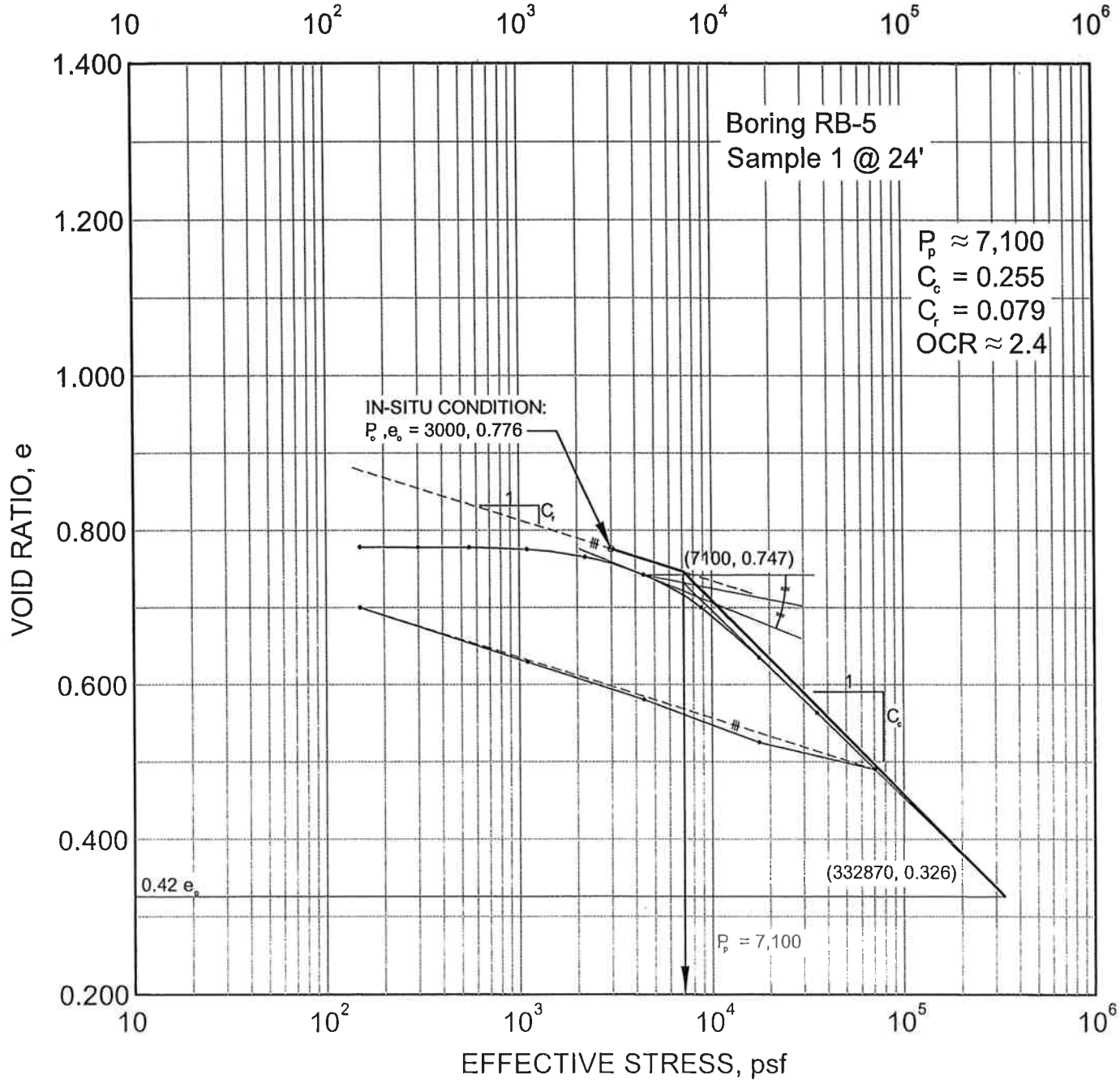
CONSOLIDATION TEST: CASAGRANDE/SCHMERTMANN CONSTRUCTION



Note: P_o based on level ground stress condition (approx. avg. of dike and landfill slope)
Groundwater at Elev. 4

2004-049 NEWBY ISLAND LANDFILL
1/18/05 RMW

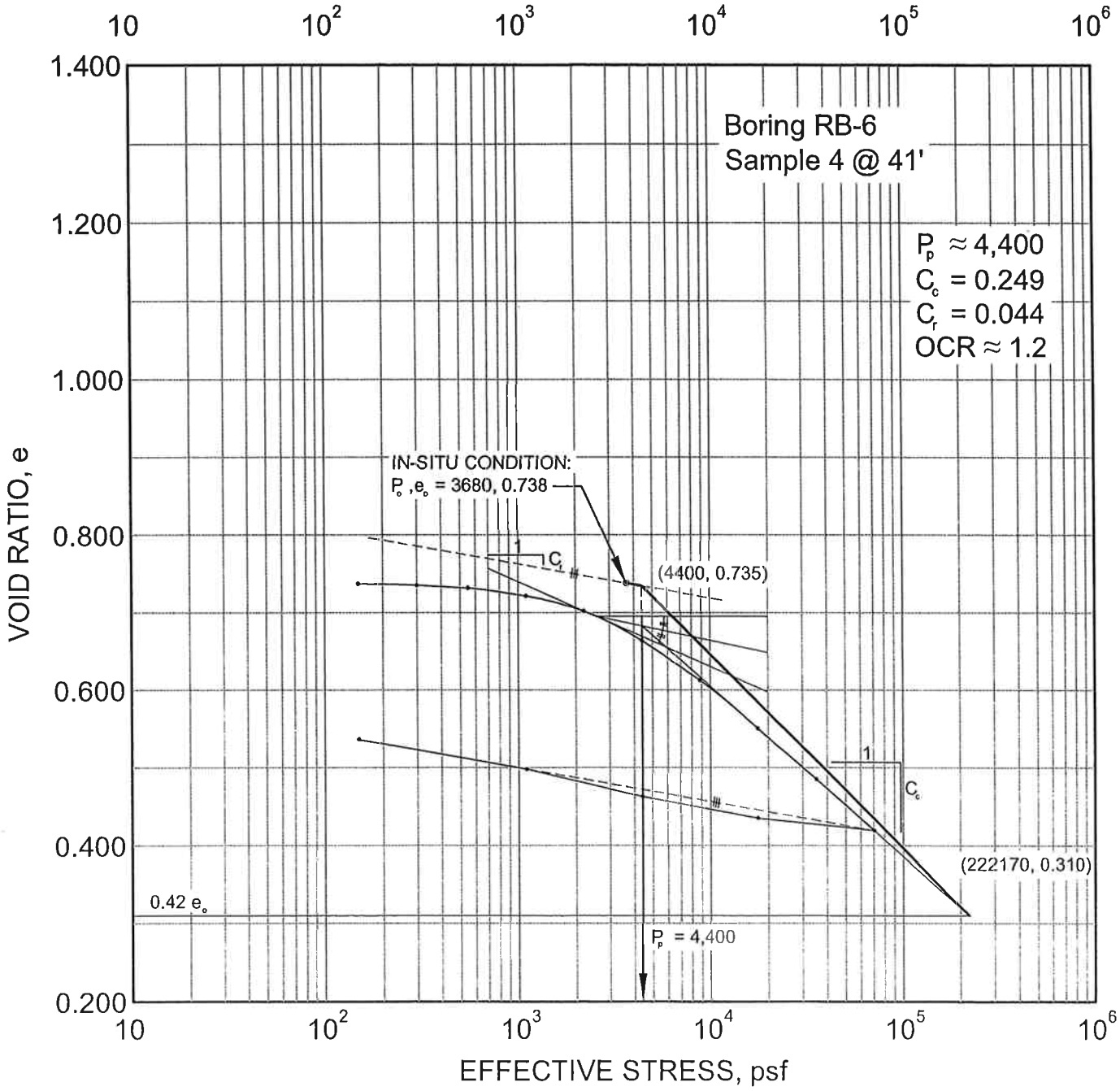
CONSOLIDATION TEST: CASAGRANDE/SCHMERTMANN CONSTRUCTION



Note: P_o based on level ground stress condition (approx. avg. of dike and landfill slope)
Groundwater at Elev. -10

2004-049 NEWBY ISLAND LANDFILL
1/18/05 RMW

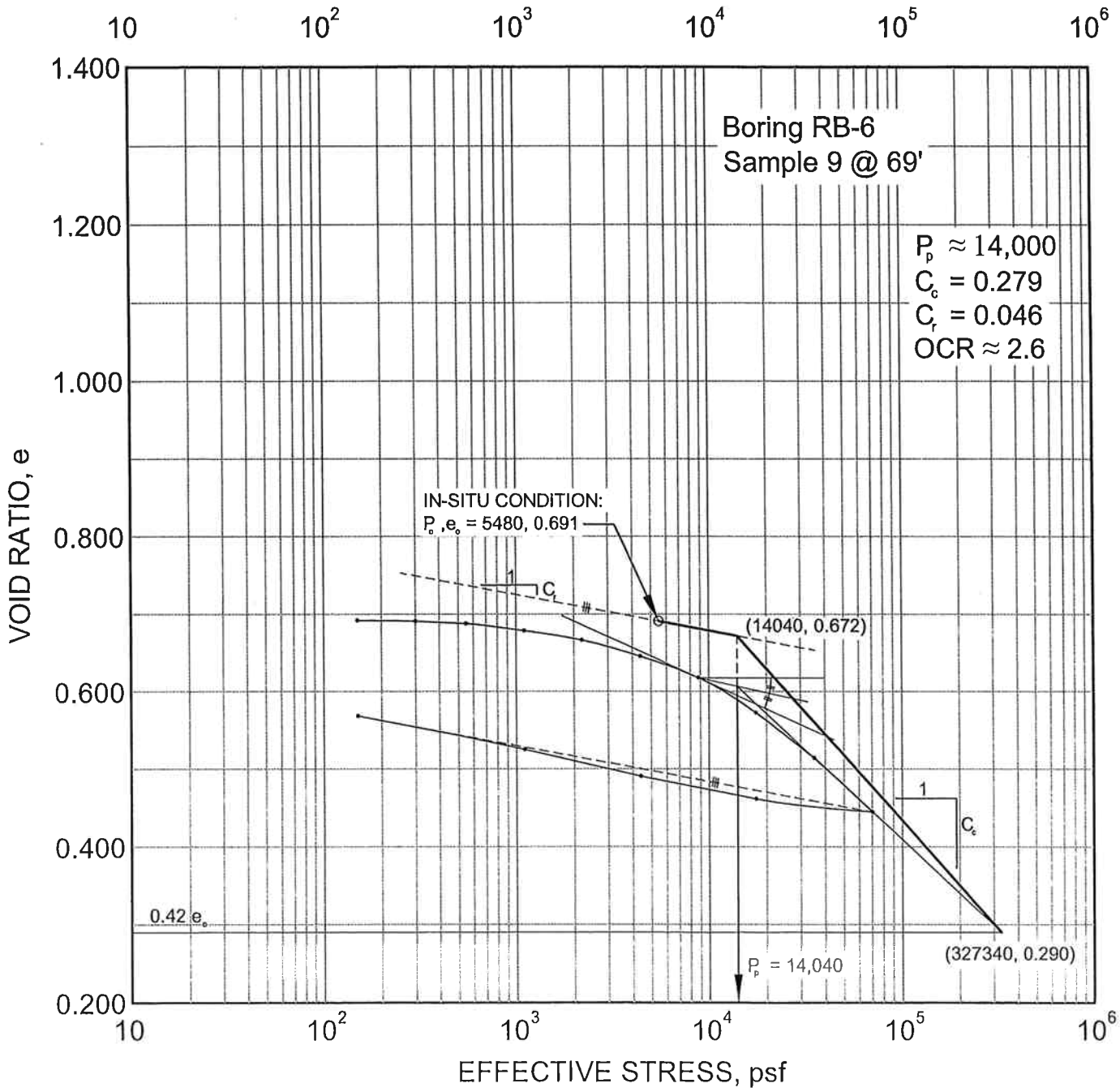
CONSOLIDATION TEST: CASAGRANDE/SCHMERTMANN CONSTRUCTION



Note: P_o based on level ground stress condition (approx. avg. of dike and landfill slope)
Groundwater at Elev. 2

2004-049 NEWBY ISLAND LANDFILL
1/18/05 RMW

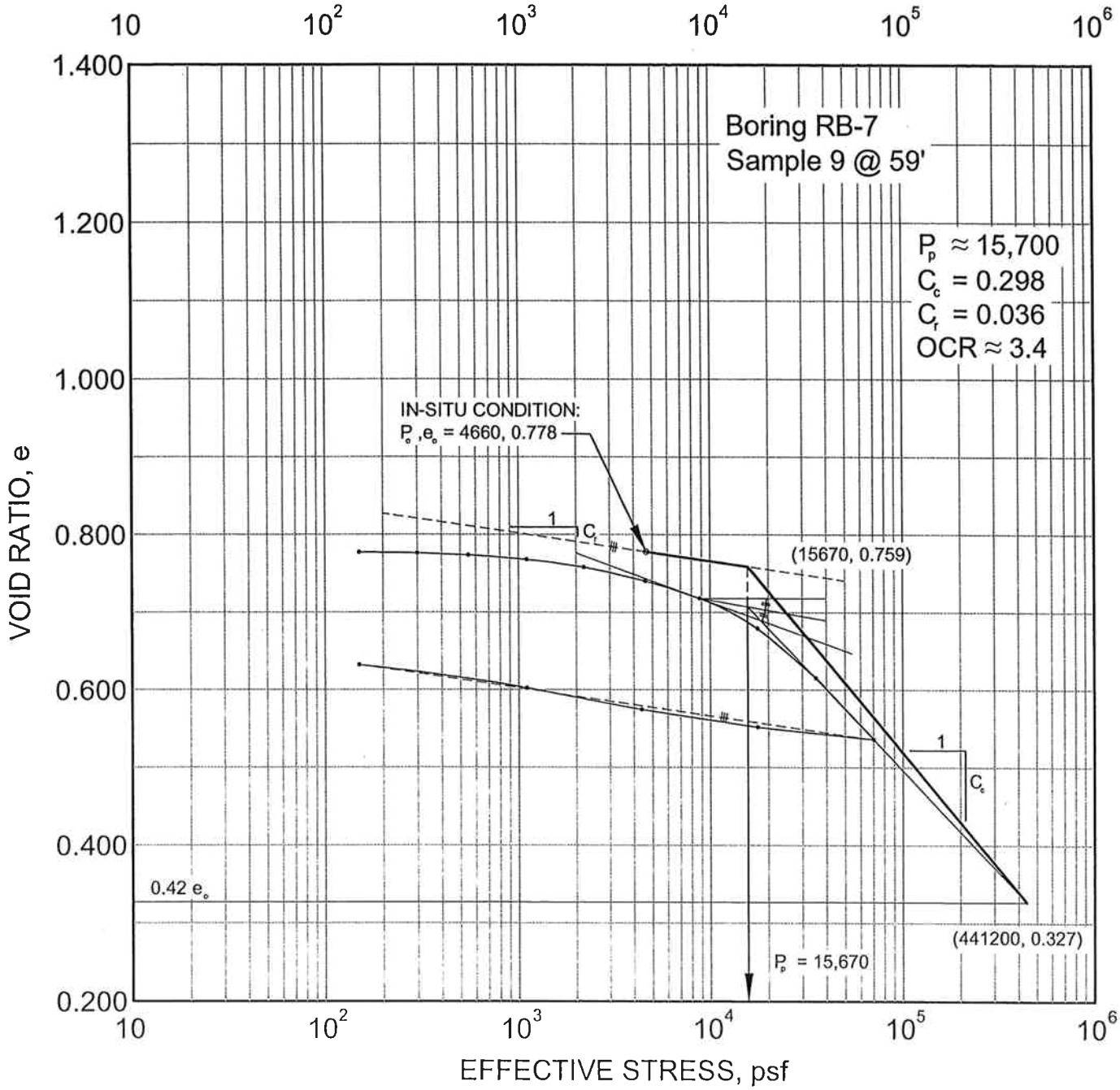
CONSOLIDATION TEST: CASAGRANDE/SCHMERTMANN CONSTRUCTION



Note: P_o based on level ground stress condition (approx. avg. of dike and landfill slope)
Groundwater at Elev. 2

2004-049 NEWBY ISLAND LANDFILL
2/15/05 RMW

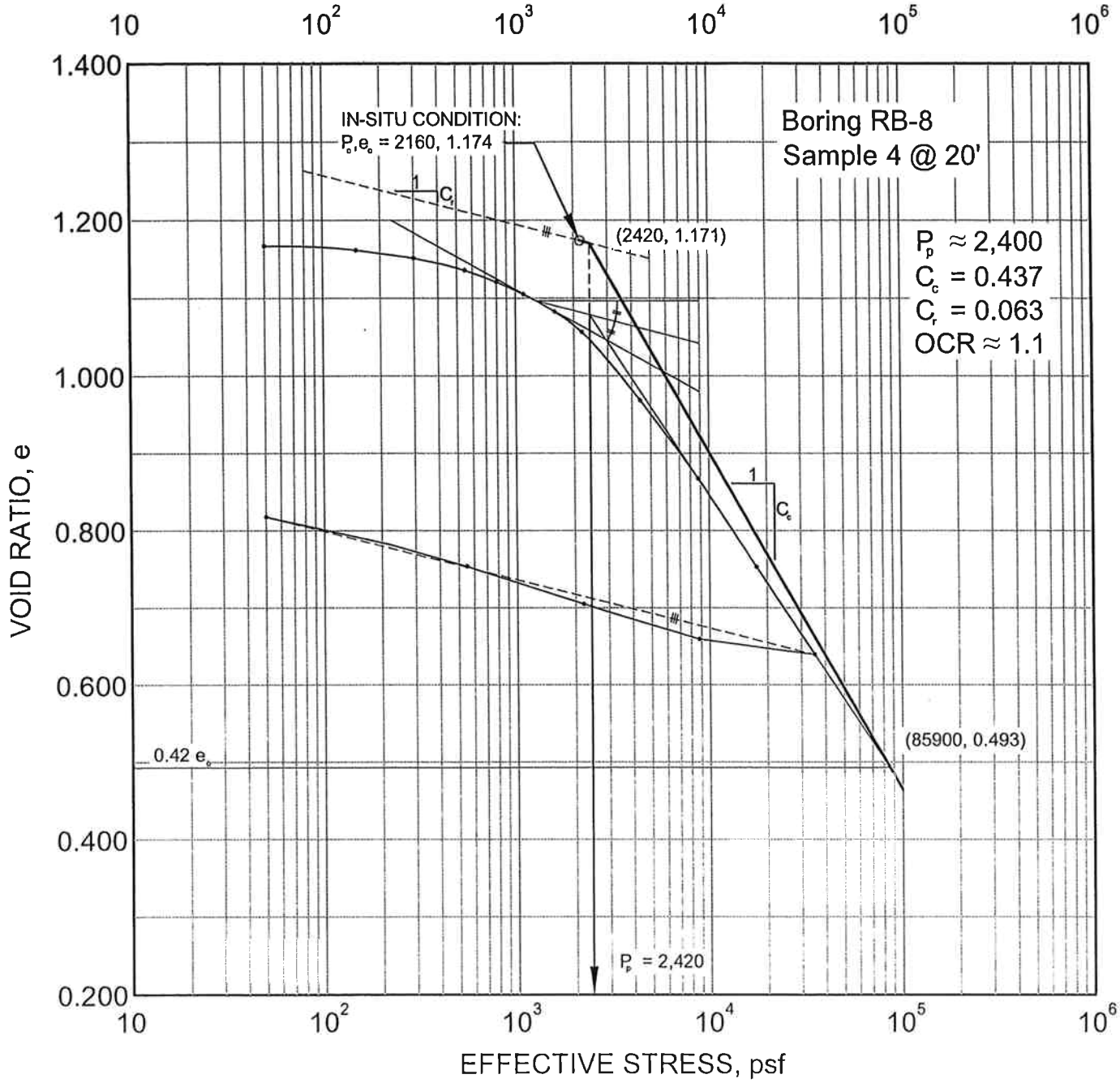
CONSOLIDATION TEST: CASAGRANDE/SCHMERTMANN CONSTRUCTION



Note: P_o based on terrace stress condition (i.e. not level ground)
Groundwater at Elev. -20

2004-049 NEWBY ISLAND LANDFILL
1/18/05 RMW

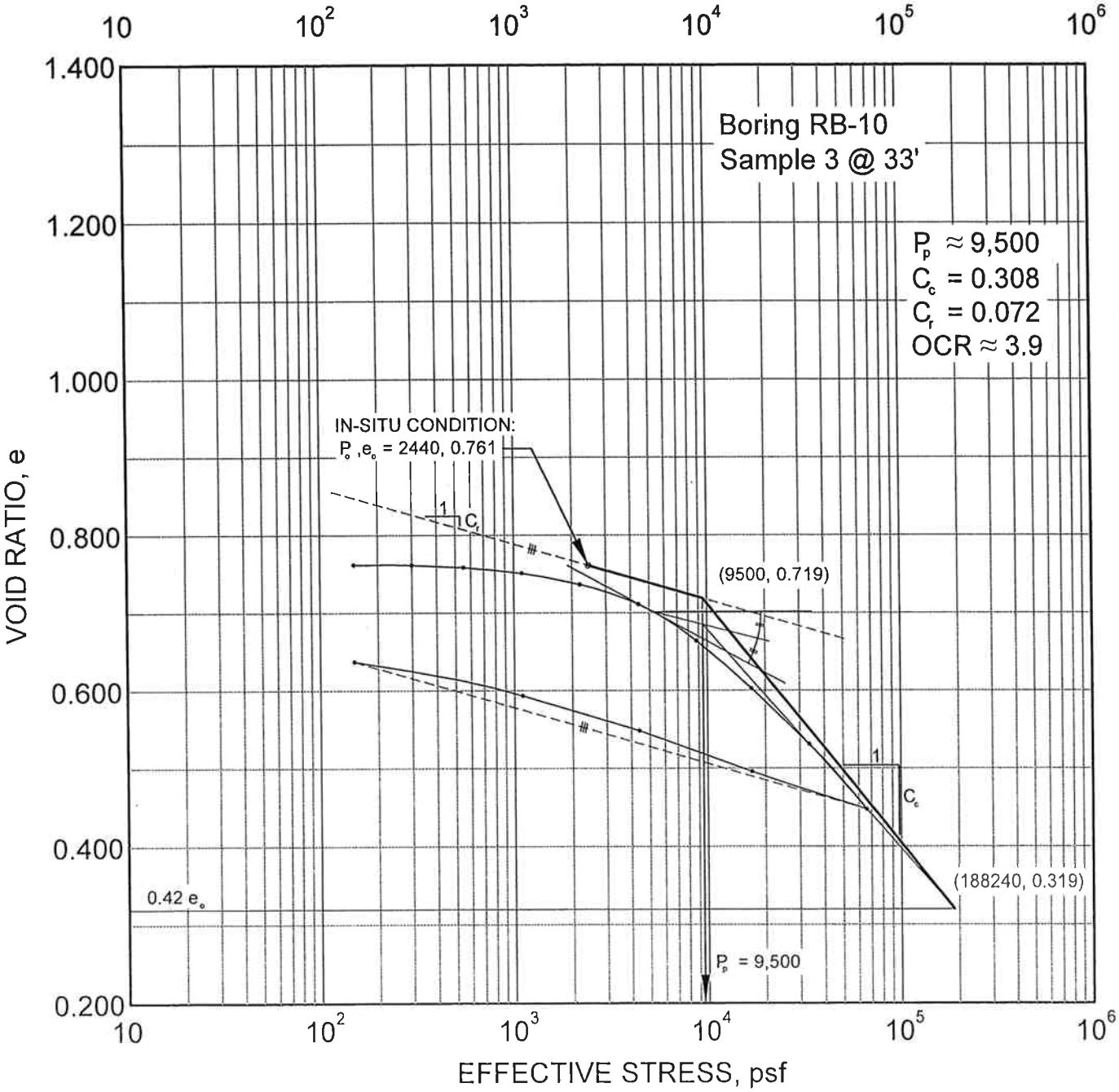
CONSOLIDATION TEST: CASAGRANDE/SCHMERTMANN CONSTRUCTION



Note: P_o based on dike stress condition (i.e. not level ground)
Groundwater at Elev. -12

2004-049 NEWBY ISLAND LANDFILL
9/23/05 RMW

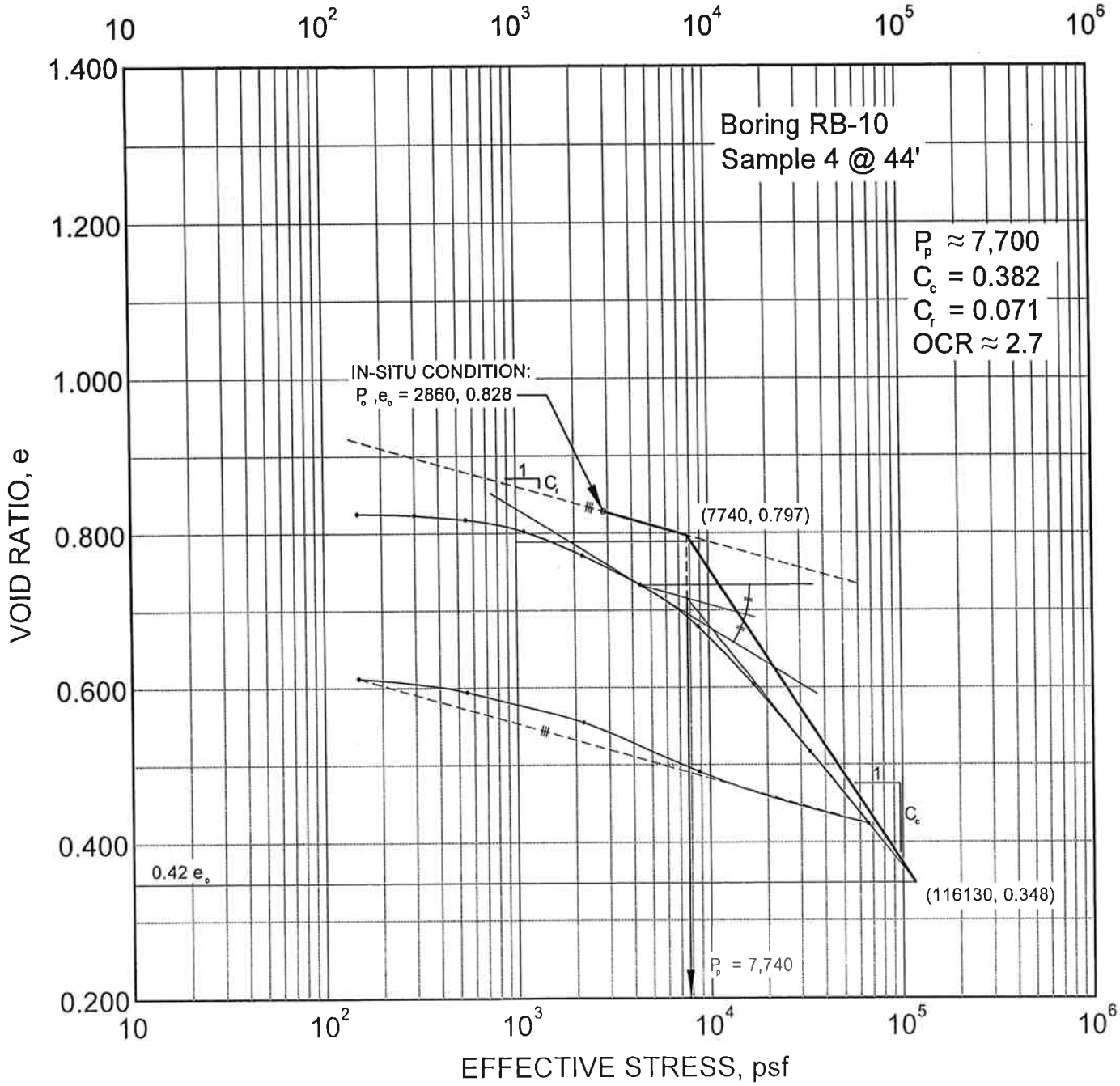
CONSOLIDATION TEST: CASAGRANDE/SCHMERTMANN CONSTRUCTION



Note: P_o based on DIKE stress condition (i.e. not level ground)
Groundwater at Elev. 2

2004-049 NEWBY ISLAND LANDFILL
9/23/05 RMW

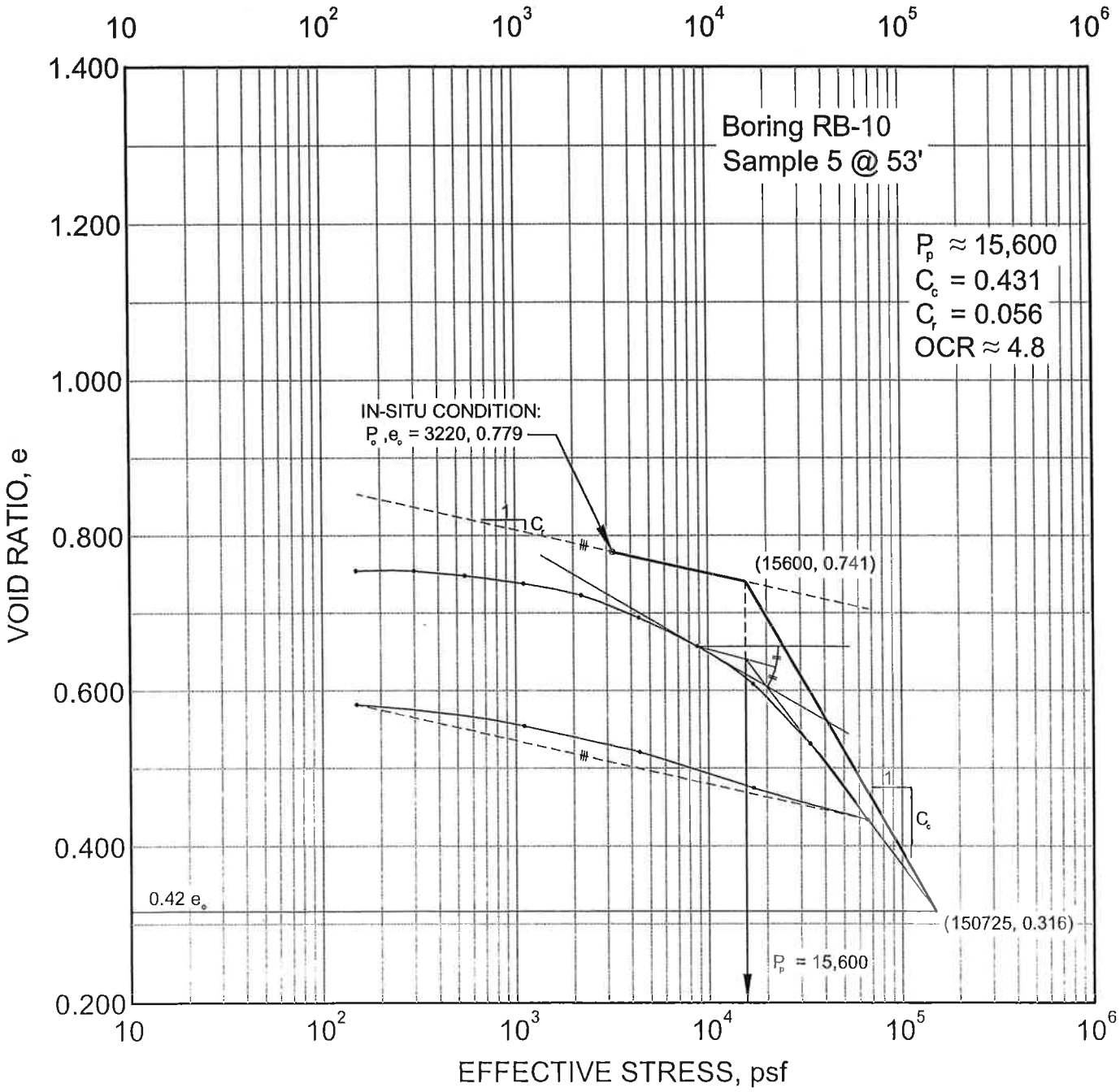
CONSOLIDATION TEST: CASAGRANDE/SCHMERTMANN CONSTRUCTION



Note: P_o based on DIKE stress condition (i.e. not level ground)
Groundwater at Elev. 2

2004-049 NEWBY ISLAND LANDFILL
9/23/05 RMW

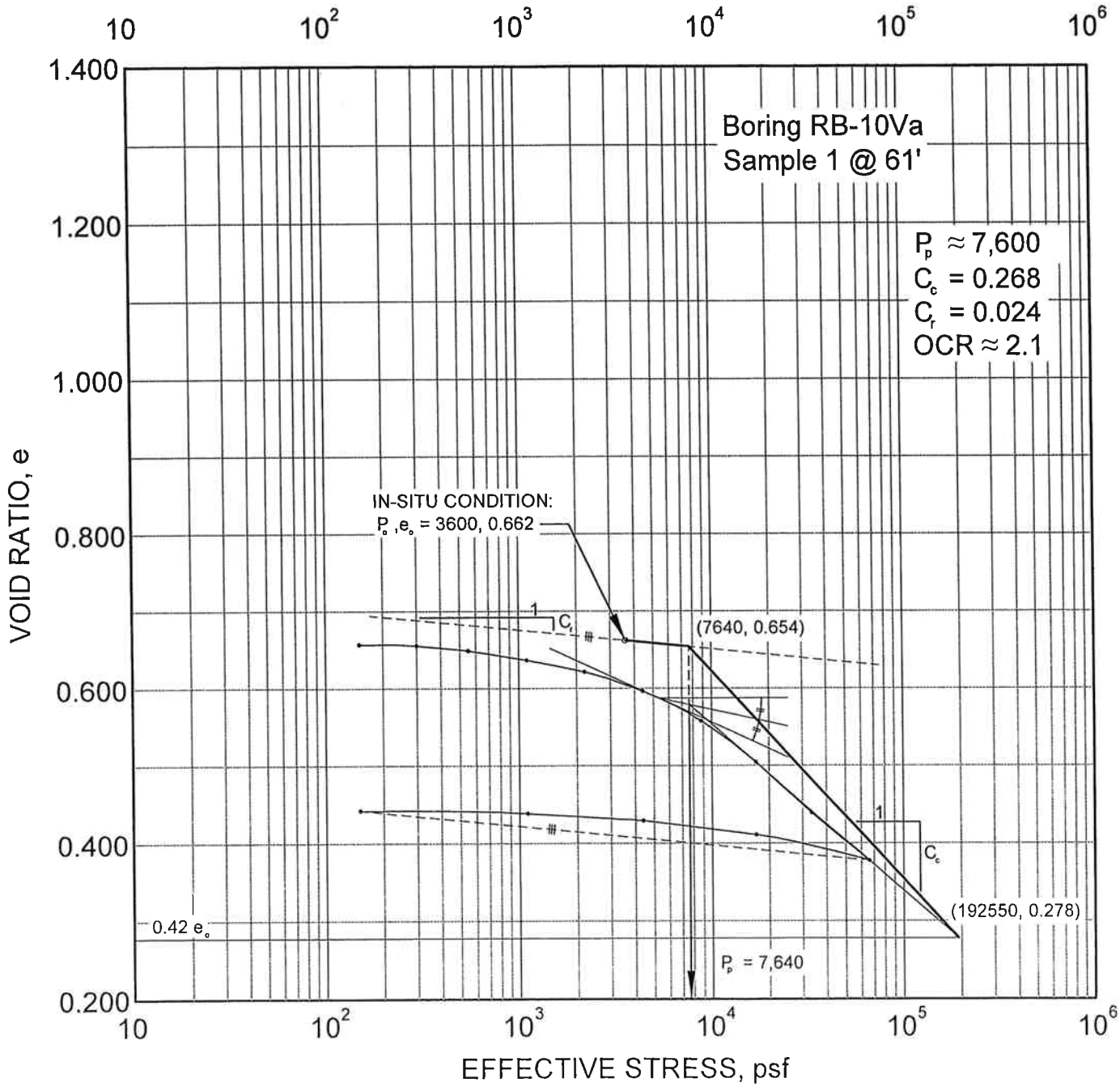
CONSOLIDATION TEST: CASAGRANDE/SCHMERTMANN CONSTRUCTION



Note: P_o based on DIKE stress condition (i.e. not level ground)
Groundwater at Elev. 2

2004-049 NEWBY ISLAND LANDFILL
9/23/05 RMW

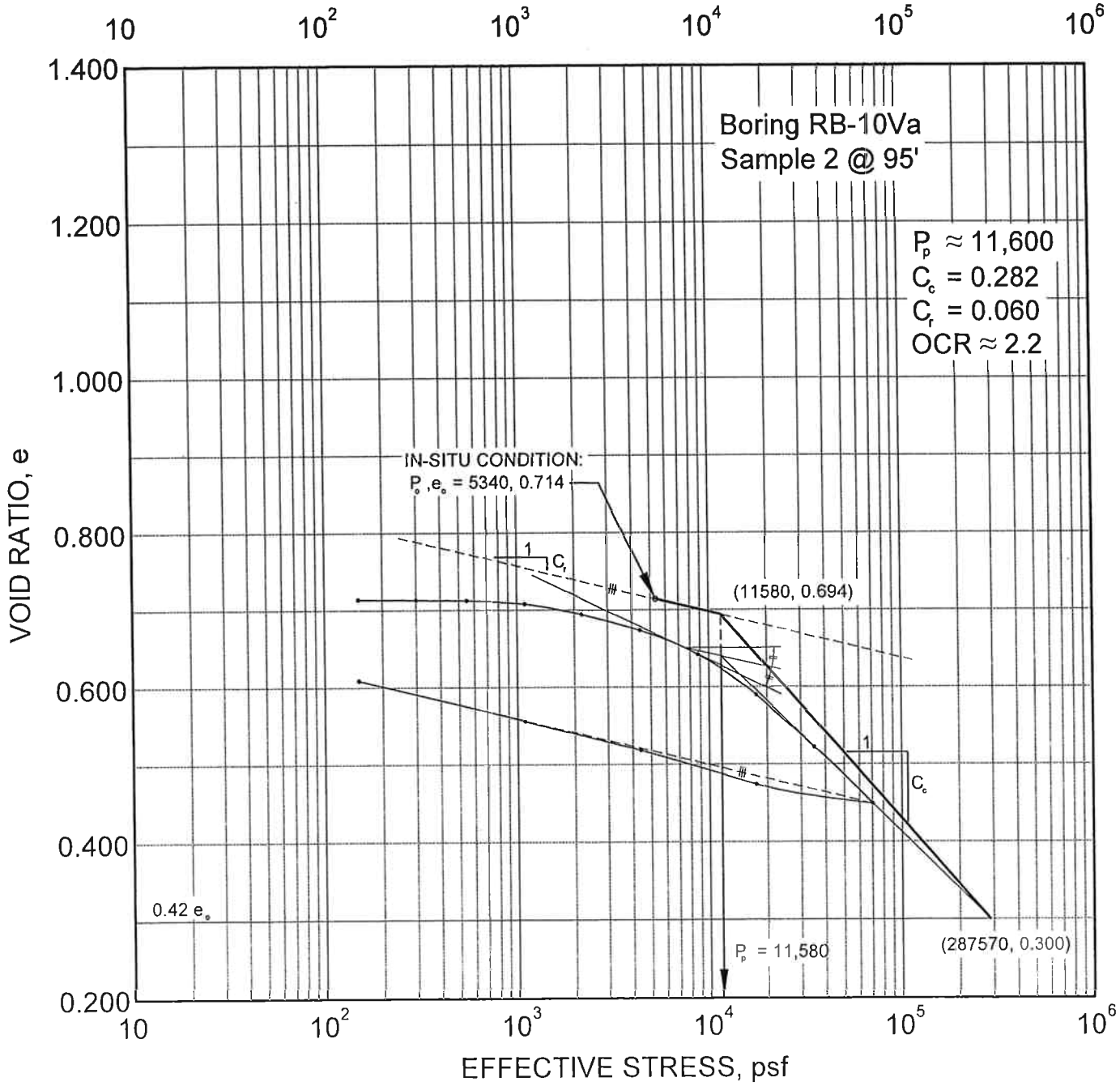
CONSOLIDATION TEST: CASAGRANDE/SCHMERTMANN CONSTRUCTION



Note: P_o based on DIKE stress condition (i.e. not level ground)
Groundwater at Elev. 2

2004-049 NEWBY ISLAND LANDFILL
9/23/05 RMW

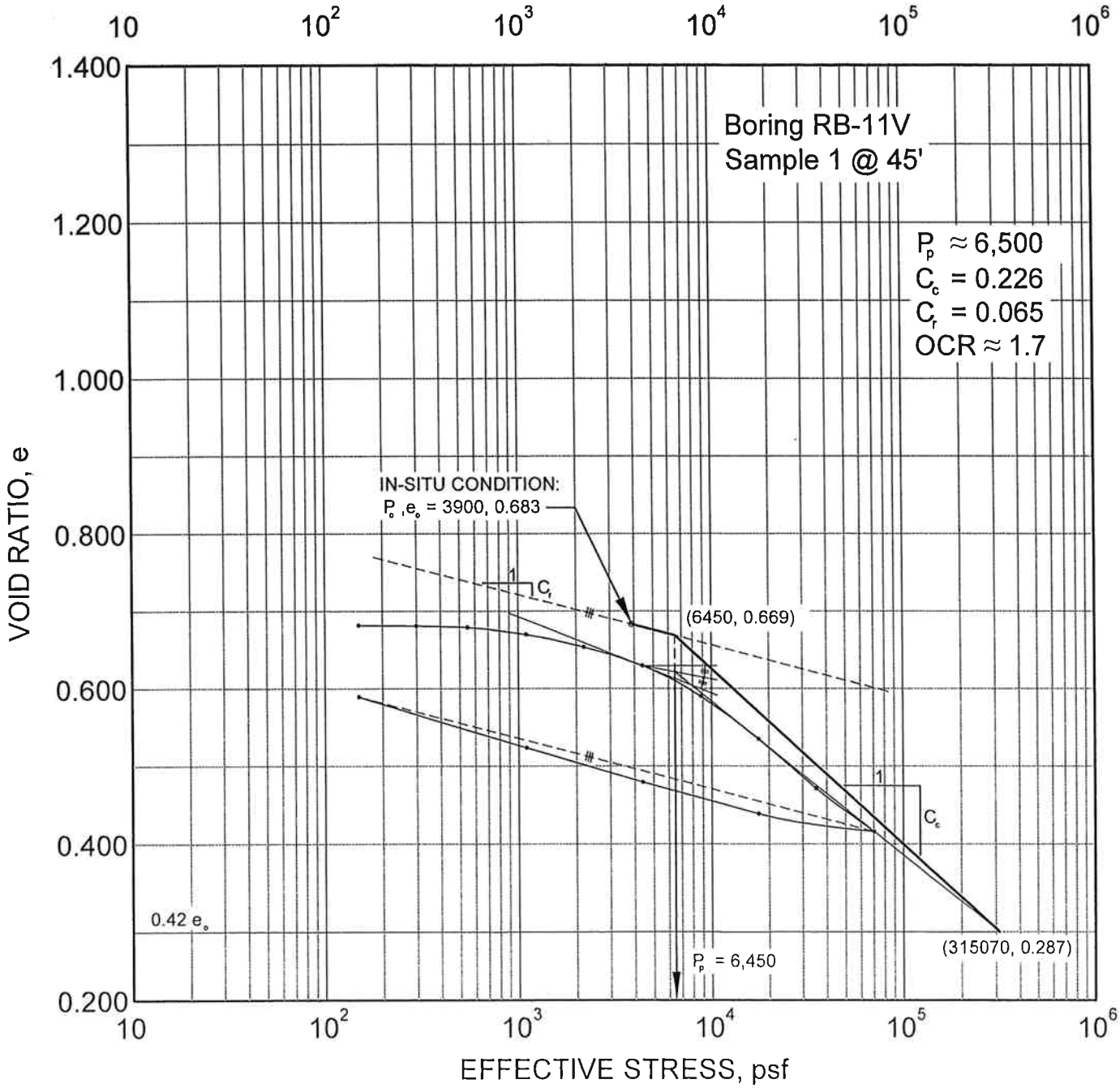
CONSOLIDATION TEST: CASAGRANDE/SCHMERTMANN CONSTRUCTION



Note: P_o based on DIKE stress condition (i.e. not level ground)
Groundwater at Elev. 2

2004-049 NEWBY ISLAND LANDFILL
9/27/05 RMW

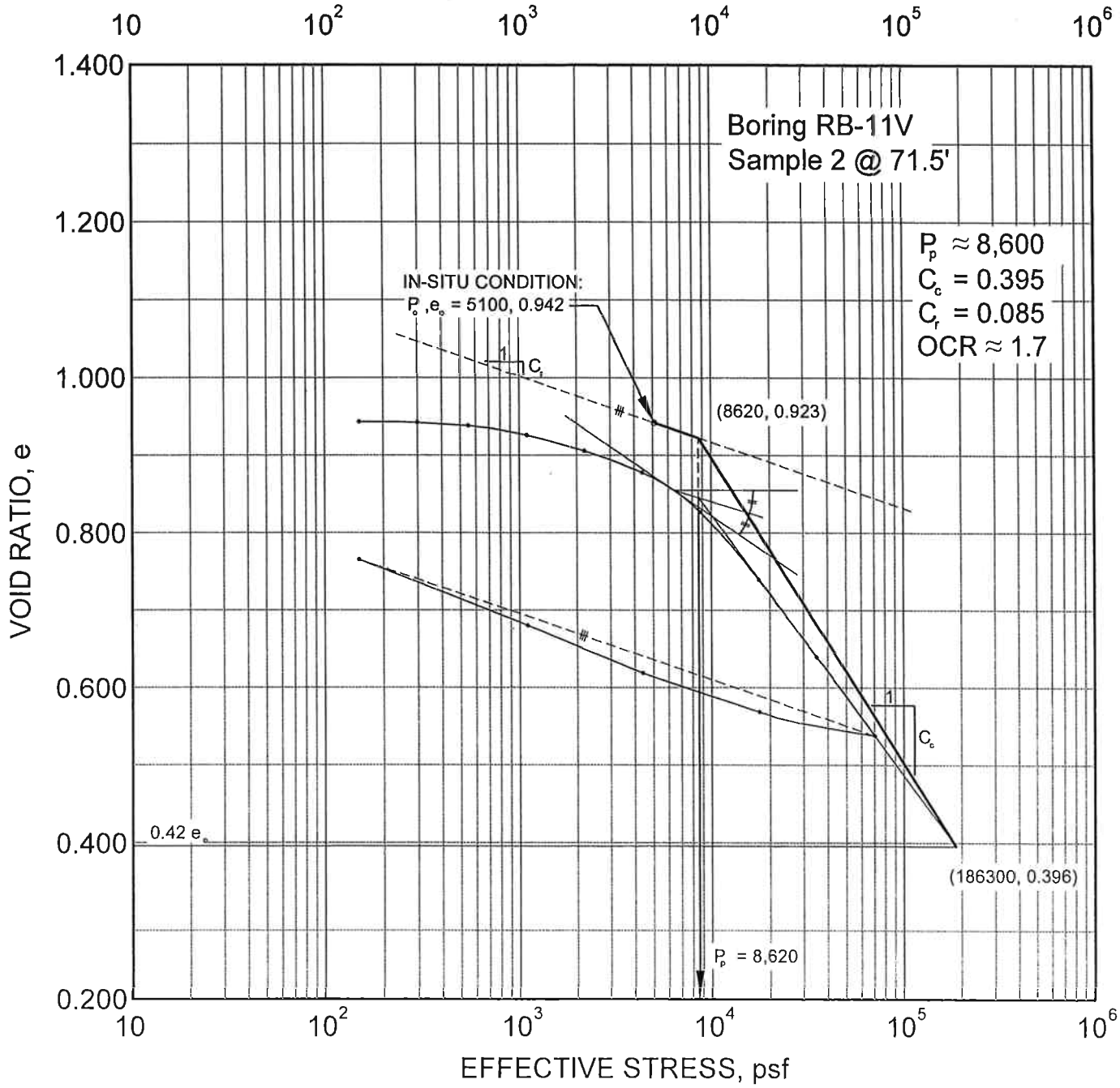
CONSOLIDATION TEST: CASAGRANDE/SCHMERTMANN CONSTRUCTION



Note: P_o based on DIKE stress condition (i.e. not level ground)
Groundwater at Elev. -12

2004-049 NEWBY ISLAND LANDFILL
9/27/05 RMW

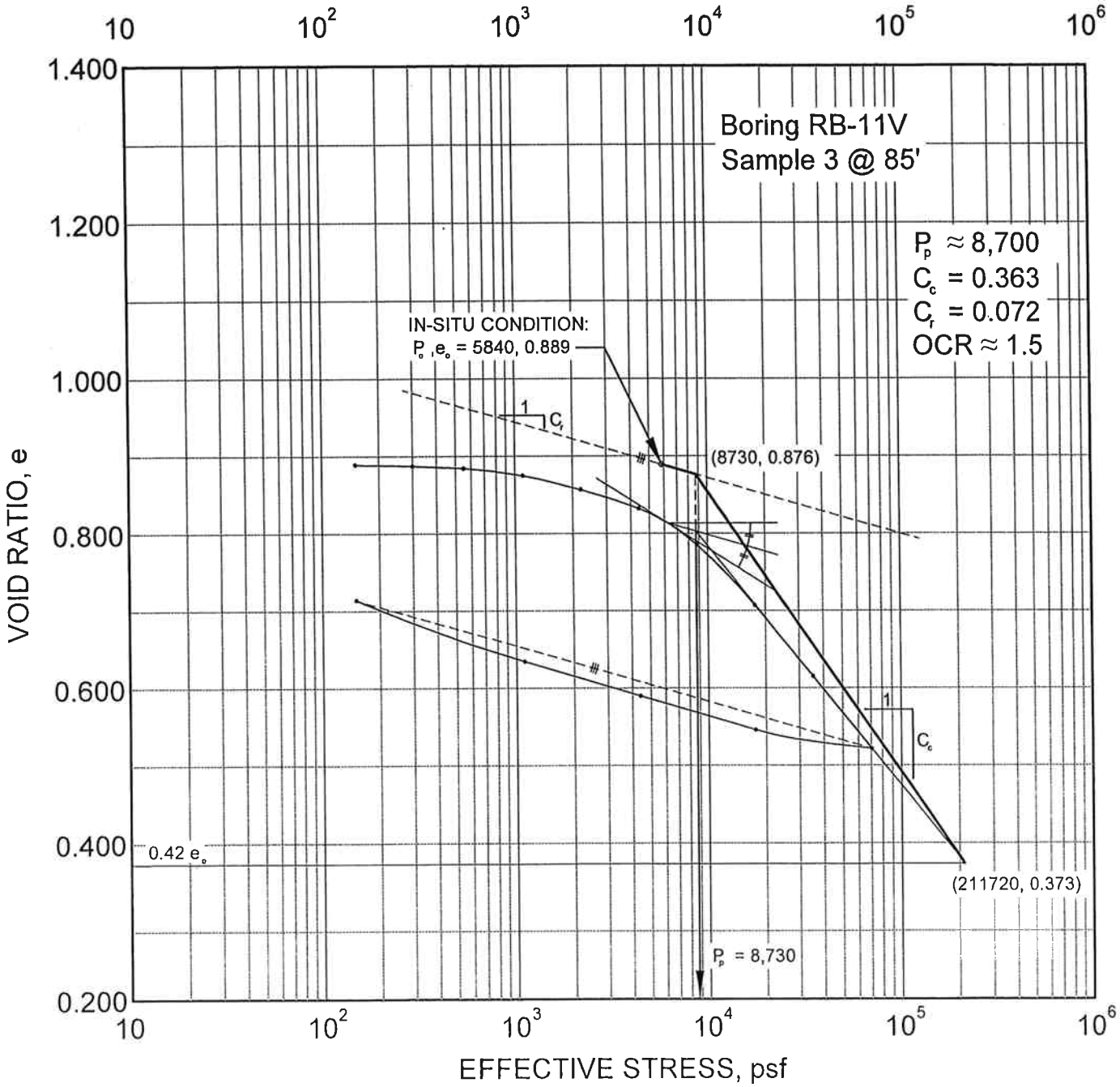
CONSOLIDATION TEST: CASAGRANDE/SCHMERTMANN CONSTRUCTION



Note: P_o based on DIKE stress condition (i.e. not level ground)
Groundwater at Elev. -12

2004-049 NEWBY ISLAND LANDFILL
9/27/05 RMW

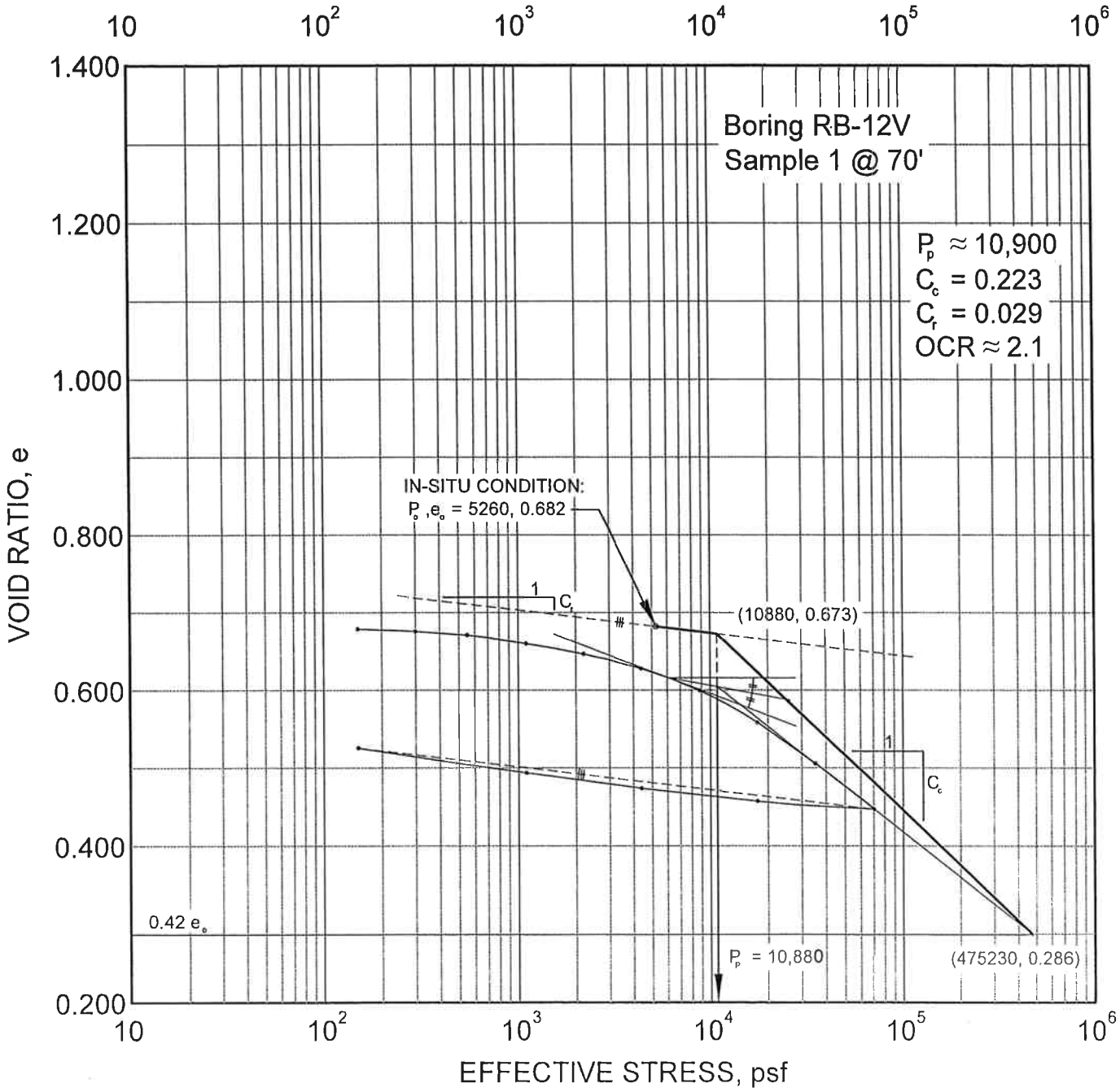
CONSOLIDATION TEST: CASAGRANDE/SCHMERTMANN CONSTRUCTION



Note: P_o based on DIKE stress condition (i.e. not level ground)
Groundwater at Elev. -12

2004-049 NEWBY ISLAND LANDFILL
10/3/05 RMW

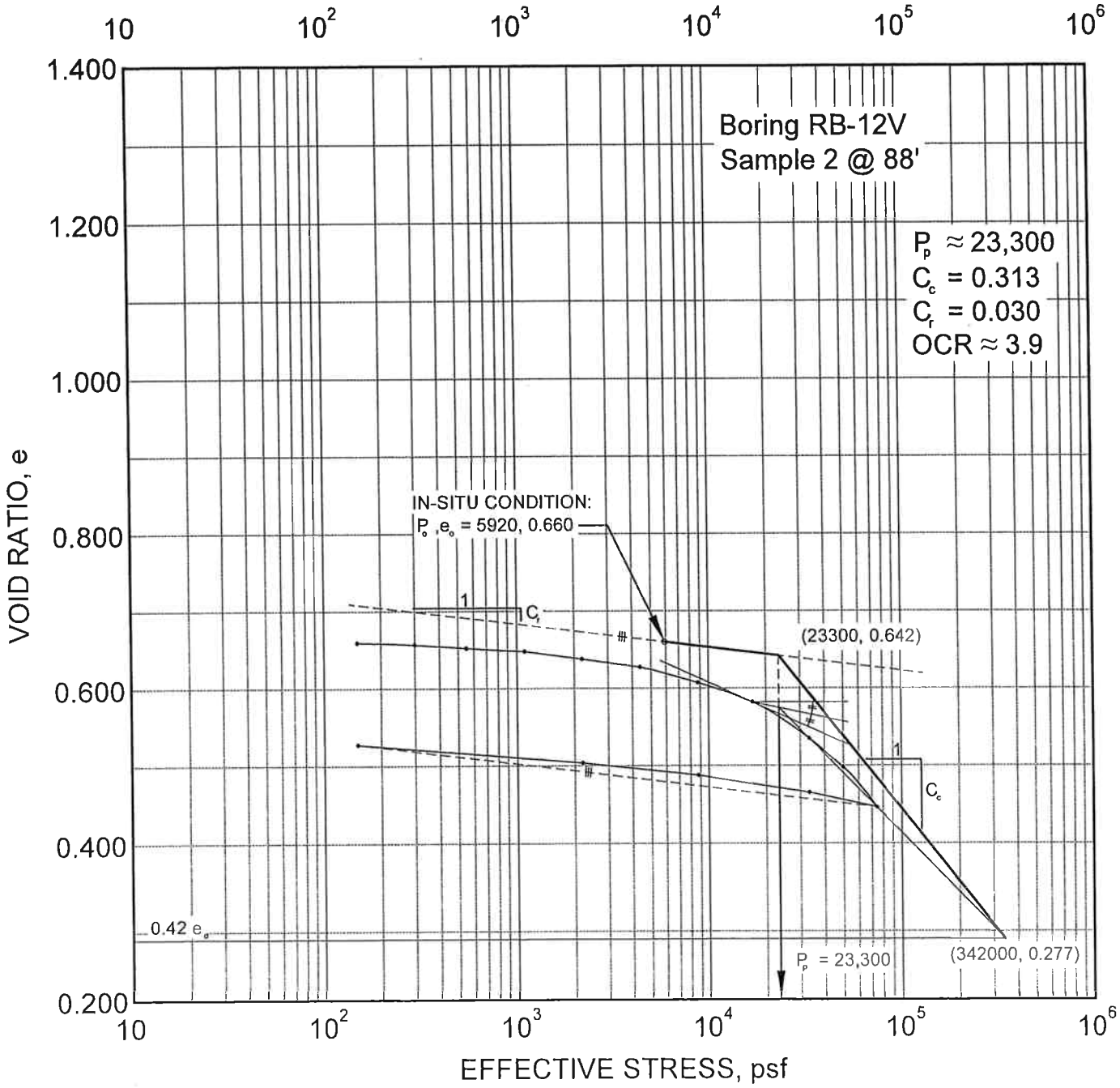
CONSOLIDATION TEST: CASAGRANDE/SCHMERTMANN CONSTRUCTION



Note: P_o based on LEVEL GROUND stress condition (approx. avg. of outboard dike and inboard landfill slope)
Groundwater at Elev. 2

2004-049 NEWBY ISLAND LANDFILL
10/3/05 RMW

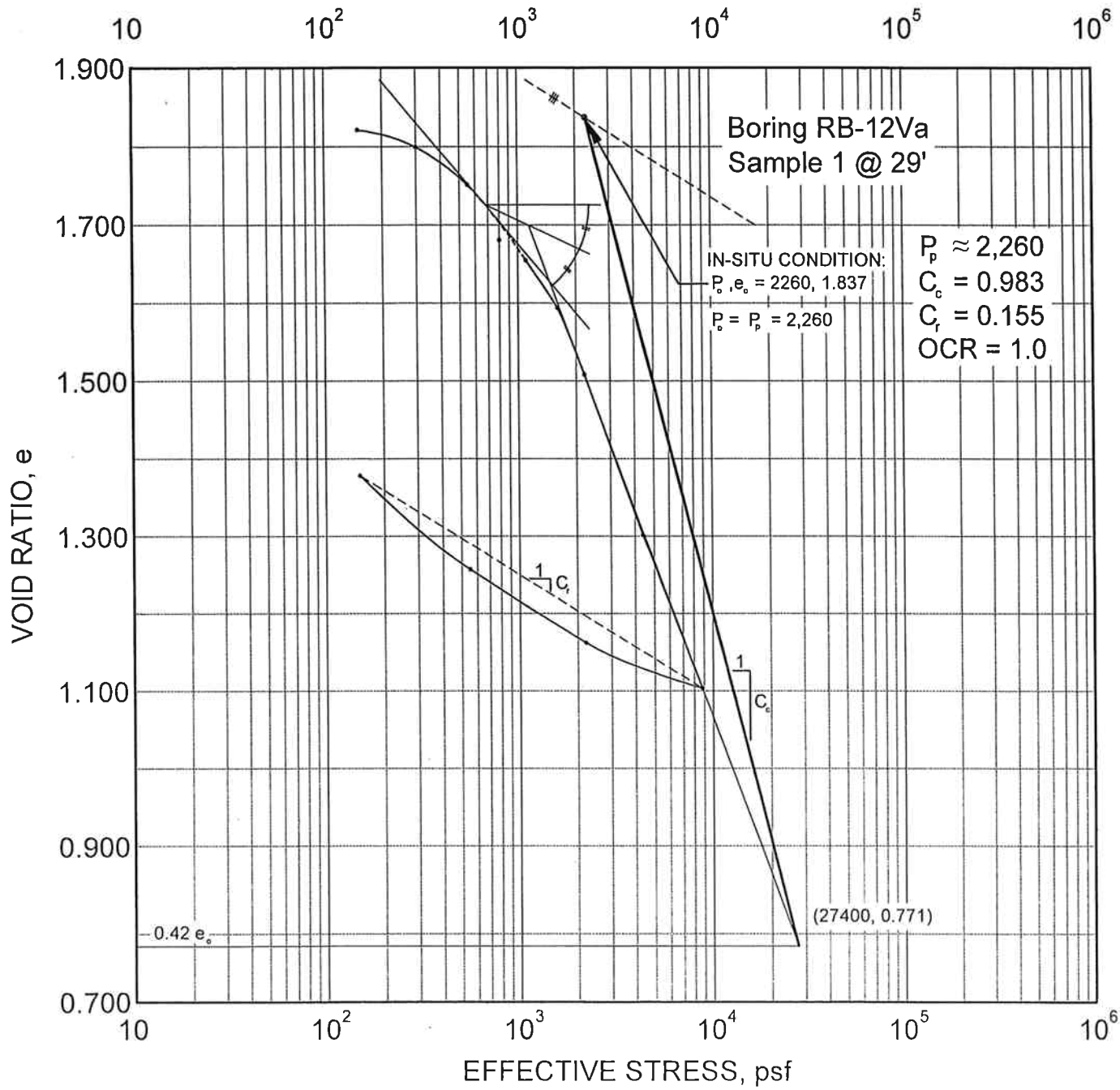
CONSOLIDATION TEST: CASAGRANDE/SCHMERTMANN CONSTRUCTION



Note: P_o based on LEVEL GROUND stress condition (approx. avg. of outboard dike and inboard landfill slope)
Groundwater at Elev. 2

2004-049 NEWBY ISLAND LANDFILL
10/4/05 RMW

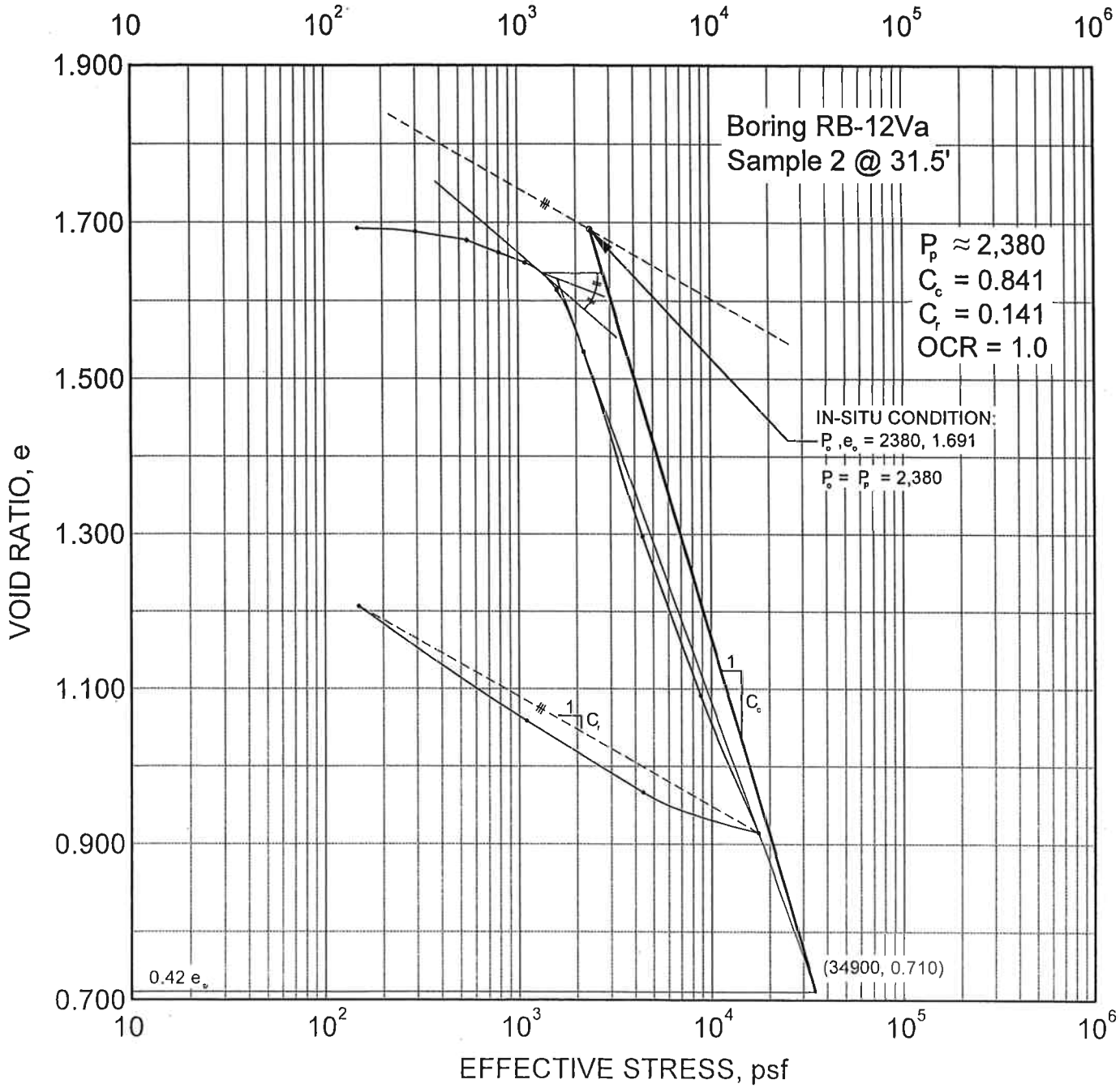
CONSOLIDATION TEST: CASAGRANDE/SCHMERTMANN CONSTRUCTION



Note: P_o based on LEVEL GROUND stress condition (approx. avg. of outboard dike and inboard landfill slope)
Groundwater at Elev. 2

2004-049 NEWBY ISLAND LANDFILL
10/4/05 RMW

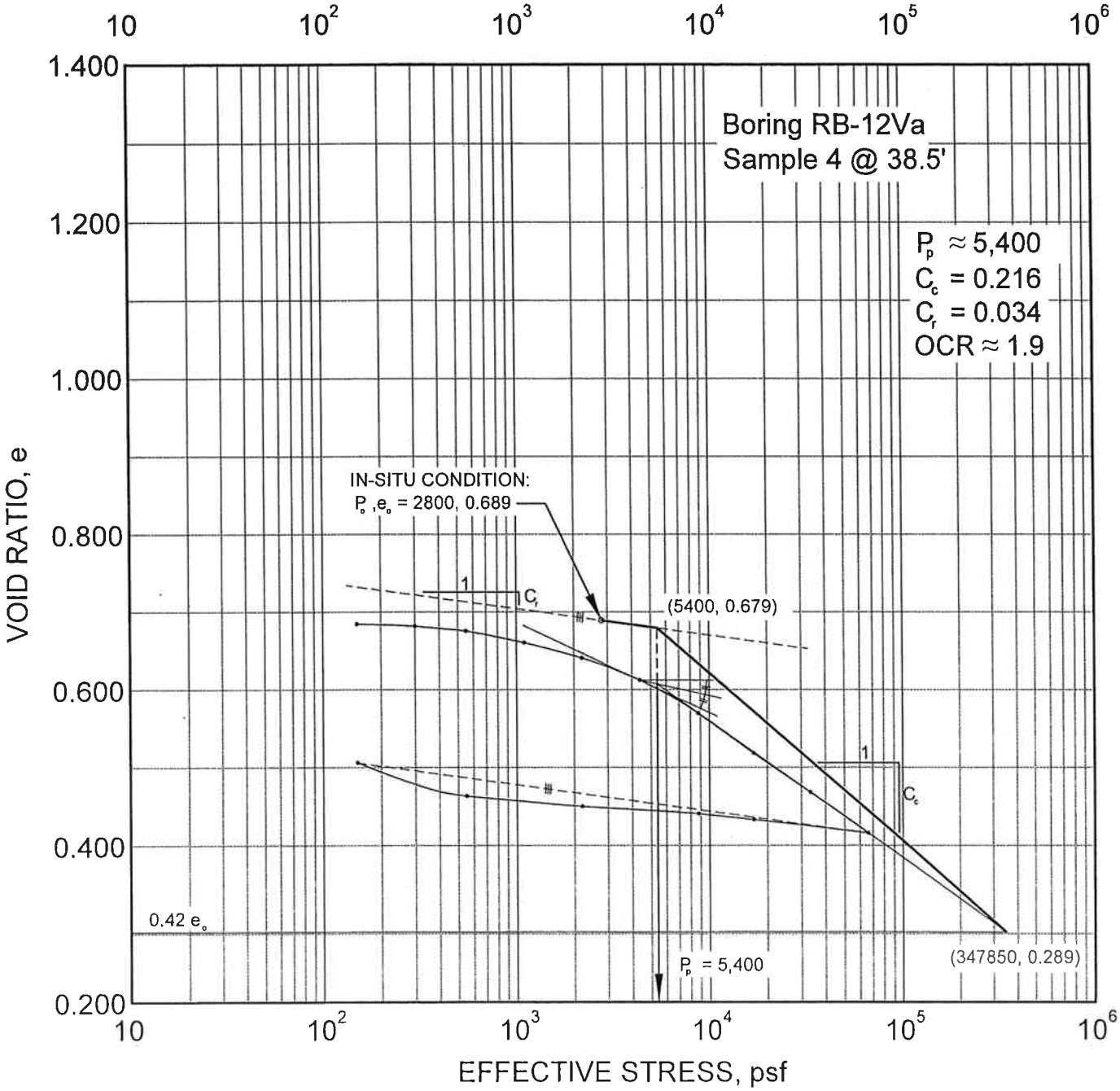
CONSOLIDATION TEST: CASAGRANDE/SCHMERTMANN CONSTRUCTION



Note: P_o based on LEVEL GROUND stress condition (approx. avg. of outboard dike and inboard landfill slope)
Groundwater at Elev. 2

2004-049 NEWBY ISLAND LANDFILL
10/4/05 RMW

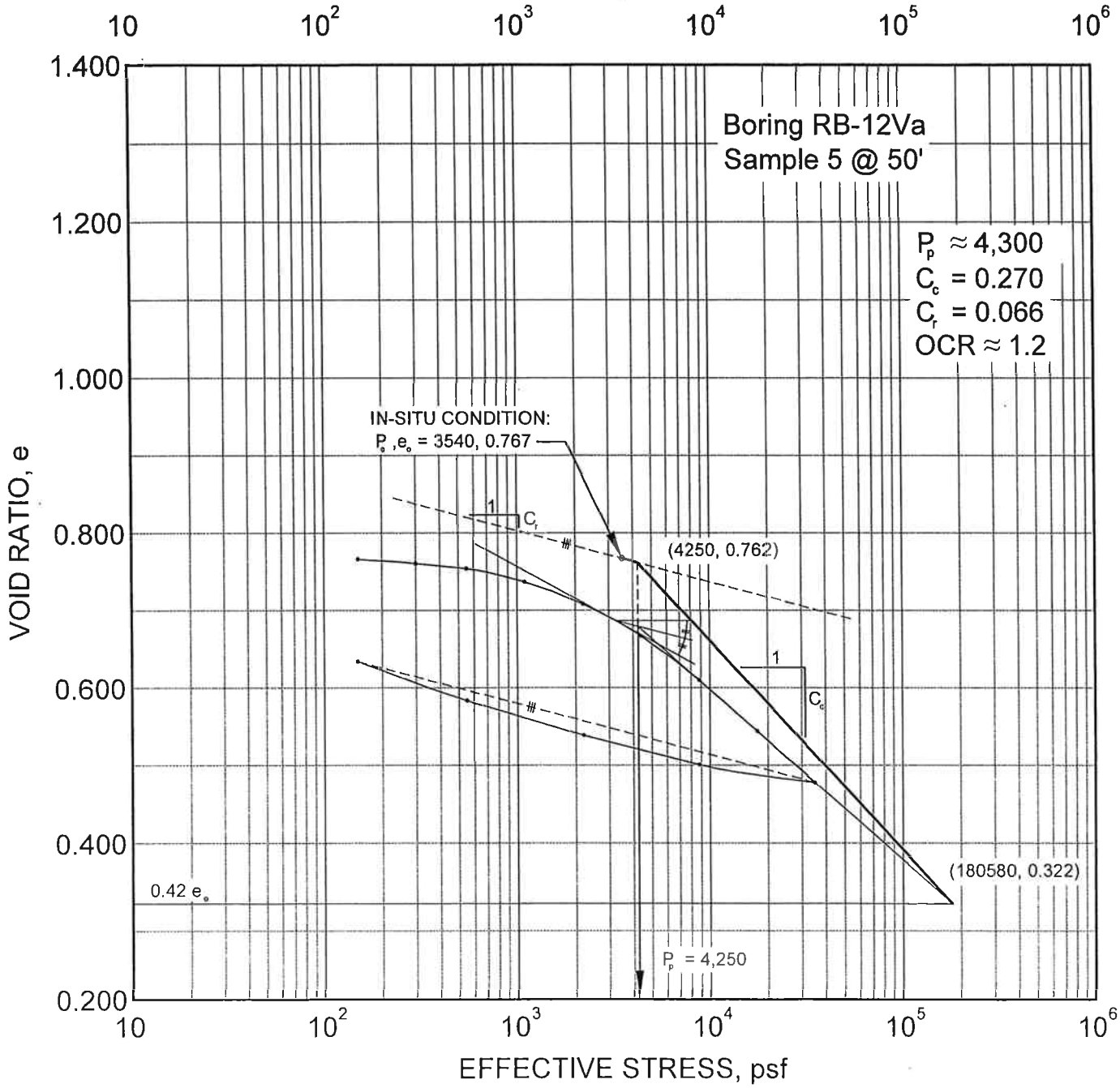
CONSOLIDATION TEST: CASAGRANDE/SCHMERTMANN CONSTRUCTION



Note: P_o based on LEVEL GROUND stress condition (approx. avg. of outboard dike and inboard landfill slope)
Groundwater at Elev. 2

2004-049 NEWBY ISLAND LANDFILL
10/4/05 RMW

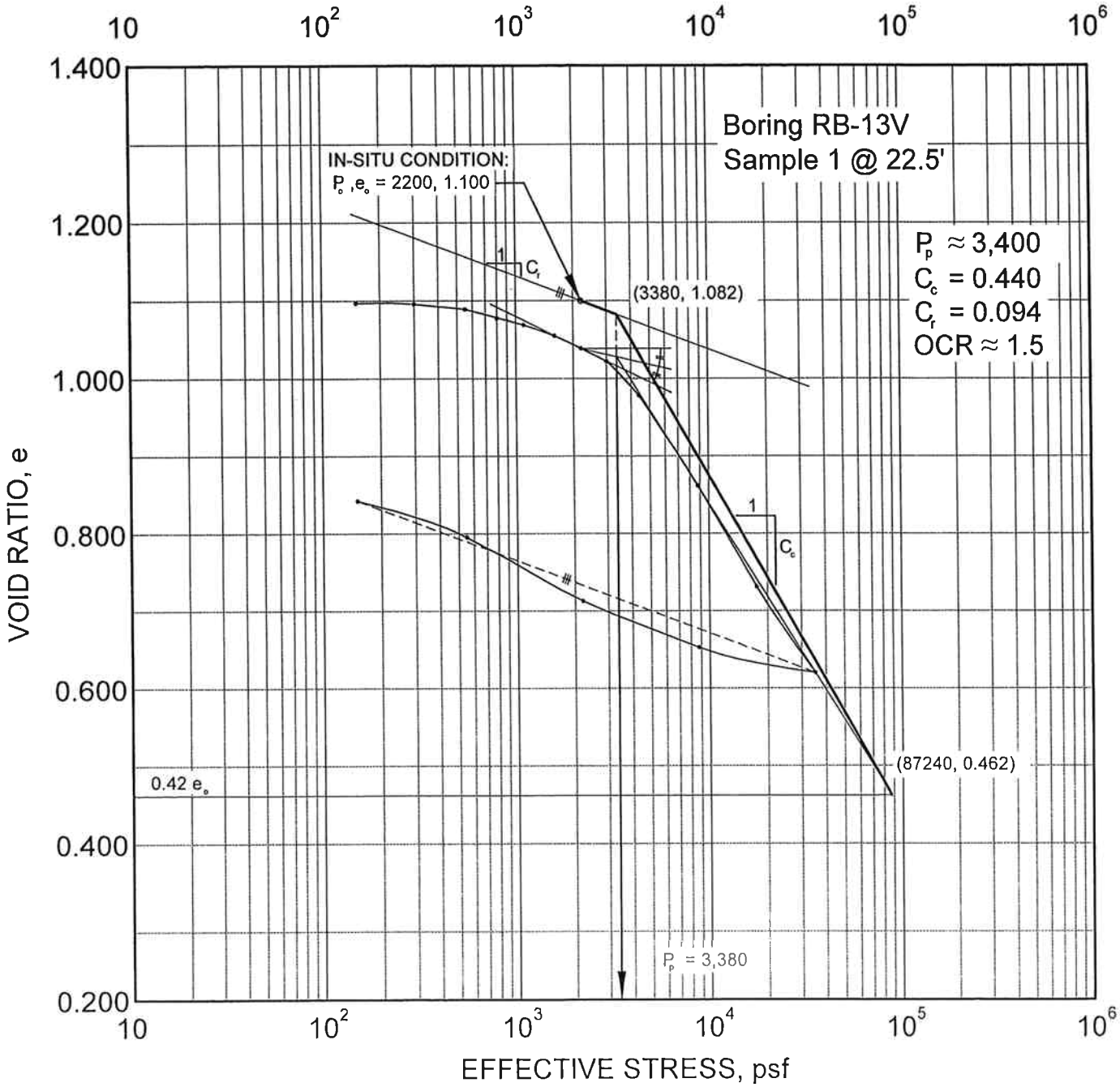
CONSOLIDATION TEST: CASAGRANDE/SCHMERTMANN CONSTRUCTION



Note: P_o based on LEVEL GROUND stress condition (approx. avg. of outboard dike and inboard landfill slope)
Groundwater at Elev. 2

2004-049 NEWBY ISLAND LANDFILL
10/4/05 RMW

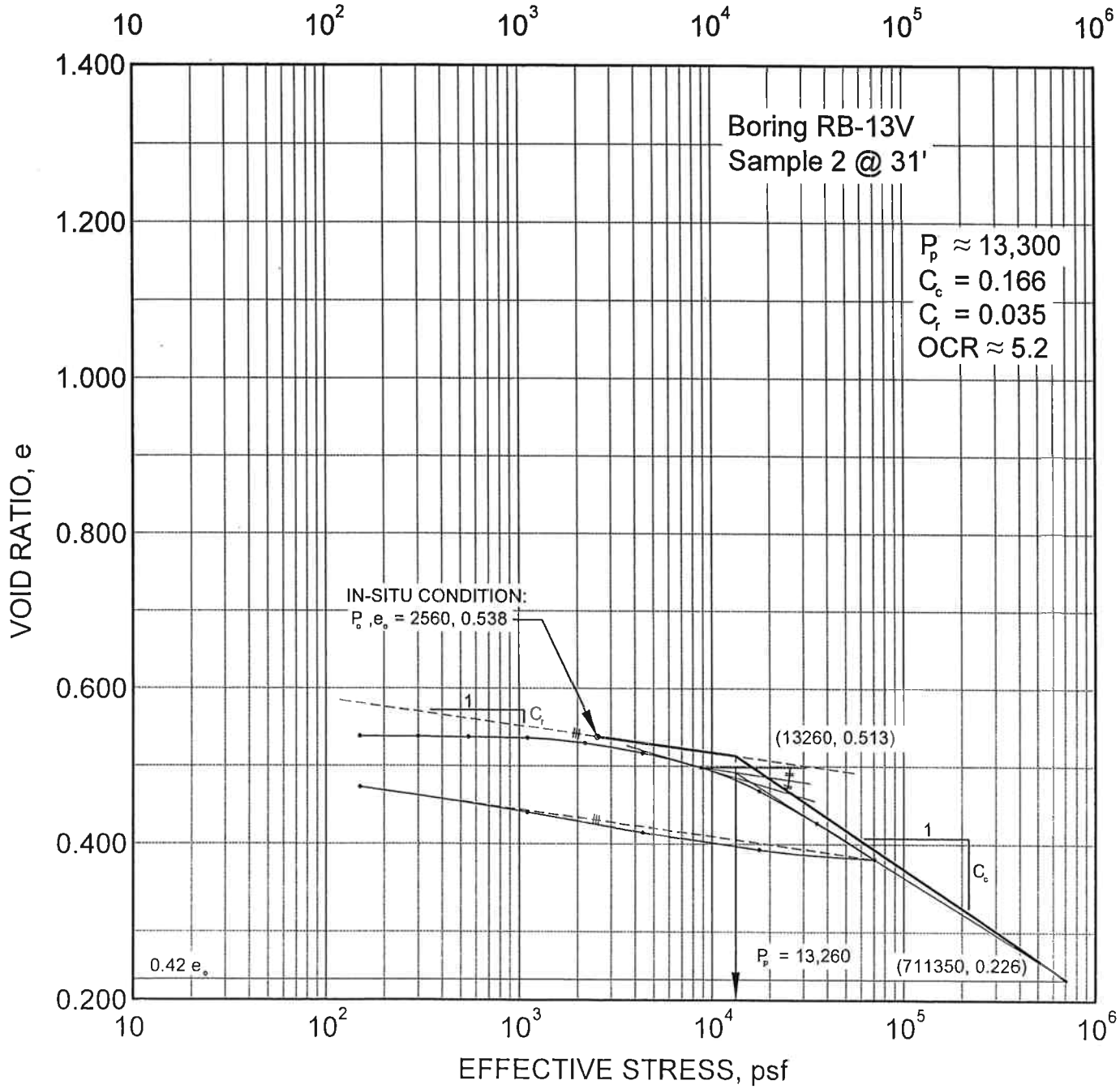
CONSOLIDATION TEST: CASAGRANDE/SCHMERTMANN CONSTRUCTION



Note: P_o based on DIKE stress condition (i.e. not level ground)
Groundwater at Elev. -5

2004-049 NEWBY ISLAND LANDFILL
10/4/05 RMW

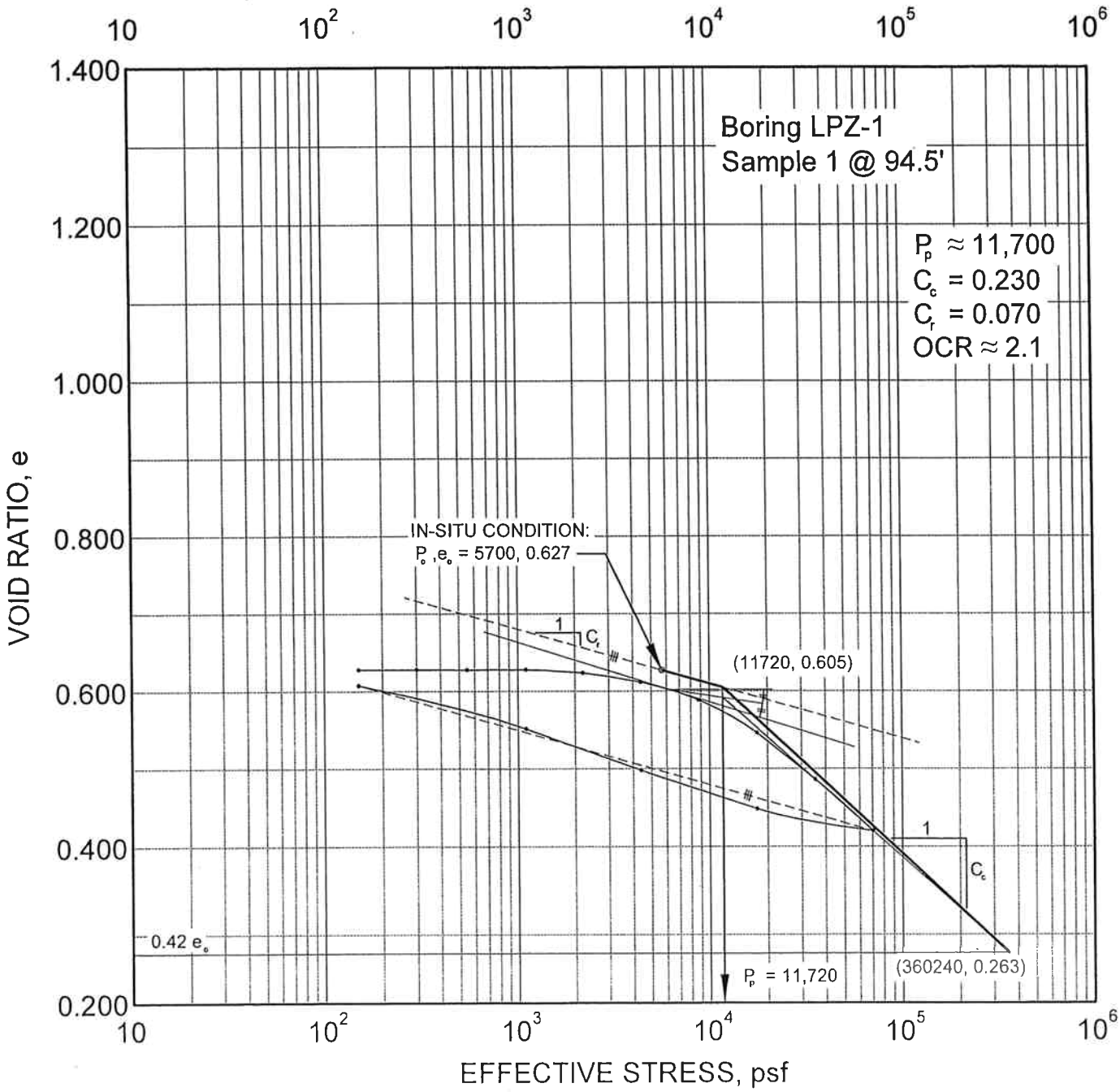
CONSOLIDATION TEST: CASAGRANDE/SCHMERTMANN CONSTRUCTION



Note: P_o based on DIKE stress condition (i.e. not level ground)
Groundwater at Elev. -5

2004-049 NEWBY ISLAND LANDFILL
10/4/05 RMW

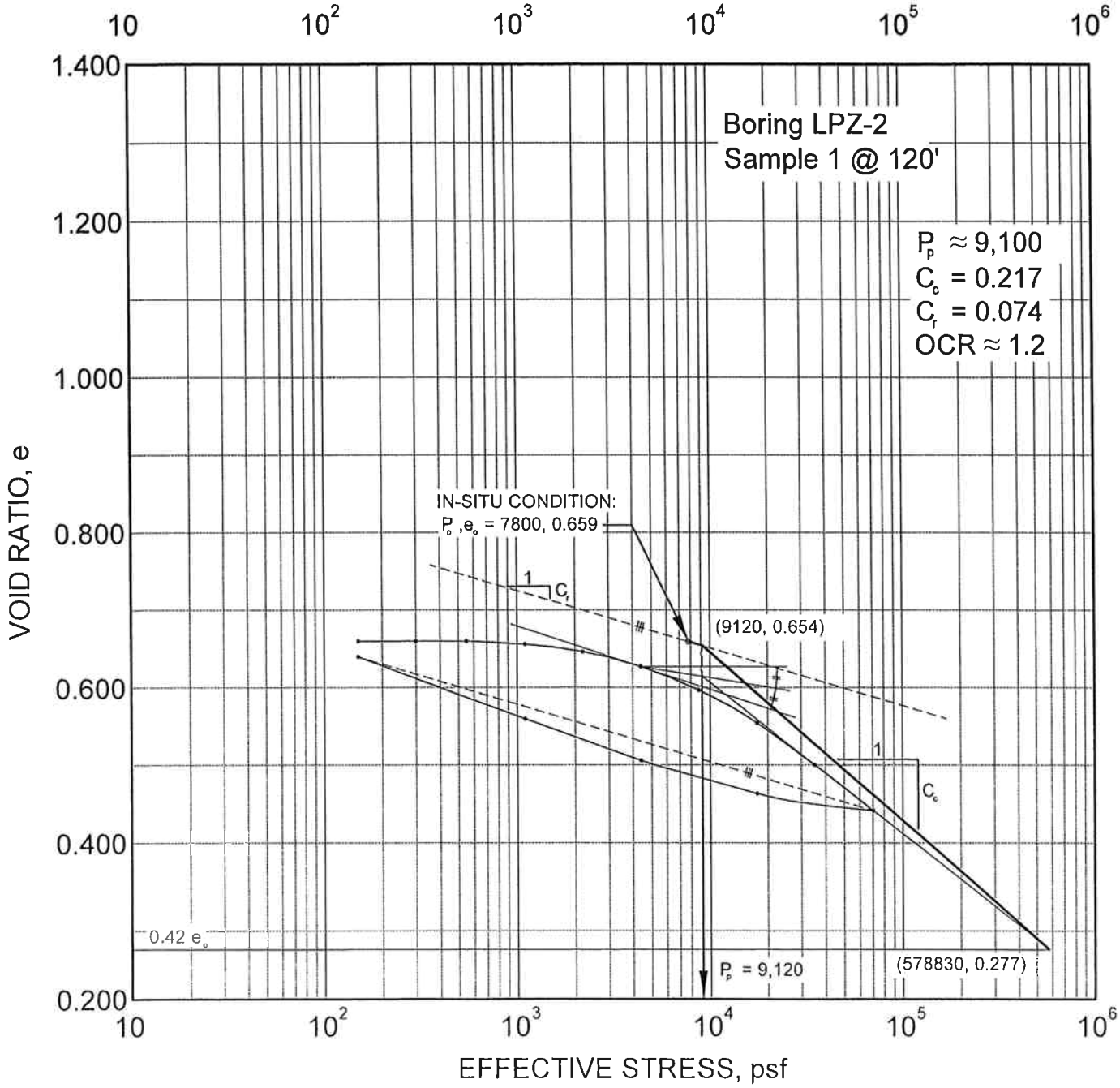
CONSOLIDATION TEST: CASAGRANDE/SCHMERTMANN CONSTRUCTION



Note: P_o based on LEVEL GROUND stress condition with MSW average unit weight = 70 pcf
Groundwater at Elev. 2

2004-049 NEWBY ISLAND LANDFILL
10/4/05 RMW

CONSOLIDATION TEST: CASAGRANDE/SCHMERTMANN CONSTRUCTION

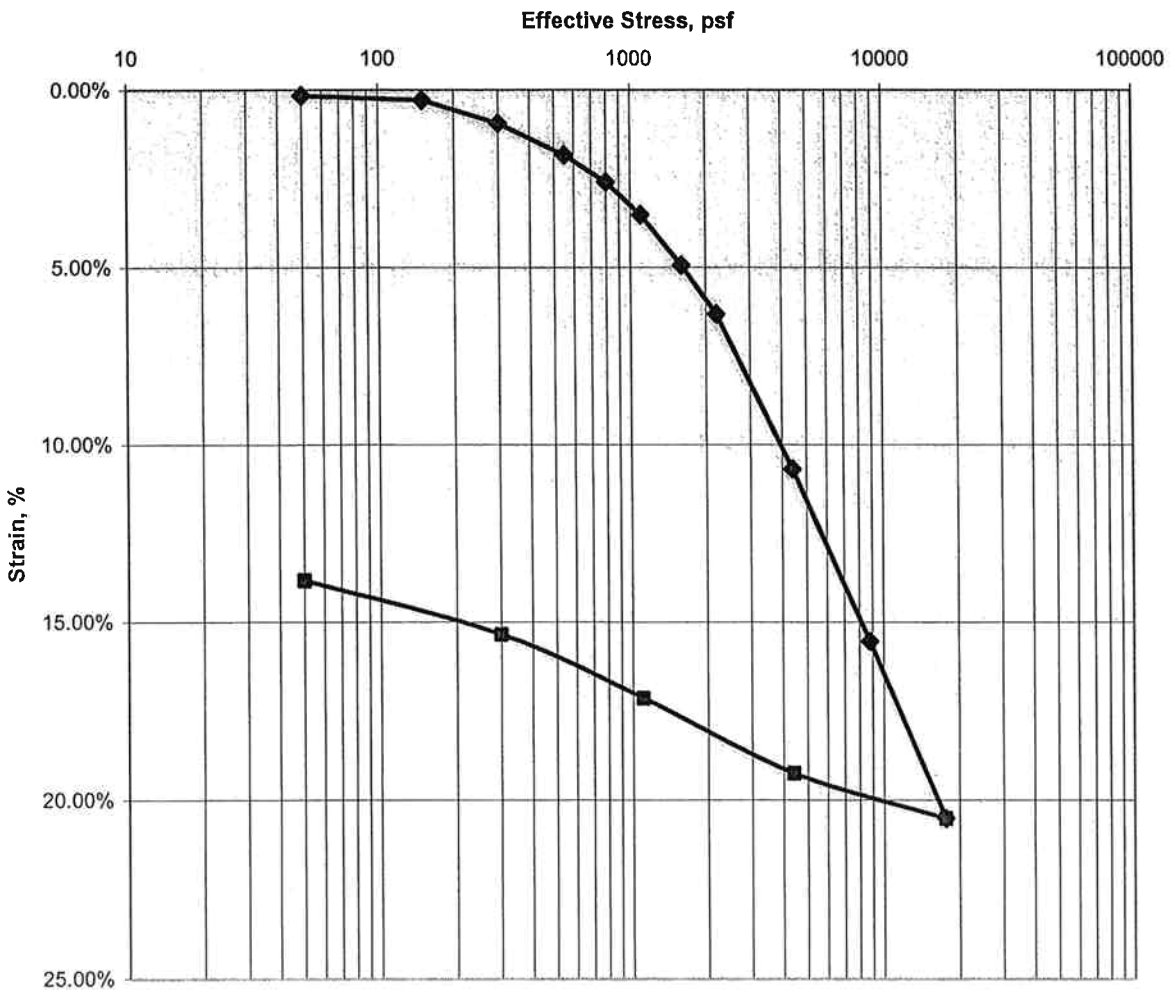


Note: P_o based on LEVEL GROUND stress condition with MSW average unit weight = 70 pcf
Groundwater at Elev. 2

Consolidation Test

ASTM D2435

Job No.:	516-002a	**Boring:**	RB-2A	**Run By:**	MD
Client:	GeoLogic Associates	**Sample:**	1	**Reduced:**	MJ
Project:	Newby Island - 2004-049	**Depth, ft.:**	23	**Checked:**	PJ
Soil Type:	Gray Fat CLAY (bay mud)			**Date:**	11/15/2004



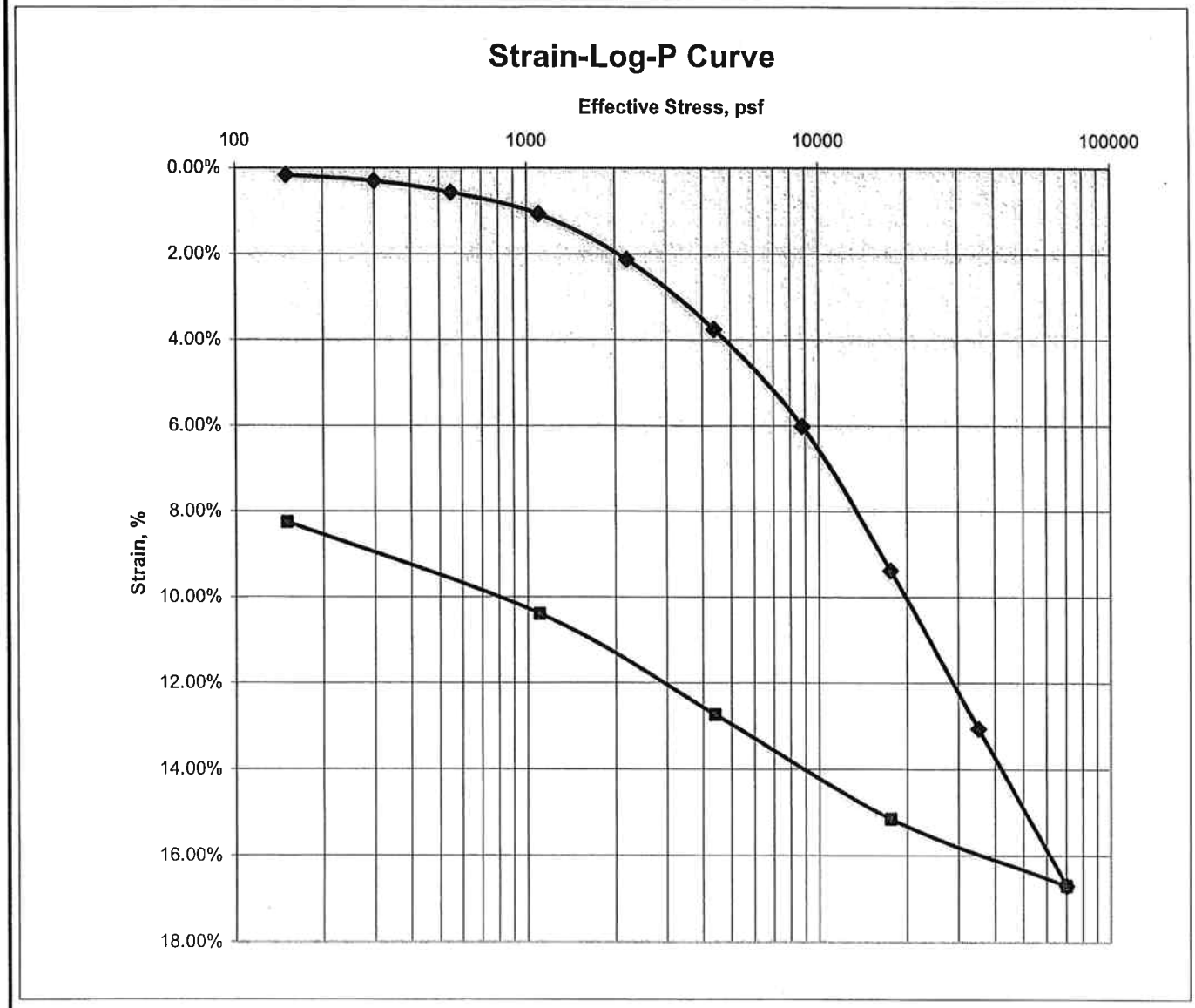
Ass. Gs = 2.75	Initial	Final
Moisture %:	42.2	30.6
Density, pcf:	79.4	93.2
Void Ratio:	1.162	0.841
% Saturation:	100.0	100

Remarks:

Consolidation Test

ASTM D2435

Job No.:	516-002bb	**Boring:**	RB-2	**Run By:**	MD
Client:	GeoLogic Associates	**Sample:**	8	**Reduced:**	MJ
Project:	Newby Island - 2004-049	**Depth, ft.:**	35	**Checked:**	PJ
Soil Type:	Brown Lean CLAY with Sand			**Date:**	11/28/2004



Ass. Gs = 2.74	Initial	Final
Moisture %:	26.2	22.6
Density, pcf:	99.7	105.7
Void Ratio:	0.715	0.618
% Saturation:	100.2	100

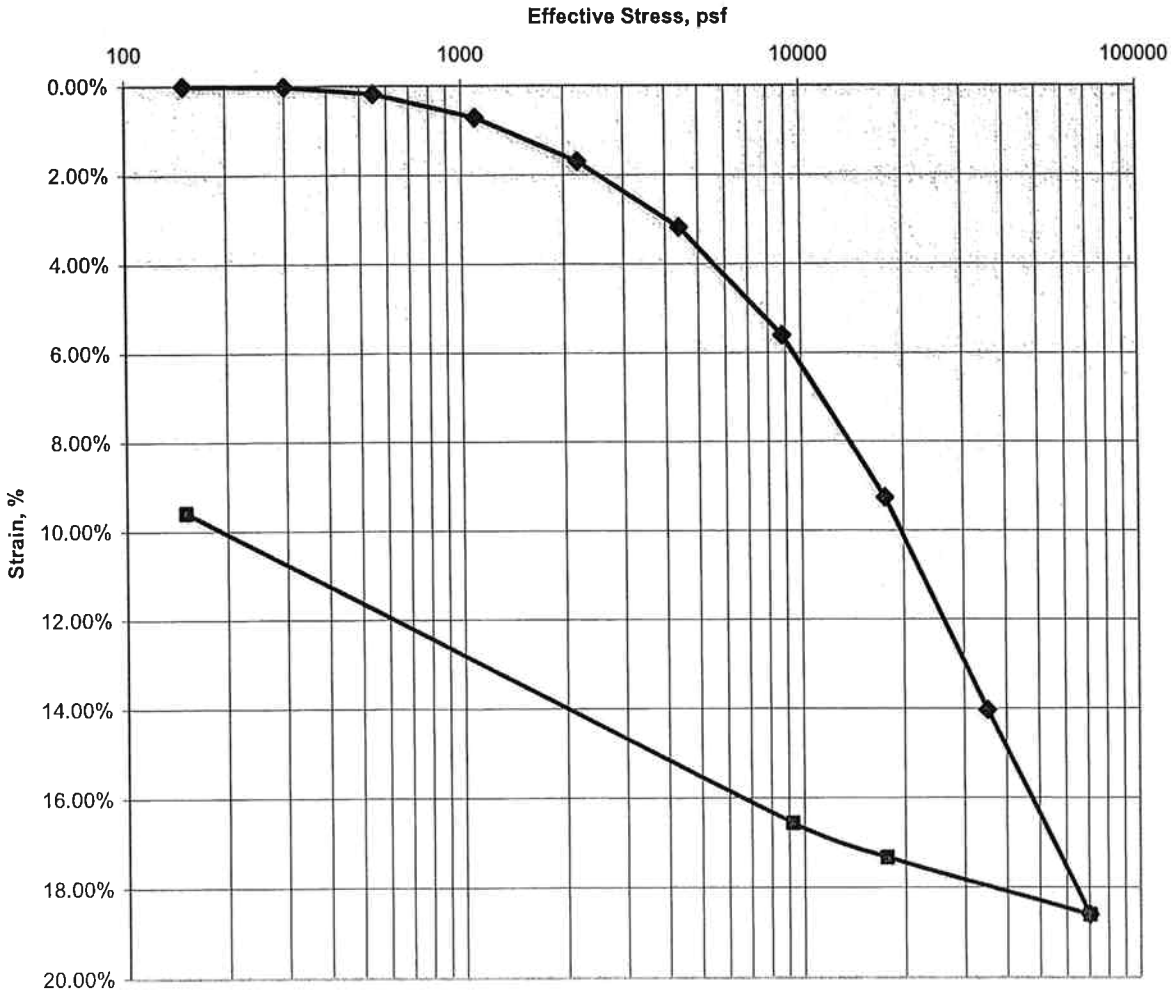
Remarks:

Consolidation Test

ASTM D2435

Job No.:	516-002c	**Boring:**	RB-2	**Run By:**	MD
Client:	Geologic Associates	**Sample:**	13	**Reduced:**	MJ
Project:	Newbie Island Landfill - 2004-049	**Depth, ft.:**	75	**Checked:**	PJ
Soil Type:	Olive Brown Lean CLAY			**Date:**	11/10/2004

Strain-Log-P Curve



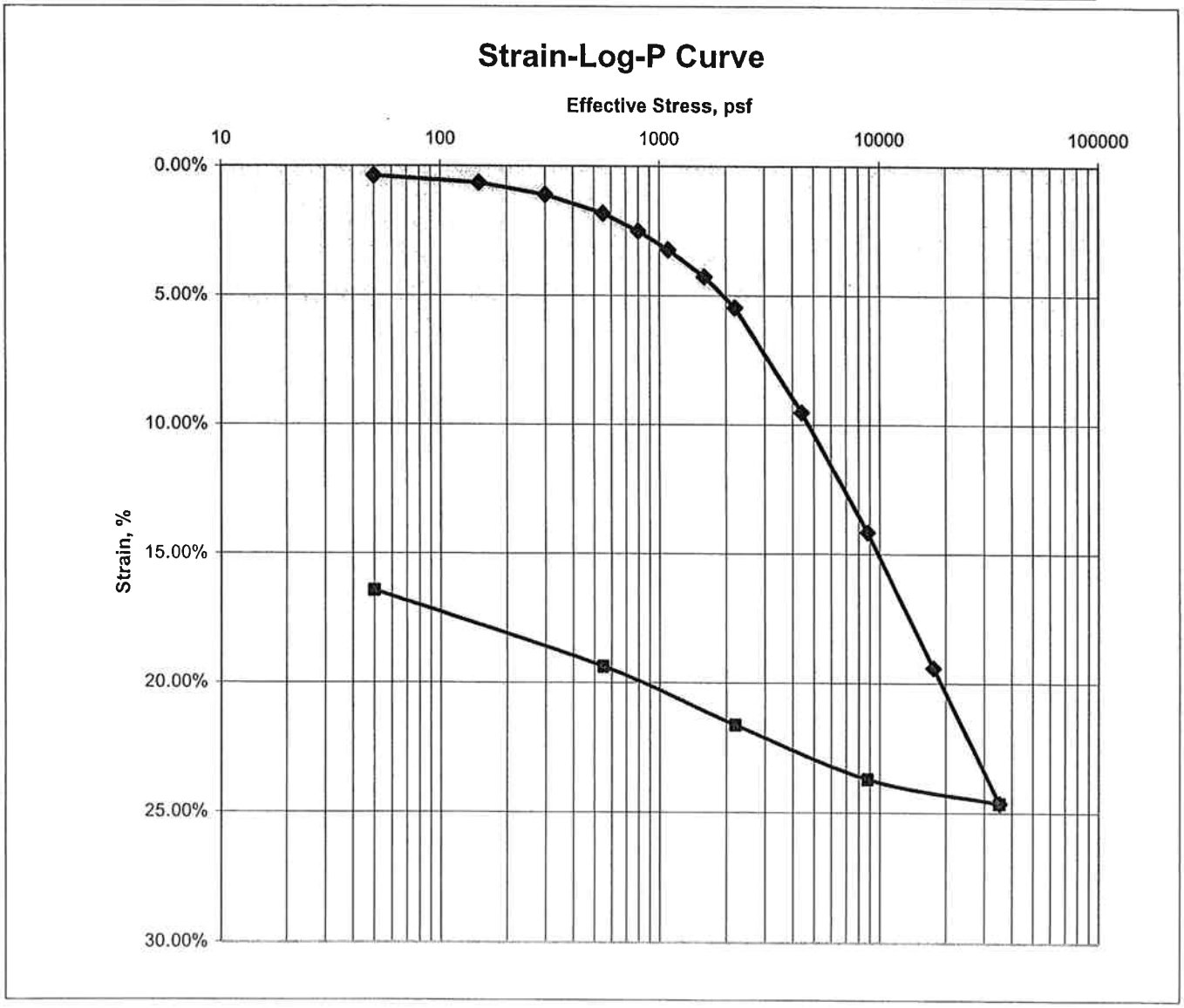
Ass. Gs = 2.74	Initial	Final
Moisture %:	27.3	23.0
Density, pcf:	97.6	105.0
Void Ratio:	0.752	0.629
% Saturation:	99.6	100

Remarks:

Consolidation Test

ASTM D2435

Job No.:	516-002d	**Boring:**	RB-8	**Run By:**	MD
Client:	GeoLogic Associates	**Sample:**	4	**Reduced:**	MJ
Project:	Newby Island - 2004-049	**Depth, ft.:**	22.5	**Checked:**	PJ
Soil Type:	Dark Gray CLAY, trace organics, Sandy pockets & lenses			**Date:**	11/19/2004



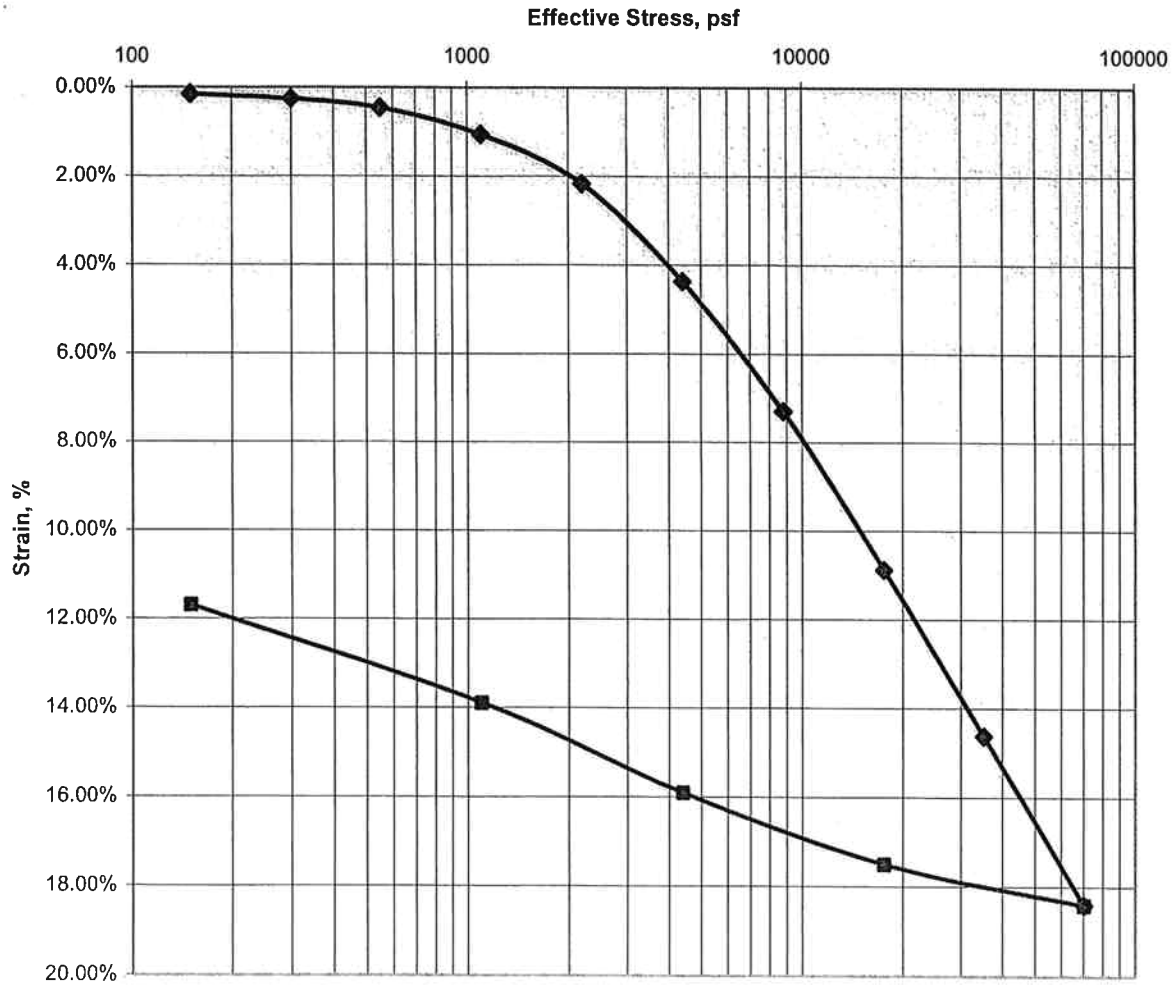
Ass. Gs = 2.76	Initial	Final
Moisture %:	42.4	30.9
Density, pcf:	79.3	93.0
Void Ratio:	1.174	0.852
% Saturation:	99.8	100

Remarks:

Consolidation Test

ASTM D2435

Job No.:	516-004a	**Boring:**	RB-6	**Run By:**	MD
Client:	Geologic Associates	**Sample:**	4	**Reduced:**	MJ
Project:	Newby Island - 2004-049	**Depth, ft.:**	43.5	**Checked:**	PJ
Soil Type:	Brown Lean CLAY with Sand			**Date:**	12/1/2004



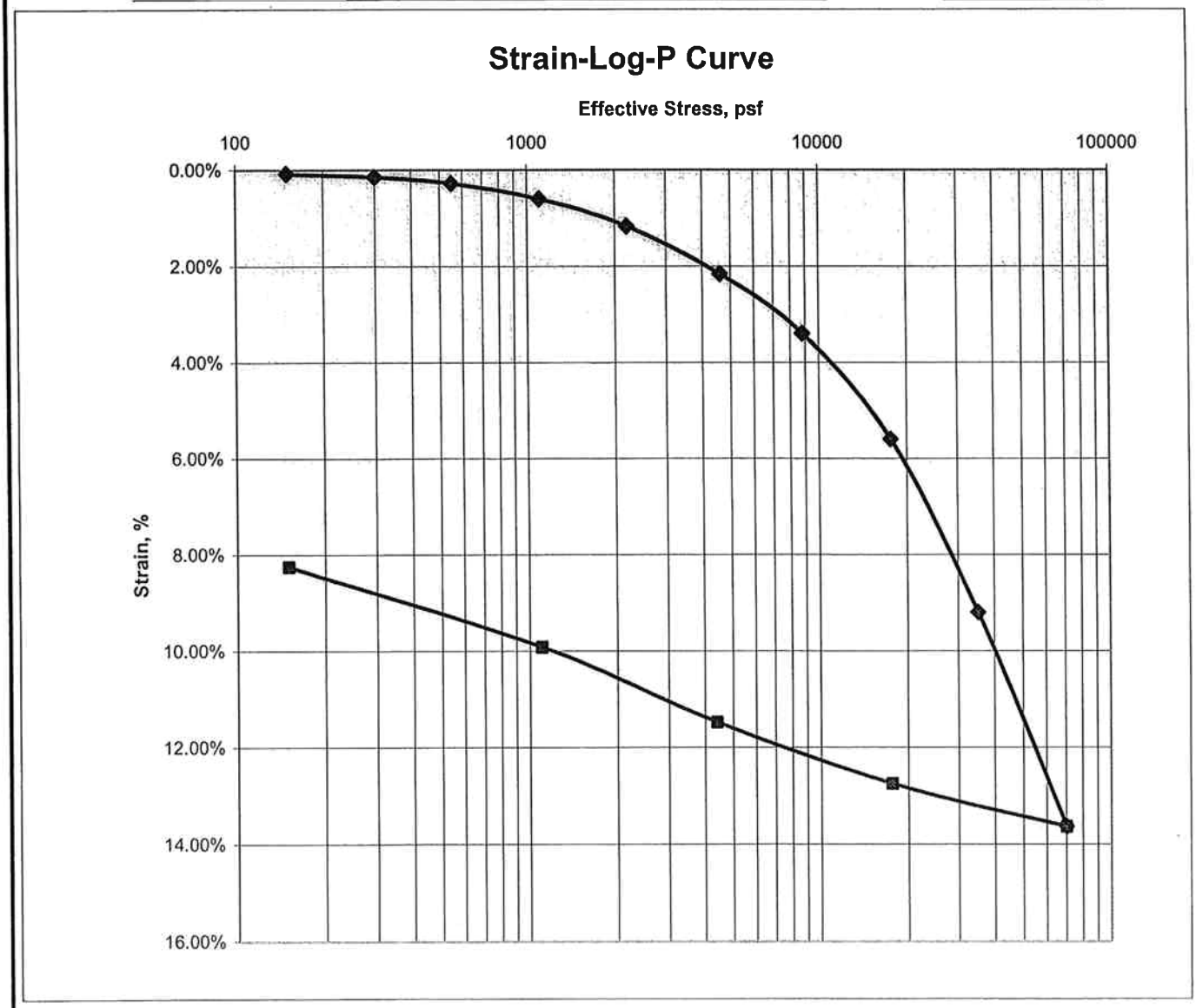
Ass. Gs = 2.74	Initial	Final
Moisture %:	26.2	19.7
Density, pcf:	98.4	111.2
Void Ratio:	0.738	0.538
% Saturation:	97.1	100

Remarks:

Consolidation Test

ASTM D2435

Job No.:	516-004b	**Boring:**	RB-7	**Run By:**	MD
Client:	Geologic Associates	**Sample:**	9	**Reduced:**	MJ
Project:	Newby Island - 2004-049	**Depth, ft.:**	59	**Checked:**	PJ
Soil Type:	Olive Gray Lean CLAY			**Date:**	12/1/2004



Ass. Gs = 2.74	Initial	Final
Moisture %:	28.4	24.0
Density, pcf:	96.2	103.3
Void Ratio:	0.777	0.657
% Saturation:	100.1	100

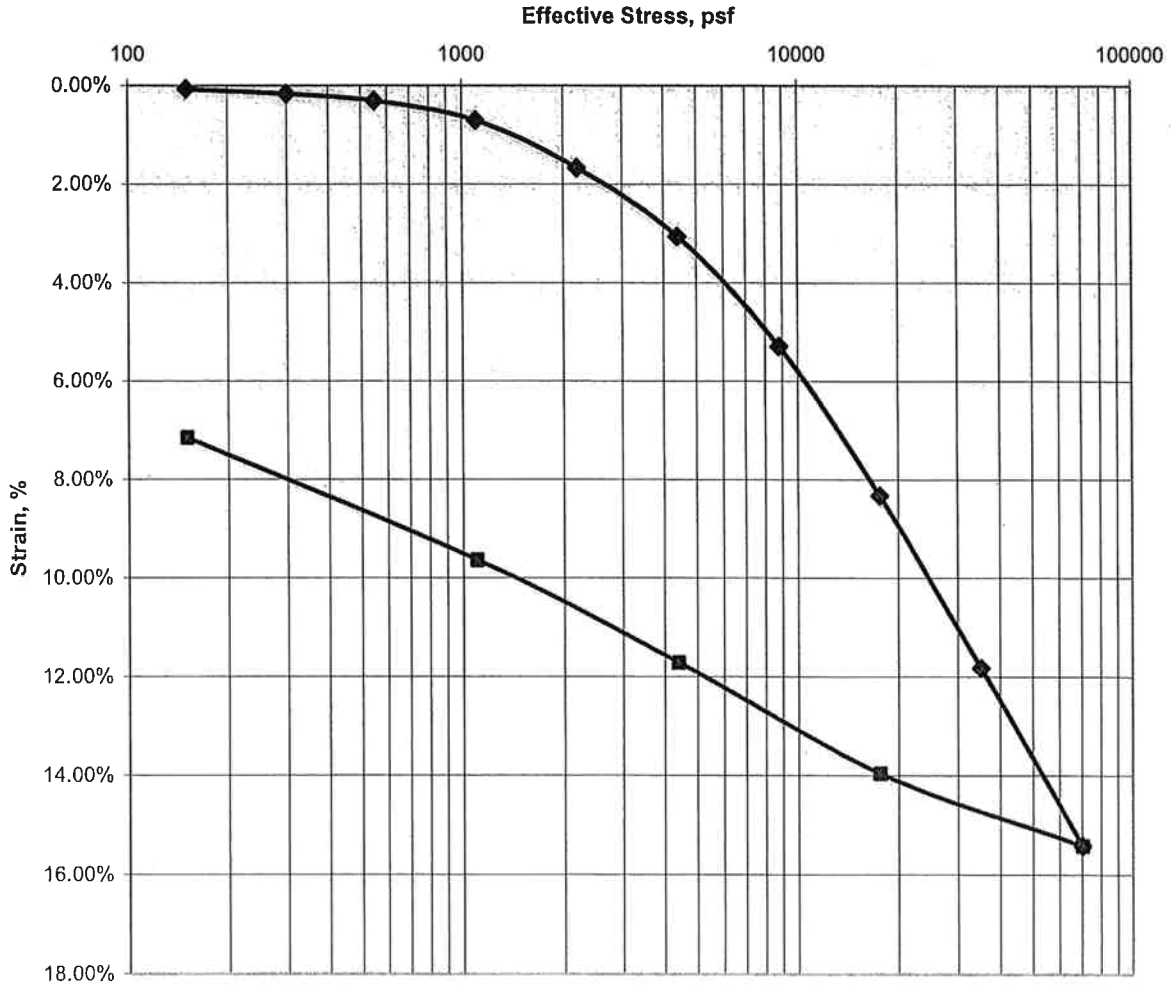
Remarks: 4400 psf load corrected up to 4600 to smooth curve, possibly due to regulator drift.

Consolidation Test

ASTM D2435

Job No.:	516-006a	**Boring:**	RB-4	**Run By:**	MD
Client:	GeoLogic Associates	**Sample:**	5	**Reduced:**	MJ
Project:	Newby Island - 2004-049	**Depth, ft.:**	48	**Checked:**	PJ
Soil Type:	Brown CLAY with Sand			**Date:**	1/6/2005

Strain-Log-P Curve



Ass. Gs = 2.75	Initial	Final
Moisture %:	25.1	22.3
Density, pcf:	101.6	106.5
Void Ratio:	0.689	0.613
% Saturation:	100.0	100

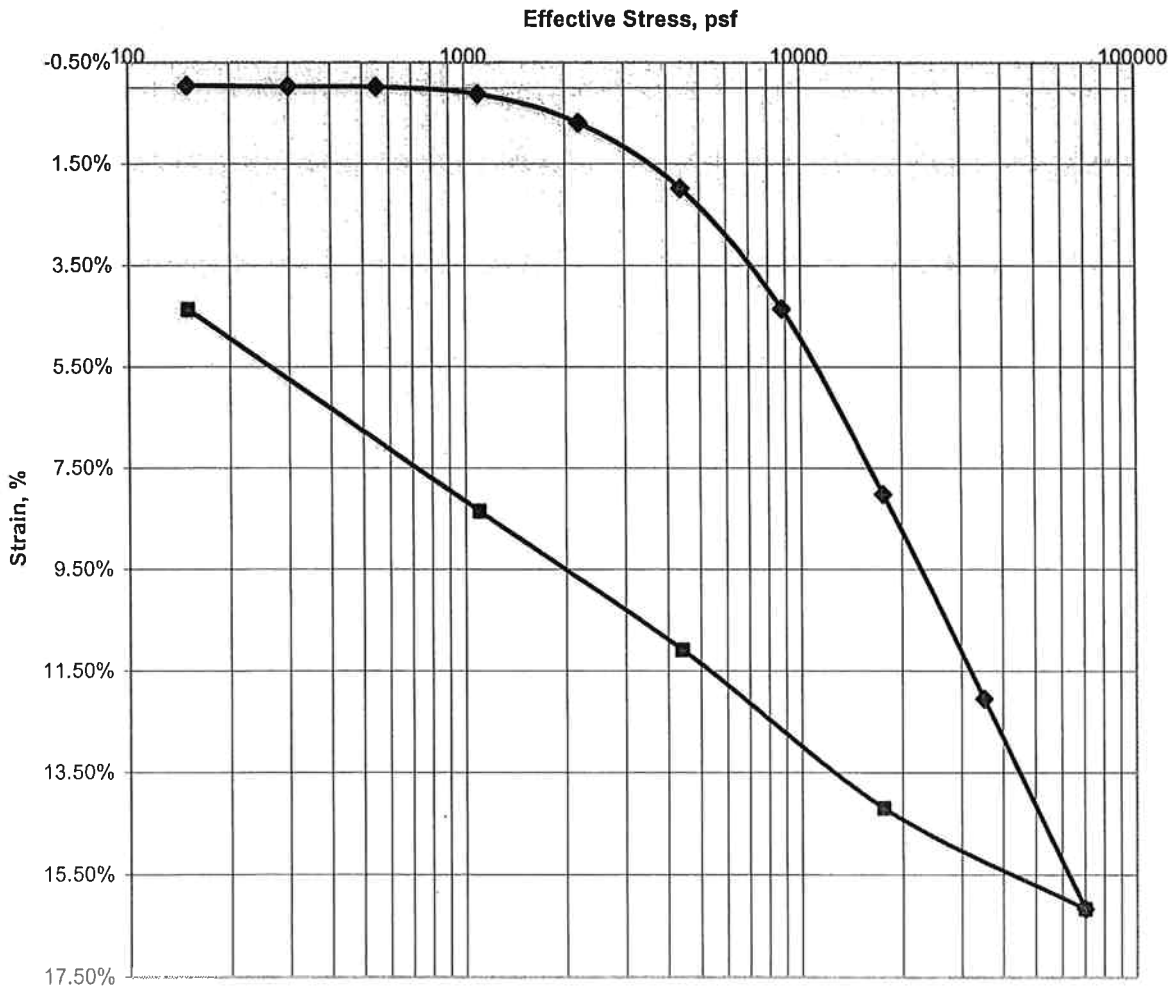
Remarks:

Consolidation Test

ASTM D2435

Job No.:	516-006b	**Boring:**	RB-5	**Run By:**	MD
Client:	GeodLogic Associates	**Sample:**	1	**Reduced:**	MJ
Project:	Newby Island - 2004-049	**Depth, ft.:**	24	**Checked:**	PJ
Soil Type:	Dark Bluish Gray CLAY			**Date:**	1/6/2005

Strain-Log-P Curve



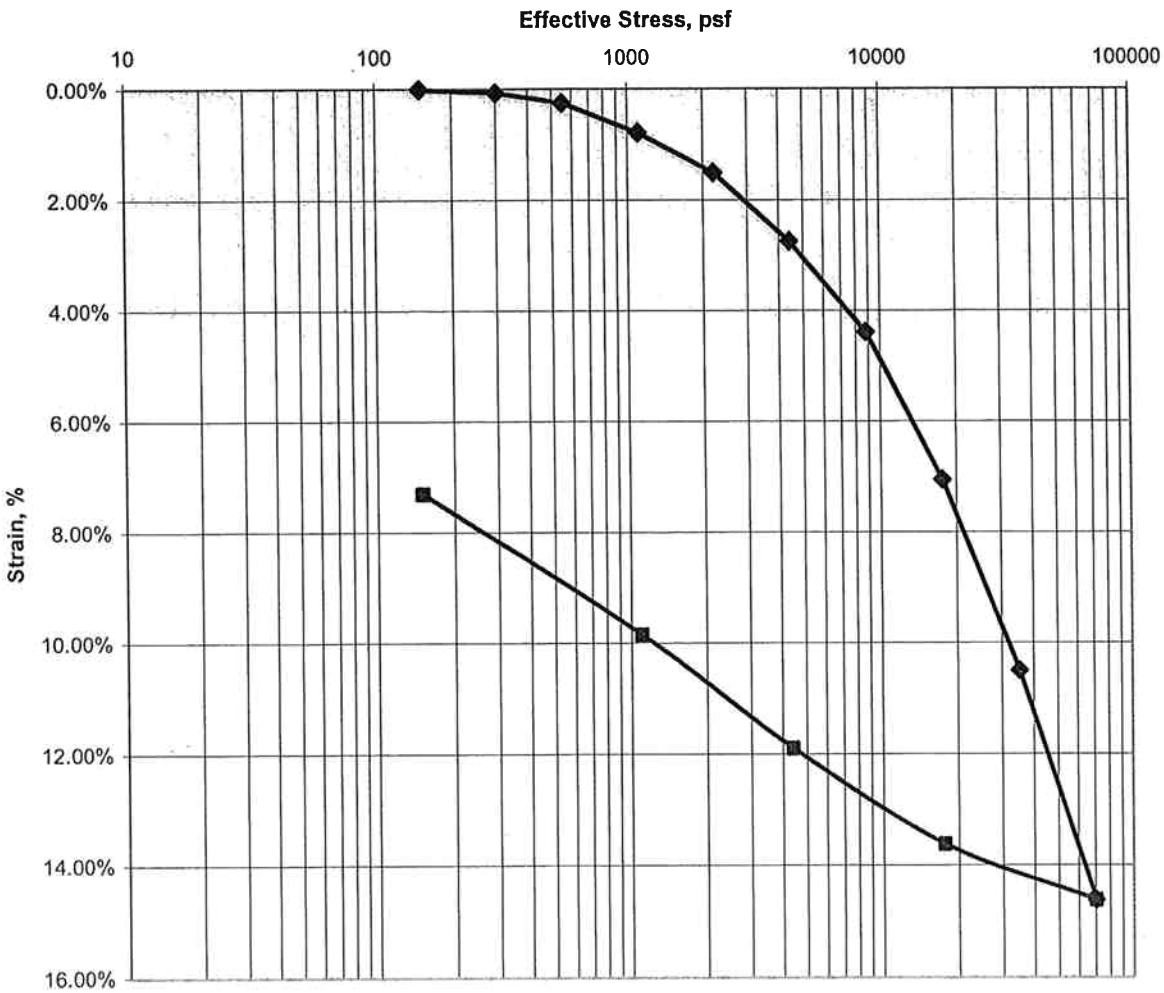
Ass. Gs = 2.75	Initial	Final
Moisture %:	28.1	26.6
Density, pcf:	96.7	99.3
Void Ratio:	0.776	0.729
% Saturation:	99.6	100

Remarks:

Consolidation Test

ASTM D2435

Job No.:	516-007	**Boring:**	RB-6	**Run By:**	MD
Client:	GeoLogic Associates	**Sample:**	9	**Reduced:**	MJ
Project:	Newby Island - 2004-049	**Depth, ft.:**	69	**Checked:**	PJ
Soil Type:	Brown Lean CLAY			**Date:**	1/18/2005

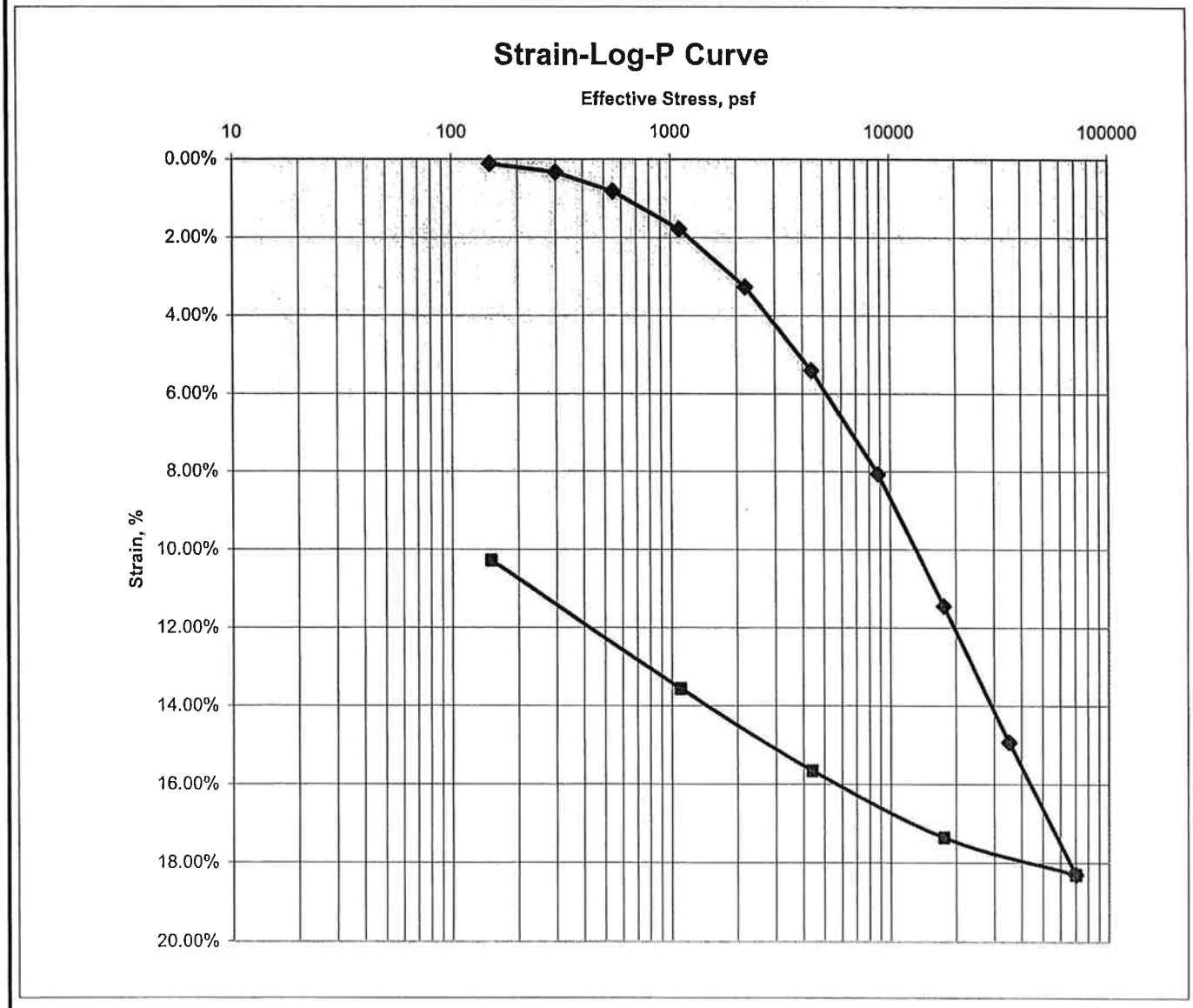


Ass. Gs = 2.75	Initial	Final
Moisture %:	24.9	21.5
Density, pcf:	101.5	108.1
Void Ratio:	0.691	0.589
% Saturation:	99.1	100

Remarks:

Consolidation Test
ASTM D2435

Job No.:	516-008b	**Boring:**	RB-2	**Run By:**	MD
Client:	GeoLogic Associates	**Sample:**	9	**Reduced:**	MJ
Project:	Newby Island - 2004-049	**Depth, ft.:**	45	**Checked:**	PJ
Soil Type:	Brown Sandy Lean CLAY			**Date:**	2/11/2005



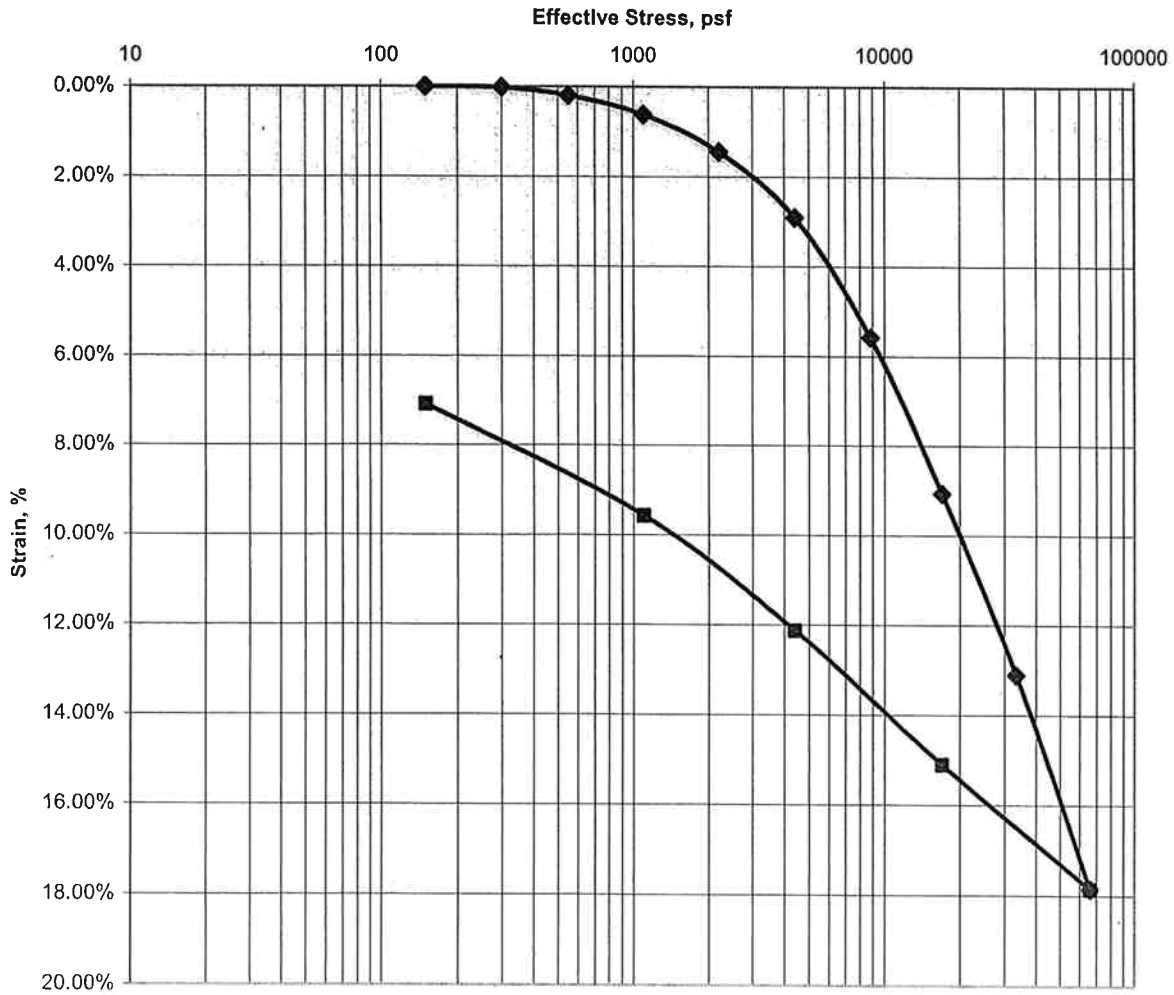
Ass. Gs = 2.75	Initial	Final
Moisture %:	23.0	18.6
Density, pcf:	102.6	113.6
Void Ratio:	0.673	0.512
% Saturation:	94.0	100

Remarks:

Consolidation Test

ASTM D2435

Job No.:	516-011a	**Boring:**	RB-10, Sta. 30+00	**Run By:**	MD
Client:	Geologic Associates	**Sample:**	10/3	**Reduced:**	MJ
Project:	Newby Island Landfill; Phase II Borings - 2004-049	**Depth, ft.:**	33-35.5	**Checked:**	PJ
Soil Type:	Brown Lean CLAY			**Date:**	9/20/2005



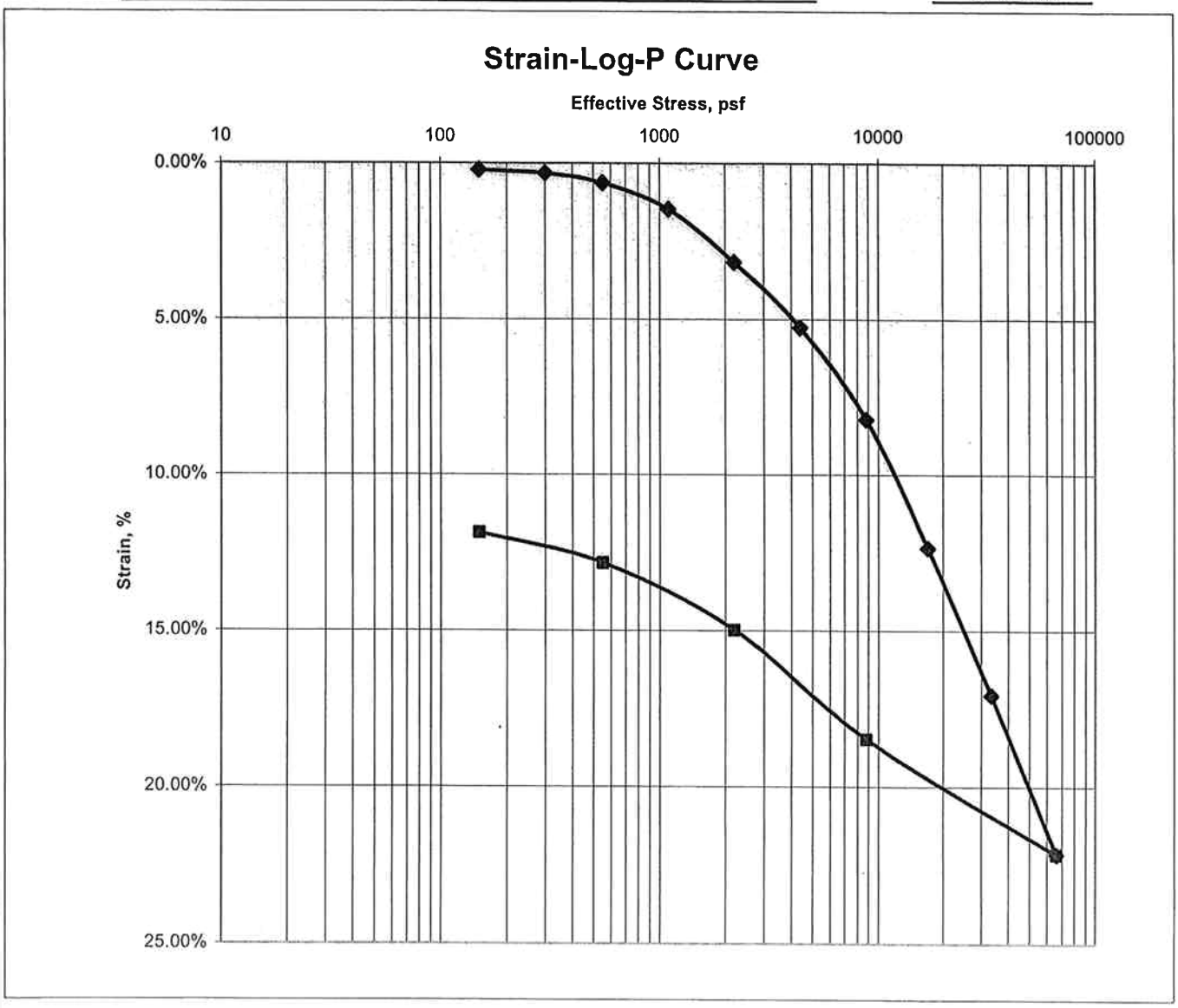
Ass. Gs = 2.74	Initial	Final
Moisture %:	27.7	25.7
Dry Density, pcf:	97.2	100.5
Void Ratio:	0.761	0.702
% Saturation:	99.8	100

Remarks:

Consolidation Test

ASTM D2435

Job No.:	516-011b	**Boring:**	RB-10, Sta. 30+00	**Run By:**	MD
Client:	Geologic Associates	**Sample:**	10/4	**Reduced:**	MJ
Project:	Newby Island Landfill; Phase II Borings - 2004-049	**Depth, ft.:**	44-46.5	**Checked:**	PJ
Soil Type:	Brown Lean CLAY			**Date:**	9/20/2005

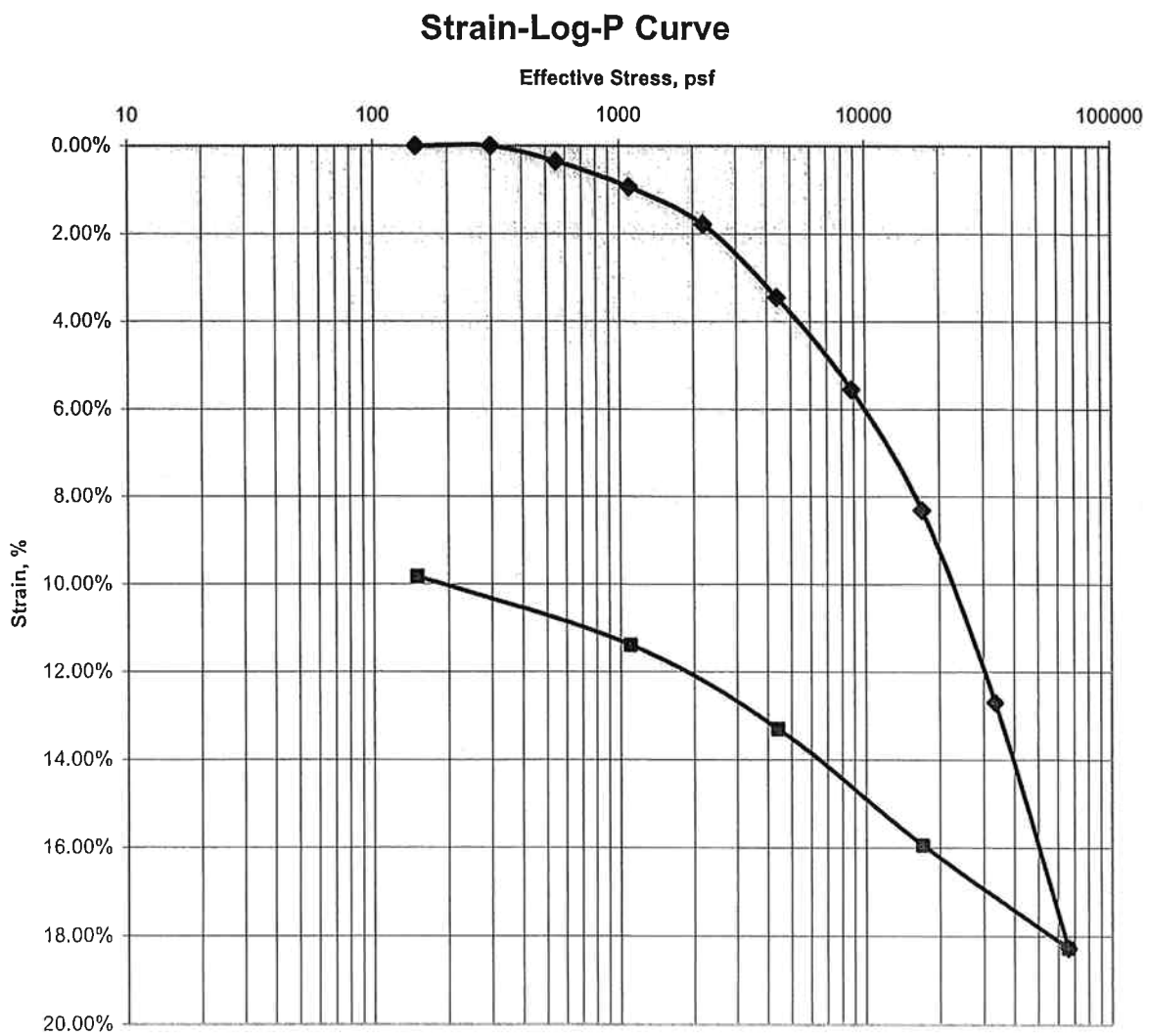


Ass. Gs = 2.74	Initial	Final
Moisture %:	28.7	25.3
Dry Density, pcf:	93.6	101.1
Void Ratio:	0.828	0.692
% Saturation:	94.9	100

Remarks:

Consolidation Test
ASTM D2435

Job No.:	516-011c	**Boring:**	RB-10, Sta. 30+00	**Run By:**	MD
Client:	Geologic Associates	**Sample:**	10/5	**Reduced:**	MJ
Project:	Newby Island Landfill; Phase II Borings - 2004-049	**Depth, ft.:**	53-55.5	**Checked:**	PJ
Soil Type:	Brown Lean CLAY			**Date:**	9/20/2005



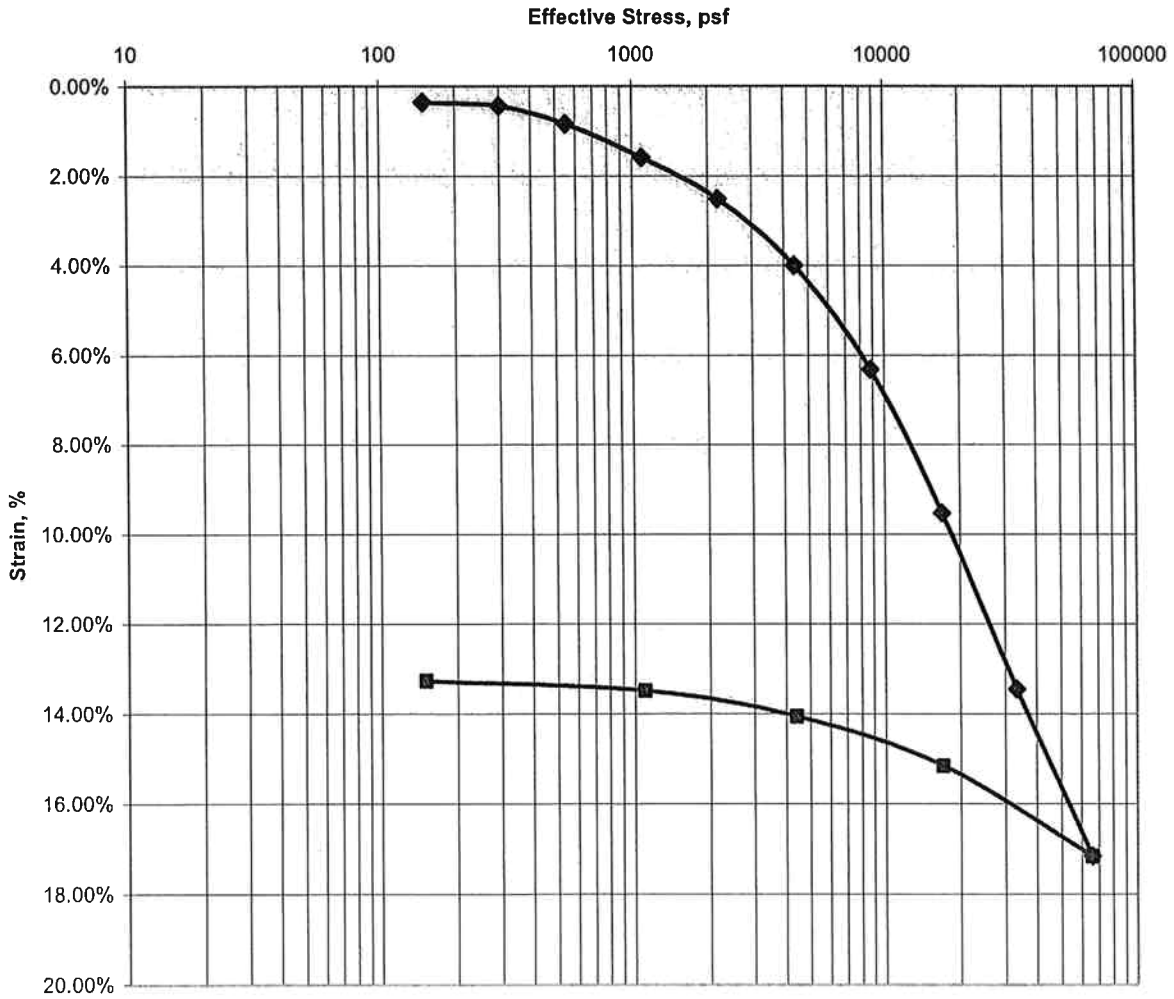
Ass. Gs = 2.74	Initial	Final
Moisture %:	26.6	23.9
Dry Density, pcf:	96.2	103.5
Void Ratio:	0.779	0.652
% Saturation:	93.6	100

Remarks:

Consolidation Test

ASTM D2435

Job No.:	516-011d	**Boring:**	RB-10Va, 30+00	**Run By:**	MD
Client:	Geologic Associates	**Sample:**	10Va/1	**Reduced:**	MJ
Project:	Newby Island Landfill; Phase II Borings - 2004-049	**Depth, ft.:**	61-63.5	**Checked:**	PJ
Soil Type:	Brown Lean CLAY w/ Sand			**Date:**	9/20/2005

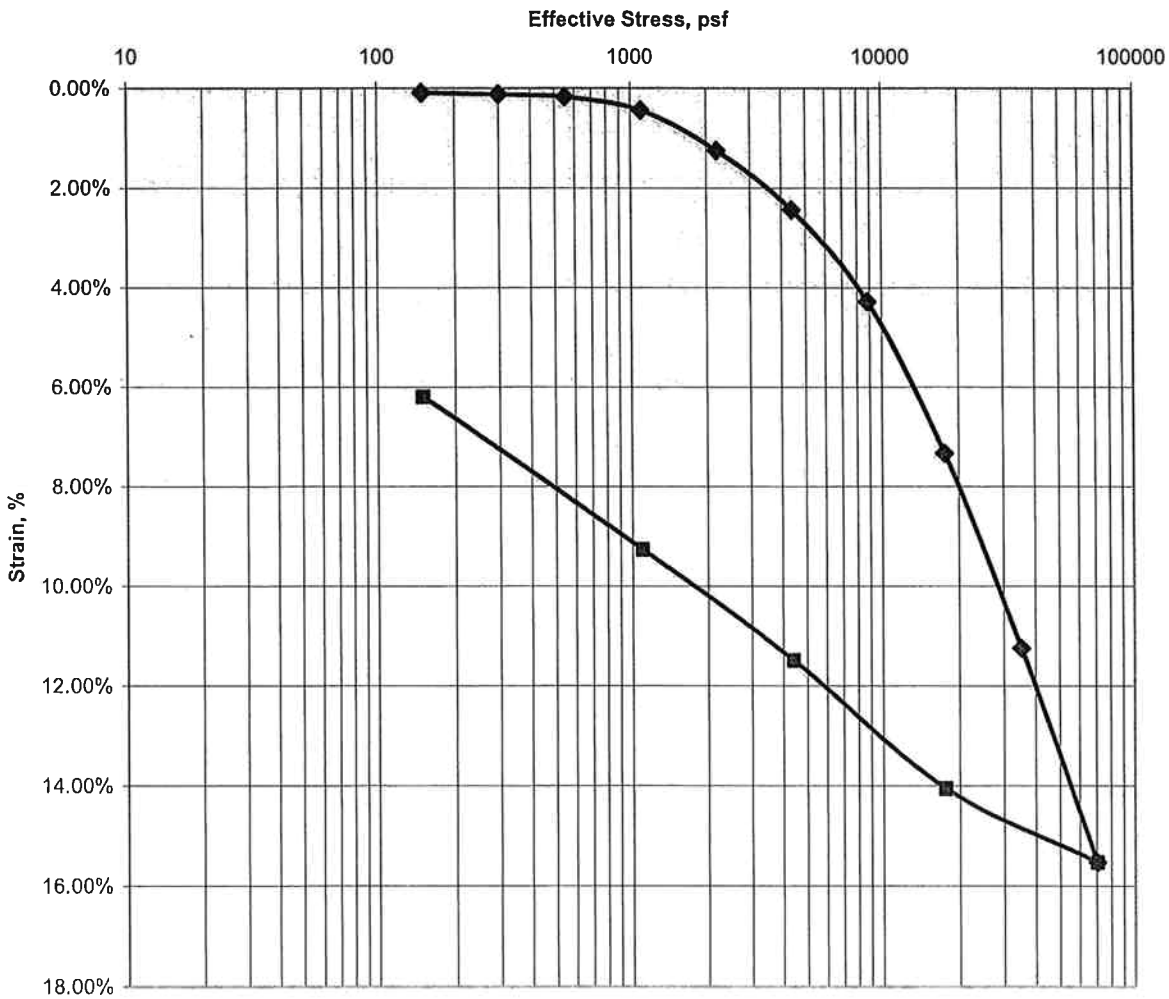


Ass. Gs = 2.74	Initial	Final
Moisture %:	21.9	16.7
Dry Density, pcf:	102.9	117.4
Void Ratio:	0.662	0.457
% Saturation:	90.6	100

Remarks:

Consolidation Test
ASTM D2435

Job No.:	516-011e	**Boring:**	RB-10Va, Ste 30+00	**Run By:**	MD
Client:	Geologic Associates	**Sample:**	10Va/2	**Reduced:**	MJ
Project:	Newby Island Landfill; Phase II Borings - 2004-049	**Depth, ft.:**	95-97.5	**Checked:**	PJ
Soil Type:	Greenish Gray Lean CLAY			**Date:**	9/20/2005



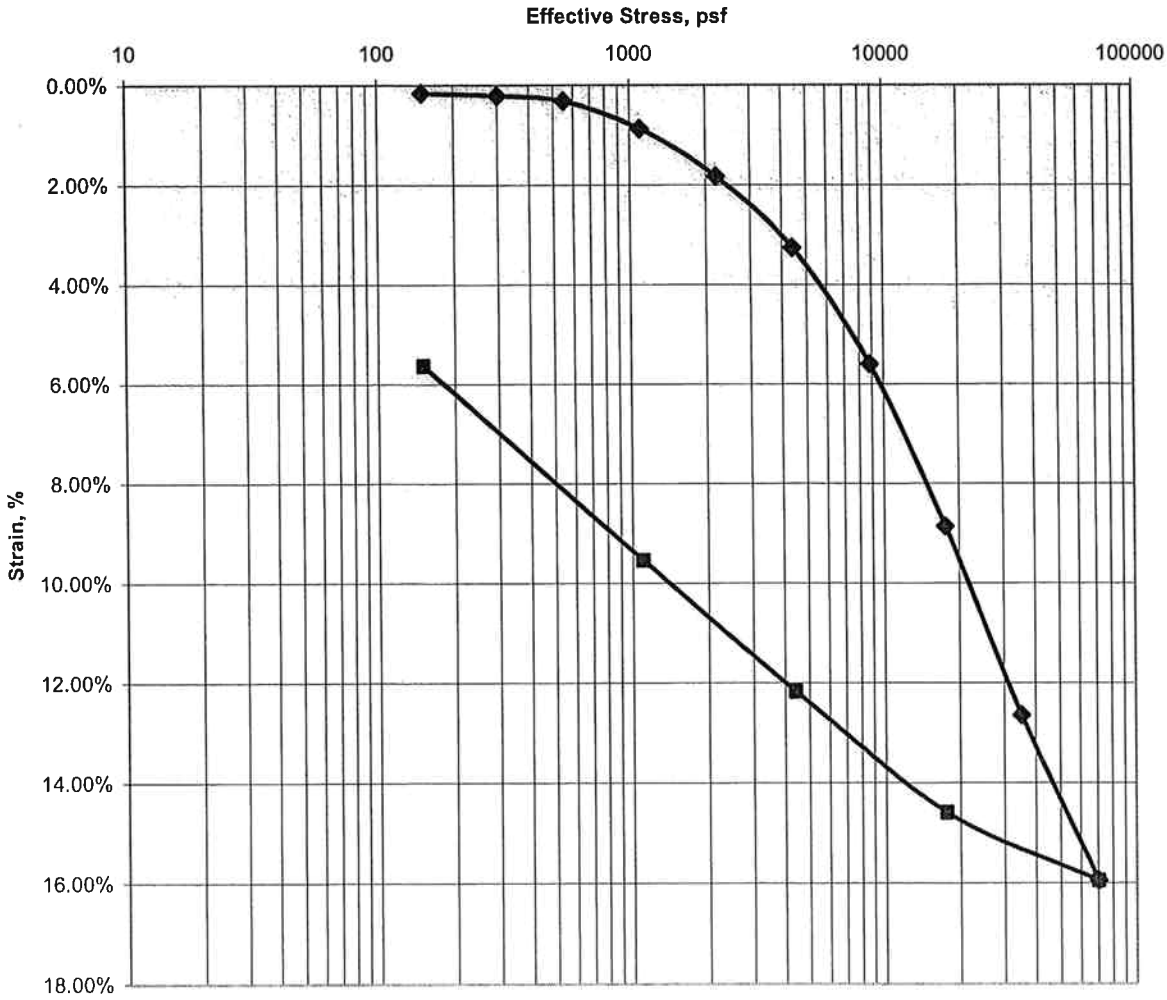
Ass. Gs = 2.74	Initial	Final
Moisture %:	25.5	23.5
Dry Density, pcf:	99.8	104.1
Void Ratio:	0.714	0.643
% Saturation:	97.9	100

Remarks:

Consolidation Test

ASTM D2435

Job No.:	516-011f	**Boring:**	RB-11V, 60+00	**Run By:**	MD
Client:	Geologic Associates	**Sample:**	11V/1	**Reduced:**	MJ
Project:	Newby Island Landfill; Phase II Borings - 2004-049	**Depth, ft.:**	45-47.5	**Checked:**	PJ
Soil Type:	Brown Lean CLAY (with Claystone)			**Date:**	9/20/2005



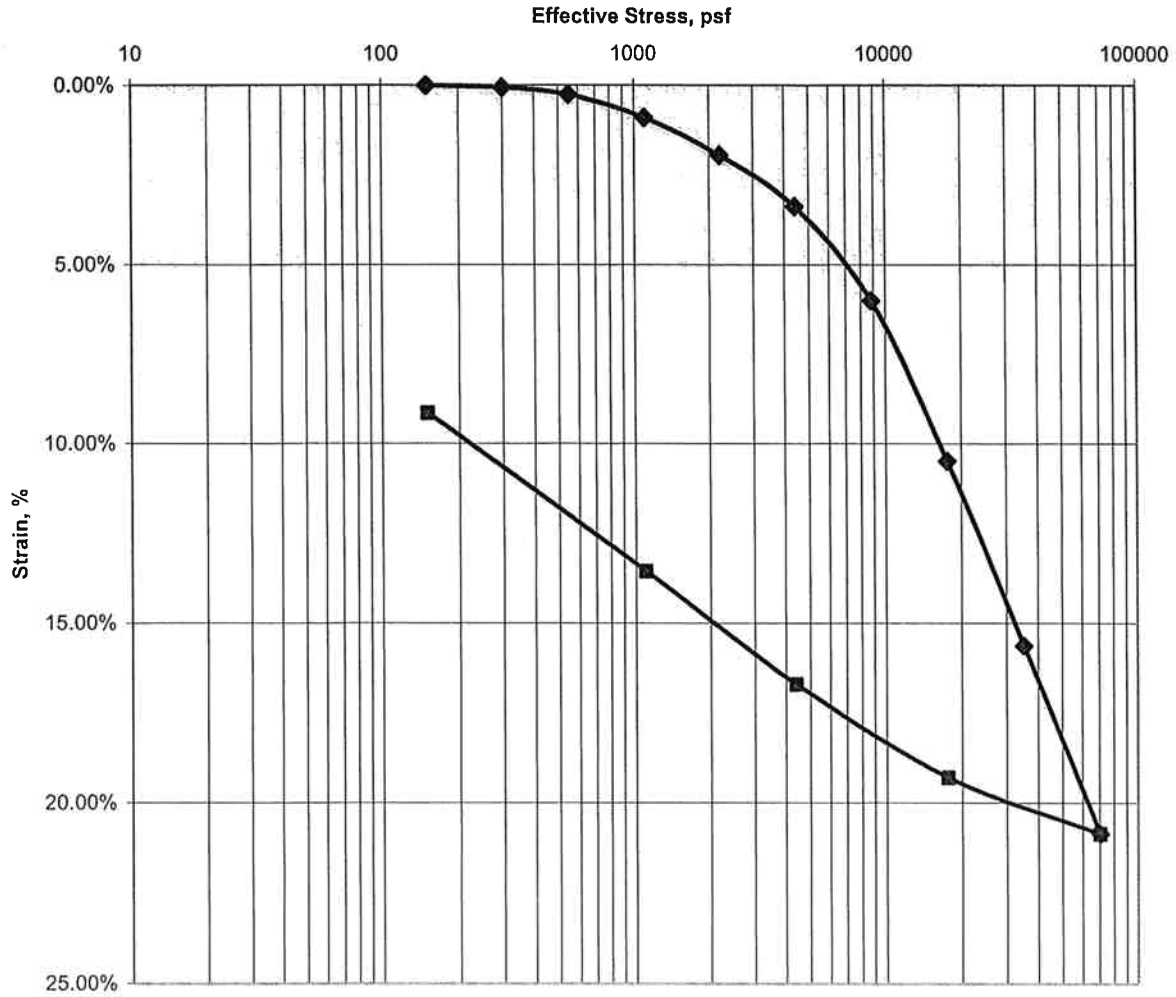
Ass. Gs = 2.74	Initial	Final
Moisture %:	23.5	22.8
Dry Density, pcf:	101.6	105.4
Void Ratio:	0.683	0.622
% Saturation:	94.3	100

Remarks:

Consolidation Test

ASTM D2435

Job No.:	516-011g	**Boring:**	RB11V, Sta. 60+00	**Run By:**	MD
Client:	Geologic Associates	**Sample:**	11/V2	**Reduced:**	MJ
Project:	Newby Island Landfill; Phase II Borings - 2004-049	**Depth, ft.:**	71.5-74	**Checked:**	PJ
Soil Type:	Brown Lean CLAY			**Date:**	9/20/2005



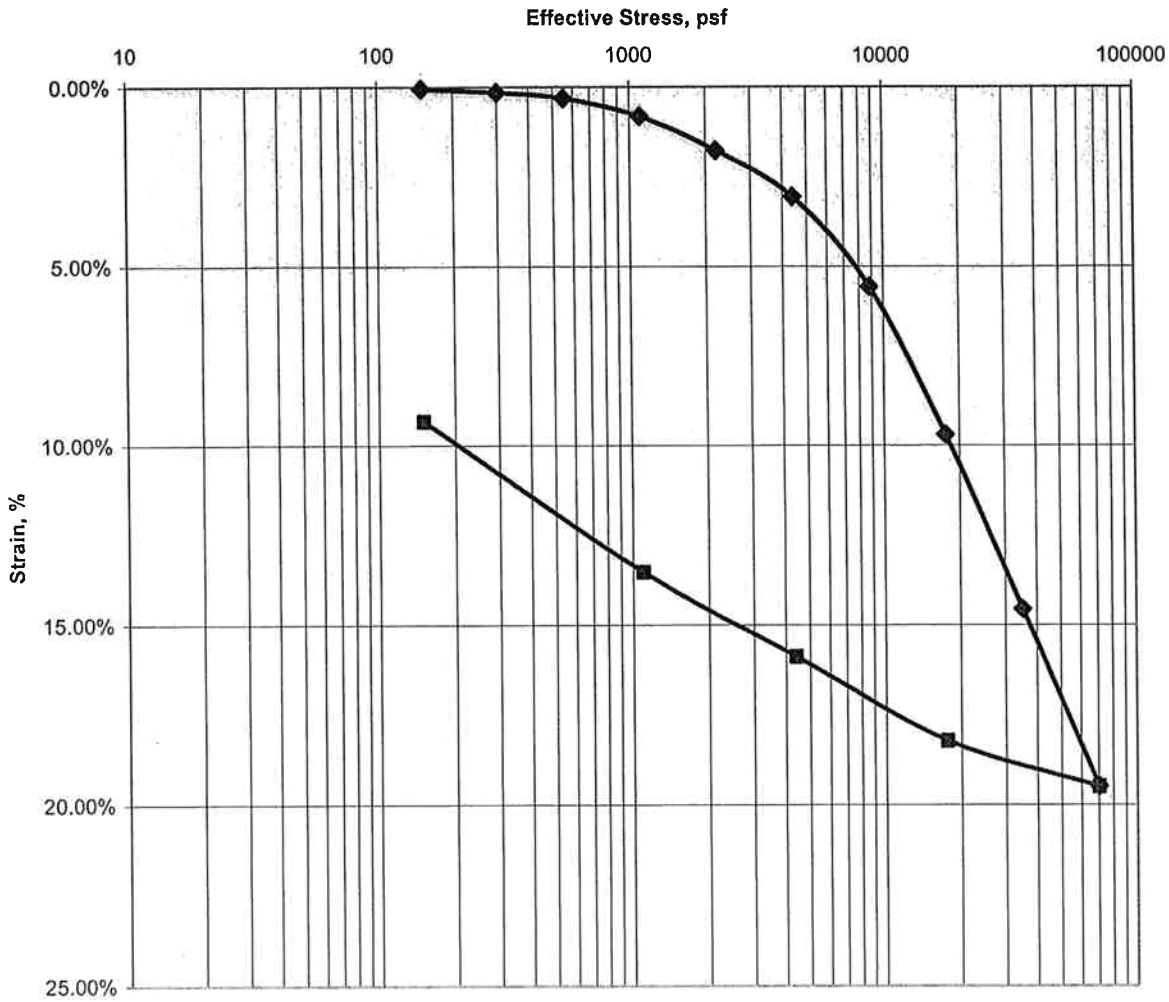
Ass. Gs = 2.74	Initial	Final
Moisture %:	34.3	29.2
Dry Density, pcf:	88.1	95.2
Void Ratio:	0.942	0.797
% Saturation:	99.9	100

Remarks:

Consolidation Test

ASTM D2435

Job No.:	516-011h	**Boring:**	RB-11V, Sta. 60+00	**Run By:**	MD
Client:	Geologic Associates	**Sample:**	11V/3	**Reduced:**	MJ
Project:	Newby Island Landfill; Phase II Borings - 2004-049	**Depth, ft.:**	85-87.5	**Checked:**	PJ
Soil Type:	Gray Lean CLAY			**Date:**	9/21/2005

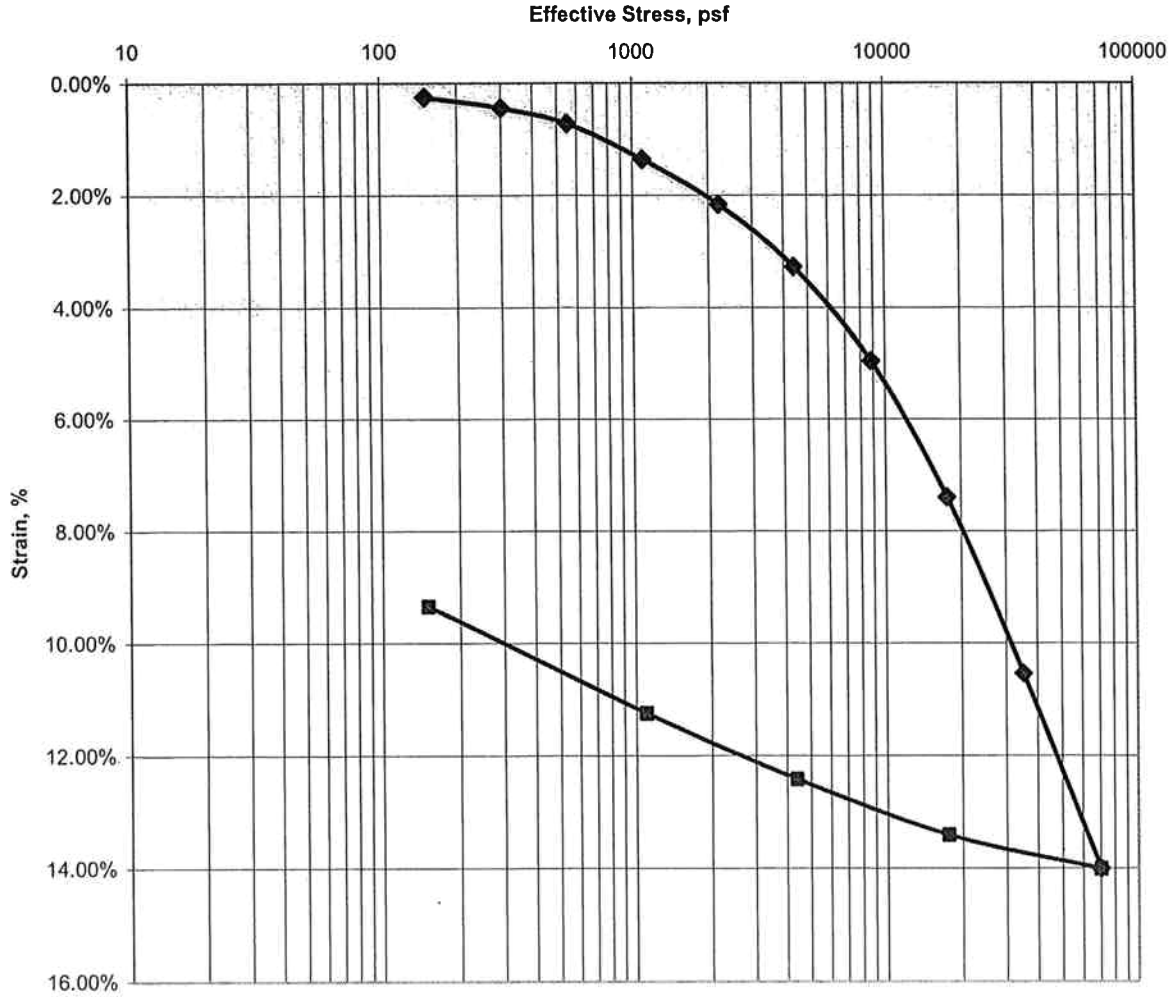


Ass. Gs = 2.74	Initial	Final
Moisture %:	31.8	26.6
Dry Density, pcf:	90.6	99.0
Void Ratio:	0.889	0.728
% Saturation:	98.0	100

Remarks:

Consolidation Test
ASTM D2435

Job No.:	516-011i	**Boring:**	RB-12V, Sta. 125+00	**Run By:**	MD
Client:	Geologic Associates	**Sample:**	12V/1	**Reduced:**	MJ
Project:	Newby Island Landfill; Phase II Borings - 2004-049	**Depth, ft.:**	70-72.5	**Checked:**	PJ
Soil Type:	Brown SILTY CLAY			**Date:**	9/20/2005



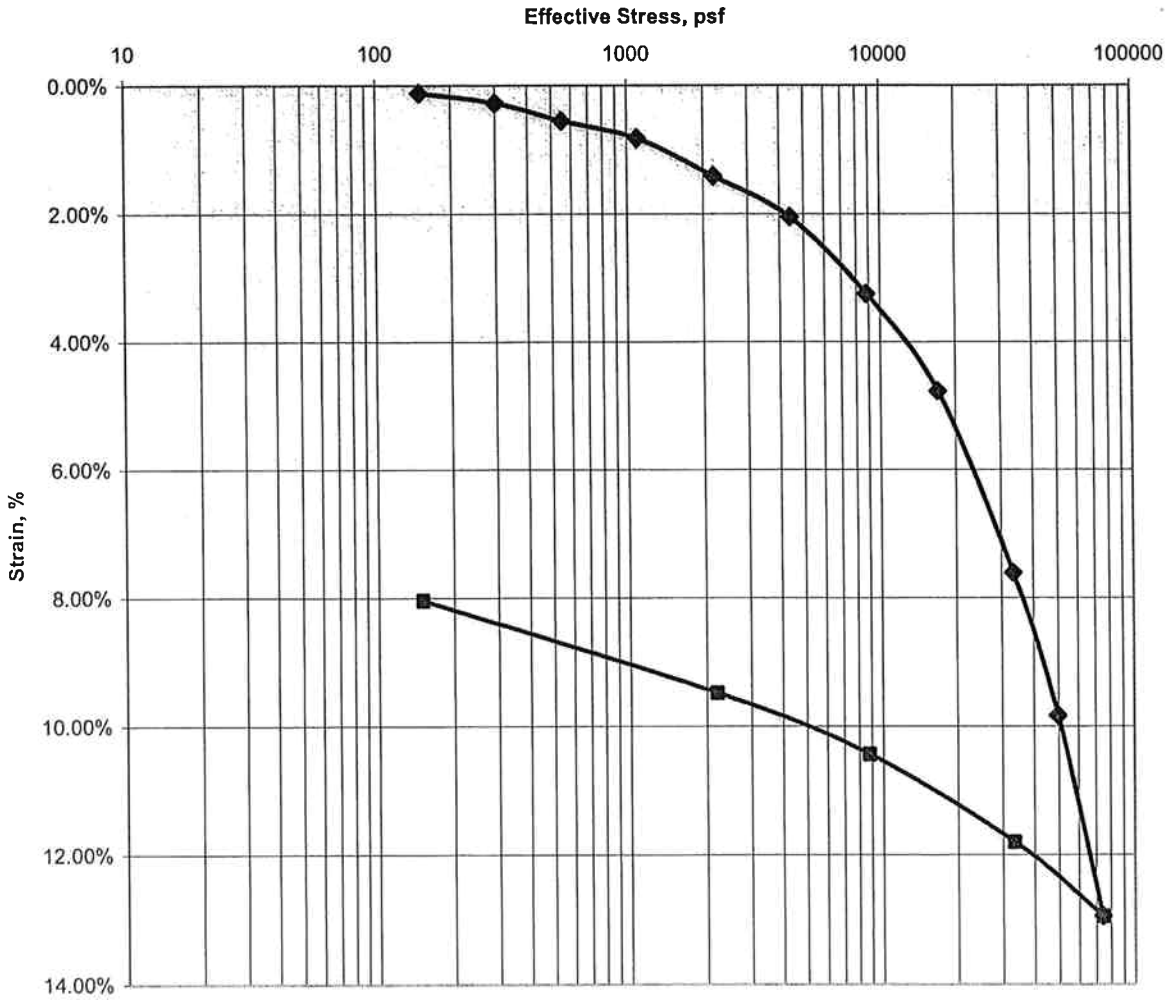
Ass. Gs = 2.74	Initial	Final
Moisture %:	24.3	19.6
Dry Density, pcf:	101.7	111.3
Void Ratio:	0.682	0.536
% Saturation:	97.7	100

Remarks:

Consolidation Test

ASTM D2435

Job No.:	516-011J	**Boring:**	RB-12V, Sta. 125+00	**Run By:**	MD
Client:	Geologic Associates	**Sample:**	12V/2	**Reduced:**	MJ
Project:	Newby Island Landfill; Phase II Borings - 2004-049	**Depth, ft.:**	88-90.5	**Checked:**	PJ
Soil Type:	Brown SILT			**Date:**	9/20/2005



Ass. Gs = 2.74	Initial	Final
Moisture %:	23.4	20.3
Dry Density, pcf:	103.0	110.1
Void Ratio:	0.660	0.554
% Saturation:	97.2	100

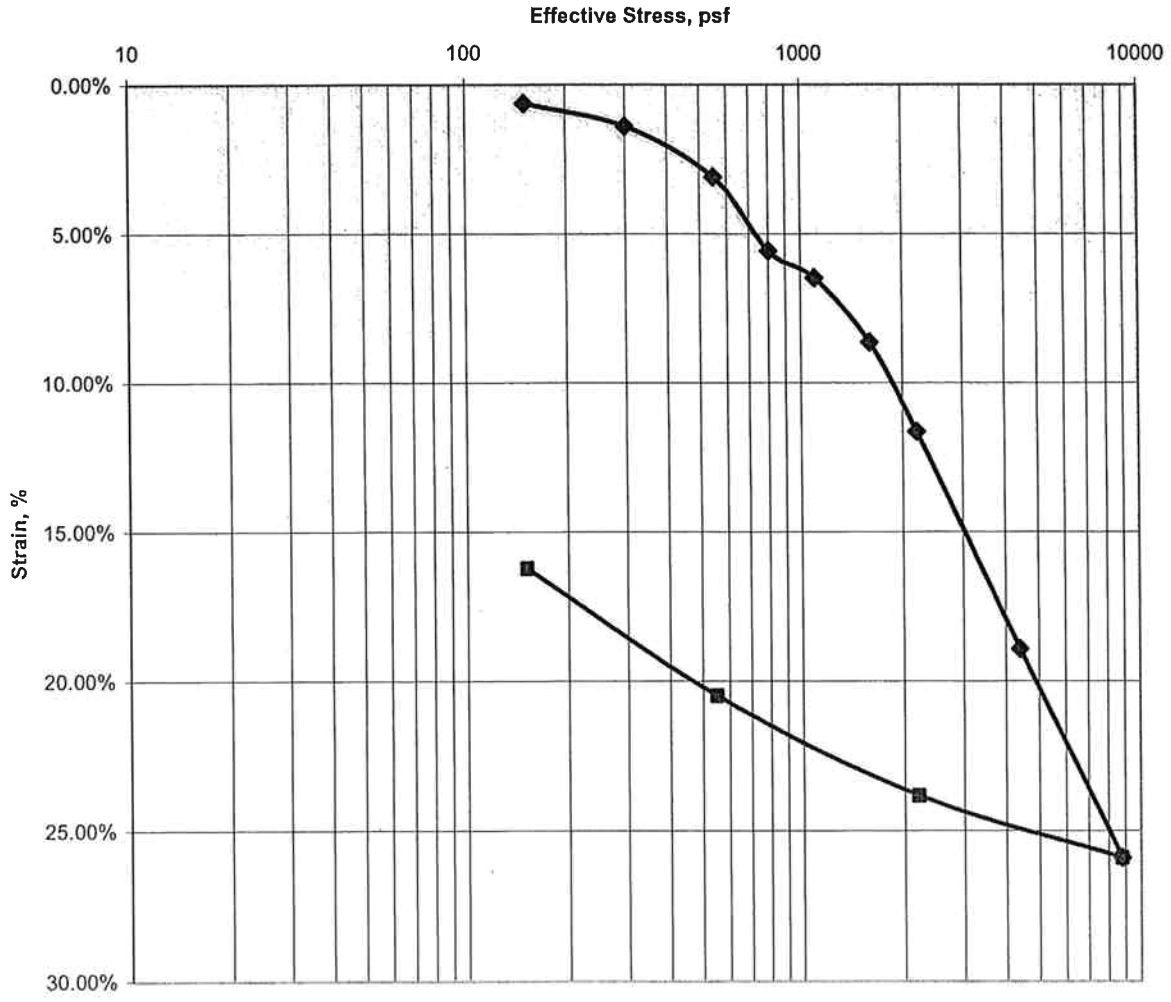
Remarks:

Consolidation Test

ASTM D2435

Job No.:	516-011k	**Boring:**	RB-12Va, Sta. 125+00	**Run By:**	MD
Client:	Geologic Associates	**Sample:**	12Va/1	**Reduced:**	MJ
Project:	Newby Island Landfill; Phase II Borings - 2004-049	**Depth, ft.:**	29-31.5	**Checked:**	PJ
Soil Type:	Gray Fat CLAY			**Date:**	9/22/2005

Strain-Log-P Curve



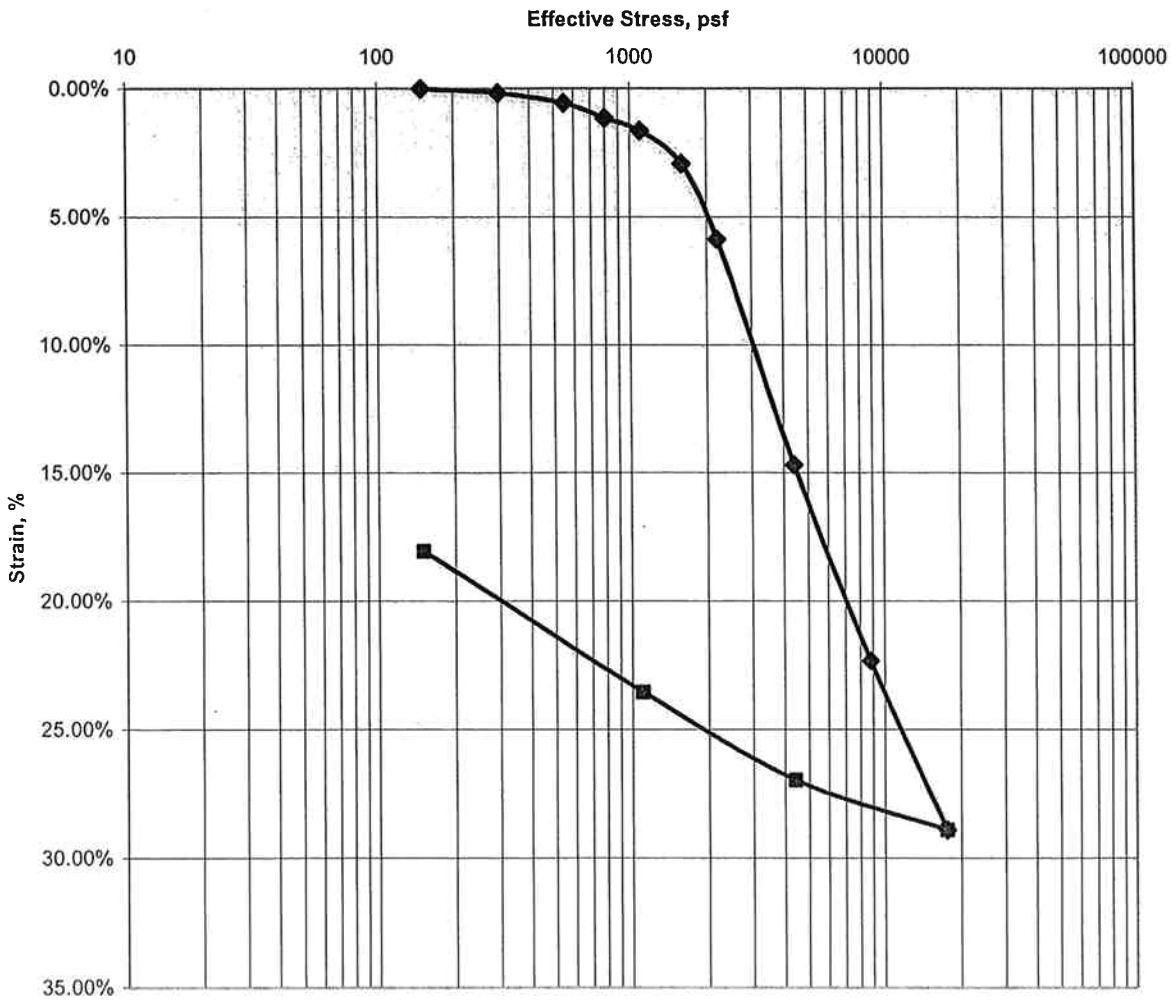
Ass. Gs = 2.77	Initial	Final
Moisture %:	66.0	50.1
Dry Density, pcf:	61.0	72.5
Void Ratio:	1.837	1.385
% Saturation:	99.6	100

Remarks: This sample exhibited odd behavior on the 550, 800, and 1100 psf points. This could be due to a void in the sample collapsing or it could be that it was hanging up somewhere. There was not enough undisturbed material left to rerun this test.

Consolidation Test

ASTM D2435

Job No.:	516-011L	**Boring:**	RB-12-Va, 125+00	**Run By:**	MD
Client:	Geologic Associates	**Sample:**	12Va/2	**Reduced:**	MJ
Project:	Newby Island Landfill; Phase II Borings - 2004-049	**Depth, ft.:**	31.5-34	**Checked:**	PJ
Soil Type:	Gray CLAY			**Date:**	9/20/2005



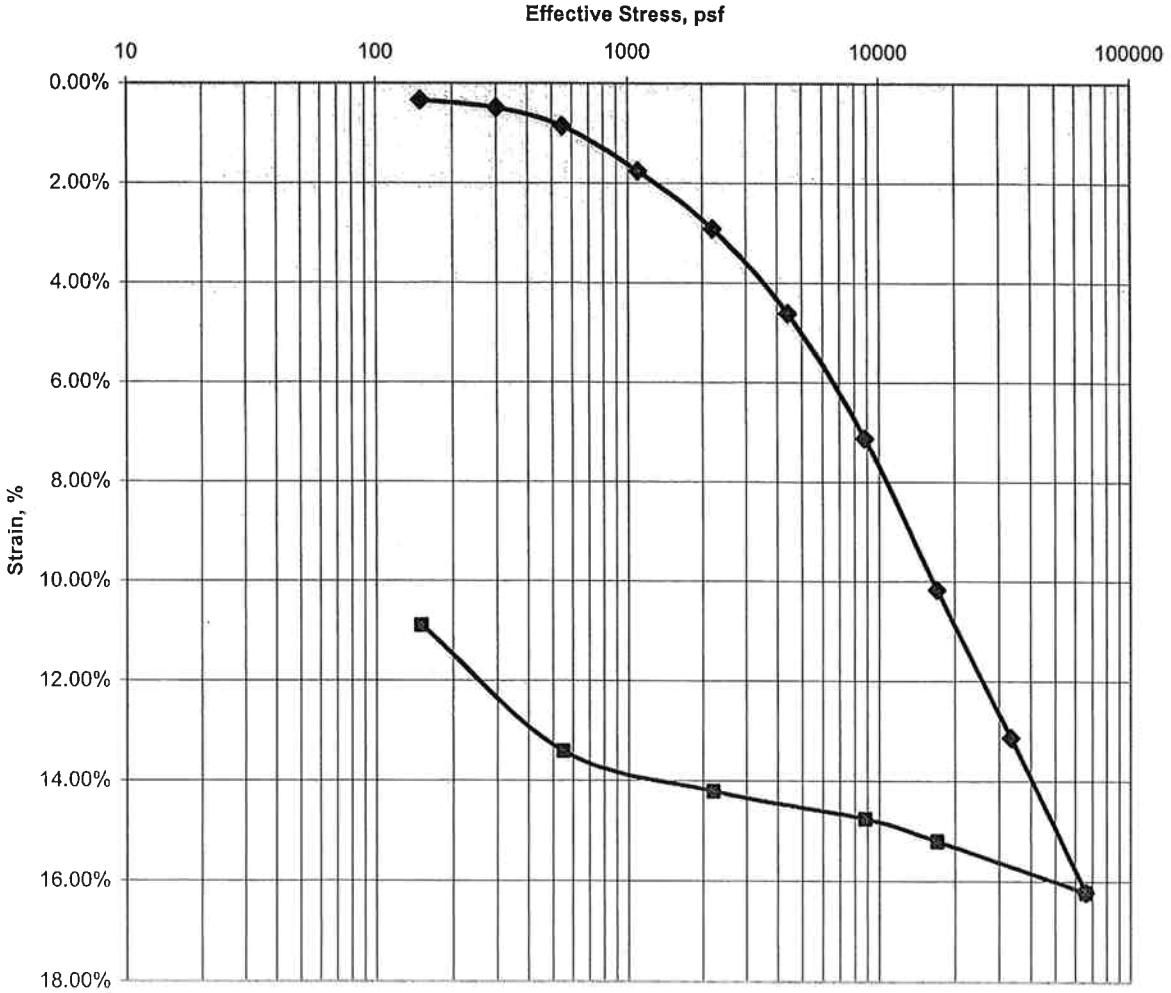
Ass. Gs = 2.76	Initial	Final
Moisture %:	60.9	43.9
Dry Density, pcf:	64.0	78.0
Void Ratio:	1.691	1.210
% Saturation:	99.4	100

Remarks:

Consolidation Test

ASTM D2435

Job No.:	516-011m	**Boring:**	RB-12Va, Sta. 125+00	**Run By:**	MD
Client:	Geologic Associates	**Sample:**	12Va/4	**Reduced:**	MJ
Project:	Newby Island Landfill; Phase II Borings - 2004-049	**Depth, ft.:**	38.5-41	**Checked:**	PJ
Soil Type:	Brown Sandy Lean CLAY			**Date:**	9/20/2005



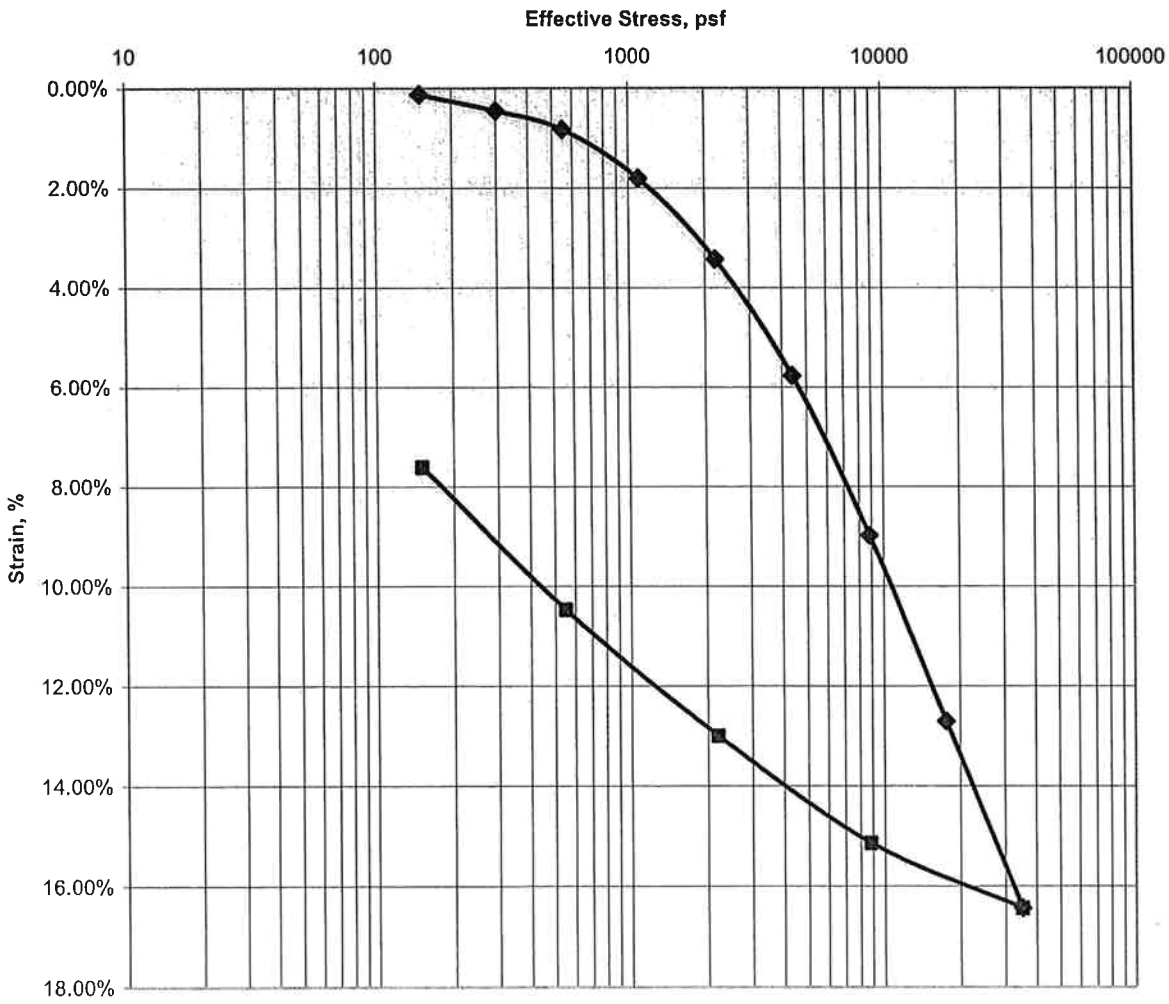
Ass. Gs = 2.74	Initial	Final
Moisture %:	22.9	18.7
Dry Density, pcf:	101.3	113.1
Void Ratio:	0.689	0.512
% Saturation:	91.1	100

Remarks: The rebound data is approximate due to equipment problems on the first two rebound points.

Consolidation Test

ASTM D2435

Job No.:	516-011n	**Boring:**	RB-12Va, Sta. 125+00	**Run By:**	MD
Client:	Geologic Associates	**Sample:**	12Va/5	**Reduced:**	MJ
Project:	Newby Island Landfill; Phase II Borings - 2004-049	**Depth, ft.:**	50-52.5	**Checked:**	PJ
Soil Type:	Brown Lean CLAY			**Date:**	9/20/2005



Ass. Gs = 2.74	Initial	Final
Moisture %:	26.1	23.5
Dry Density, pcf:	96.8	104.2
Void Ratio:	0.767	0.642
% Saturation:	93.1	100

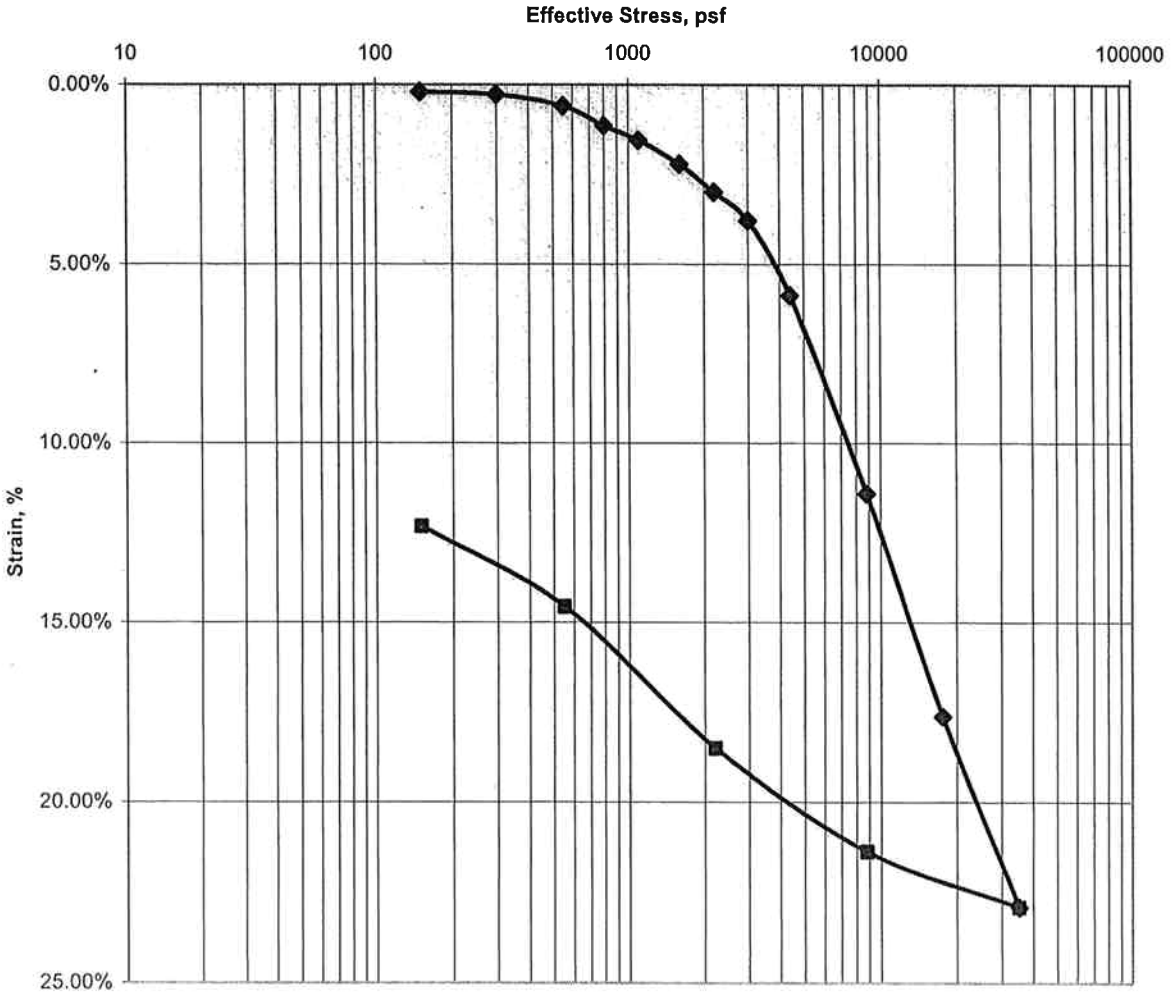
Remarks:

Consolidation Test

ASTM D2435

Job No.:	516-011o	**Boring:**	RB-13V, Sta. 40+00	**Run By:**	MD
Client:	Geologic Associates	**Sample:**	13V/1	**Reduced:**	MJ
Project:	Newby Island Landfill; Phase II Borings - 2004-049	**Depth, ft.:**	22.5-25	**Checked:**	PJ
Soil Type:	Gray Fat CLAY, trace Sand pockets			**Date:**	9/20/2005

Strain-Log-P Curve



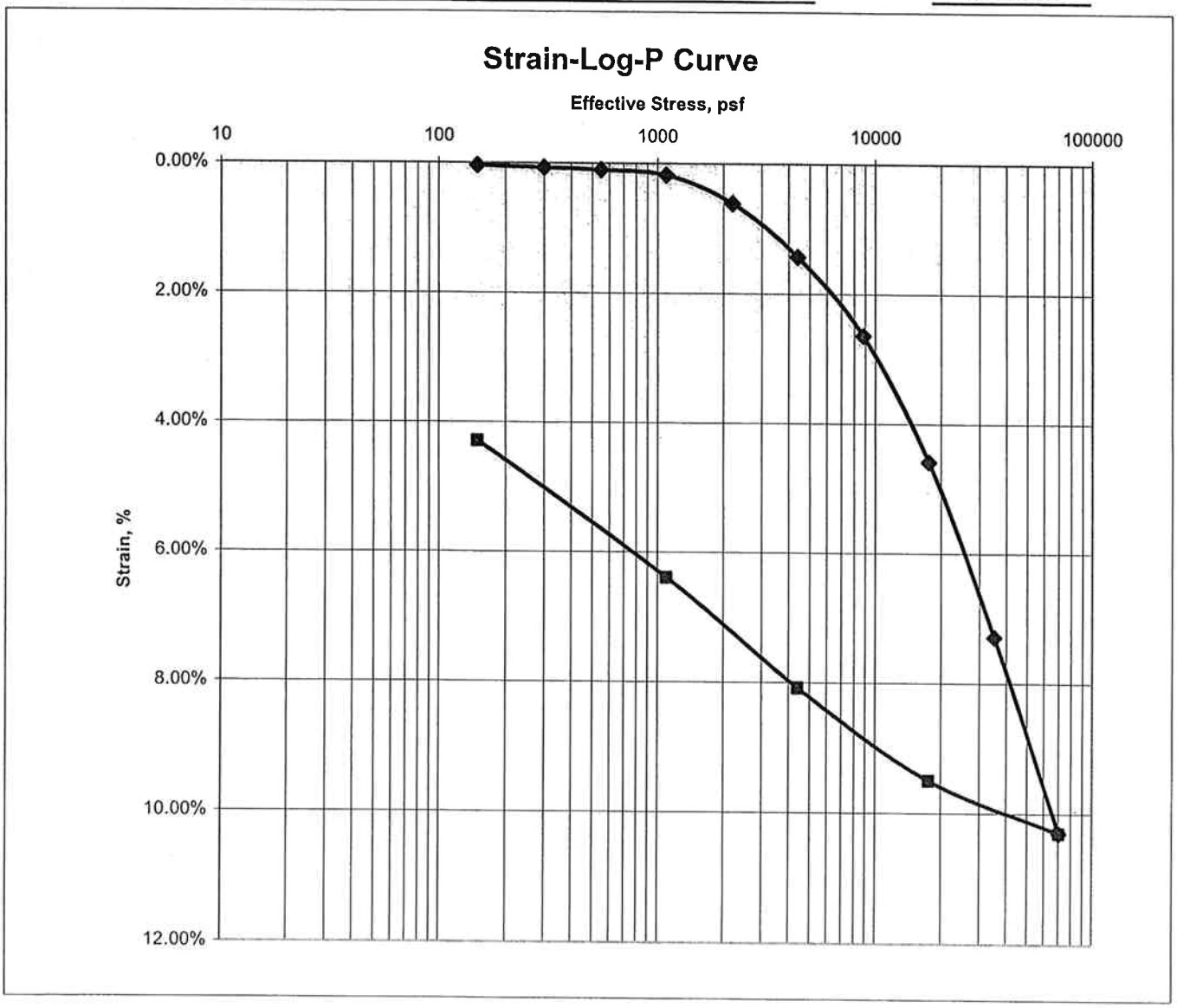
Ass. Gs = 2.75	Initial	Final
Moisture %:	39.2	31.1
Dry Density, pcf:	81.8	92.7
Void Ratio:	1.100	0.852
% Saturation:	98.1	100

Remarks:

Consolidation Test

ASTM D2435

Job No.:	516-011p	**Boring:**	RB-13V, Sta. 40+00	**Run By:**	MD
Client:	Geologic Associates	**Sample:**	13V/2	**Reduced:**	MJ
Project:	Newby Island Landfill; Phase II Borings - 2004-049	**Depth, ft.:**	31-33.5	**Checked:**	PJ
Soil Type:	Brown CLAY, trace Sand			**Date:**	9/20/2005



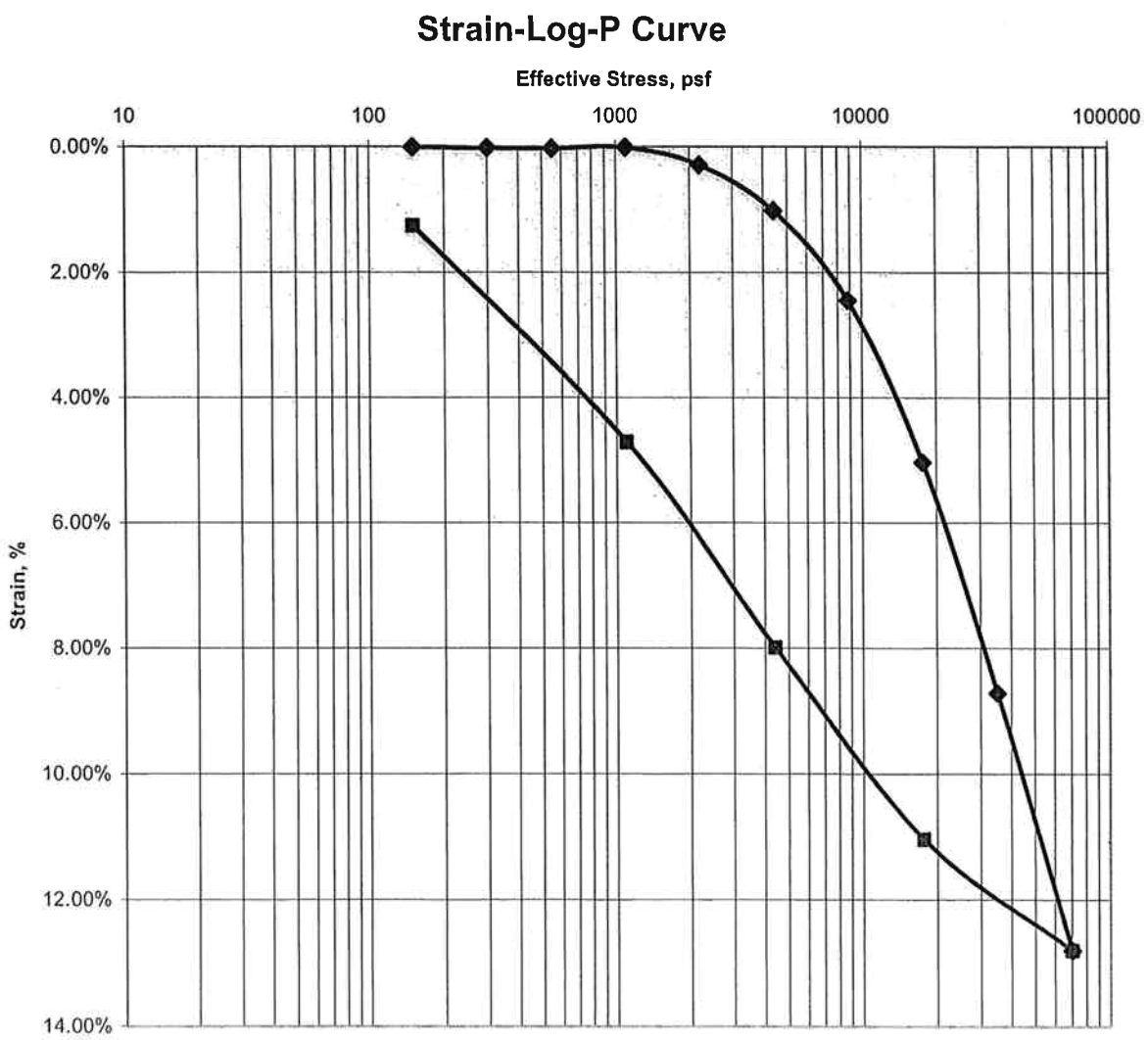
Ass. Gs = 2.74	Initial	Final
Moisture %:	18.8	18.2
Dry Density, pcf:	111.2	114.3
Void Ratio:	0.538	0.497
% Saturation:	95.6	100

Remarks:

Consolidation Test

ASTM D2435

Job No.:	516-011q	**Boring:**	LPZ-1, Sta. 106+50	**Run By:**	MD
Client:	Geologic Associates	**Sample:**	LPZ-1/1	**Reduced:**	MJ
Project:	Newby Island Landfill; Phase II Borings - 2004-049	**Depth, ft.:**	94.5-97	**Checked:**	PJ
Soil Type:	Brown Fat CLAY			**Date:**	9/20/2005

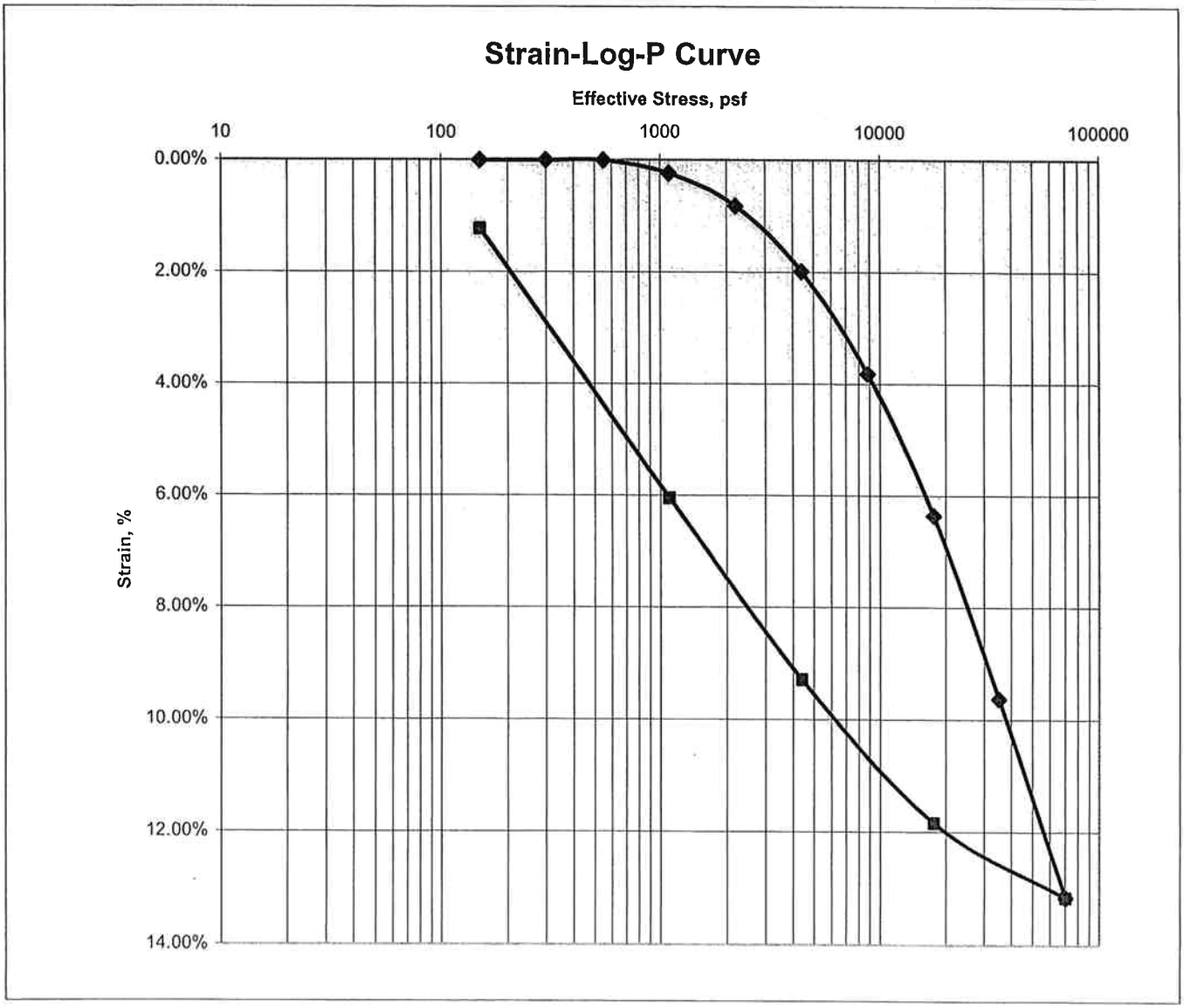


Ass. Gs = 2.74	Initial	Final
Moisture %:	22.8	23.5
Dry Density, pcf:	105.1	104.1
Void Ratio:	0.627	0.643
% Saturation:	99.6	100

Remarks: This sample exhibited a tendency to swell.

Consolidation Test
ASTM D2435

Job No.:	516-011r	**Boring:**	LPZ-2, 129+30	**Run By:**	MD
Client:	Geologic Associates	**Sample:**	LPZ-2/1	**Reduced:**	MJ
Project:	Newby Island Landfill; Phase II Borings - 2004-049	**Depth, ft.:**	120-122.5	**Checked:**	PJ
Soil Type:	Brown Lean CLAY			**Date:**	9/20/2005



Ass. Gs = 2.8	Initial	Final
Moisture %:	22.8	23.0
Dry Density, pcf:	105.4	106.4
Void Ratio:	0.659	0.642
% Saturation:	97.0	100

Remarks: This sample exhibited a tendency to swell.

LABORATORY DATA

- **Consolidation Time Test**

2004-049 Newby Island Landfill
12/22/2005 RMW

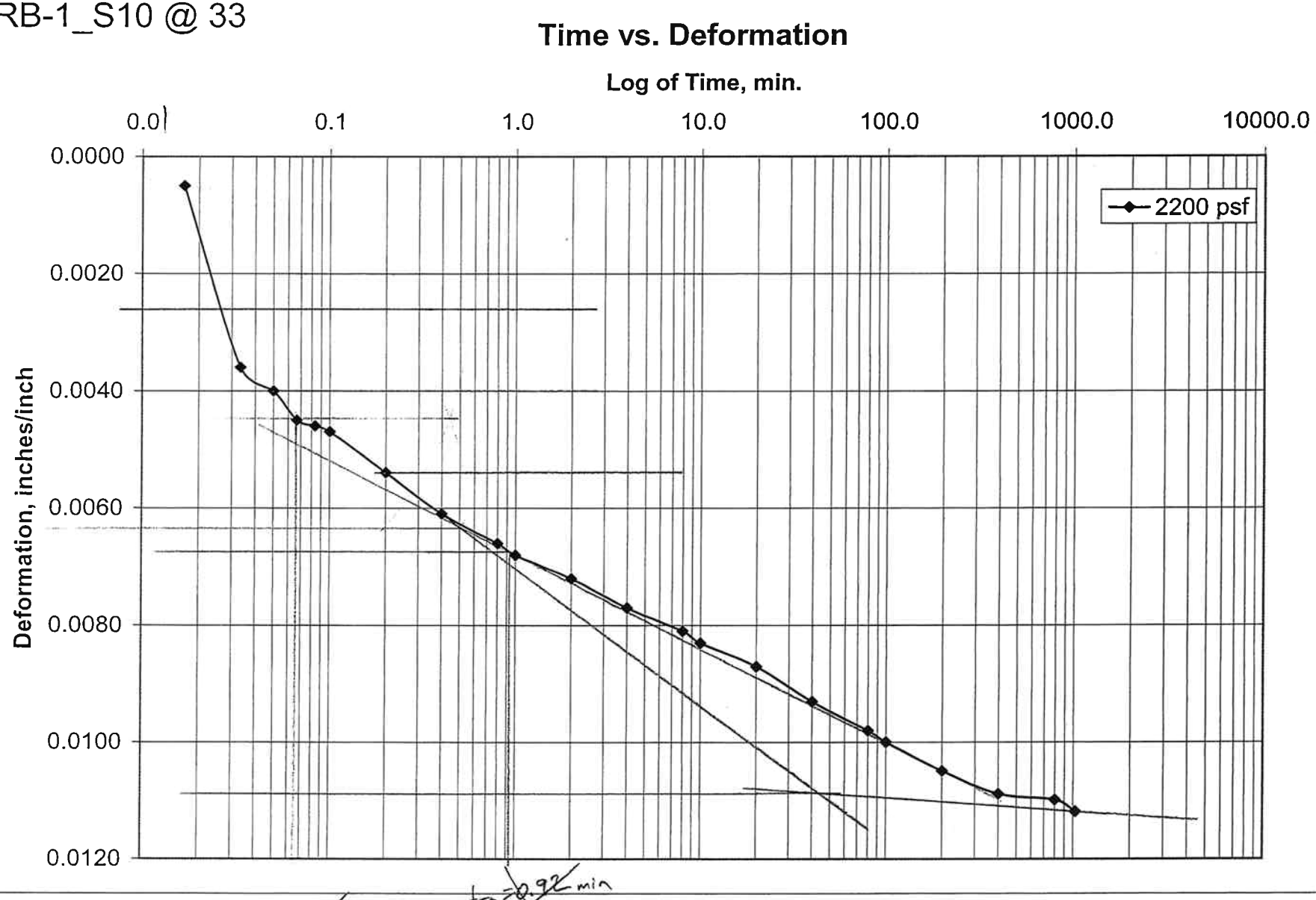
Soil Time Consolidation Summary

									Casagrande Log-Time Method				Taylor Square-Root Time Method			
									Load Increment (psf)				Load Increment (psf)			
									2,200	4,400	8,800	17,600	2,200	4,400	8,800	17,600
Boring	Sample	Sample Depth (ft)	Station Location	Boring Elevation (ft)	Sample Elevation (ft)	Material	Precon-solida-tion Pressure P_p (psf)	In-Situ Eff. Stress P_o (psf)	C_v (in^2/yr)	C_v (in^2/yr)	C_v (in^2/yr)	C_v (in^2/yr)	C_v (in^2/yr)	C_v (in^2/yr)	C_v (in^2/yr)	C_v (in^2/yr)
LPZ-2	1	120	129+30	106	-14	OBA	9,100	7,800	22.5	15.0	12.8	11.2				
LPZ-1	1	94.5	106+50	80	-14.5	OBA	11,700	5,700	99.9	21.4	8.2	5.0				
RB-1	10	33		15.5	-17.5	OBA	9,100	7,800	2767.4	2193.7	899.4	1058.1	1580.2	1209.9	1209.9	1209.9
RB-10	3	33	30+00	13.5	-19.5	OBA	9,500	2,440	81.8	54.5	50.0	30.0				
RB-13V	2	31	40+00	11	-20	OBA	13,300	2,560	209.2	128.5	99.9	75.0				
RB-6	4	41		21	-20.0	OBA	11,700	5,700	75.0	51.4	31.6	25.3	106.2	75.6	56.6	46.1
RB-12Va	4	38.5	125+00	18	-20.5	OBA	5,400	2,800	1199.2	946.7	666.2	285.5				
RB-2	8	35		13.5	-21.5	OBA	4,600	3,080	54.5	21.4	14.5	9.0	80.6	53.6	20.1	10.5
RB-4	5	48		19	-29.0	OBA	9,500	2,440	78.2	75.0	33.9	16.8				
RB-11V	1	45	60+00	15	-30	OBA	6,500	3,900	359.8	163.5	199.9	66.6				
RB-10	4	44	30+00	13.5	-30.5	OBA	7,700	2,860	105.8	39.1	20.0	10.6				
RB-2	9	45		13.5	-31.5	OBA	4,400	3,680	179.9	99.9	56.2	27.3	175.6	98.8	56.6	26.6
RB-12Va	5	50	125+00	18	-32	OBA	4,300	3,540	257.0	138.4	69.2	23.7				
RB-10	5	53	30+00	13.5	-39.5	OBA	15,600	3,220	163.5	112.4	119.9	138.4				
RB-10Va	1	61	30+00	13.5	-47.5	OBA	7,600	3,600	1199.2	817.6	749.5	461.2				
RB-6	9	69		21	-48.0	OBA	13,300	2,560	185.4	272.5	304.9	149.9				
RB-12V	1	70	125+00	18	-52	OBA	10,900	5,260	5290.6	4733.7	5290.6	4497.0				
RB-11V	2	71.5	60+00	15	-56.5	OBA	8,600	5,100	499.7	391.0	281.1	179.9				
RB-7	9	59		0.5	-58.5	OBA	5,400	2,800								
RB-2	13	75		13.5	-61.5	OBA	11,600	5,340	128.5	310.1	149.9	62.0	193.6	267.9	146.4	86.0
RB-11V	3	85	60+00	15	-70	OBA	8,700	5,840	272.5	206.8	128.5	81.8				
RB-12V	2	88	125+00	18	-70	OBA	23,300	5,920								
RB-10Va	2	95	30+00	13.5	-81.5	OBA	11,600	5,340	119.9	39.4	29.6	45.0				

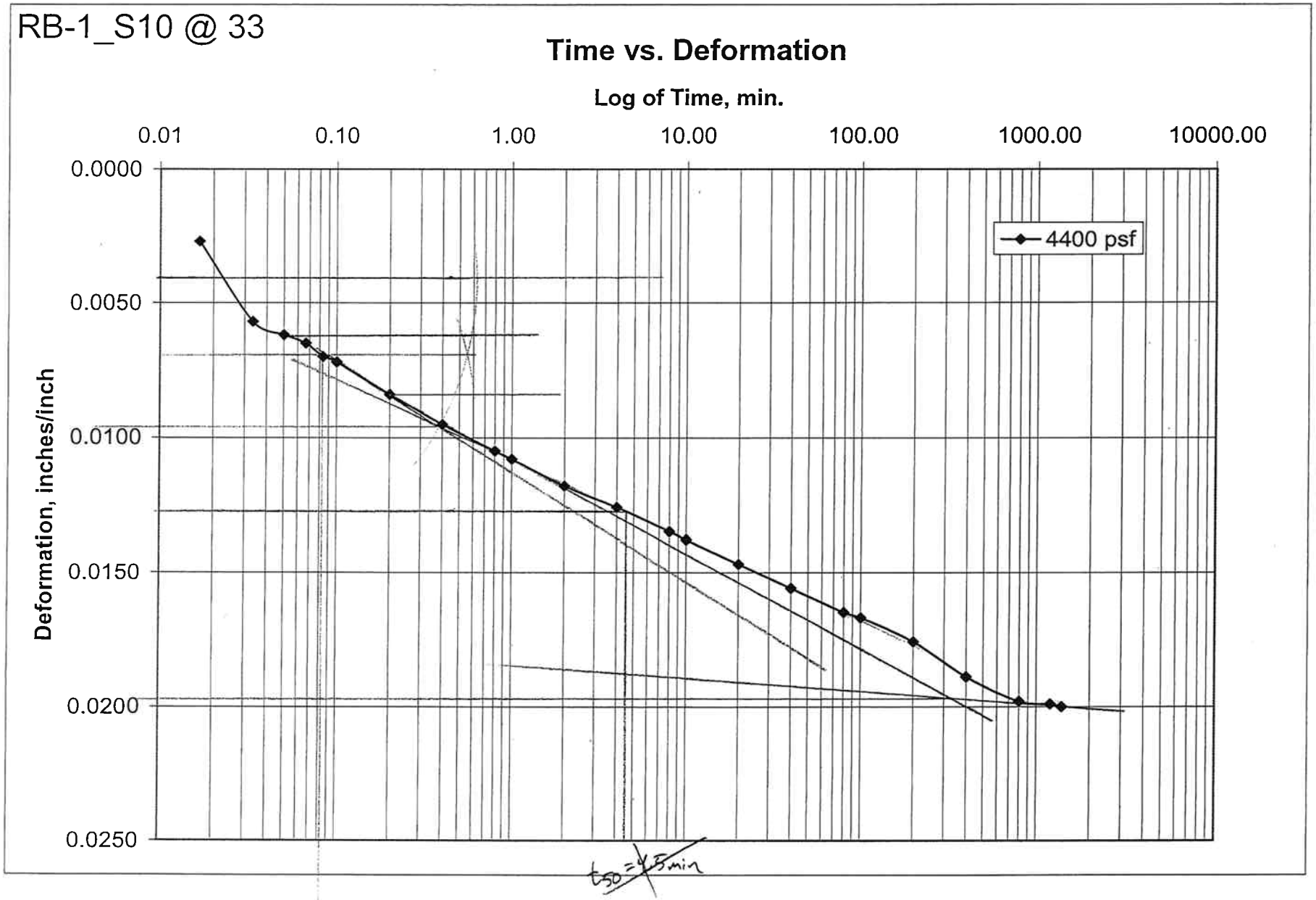
									Casagrande Log-Time Method					Taylor Square-Root Time Method			
									Load Increment (psf)					Load Increment (psf)			
									1,600	2,200	3,000	4,400	8,800	1,600	2,200	4,400	8,800
									C_v (in^2/yr)	C_v (in^2/yr)	C_v (in^2/yr)	C_v (in^2/yr)	C_v (in^2/yr)	C_v (in^2/yr)	C_v (in^2/yr)	C_v (in^2/yr)	C_v (in^2/yr)
RB-8	4	20		15	-5	YBM	2,400	2,160				119.9	138.4	640	538	268	268
RB-2A	1	23		13.5	-9.5	YBM	1,700	1,640	5.1	4.3		12.4	13.1	18.9	14.9	19.5	19.5
RB-12Va	1	29	125+00	18	-11	YBM	2,260	2,260	4.3	6.4		8.2	8.2				
RB-13V	1	22.5	40+00	11	-11.5	YBM	3,400	2,200	45.0	89.9	72.0	24.6	17.1				
RB-12Va	2	31.5	125+00	18	-13.5	YBM	2,380	2,380				9.0	10.0				

OBM

RB-1_S10 @ 33

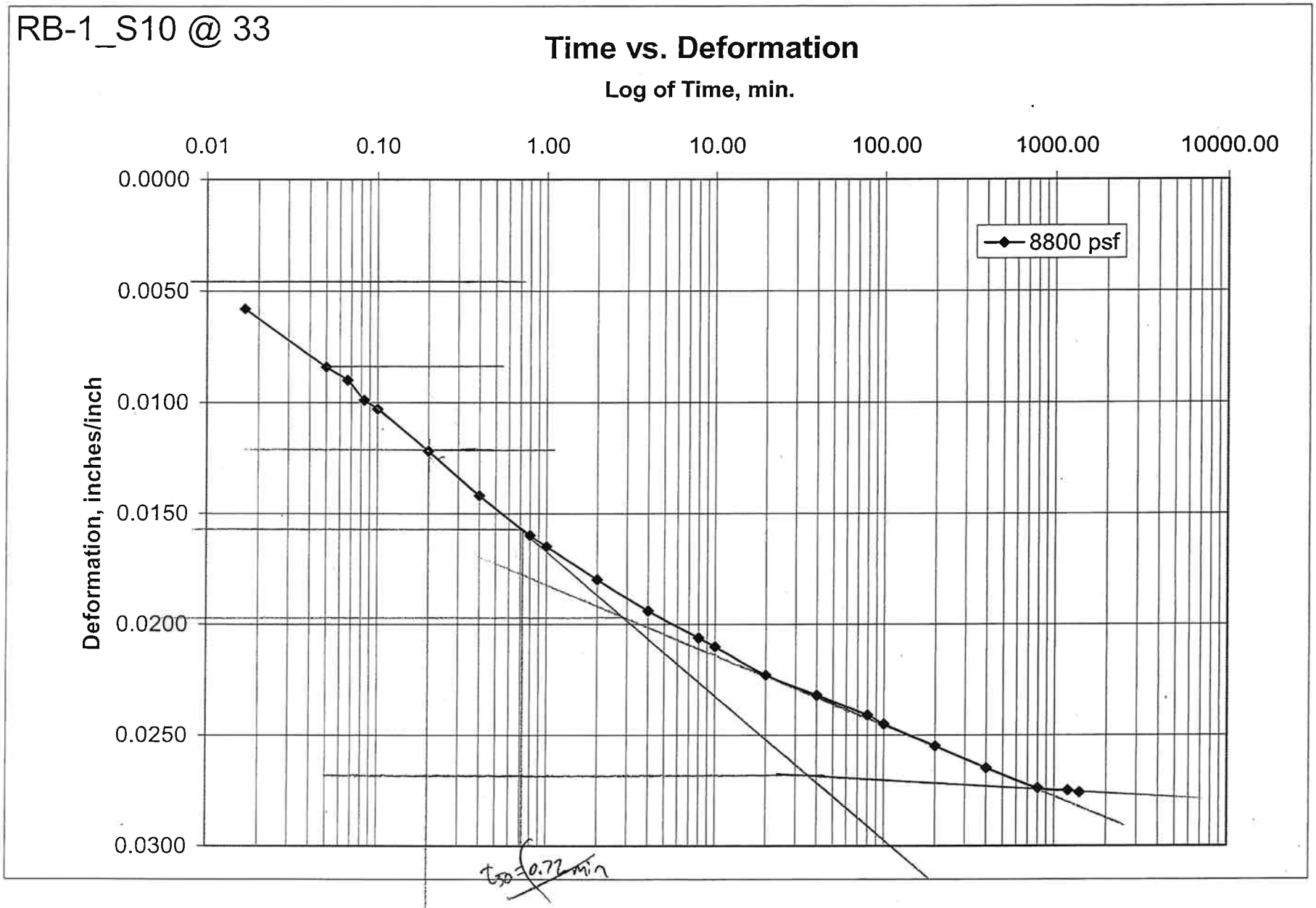


RB-1_S10 @ 33



0.012

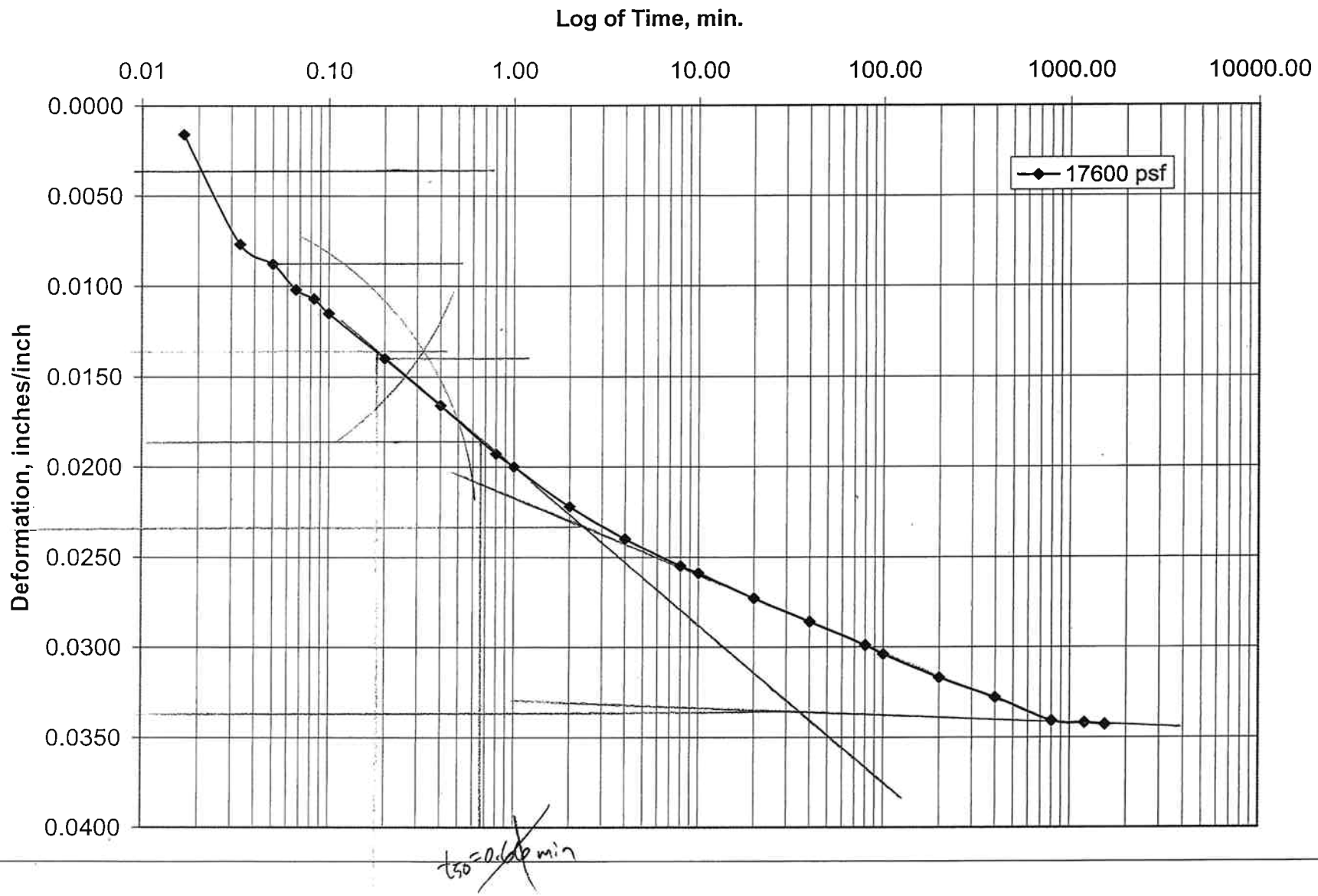
RB-1_S10 @ 33


Time vs. Deformation
Log of Time, min.
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
0.0000
0.0050
0.0100
0.0150
0.0200
0.0250
0.0300
Deformation, inches/inch
8800 psf
t_{50}=0.72 min

0.2

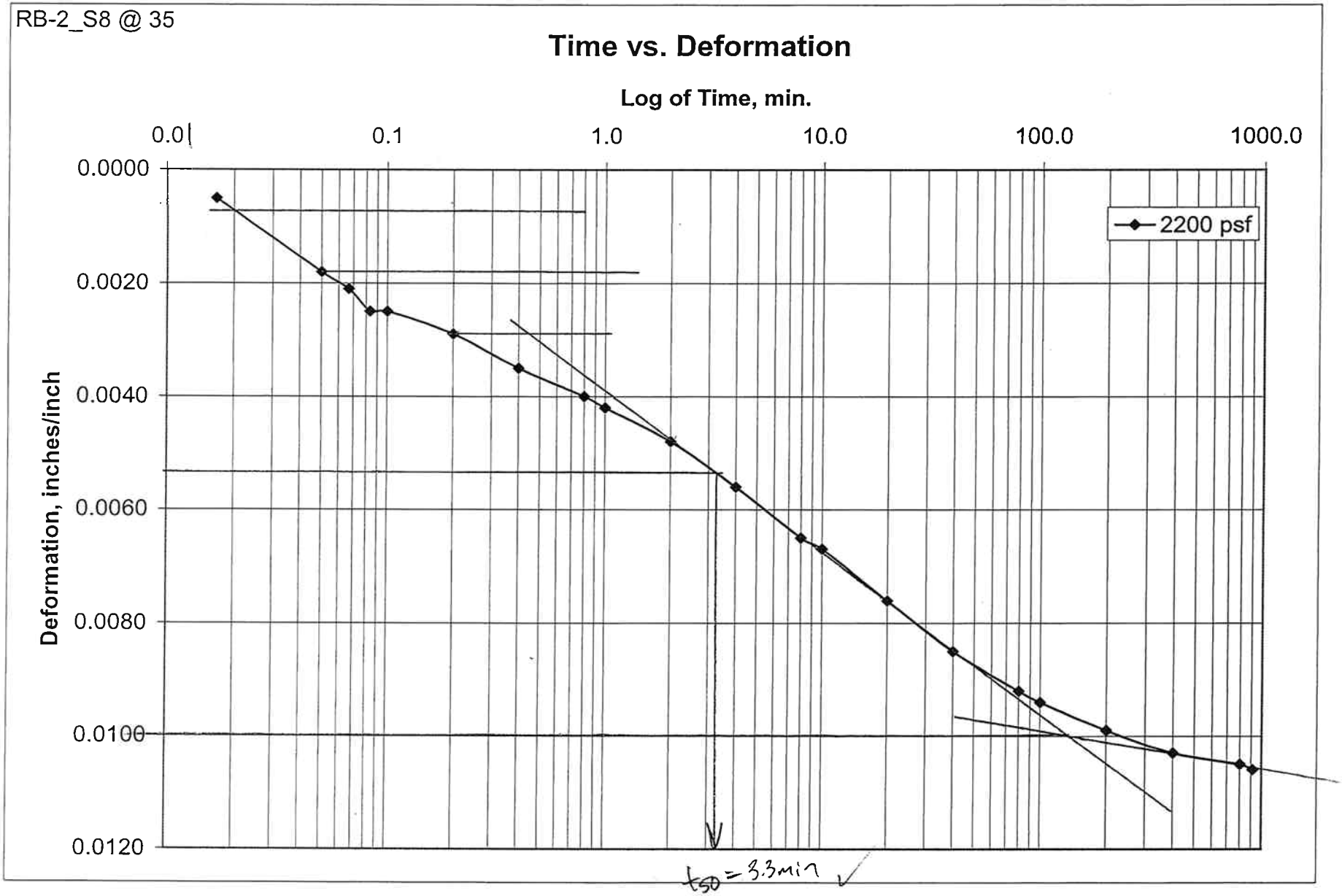
E'

RB-1_S10 @ 33

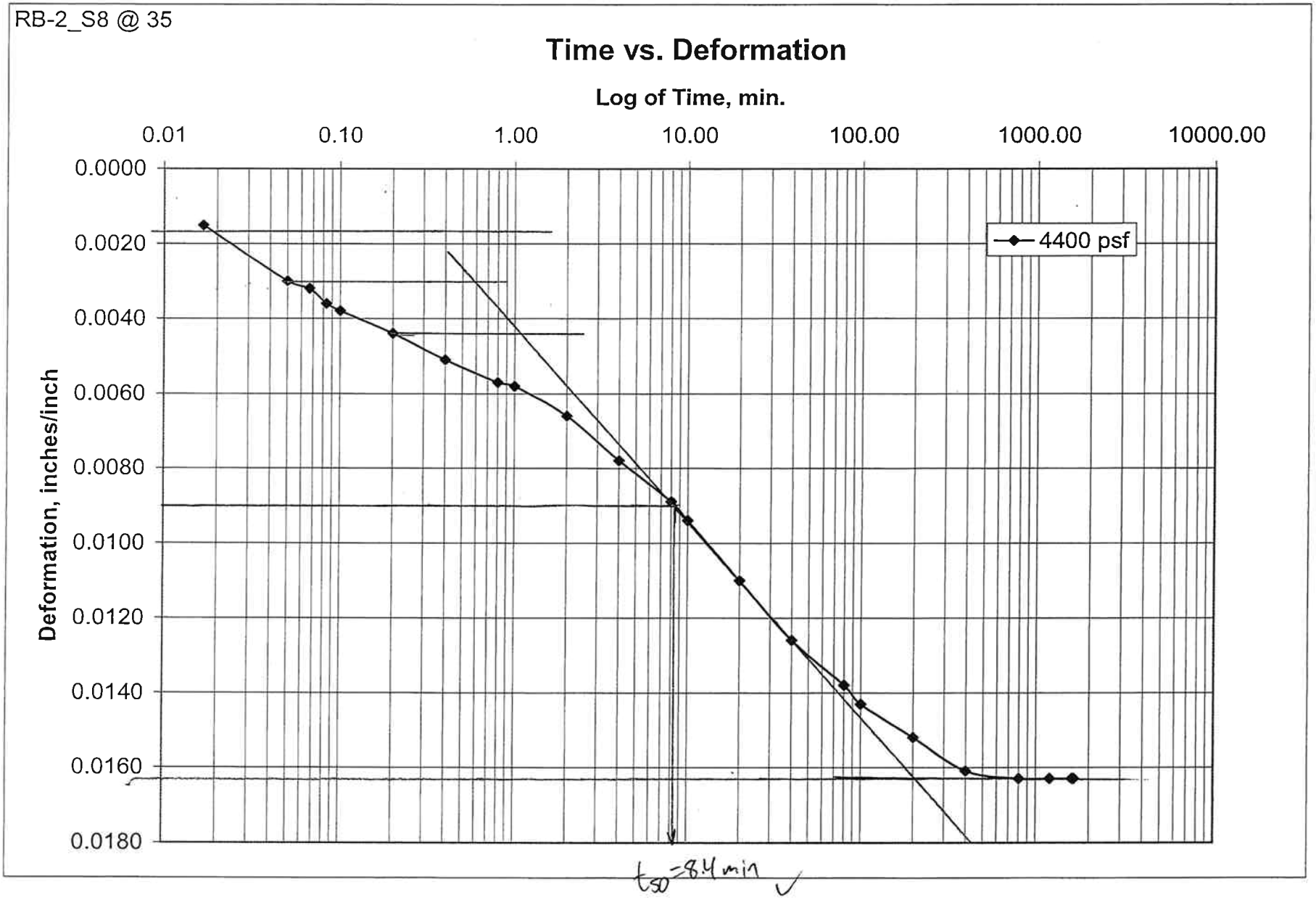


0.17

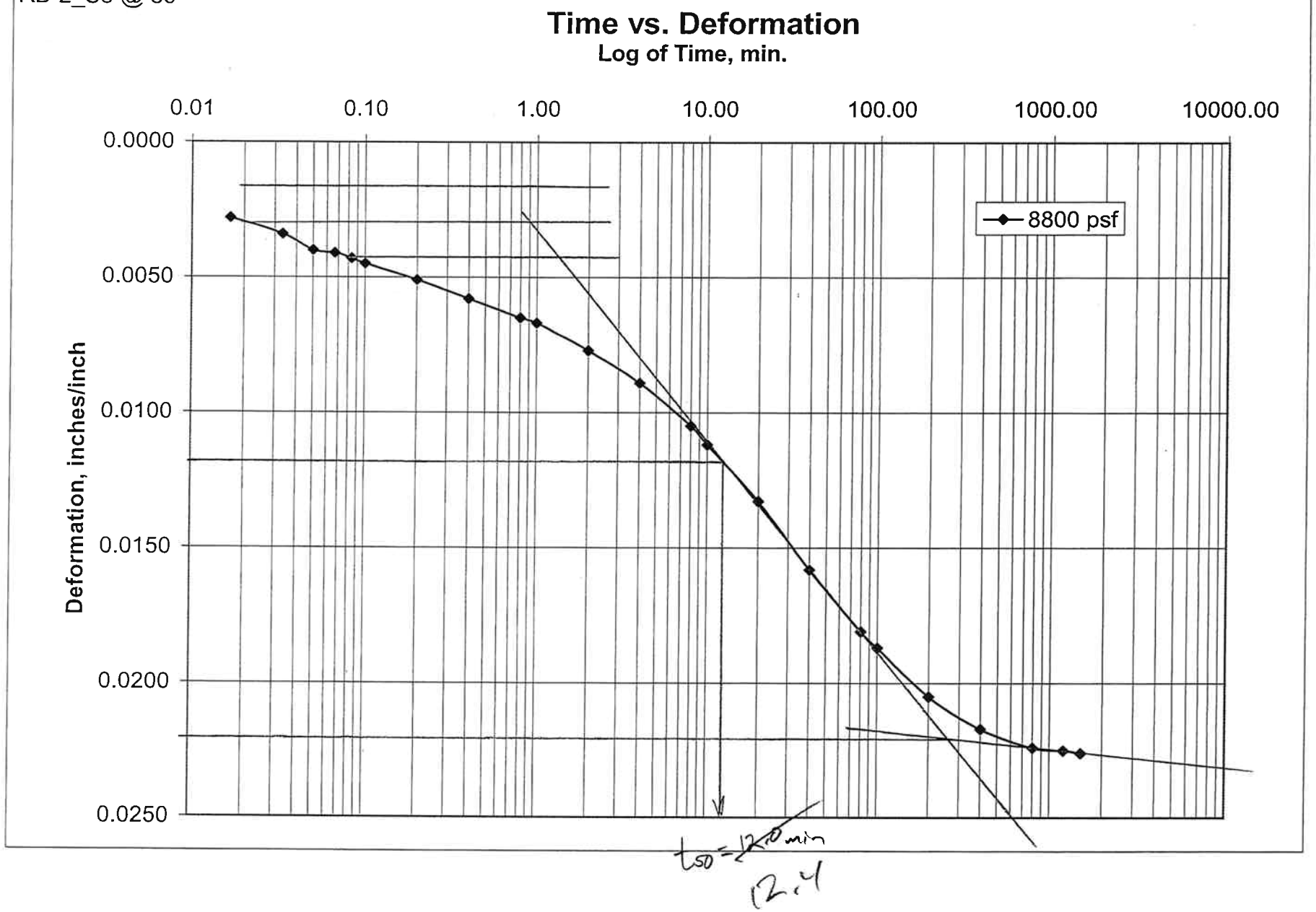
RB-2_S8 @ 35

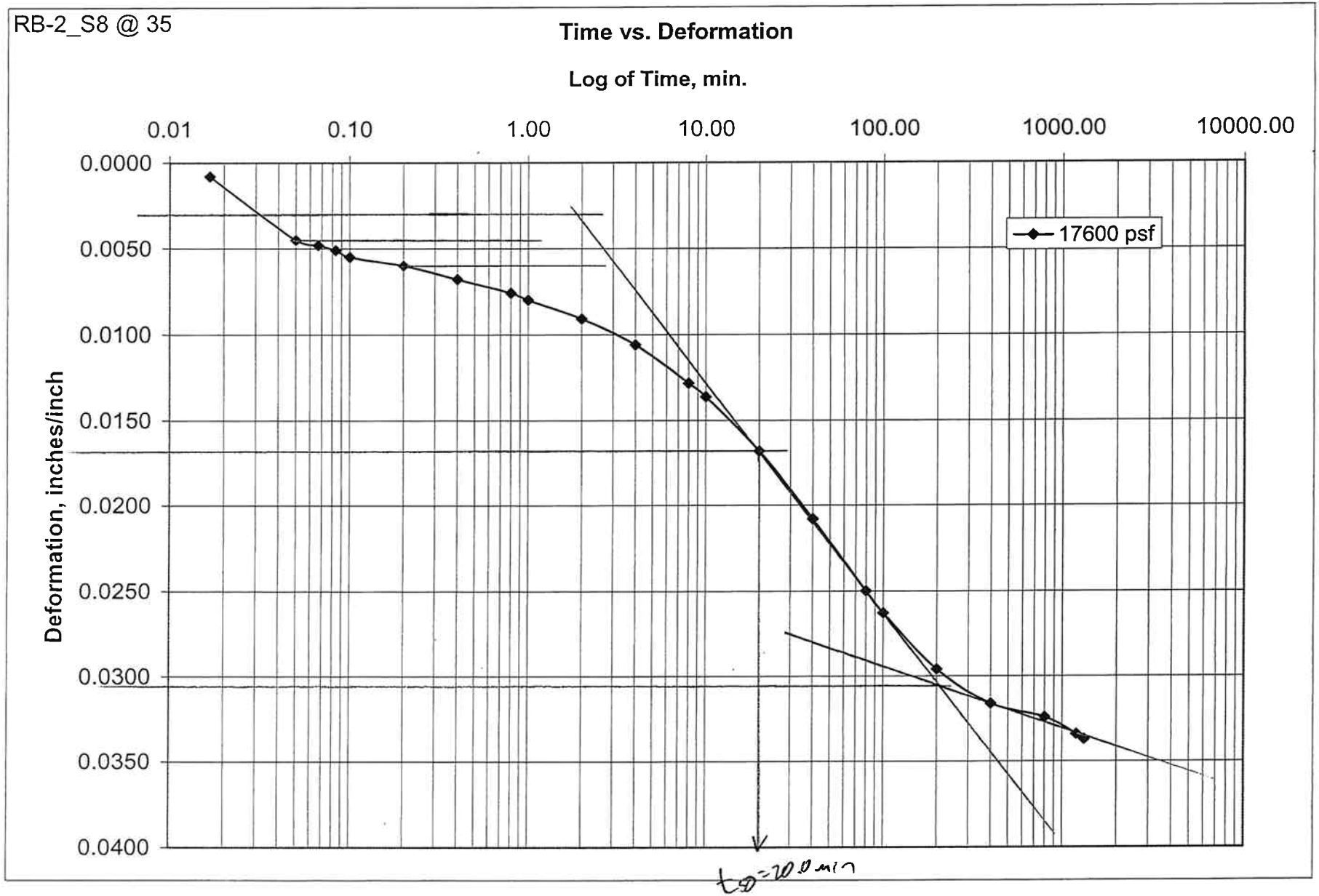

Time vs. Deformation
Log of Time, min.
0.01
0.1
1.0
10.0
100.0
1000.0
Deformation, inches/inch
0.0000
0.0020
0.0040
0.0060
0.0080
0.0100
0.0120
2200 psf
t50 = 3.3min

RB-2_S8 @ 35

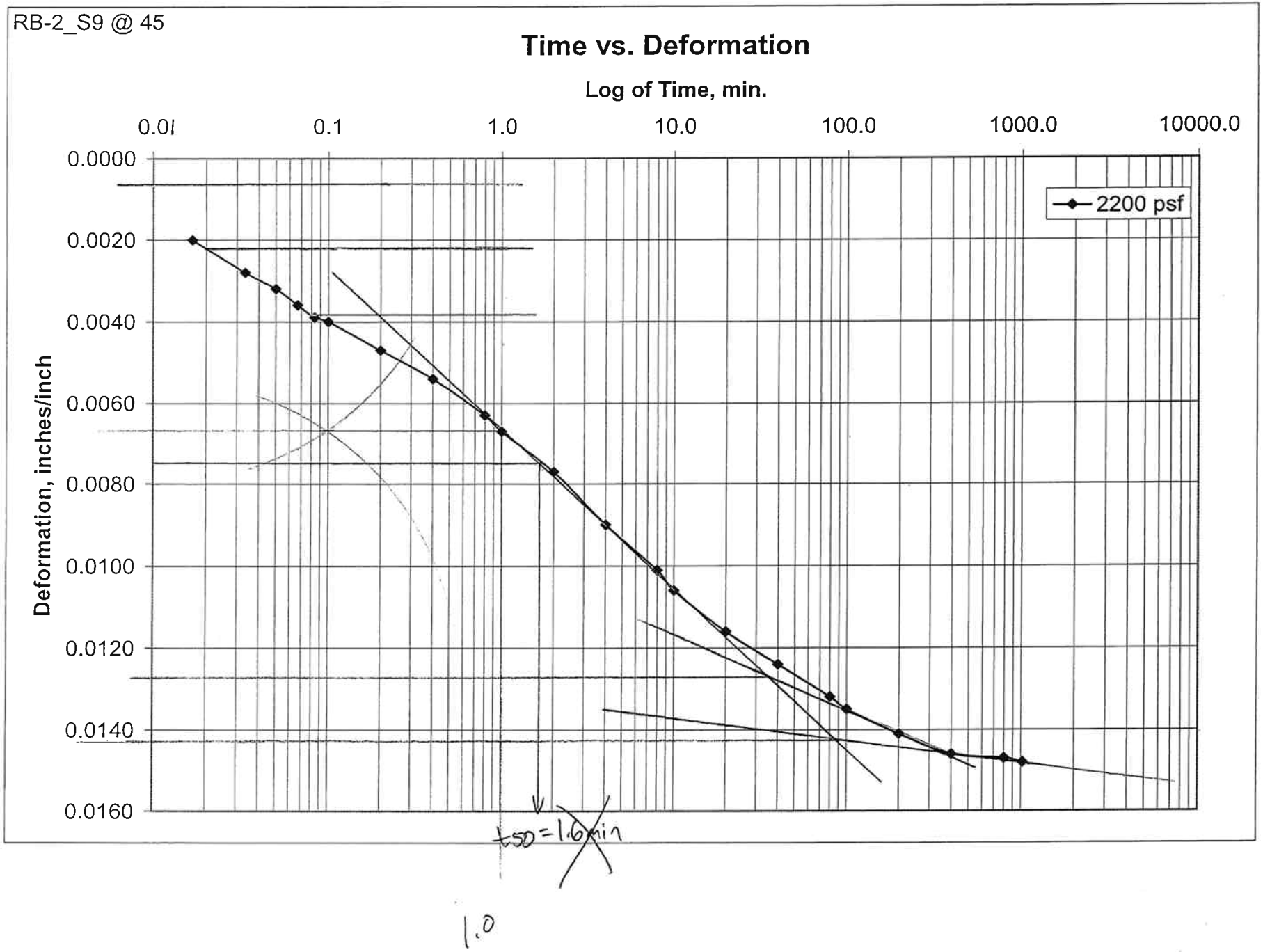

Time vs. Deformation
Log of Time, min.
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
Deformation, inches/inch
0.0000
0.0020
0.0040
0.0060
0.0080
0.0100
0.0120
0.0140
0.0160
0.0180
4400 psf
t_{50}=8.4 min

RB-2_S8 @ 35

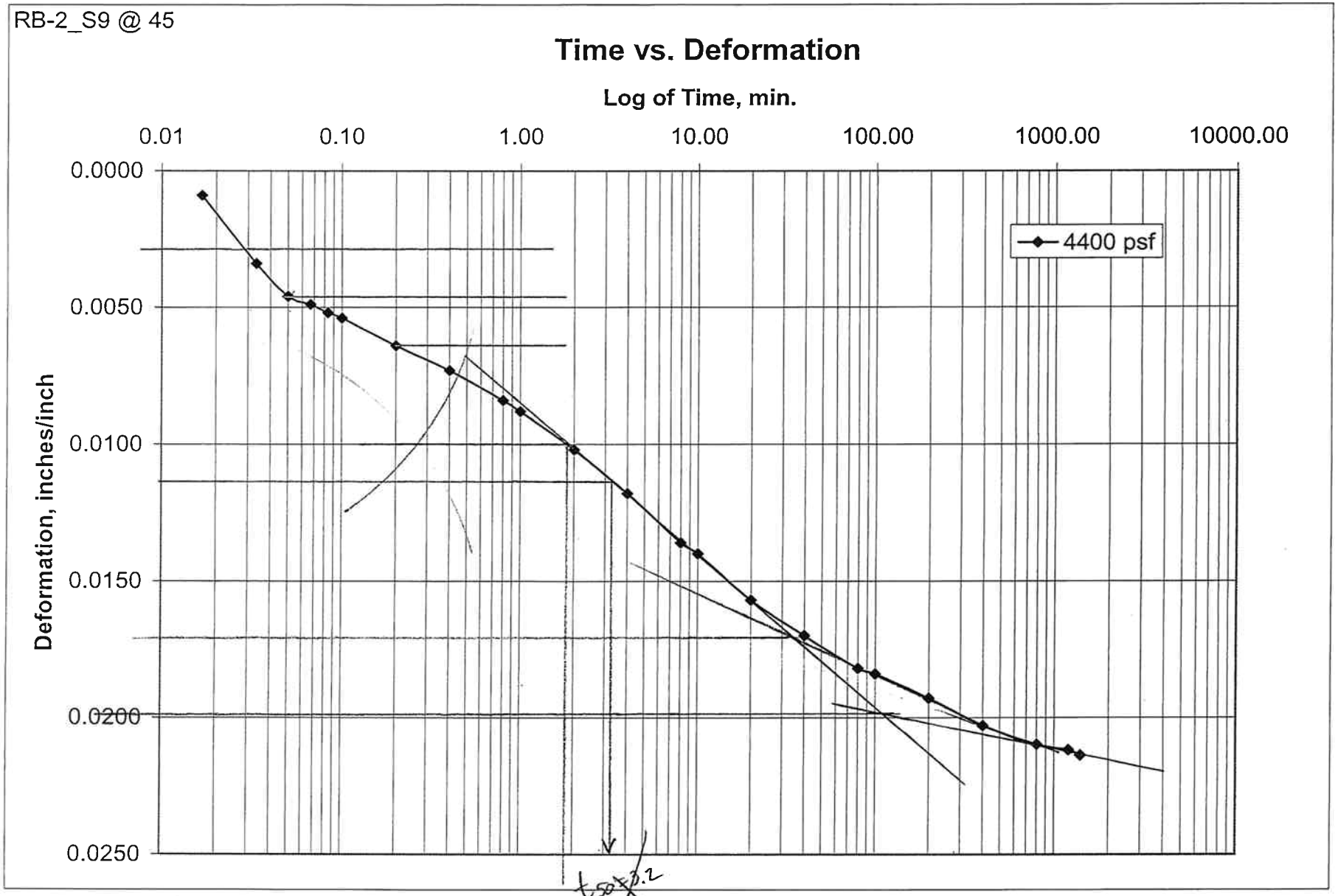

Time vs. Deformation
Log of Time, min.
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
0.0000
0.0050
0.0100
0.0150
0.0200
0.0250
Deformation, inches/inch
8800 psf
t50 = 12.0 min
12.4


RB-2_S8 @ 35
Time vs. Deformation
Log of Time, min.
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
0.0000
0.0050
0.0100
0.0150
0.0200
0.0250
0.0300
0.0350
0.0400
Deformation, inches/inch
17600 psf
t50=200 min

RB-2_S9 @ 45


Time vs. Deformation
Log of Time, min.
0.01
0.1
1.0
10.0
100.0
1000.0
10000.0
Deformation, inches/inch
0.0000
0.0020
0.0040
0.0060
0.0080
0.0100
0.0120
0.0140
0.0160
2200 psf
t50 = 1.6 min
1.0

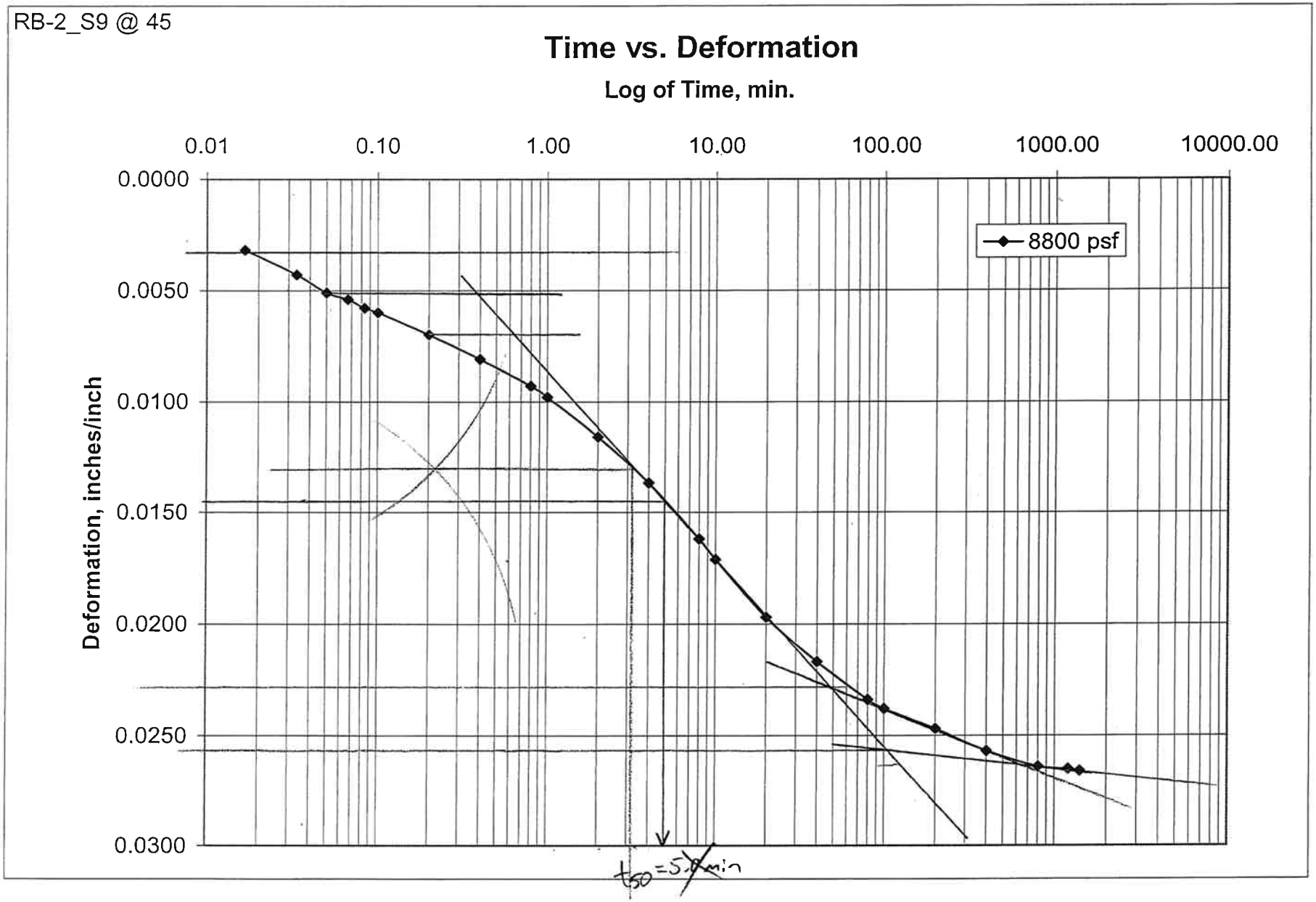
RB-2_S9 @ 45



$t_{50} = 3.2$

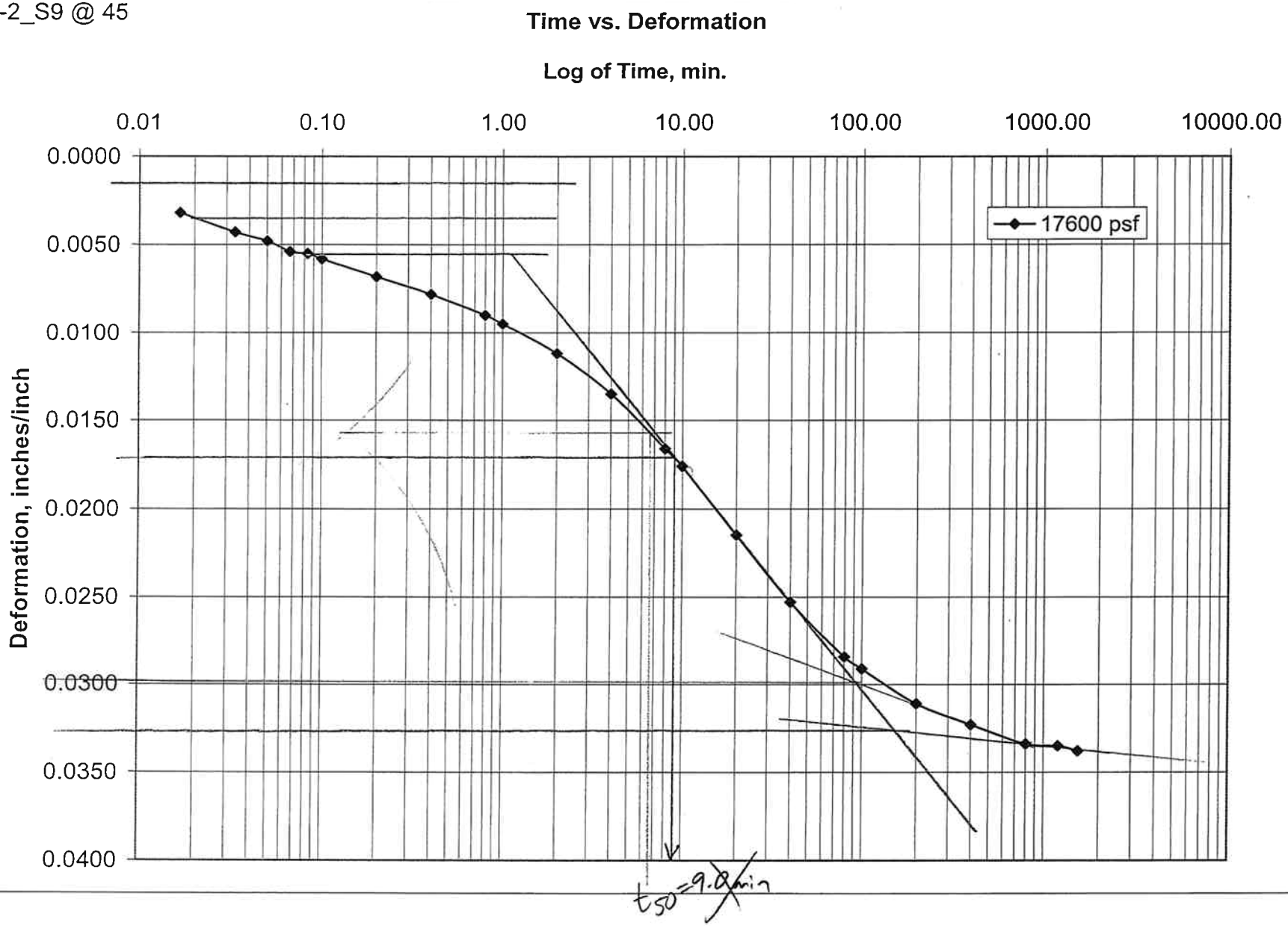
1.8

RB-2_S9 @ 45


Time vs. Deformation
Log of Time, min.
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
0.0000
0.0050
0.0100
0.0150
0.0200
0.0250
0.0300
Deformation, inches/inch
8800 psf
t50 = 5.0 min

3.2

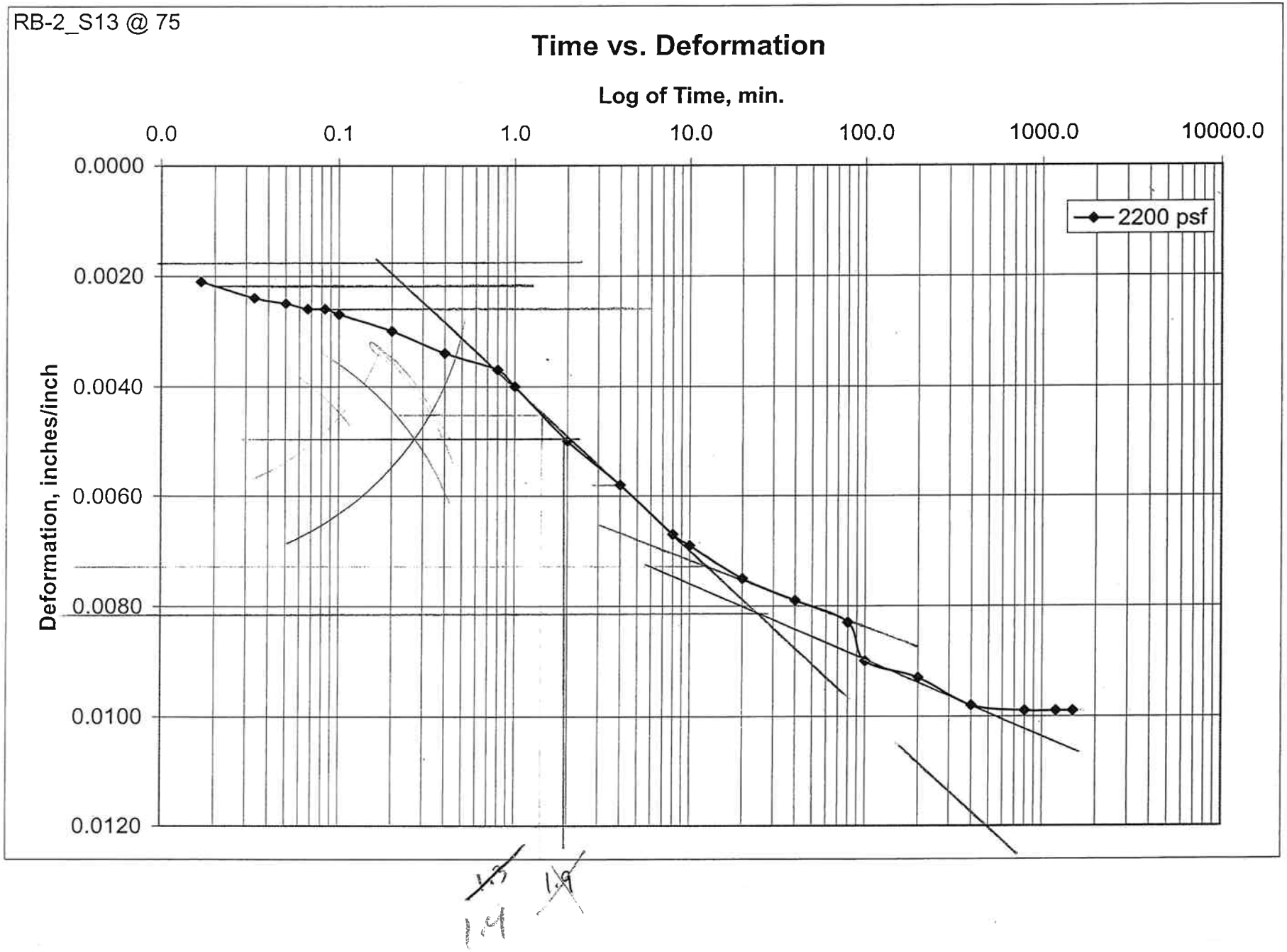
RB-2_S9 @ 45



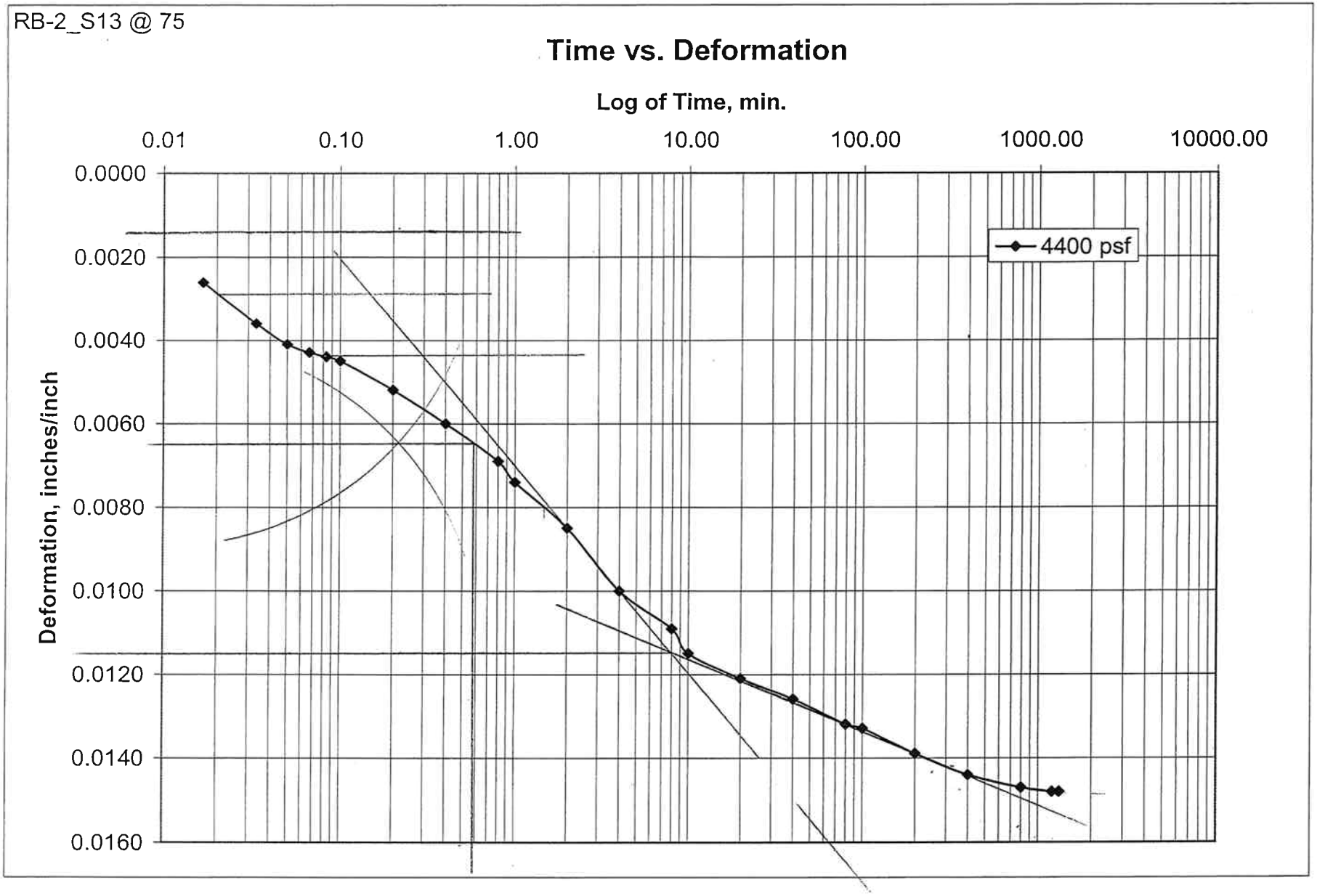
t_{50}=9.0min

6.6

RB-2_S13 @ 75

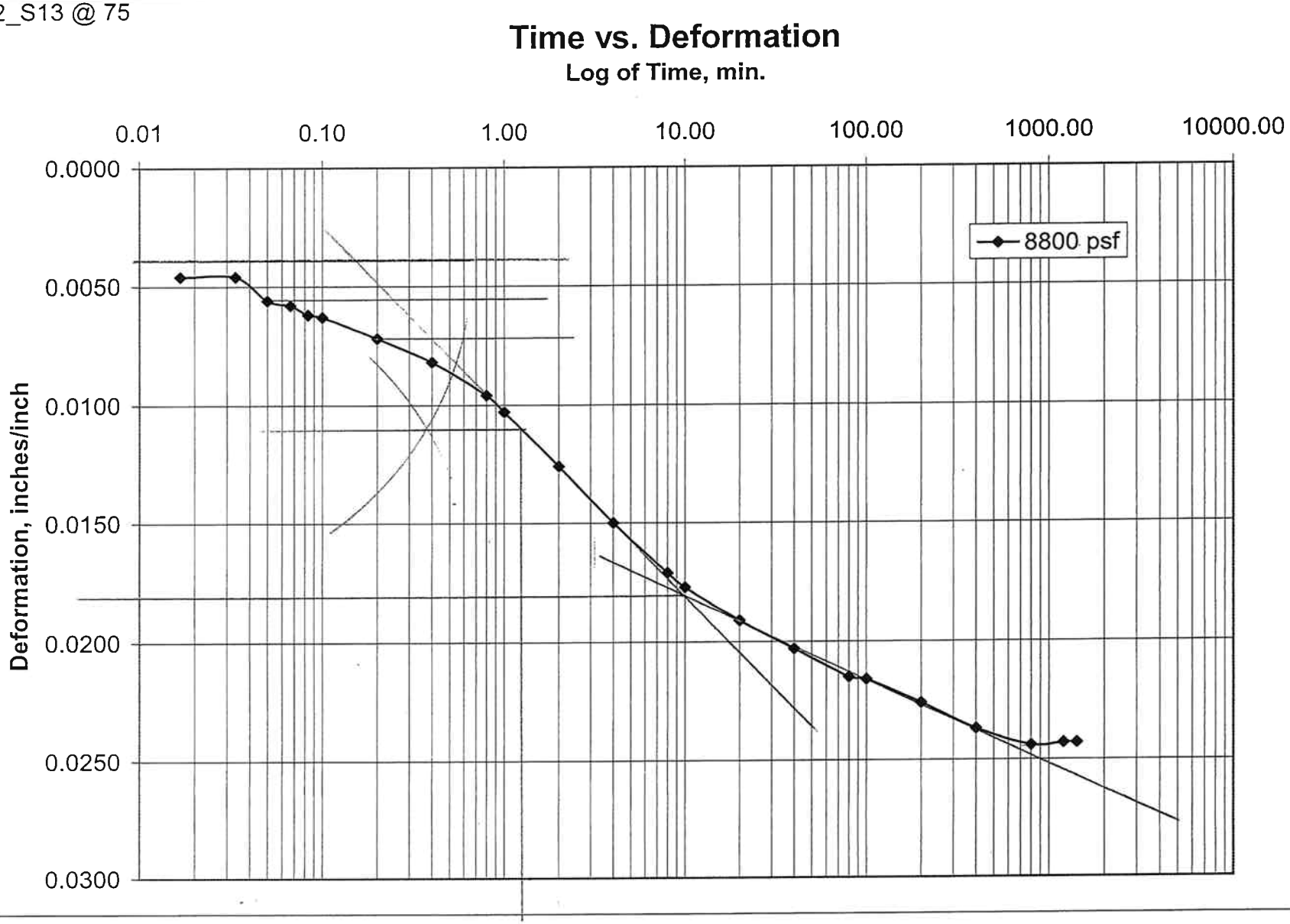

Time vs. Deformation
Log of Time, min.
0.0
0.1
1.0
10.0
100.0
1000.0
10000.0
0.0000
0.0020
0.0040
0.0060
0.0080
0.0100
0.0120
Deformation, inches/inch
2200 psf
1.9
1.9

RB-2_S13 @ 75

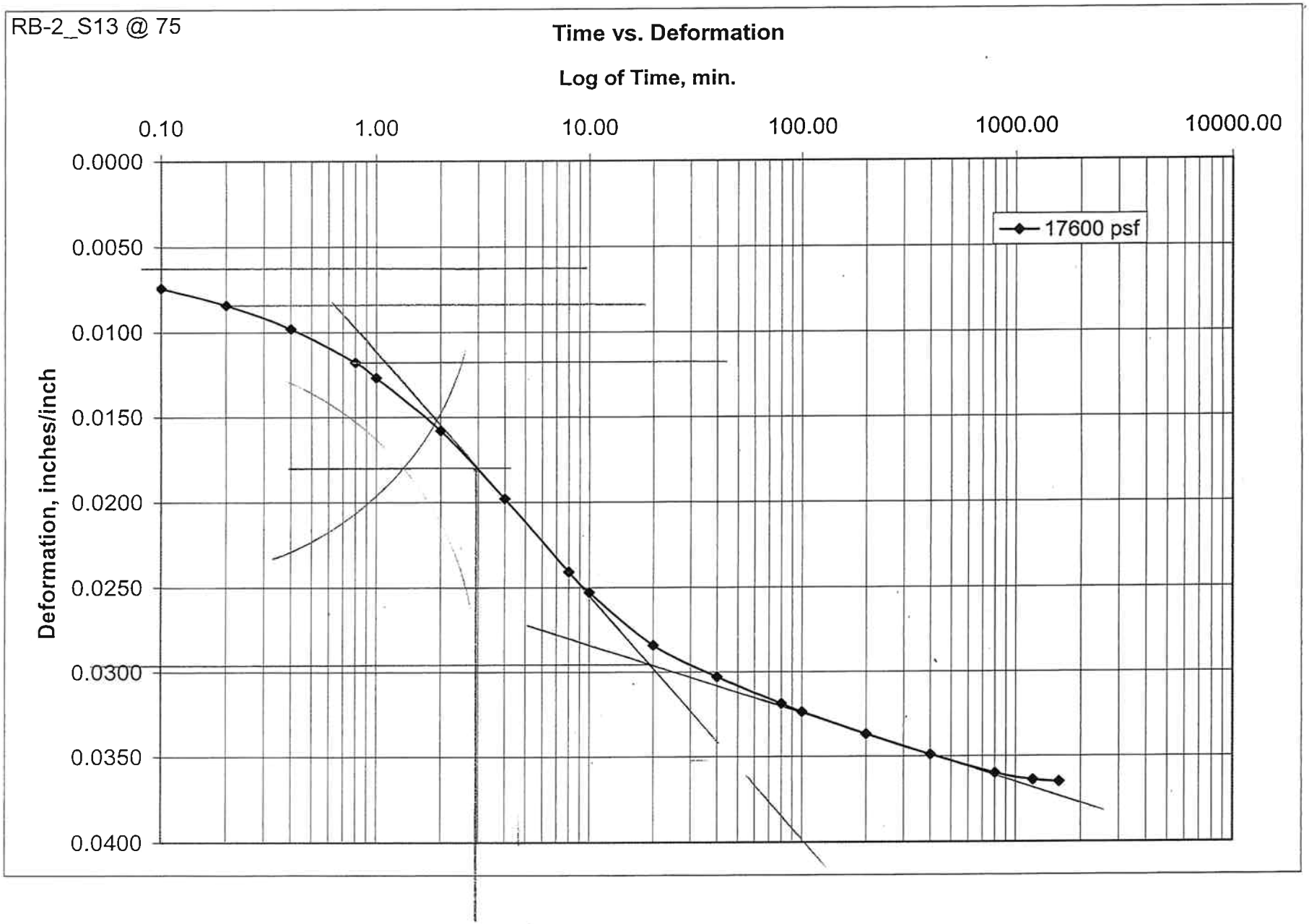


~~0.57~~ 0.56

RB-2_S13 @ 75

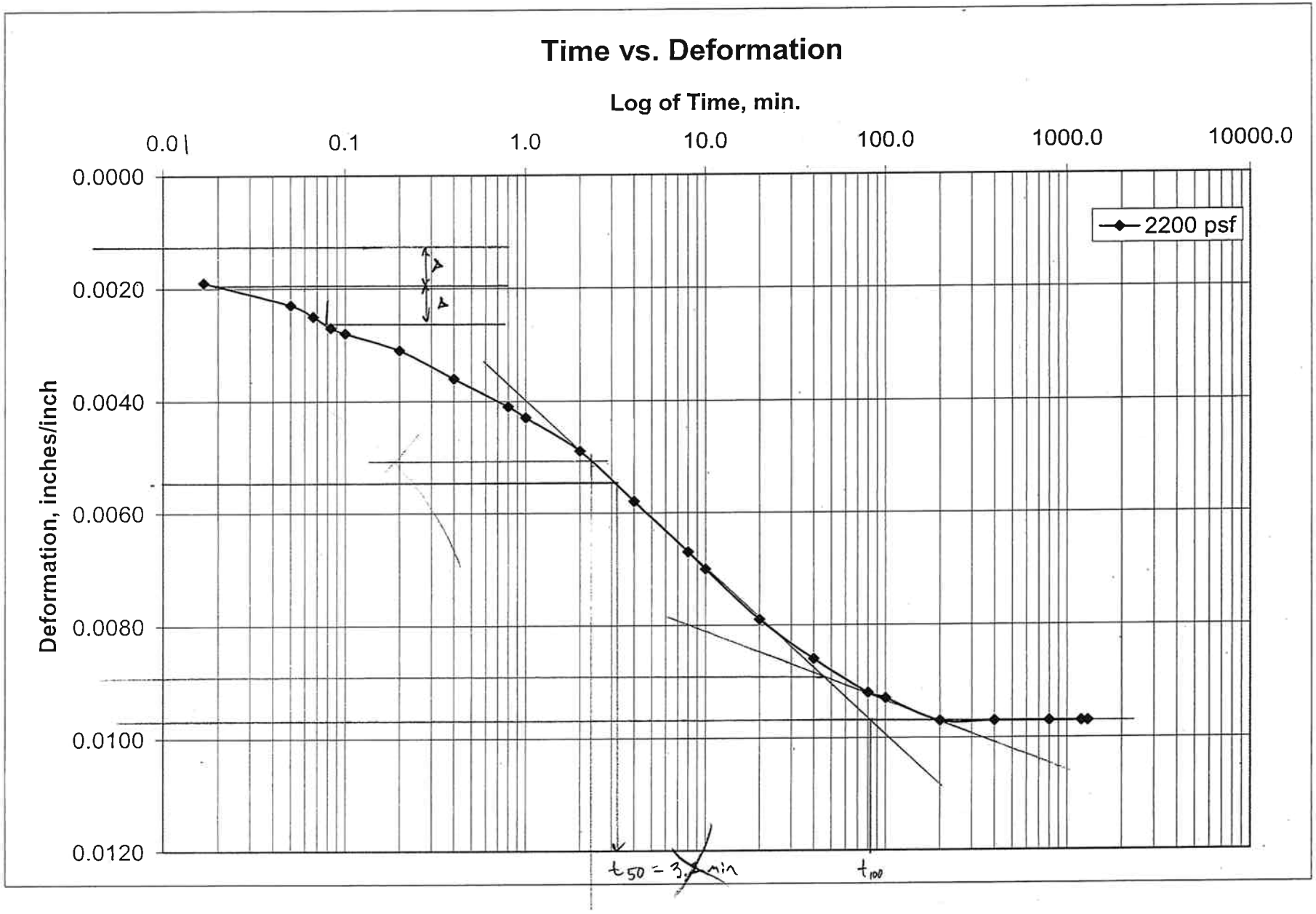

Time vs. Deformation
Log of Time, min.
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
0.0000
0.0050
0.0100
0.0150
0.0200
0.0250
0.0300
Deformation, inches/inch
8800 psf

1.2 ✓


RB-2_S13 @ 75
Time vs. Deformation
Log of Time, min.
0.10
1.00
10.00
100.00
1000.00
10000.00
0.0000
0.0050
0.0100
0.0150
0.0200
0.0250
0.0300
0.0350
0.0400
Deformation, inches/inch
17600 psf

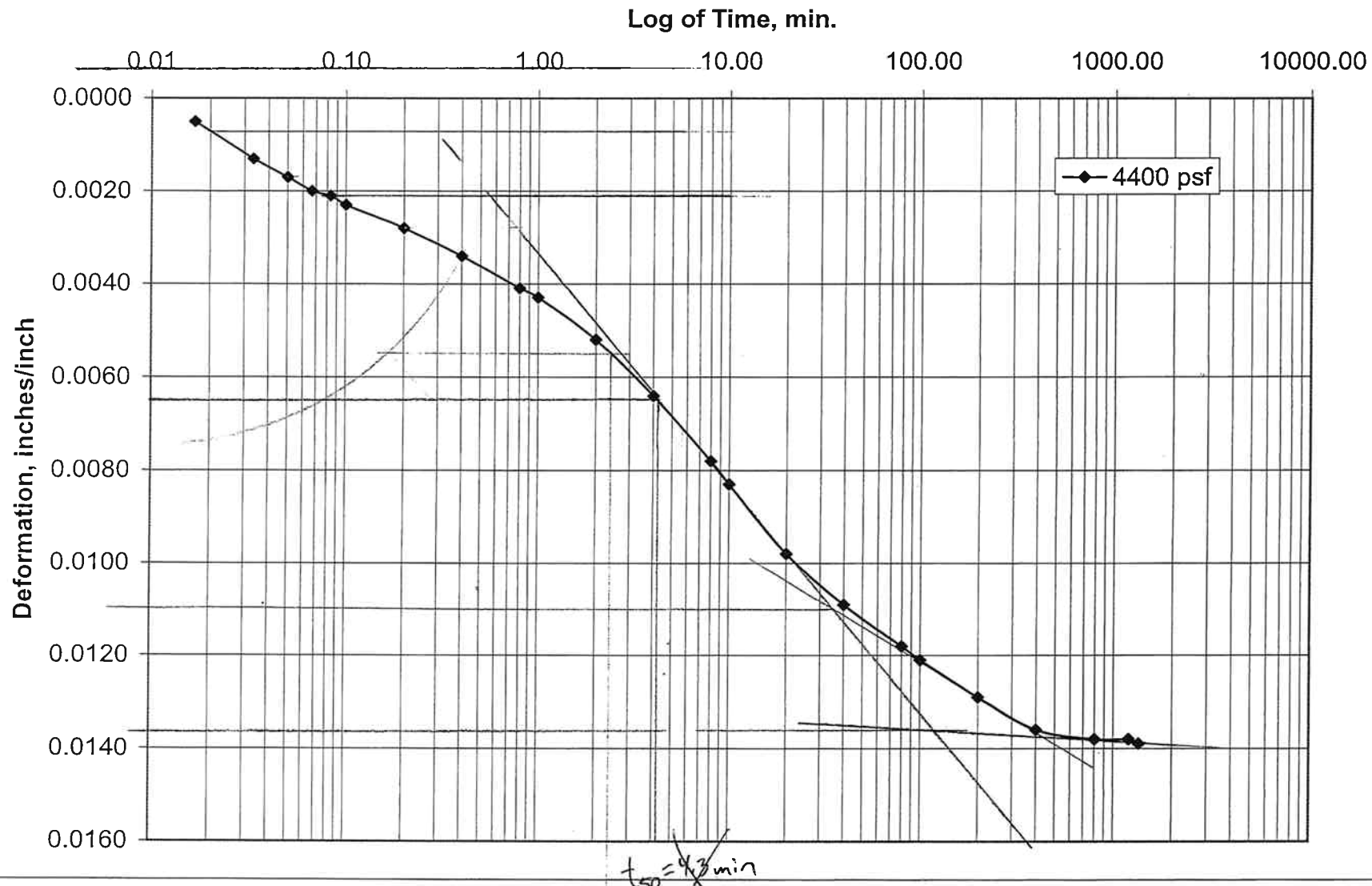
2.9

RB-4 SS @ 78


Time vs. Deformation
Log of Time, min.
0.01
0.1
1.0
10.0
100.0
1000.0
10000.0
0.0000
0.0020
0.0040
0.0060
0.0080
0.0100
0.0120
Deformation, inches/inch
2200 psf
Δ
Δ
t_{50} = 3.2 min
t_{100}

2.3

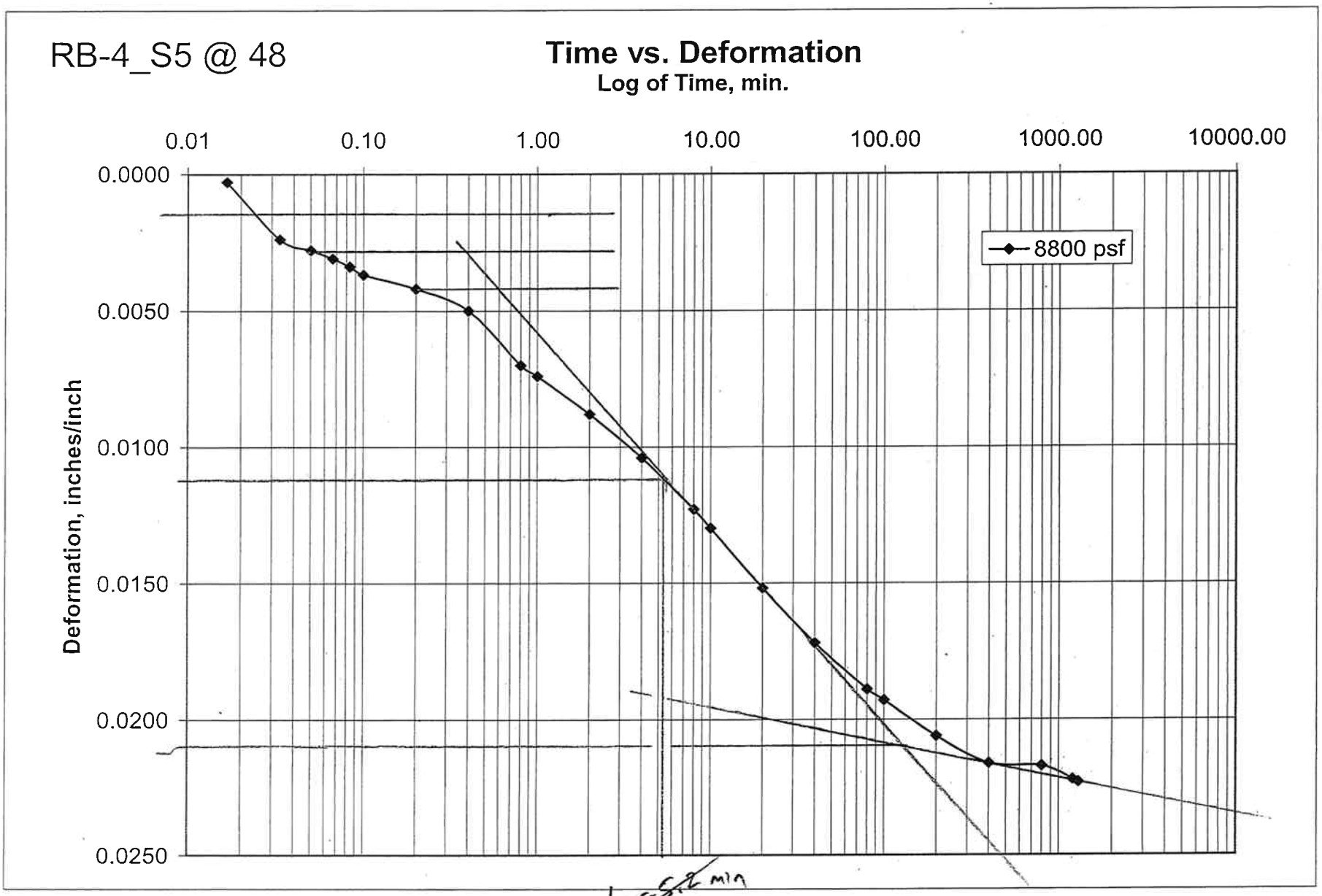
RB-4_S5 @ 48



t_{50} = ~~4.3~~ min

~~2.3~~ 2.1

RB-4_S5 @ 48

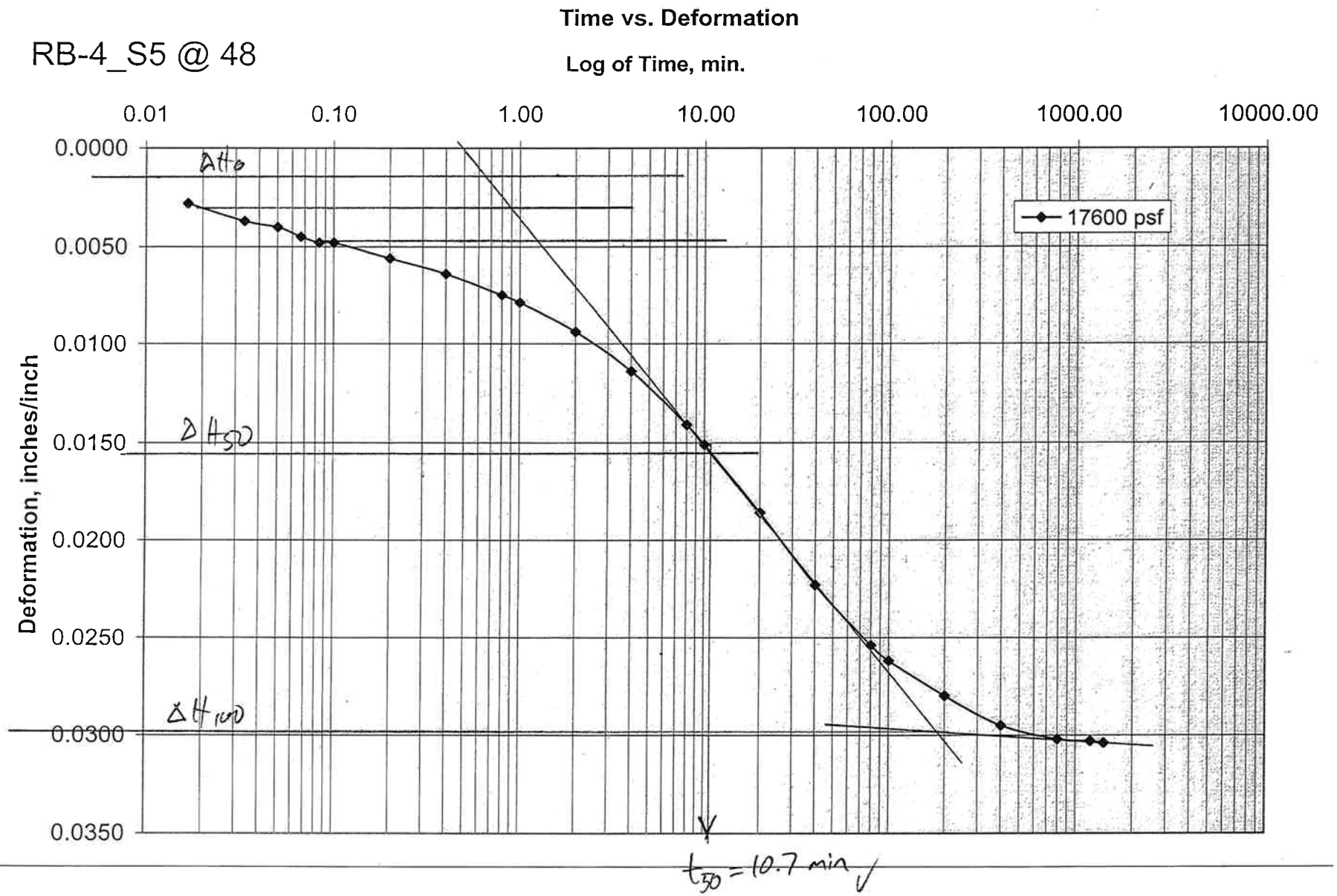


t_{50}=5.2 min

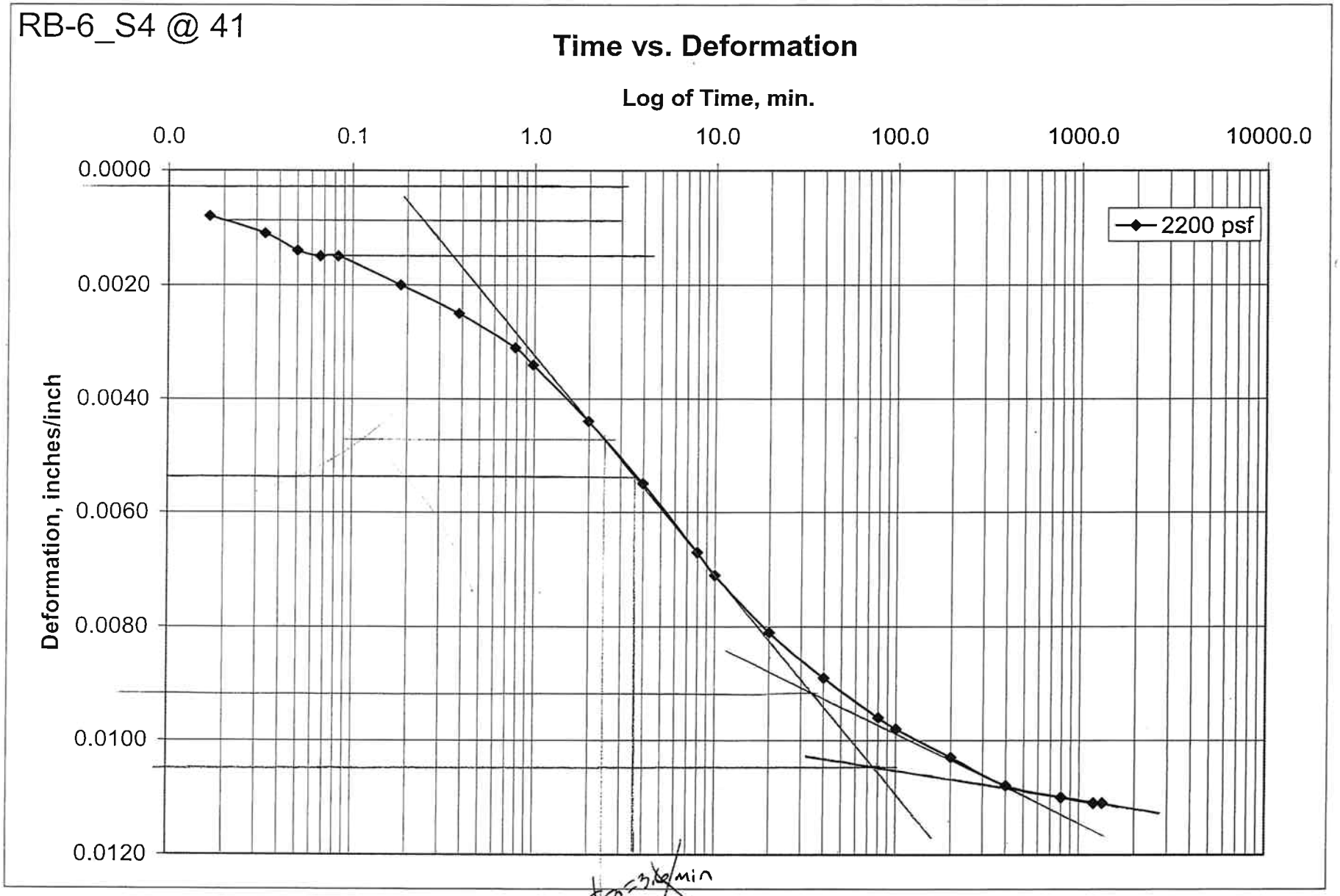
5.3

E

RB-4_S5 @ 48

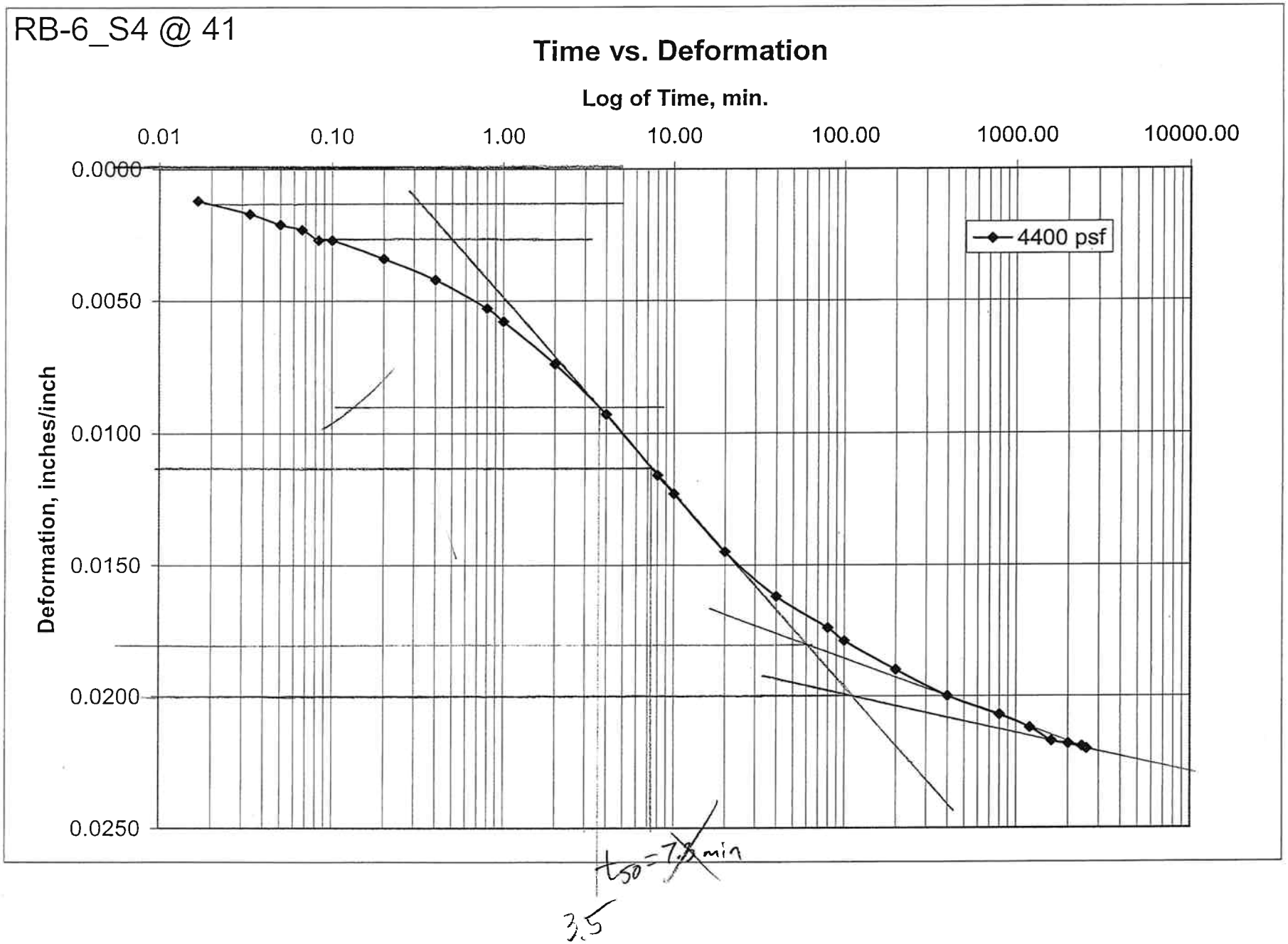

Time vs. Deformation
Log of Time, min.
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
0.0000
0.0050
0.0100
0.0150
0.0200
0.0250
0.0300
0.0350
Deformation, inches/inch
17600 psf
Δ H0
Δ H50
Δ H100
t50 = 10.7 min

RB-6_S4 @ 41

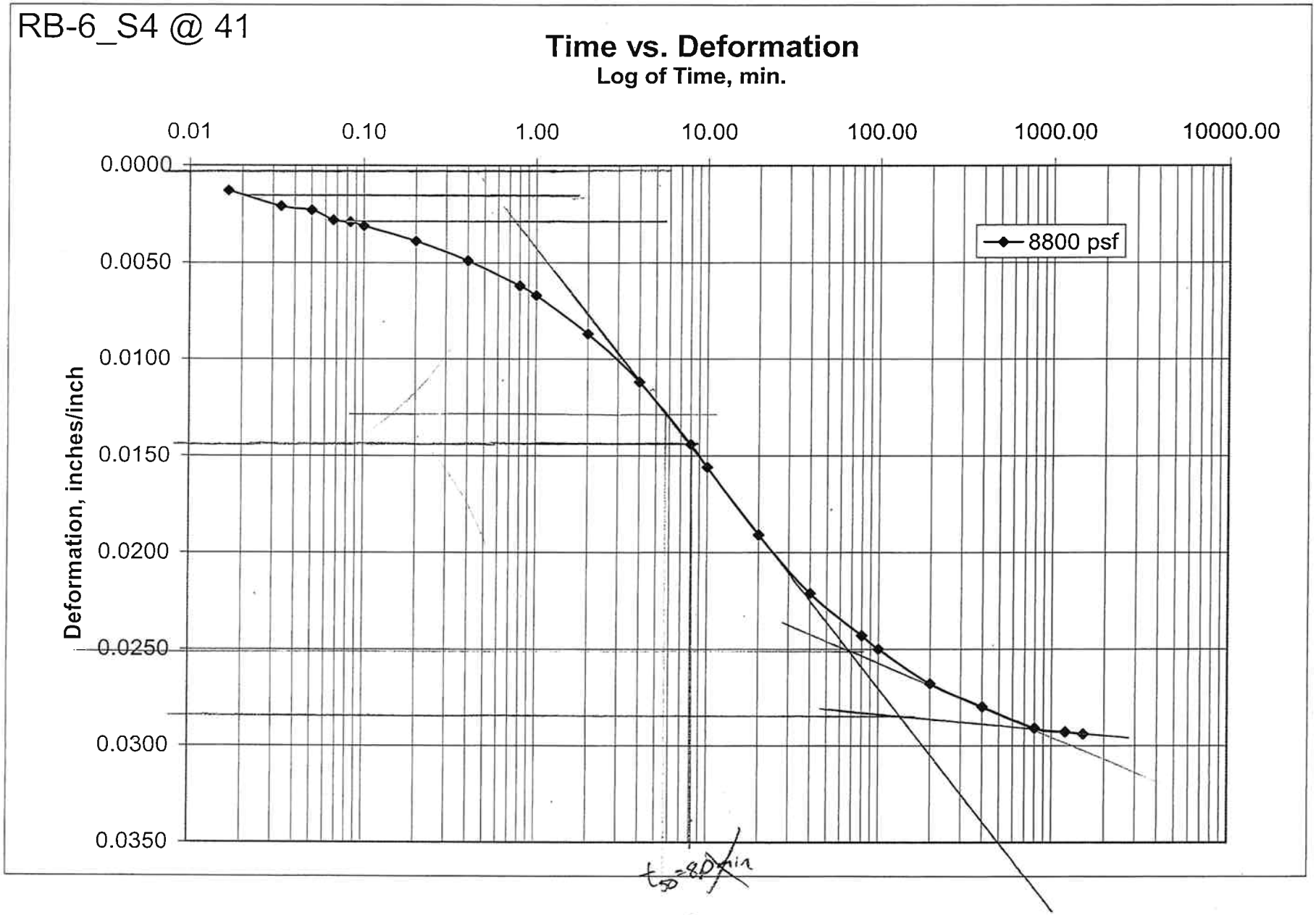

Time vs. Deformation
Log of Time, min.
0.0
0.1
1.0
10.0
100.0
1000.0
10000.0
0.0000
0.0020
0.0040
0.0060
0.0080
0.0100
0.0120
Deformation, inches/inch
2200 psf
t50=3.6/min

2.4

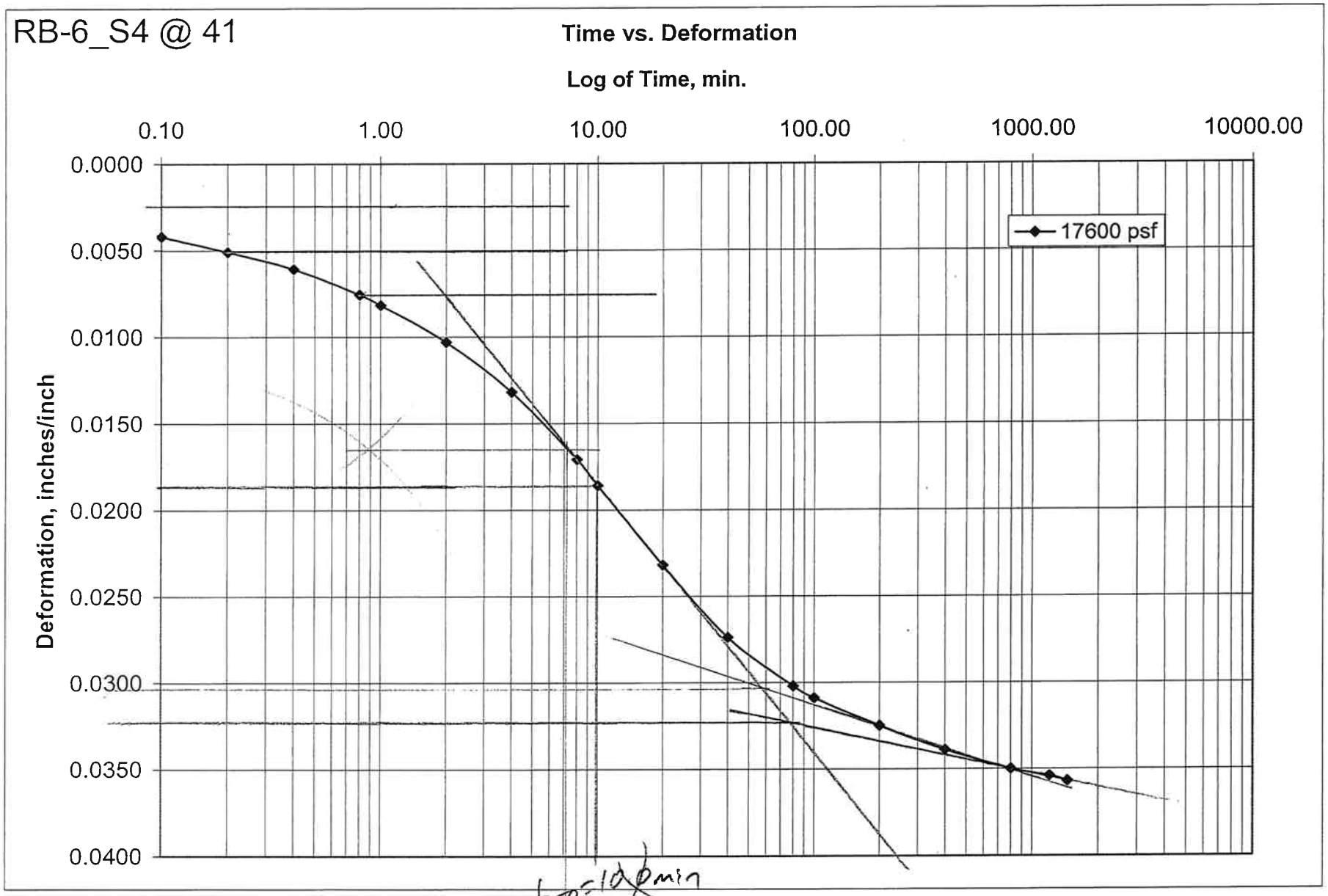
RB-6_S4 @ 41


Time vs. Deformation
Log of Time, min.
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
0.0000
0.0050
0.0100
0.0150
0.0200
0.0250
Deformation, inches/inch
4400 psf
t50 = 7.5 min
3.5

RB-6_S4 @ 41


Time vs. Deformation
Log of Time, min.
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
0.0000
0.0050
0.0100
0.0150
0.0200
0.0250
0.0300
0.0350
Deformation, inches/inch
8800 psf
t_{50}=80 min

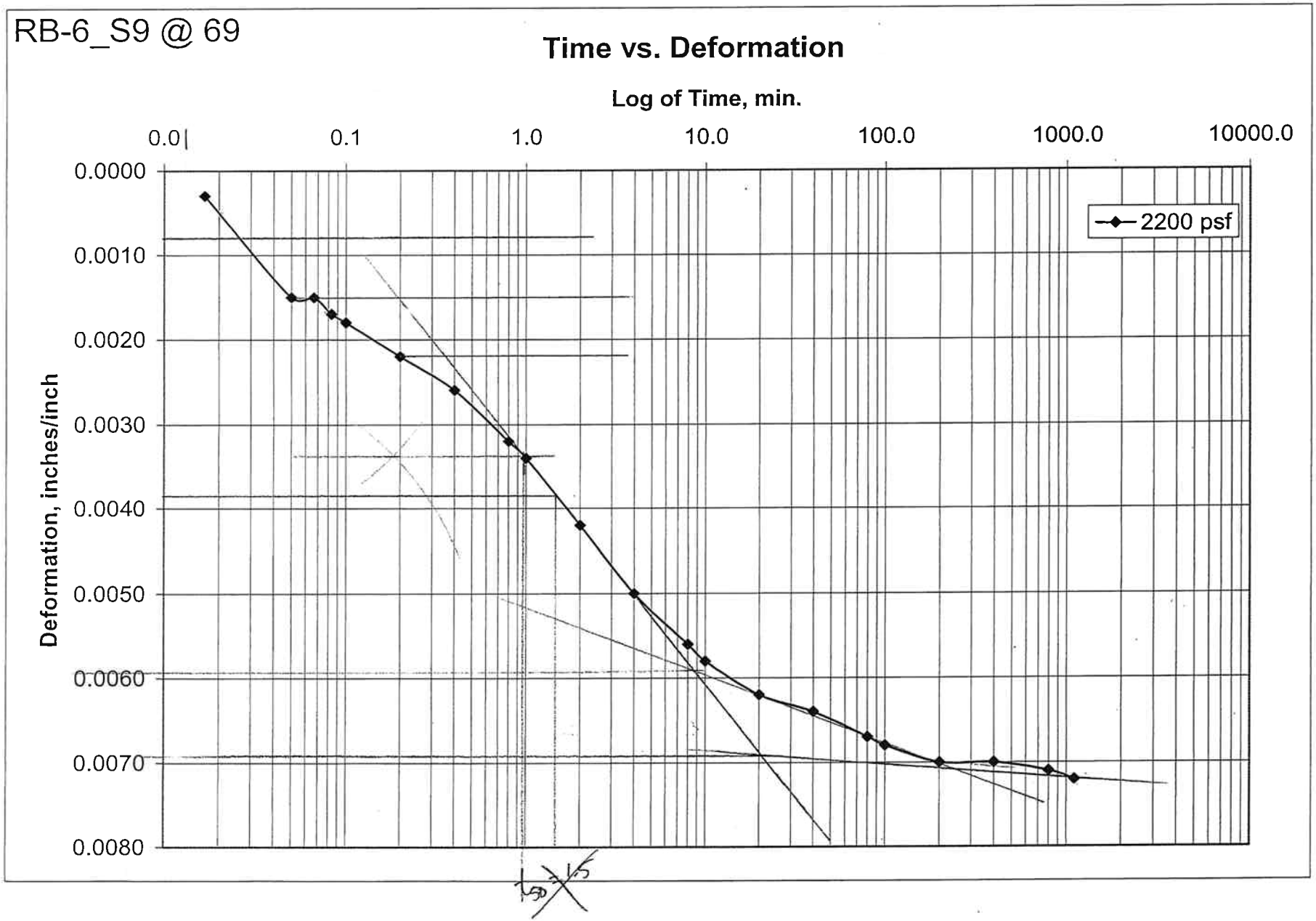
5.7



t50=10.0min

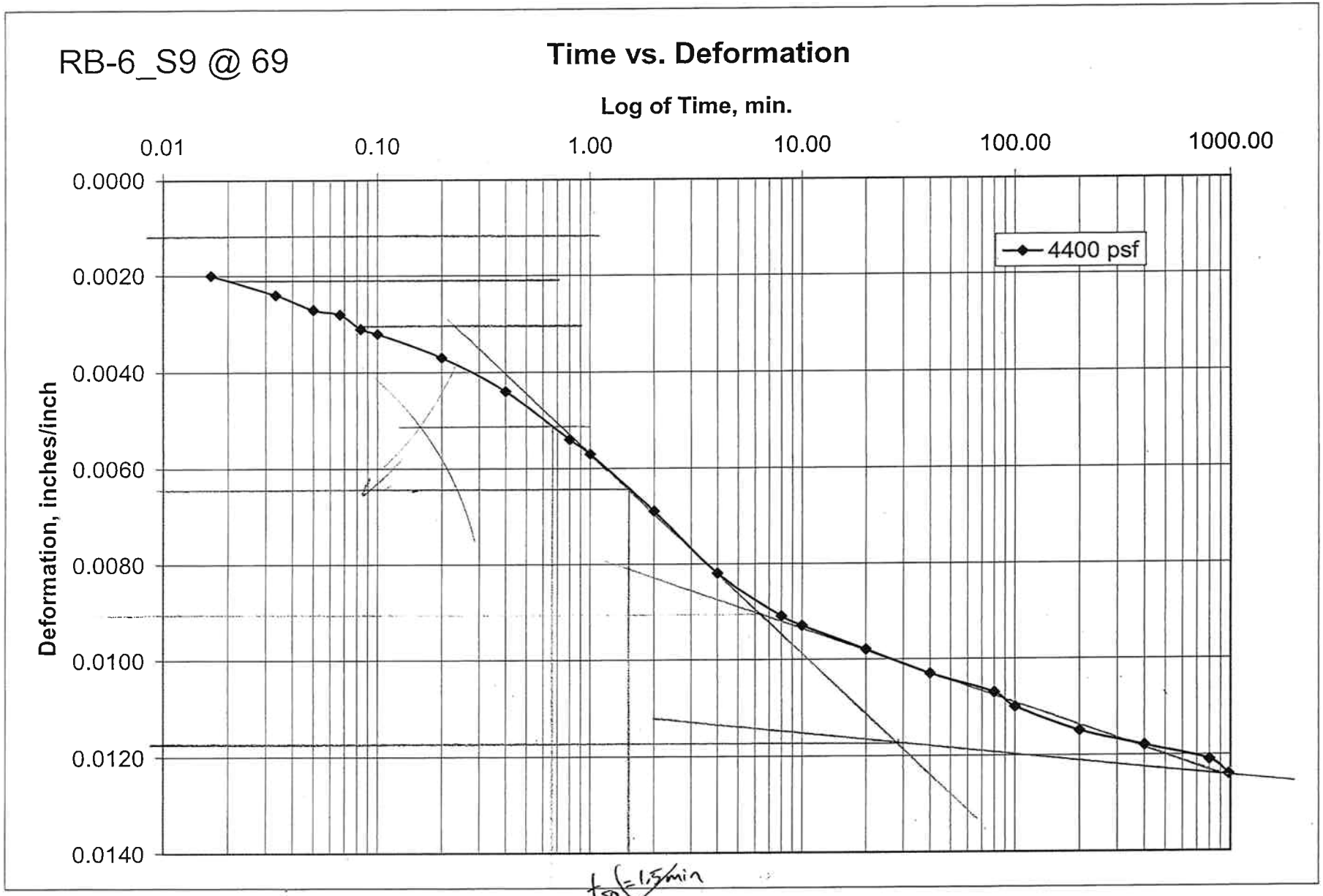
7.1

RB-6_S9 @ 69



~~t50 = 1.5~~

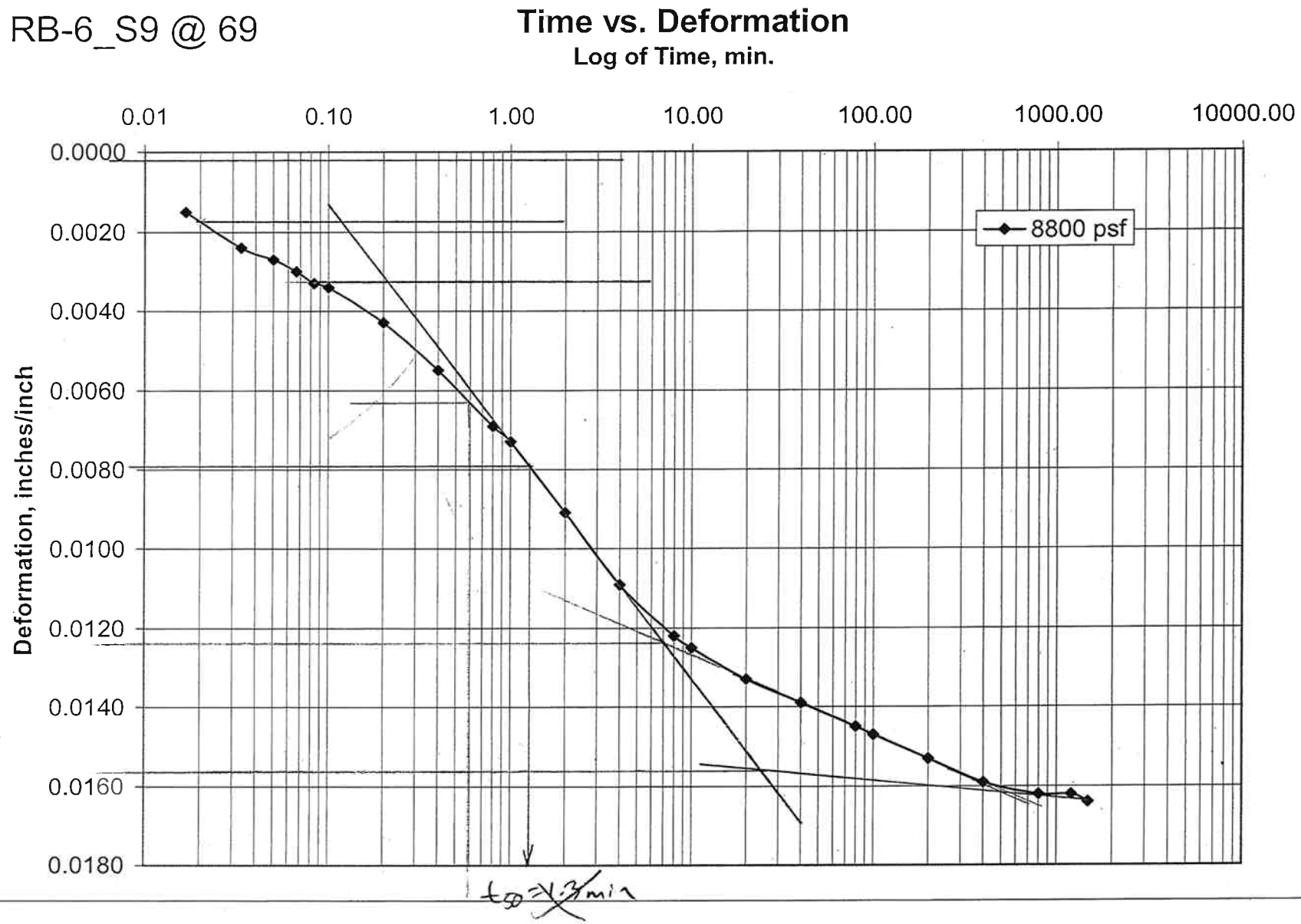
0.97



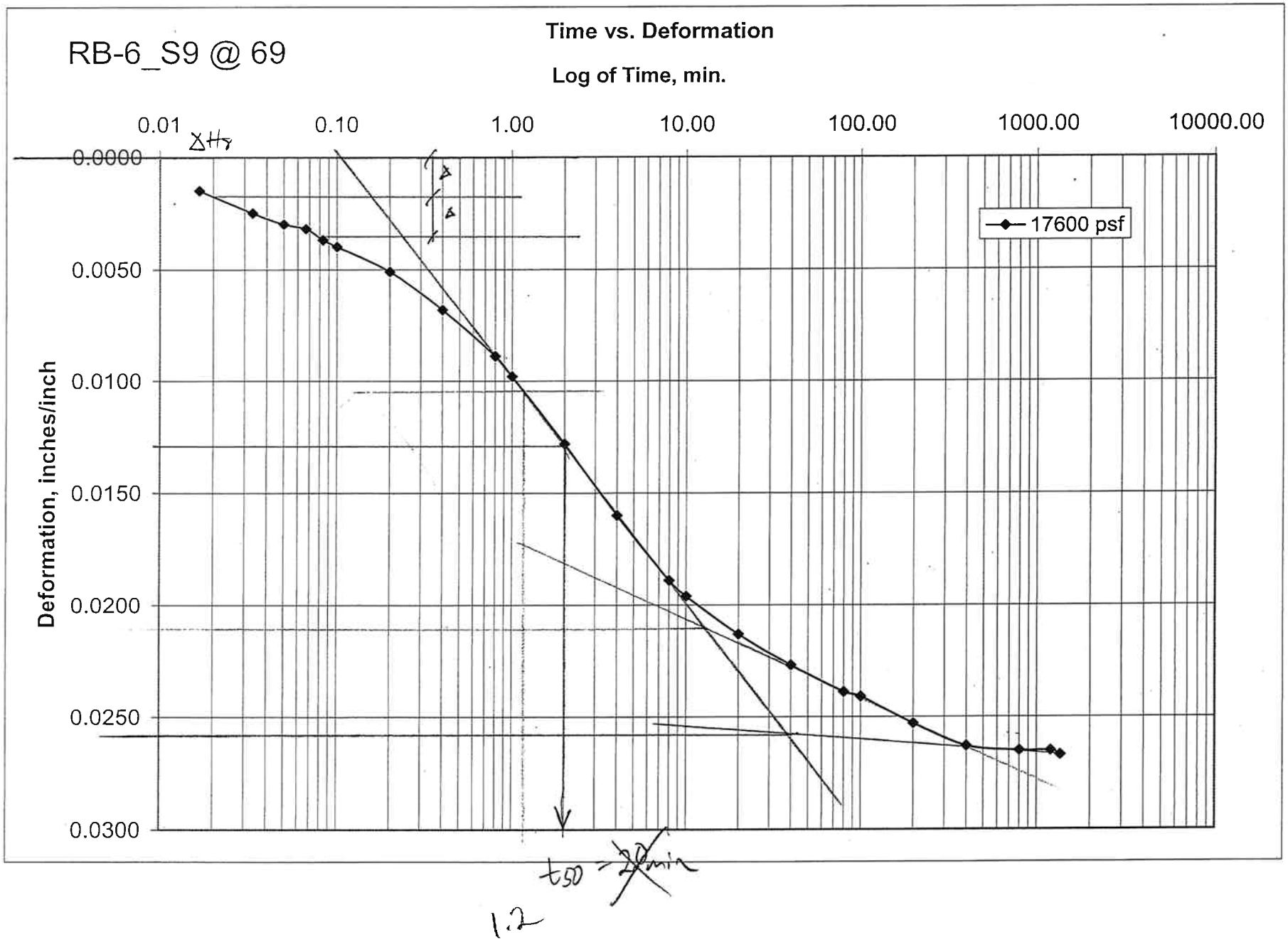
t_{50} = 1.5 min

~~0.64~~
0.66

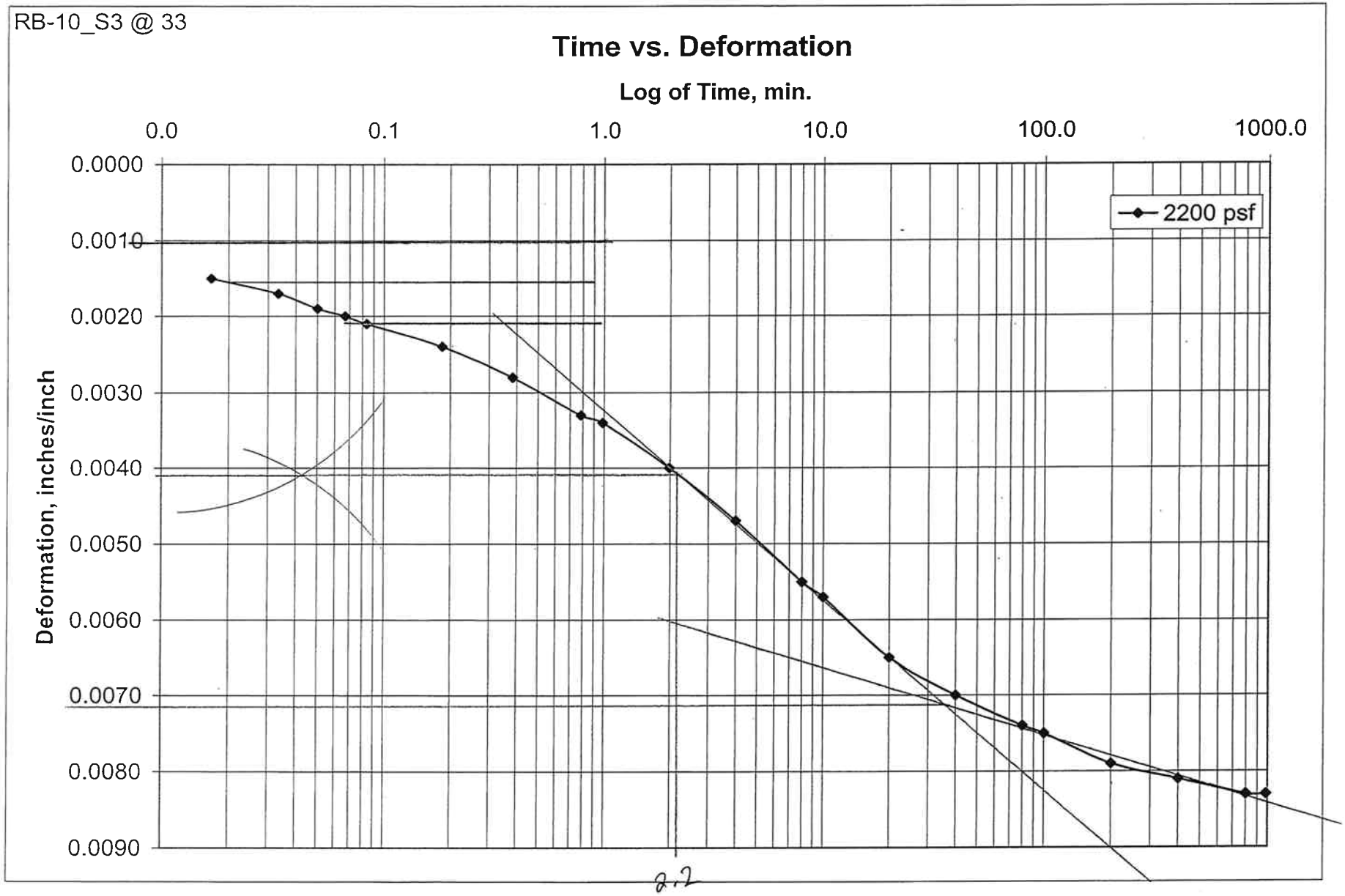
RB-6_S9 @ 69


Time vs. Deformation
Log of Time, min.
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
0.0000
0.0020
0.0040
0.0060
0.0080
0.0100
0.0120
0.0140
0.0160
0.0180
Deformation, inches/inch
8800 psf
t50=1.3min

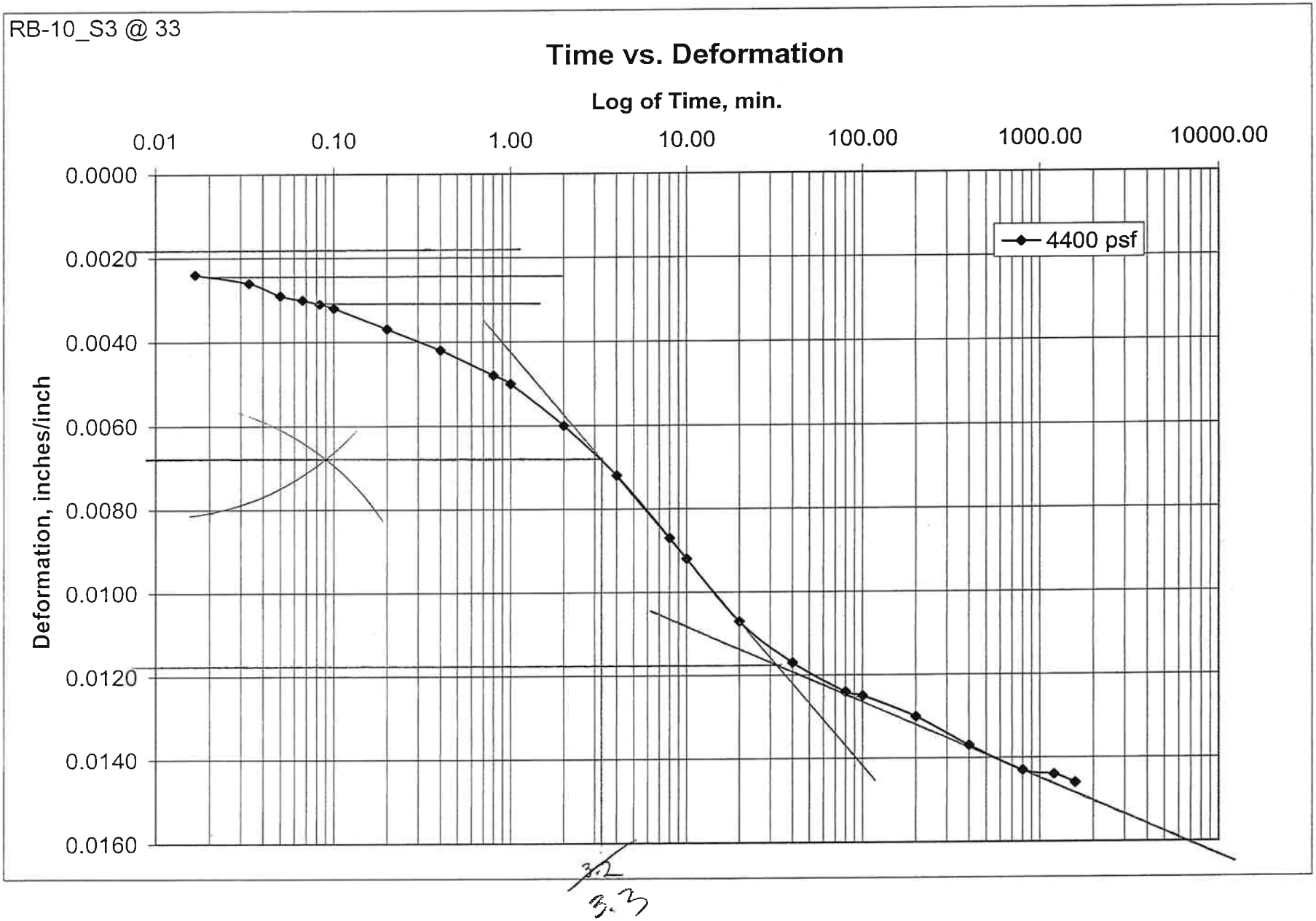
0.59


RB-6_S9 @ 69
Time vs. Deformation
Log of Time, min.
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
0.0000
0.0050
0.0100
0.0150
0.0200
0.0250
0.0300
Deformation, inches/inch
17600 psf
Δ
Δ
t50 = 20 min
1.2

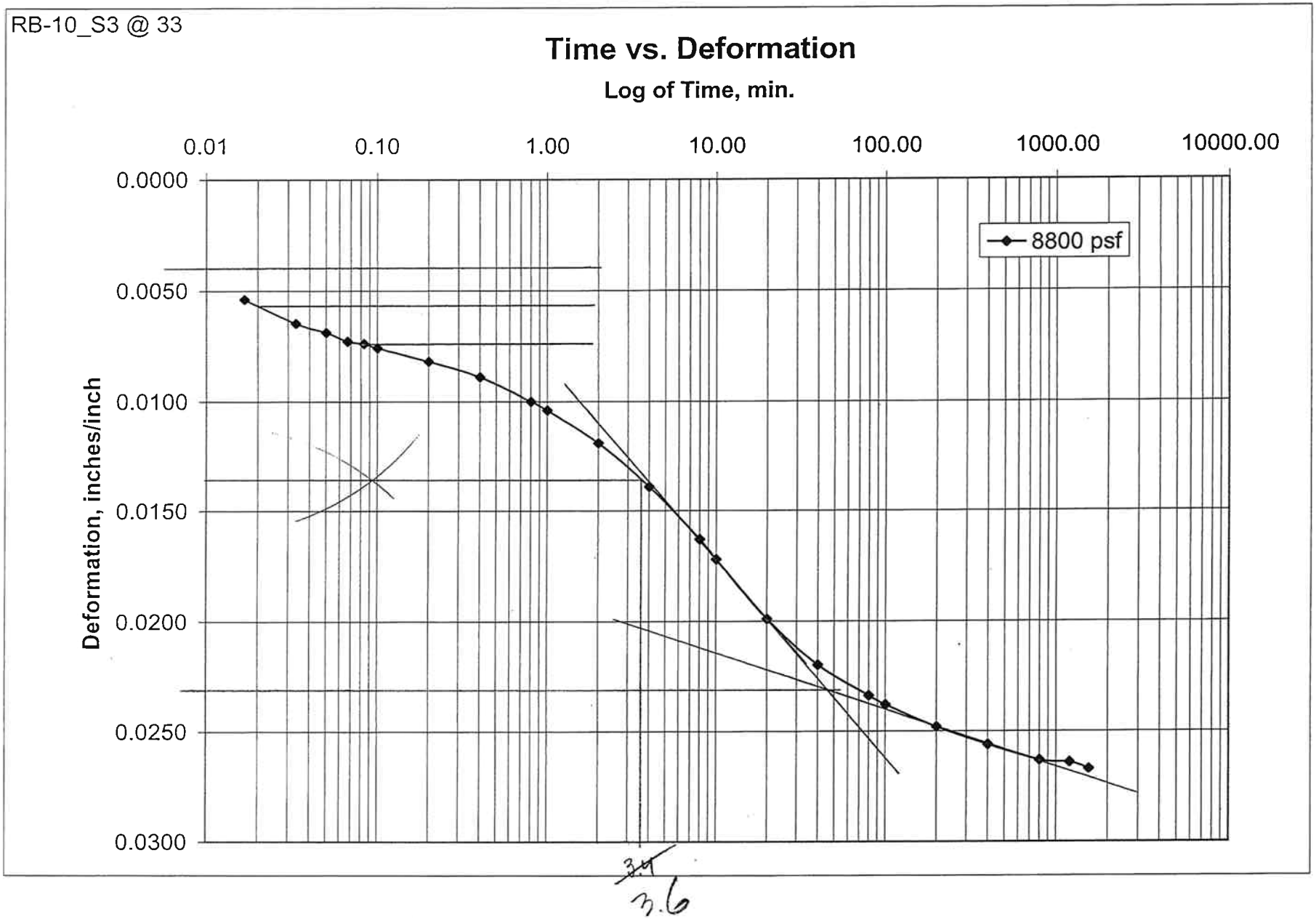
RB-10_S3 @ 33


Time vs. Deformation
Log of Time, min.
0.0
0.1
1.0
10.0
100.0
1000.0
0.0000
0.0010
0.0020
0.0030
0.0040
0.0050
0.0060
0.0070
0.0080
0.0090
Deformation, inches/inch
2200 psf
2.2

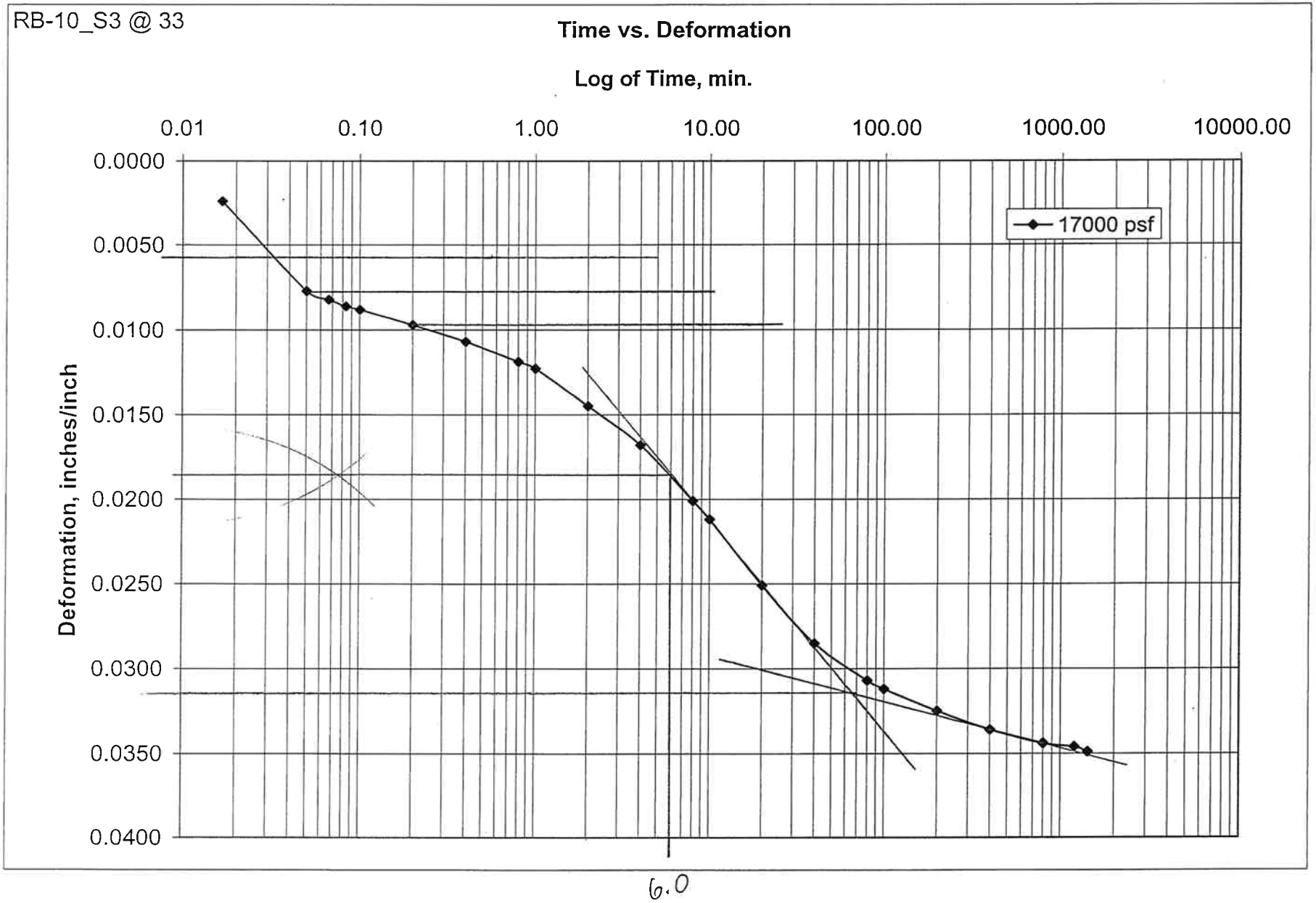
RB-10_S3 @ 33


Time vs. Deformation
Log of Time, min.
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
0.0000
0.0020
0.0040
0.0060
0.0080
0.0100
0.0120
0.0140
0.0160
Deformation, inches/inch
4400 psf
3.2
3.3

RB-10_S3 @ 33

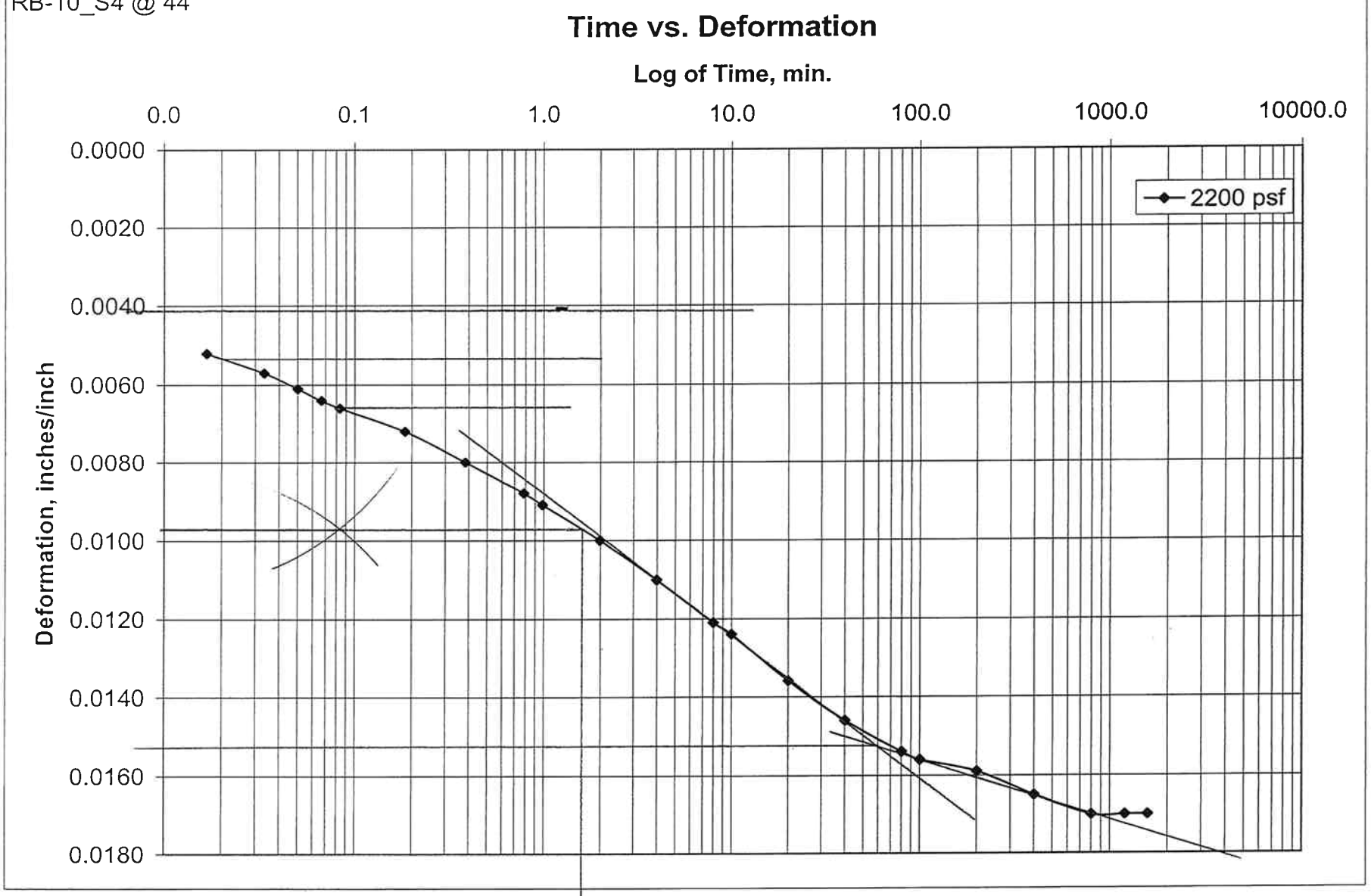

Time vs. Deformation
Log of Time, min.
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
0.0000
0.0050
0.0100
0.0150
0.0200
0.0250
0.0300
Deformation, inches/inch
8800 psf
~~3.4~~
3.6

3


RB-10_S3 @ 33
Time vs. Deformation
Log of Time, min.
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
0.0000
0.0050
0.0100
0.0150
0.0200
0.0250
0.0300
0.0350
0.0400
Deformation, inches/inch
17000 psf

6.0

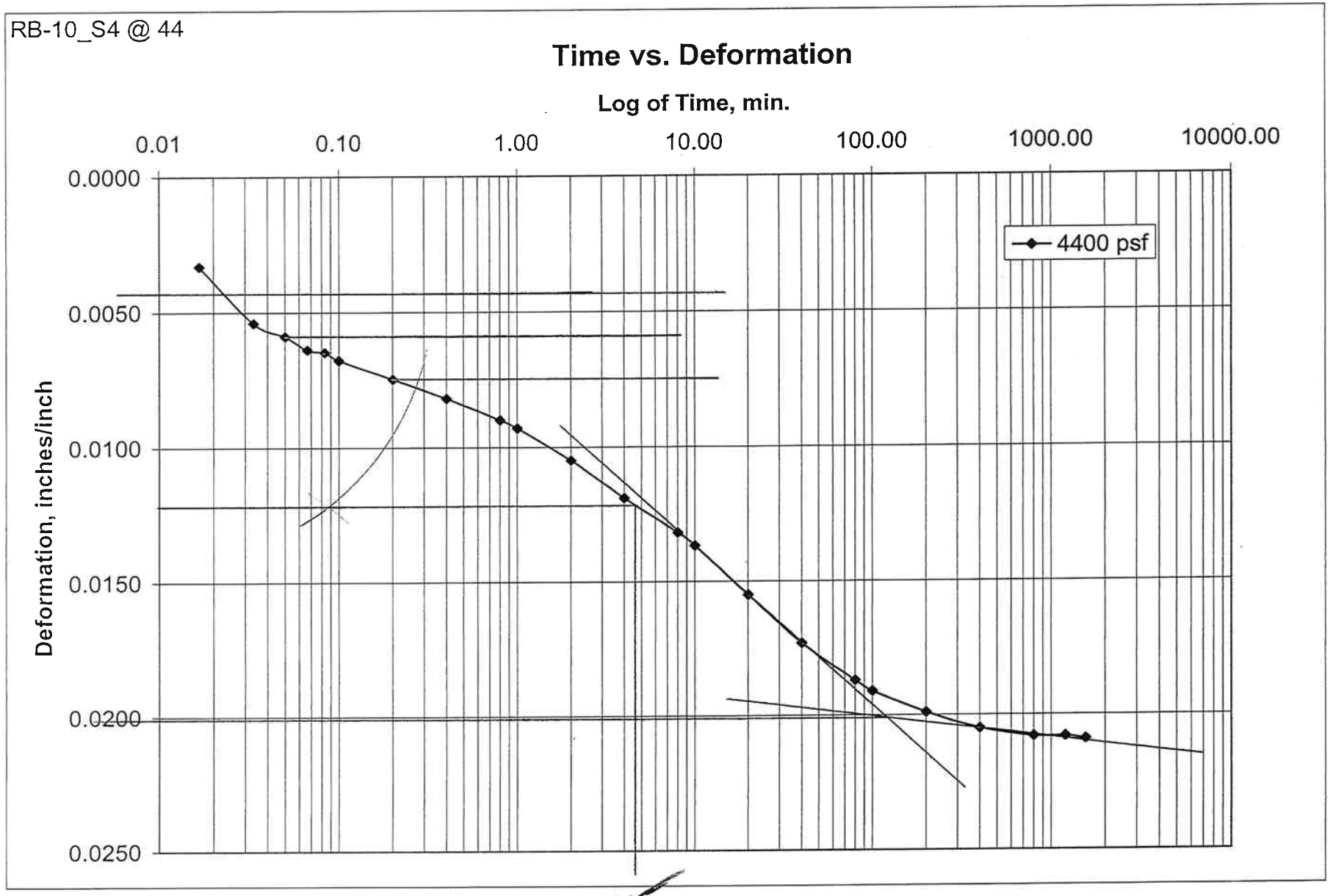
RB-10_S4 @ 44



~~1.5~~ 1.7

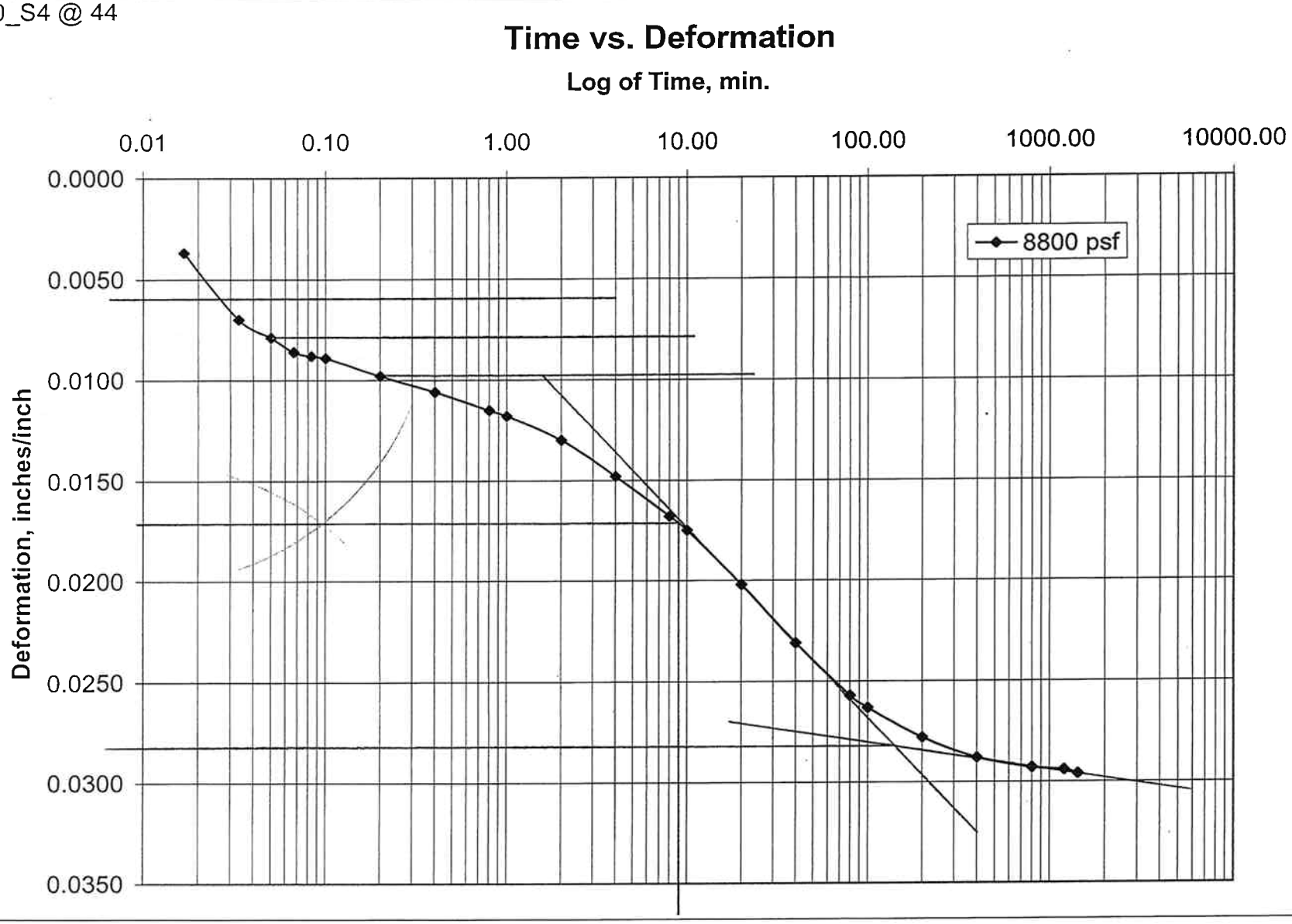
3

RB-10_S4 @ 44



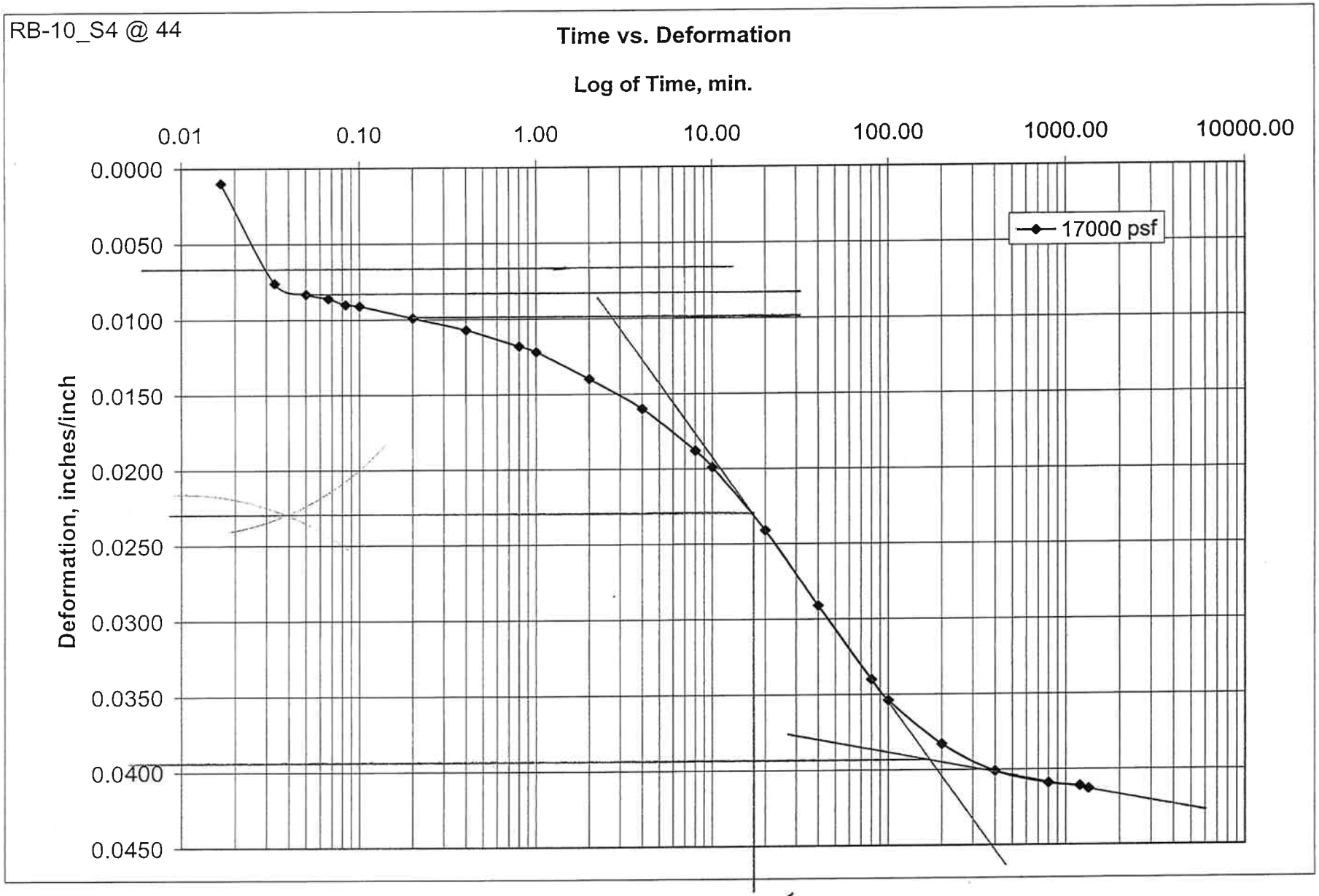
~~4.5~~ 4.6

RB-10_S4 @ 44


Time vs. Deformation
Log of Time, min.
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
0.0000
0.0050
0.0100
0.0150
0.0200
0.0250
0.0300
0.0350
Deformation, inches/inch
8800 psf

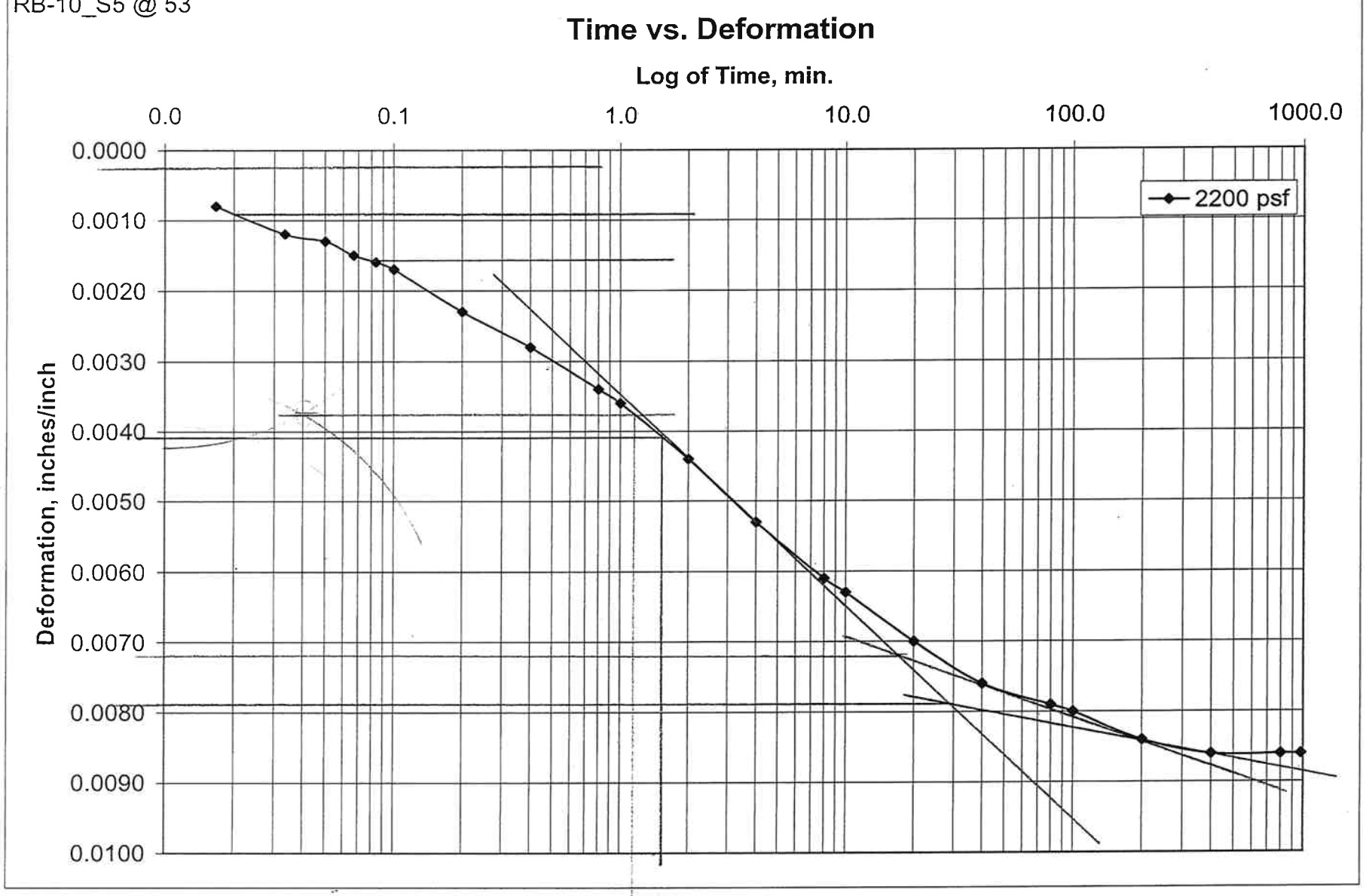
9.0

RB-10_S4 @ 44



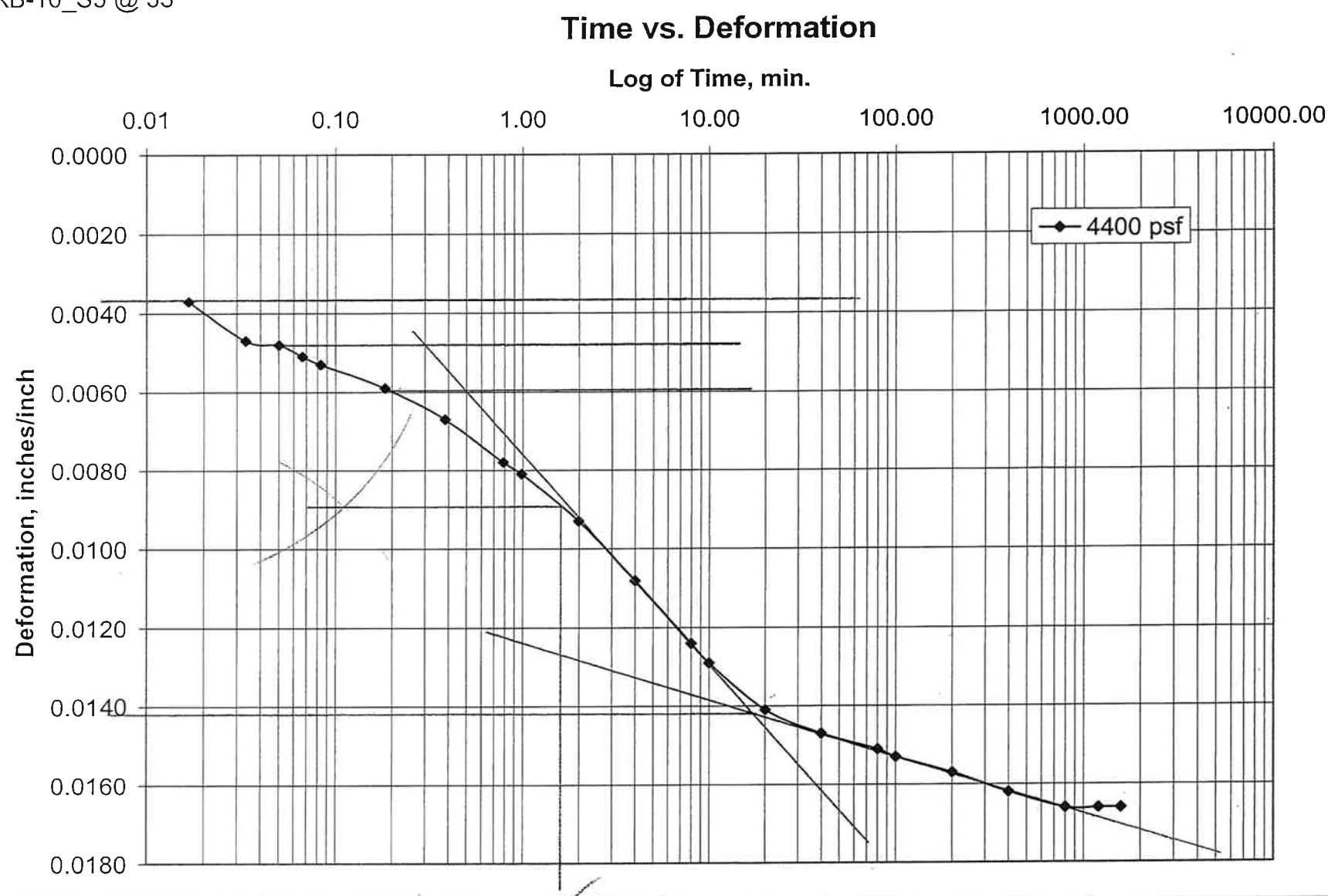
~~16.0~~ 17

RB-10_S5 @ 53


Time vs. Deformation
Log of Time, min.
0.0
0.1
1.0
10.0
100.0
1000.0
0.0000
0.0010
0.0020
0.0030
0.0040
0.0050
0.0060
0.0070
0.0080
0.0090
0.0100
Deformation, inches/inch
2200 psf

14

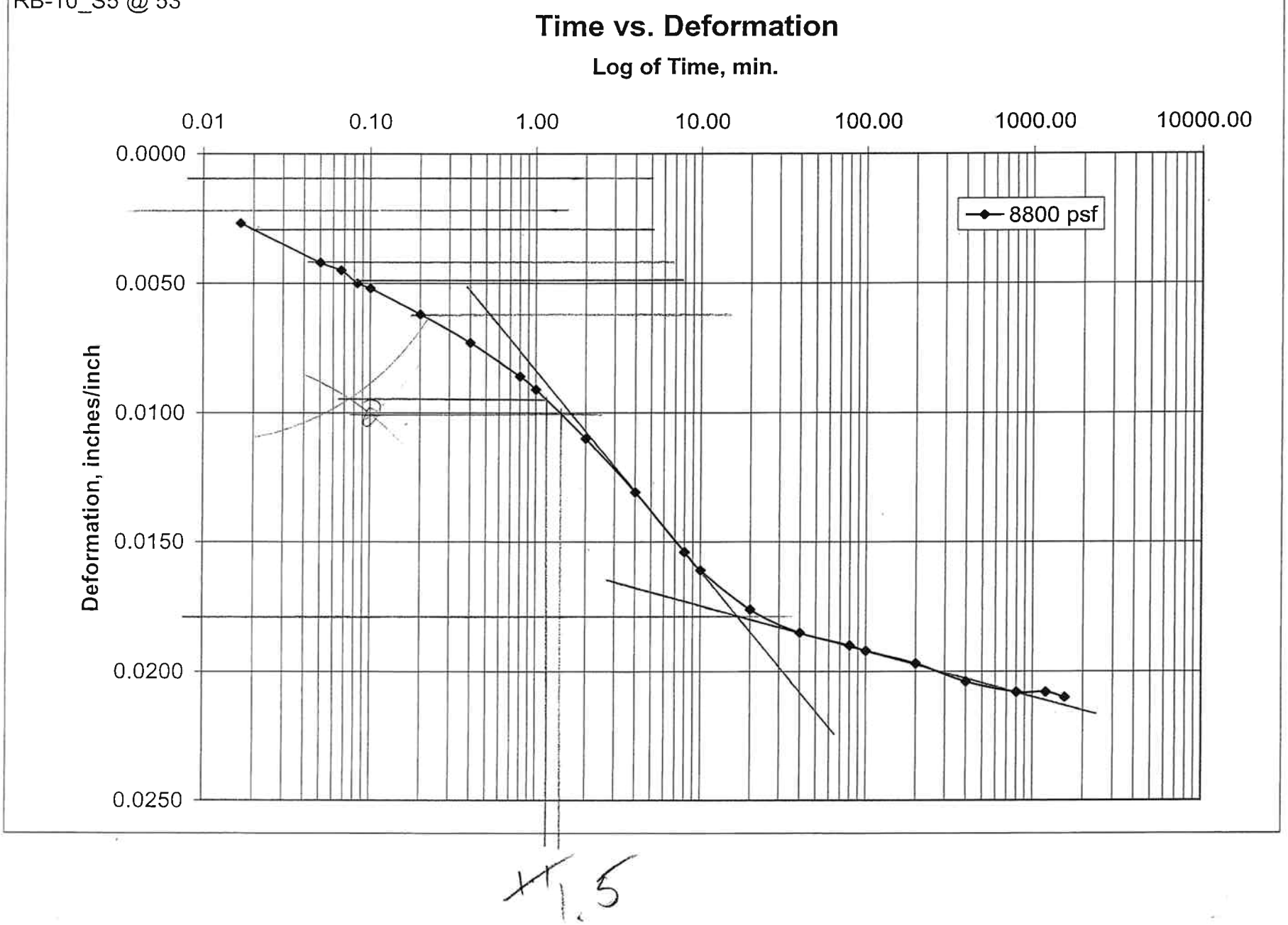
RB-10_S5 @ 53



1.4

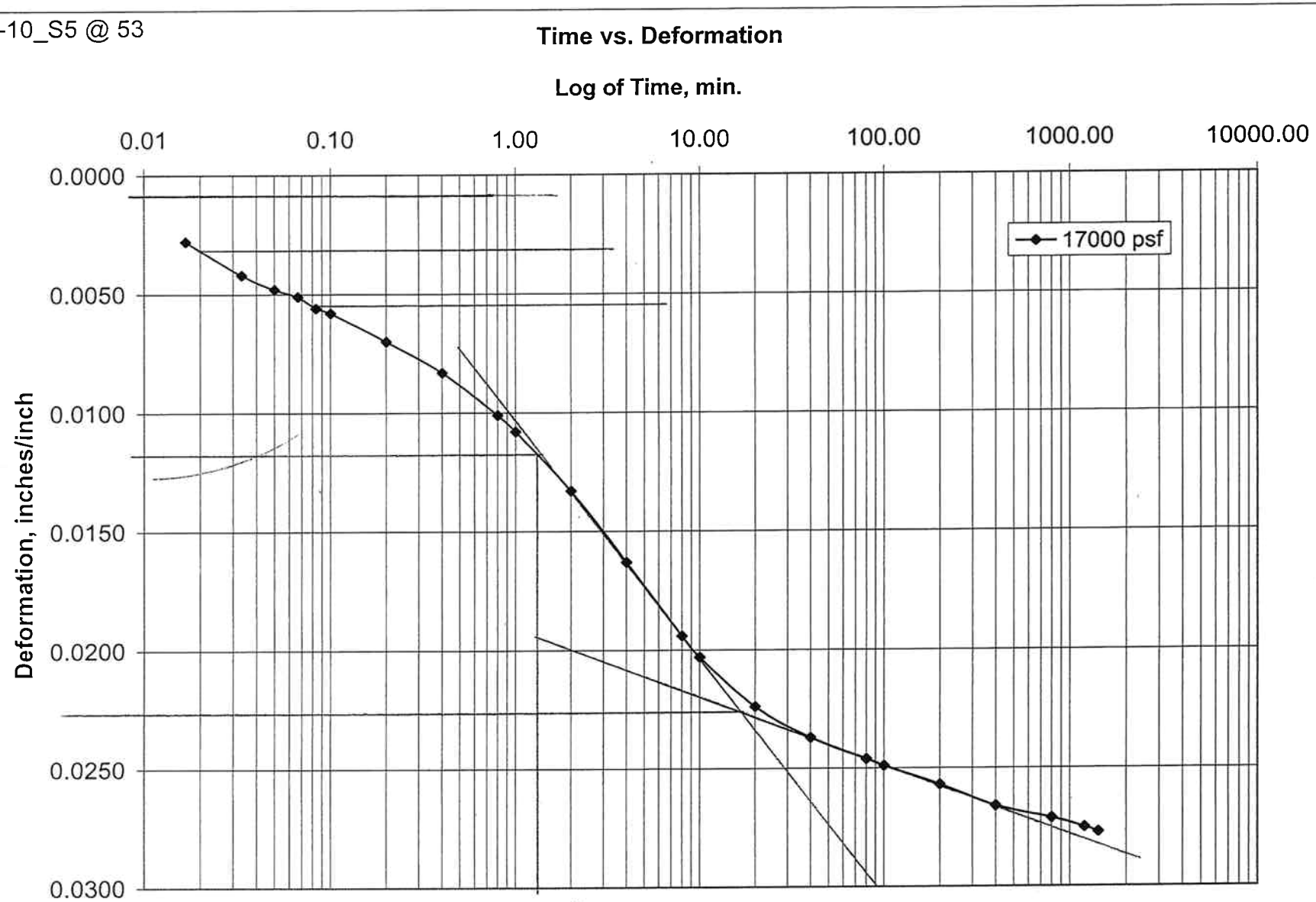
1.6

RB-10_S5 @ 53


Time vs. Deformation
Log of Time, min.
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
0.0000
0.0050
0.0100
0.0150
0.0200
0.0250
Deformation, inches/inch
8800 psf

1.5

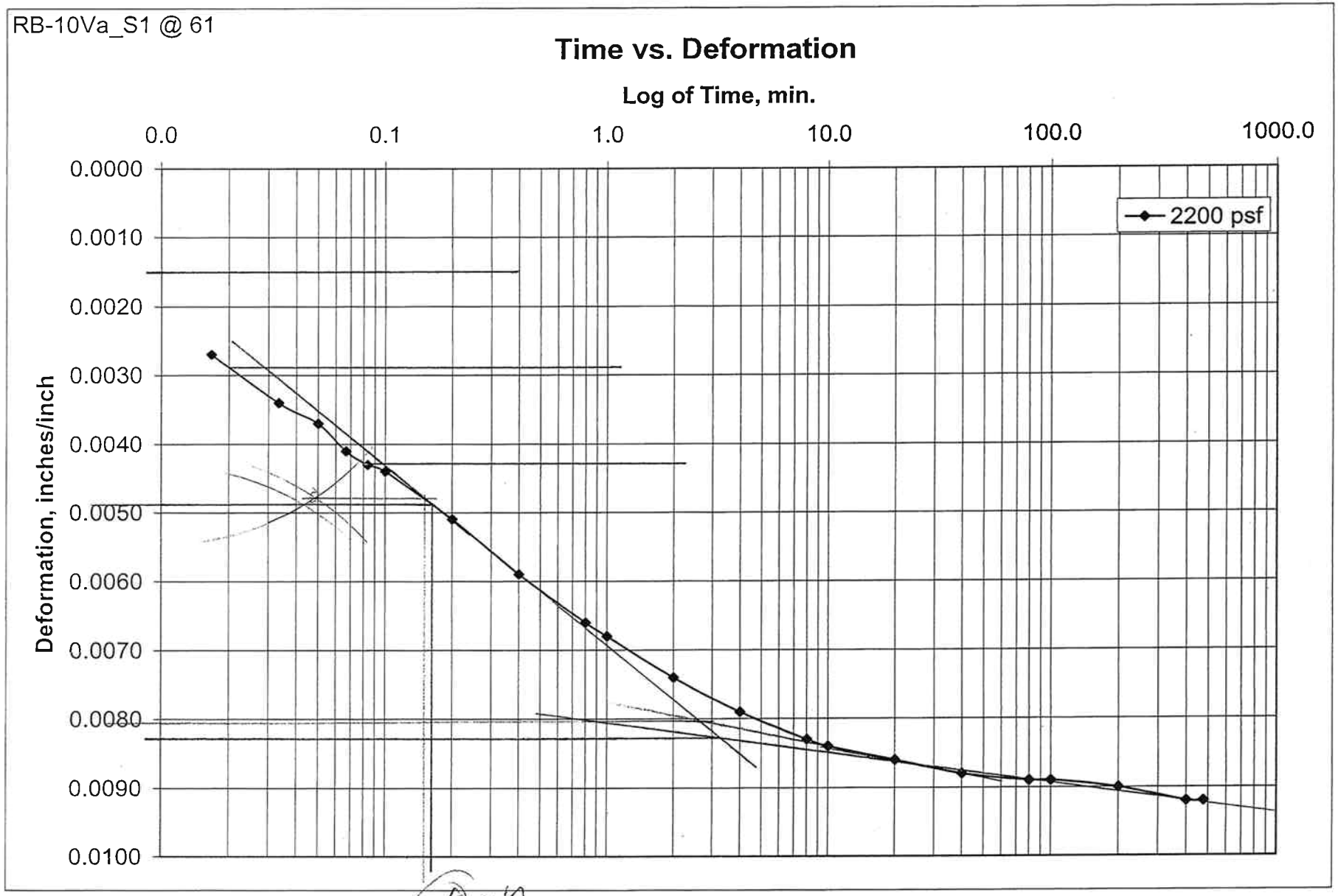
RB-10_S5 @ 53



1.2

1.3

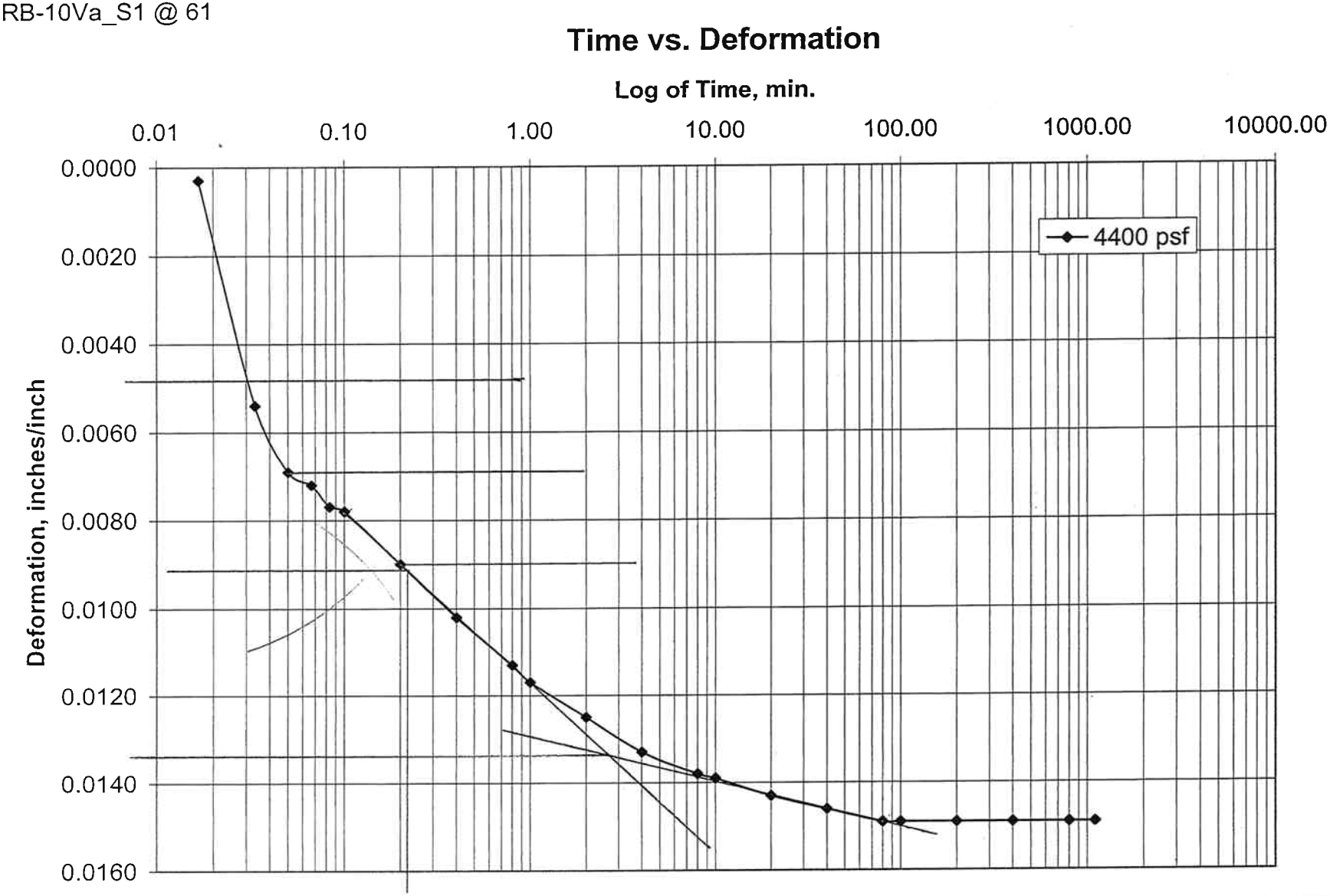
RB-10Va_S1 @ 61



0.15 0.4

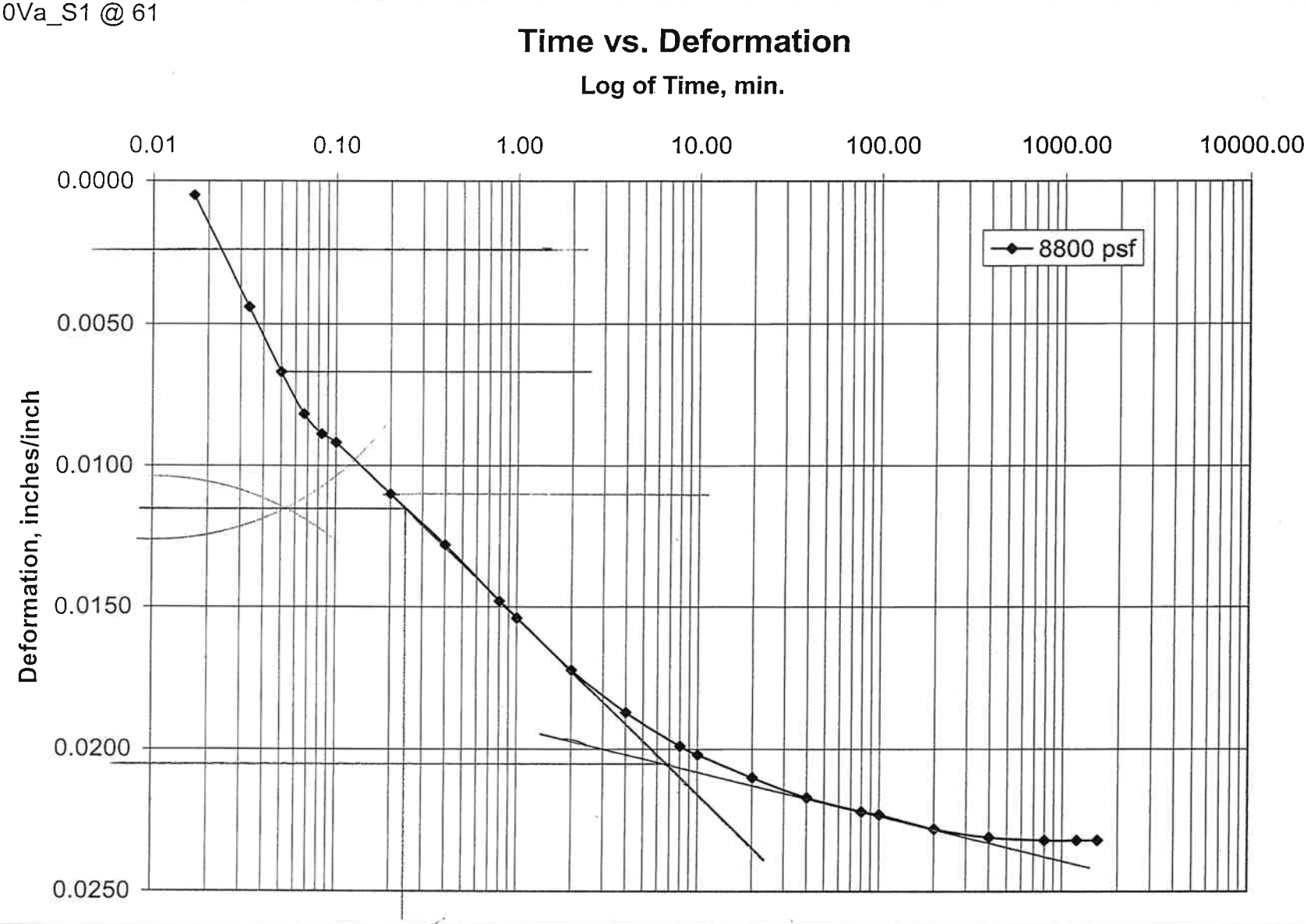
0.15

RB-10Va_S1 @ 61

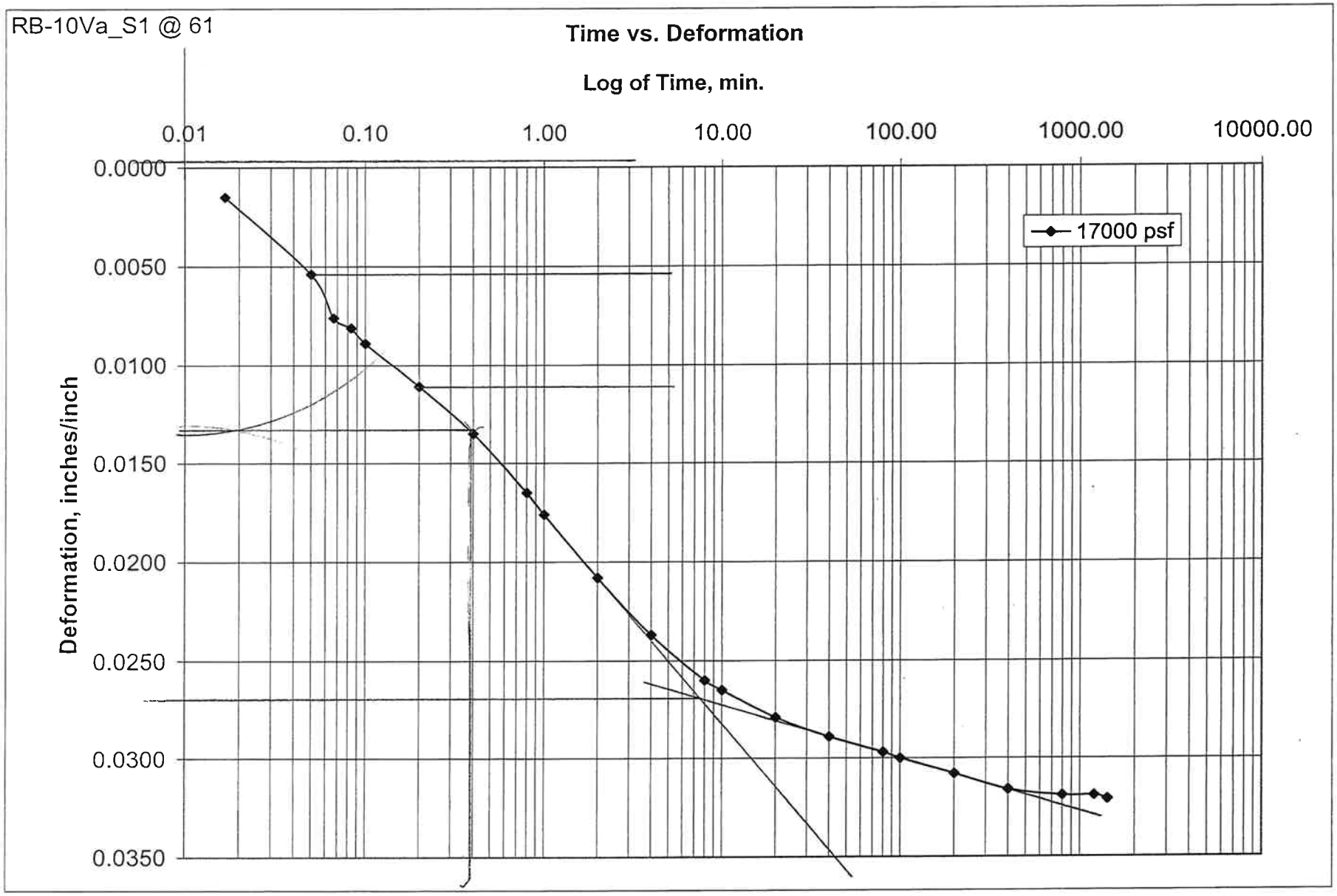


~~0.21~~ 0.22

RB-10Va_S1 @ 61

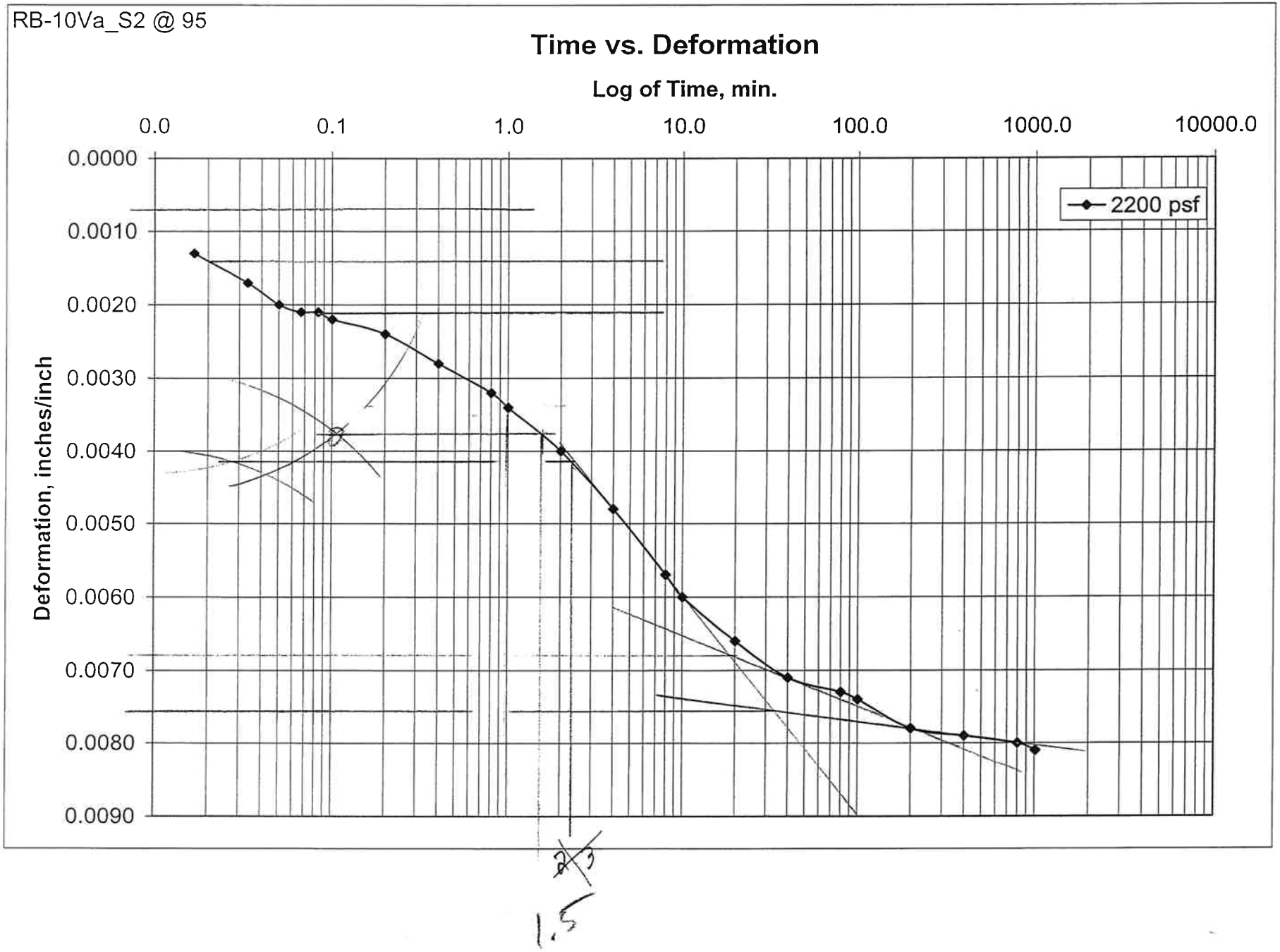


~~0.23~~ 0.24

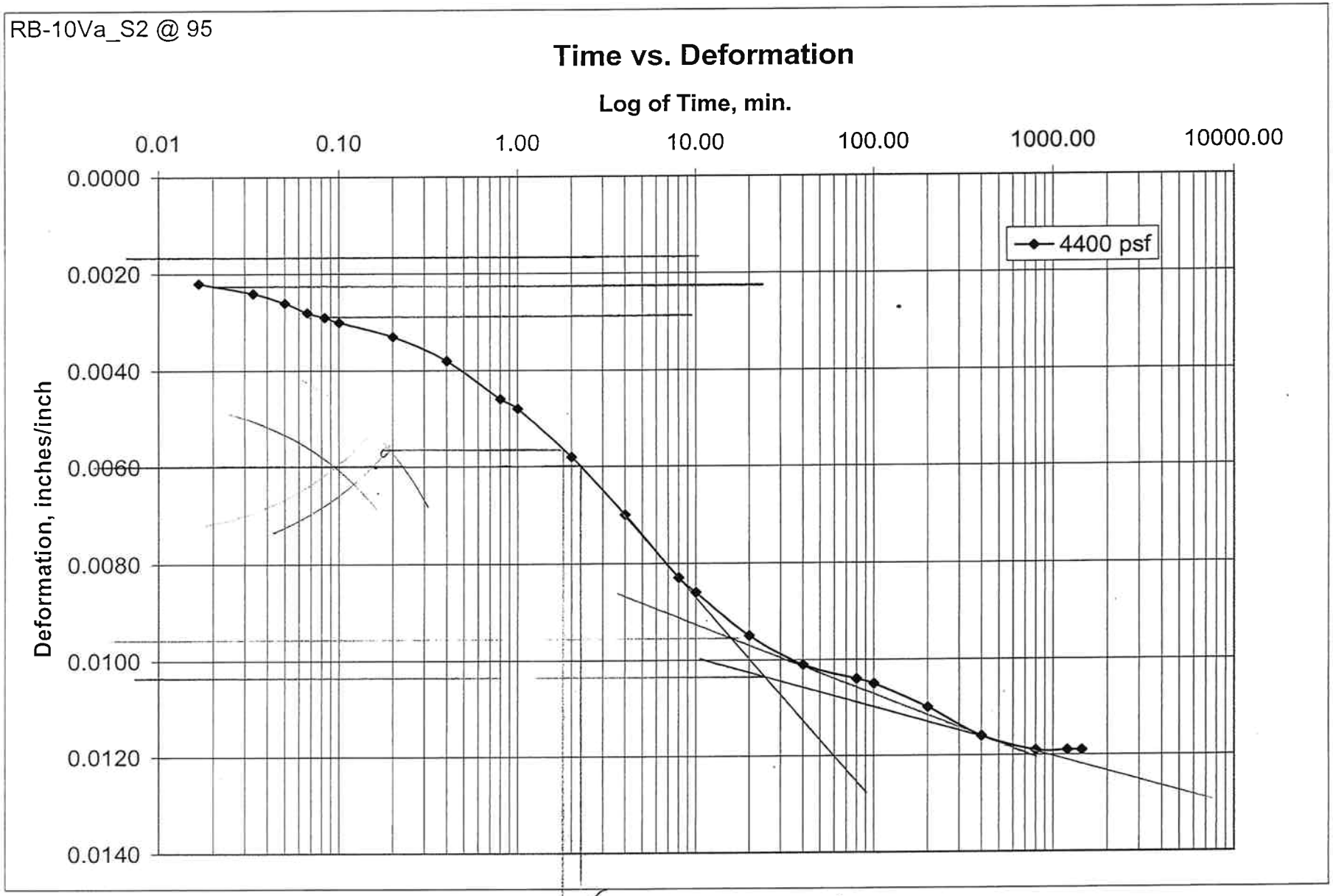

RB-10Va_S1 @ 61
Time vs. Deformation
Log of Time, min.
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
0.0000
0.0050
0.0100
0.0150
0.0200
0.0250
0.0300
0.0350
Deformation, inches/inch
17000 psf

0.39

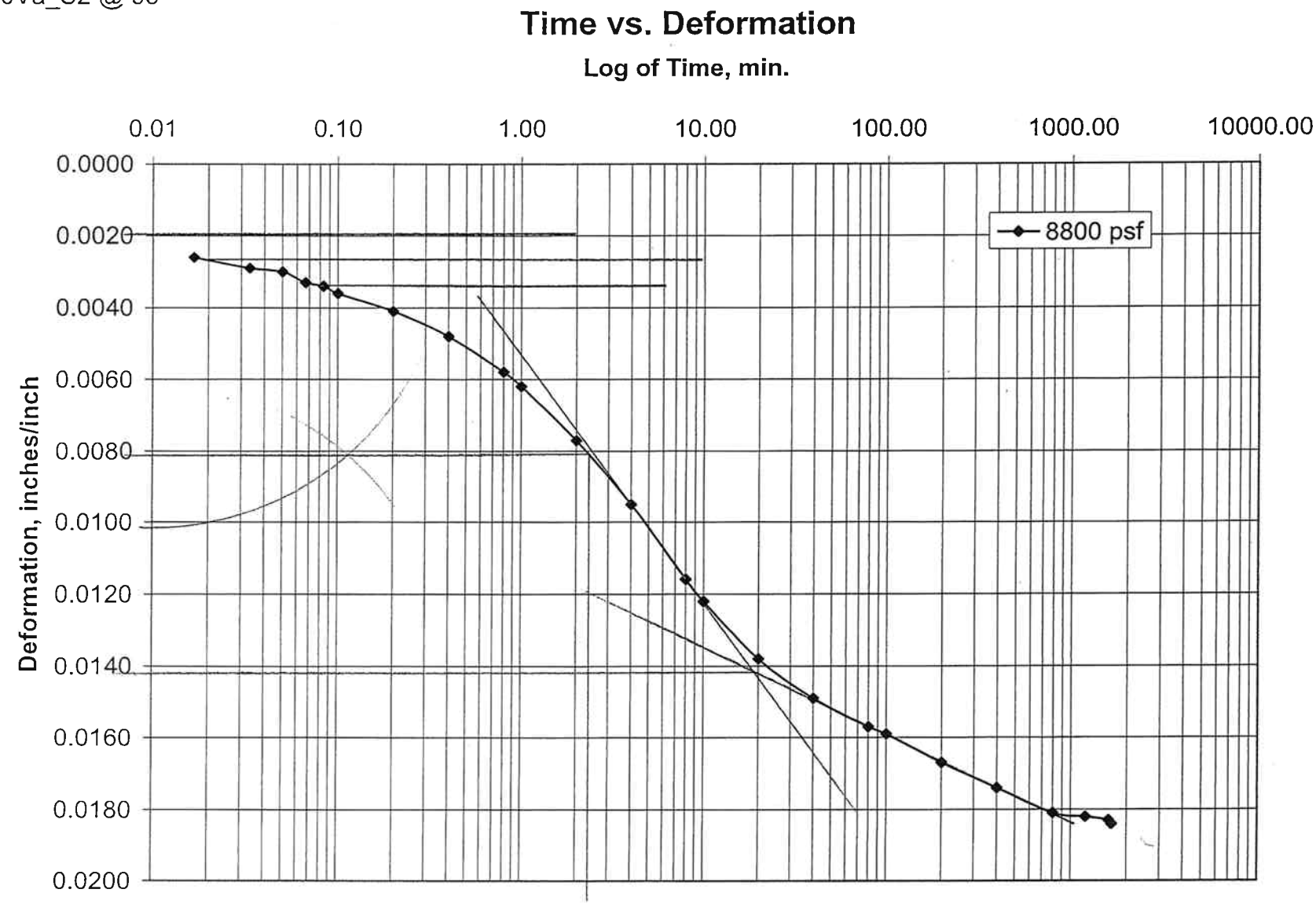
RB-10Va_S2 @ 95


Time vs. Deformation
Log of Time, min.
0.0
0.1
1.0
10.0
100.0
1000.0
10000.0
0.0000
0.0010
0.0020
0.0030
0.0040
0.0050
0.0060
0.0070
0.0080
0.0090
Deformation, inches/inch
2200 psf
1.5

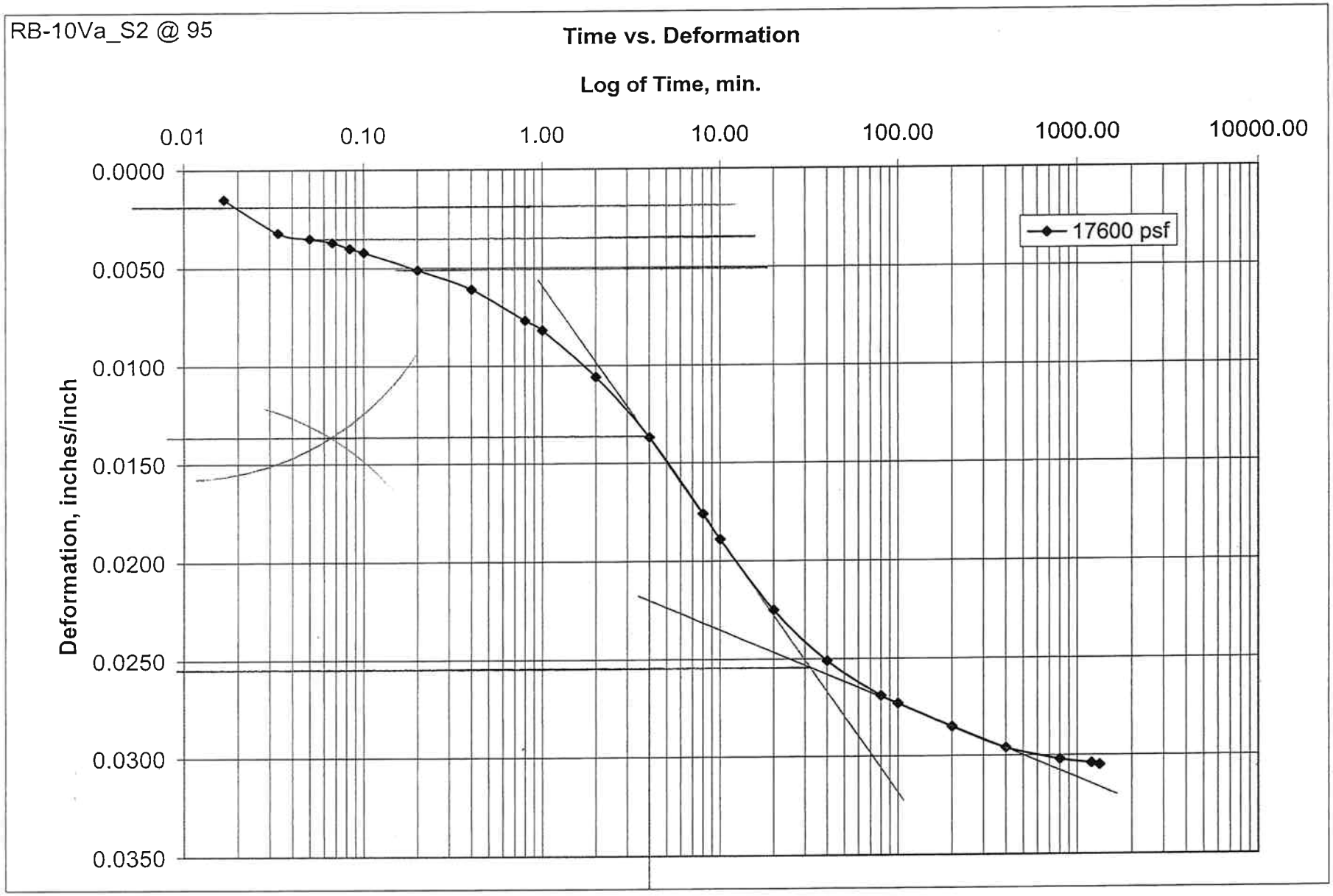
RB-10Va_S2 @ 95


Time vs. Deformation
Log of Time, min.
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
Deformation, inches/inch
0.0000
0.0020
0.0040
0.0060
0.0080
0.0100
0.0120
0.0140
4400 psf

RB-10Va_S2 @ 95

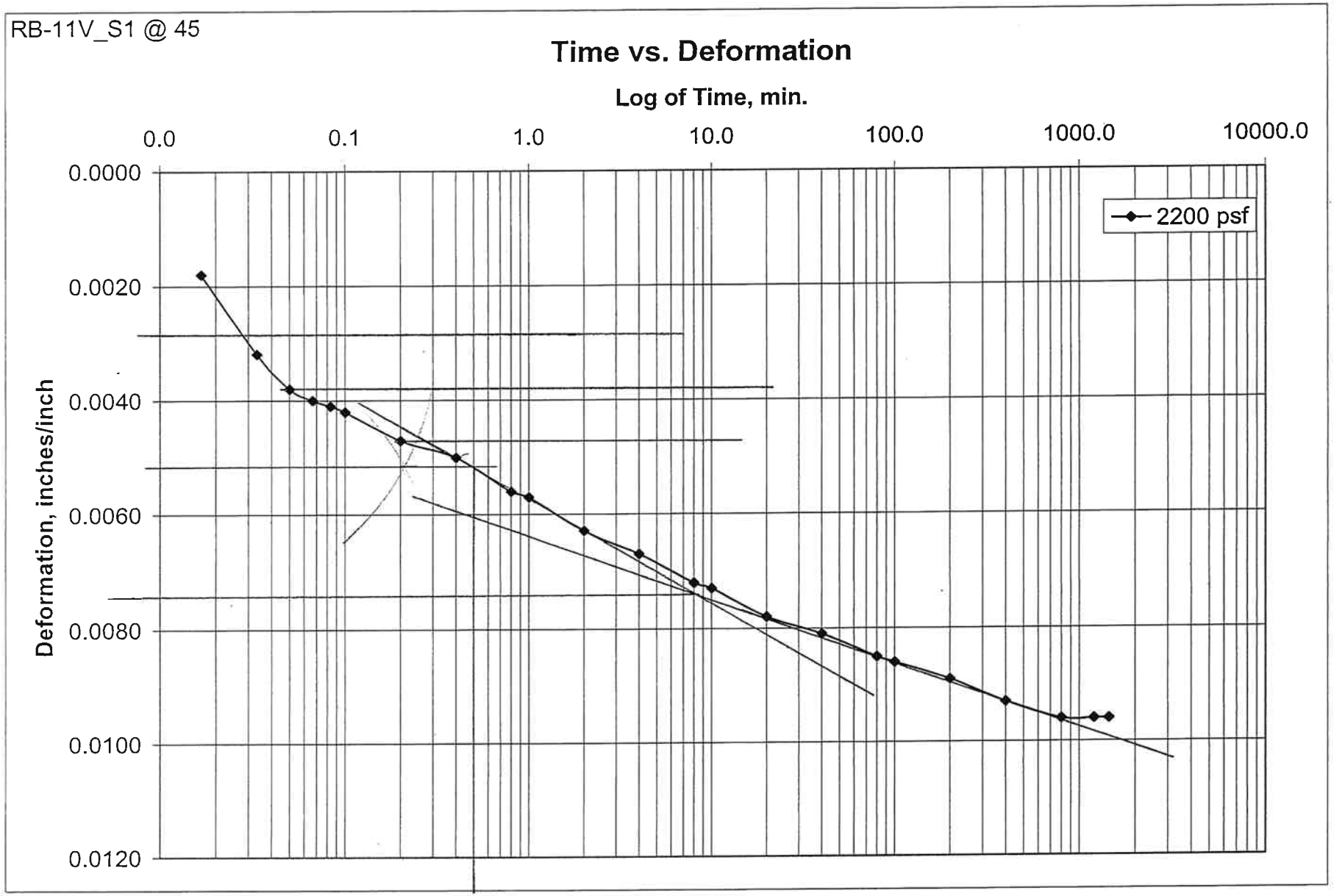


~~2.3~~
2.4


RB-10Va_S2 @ 95
Time vs. Deformation
Log of Time, min.
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
0.0000
0.0050
0.0100
0.0150
0.0200
0.0250
0.0300
0.0350
Deformation, inches/inch
17600 psf

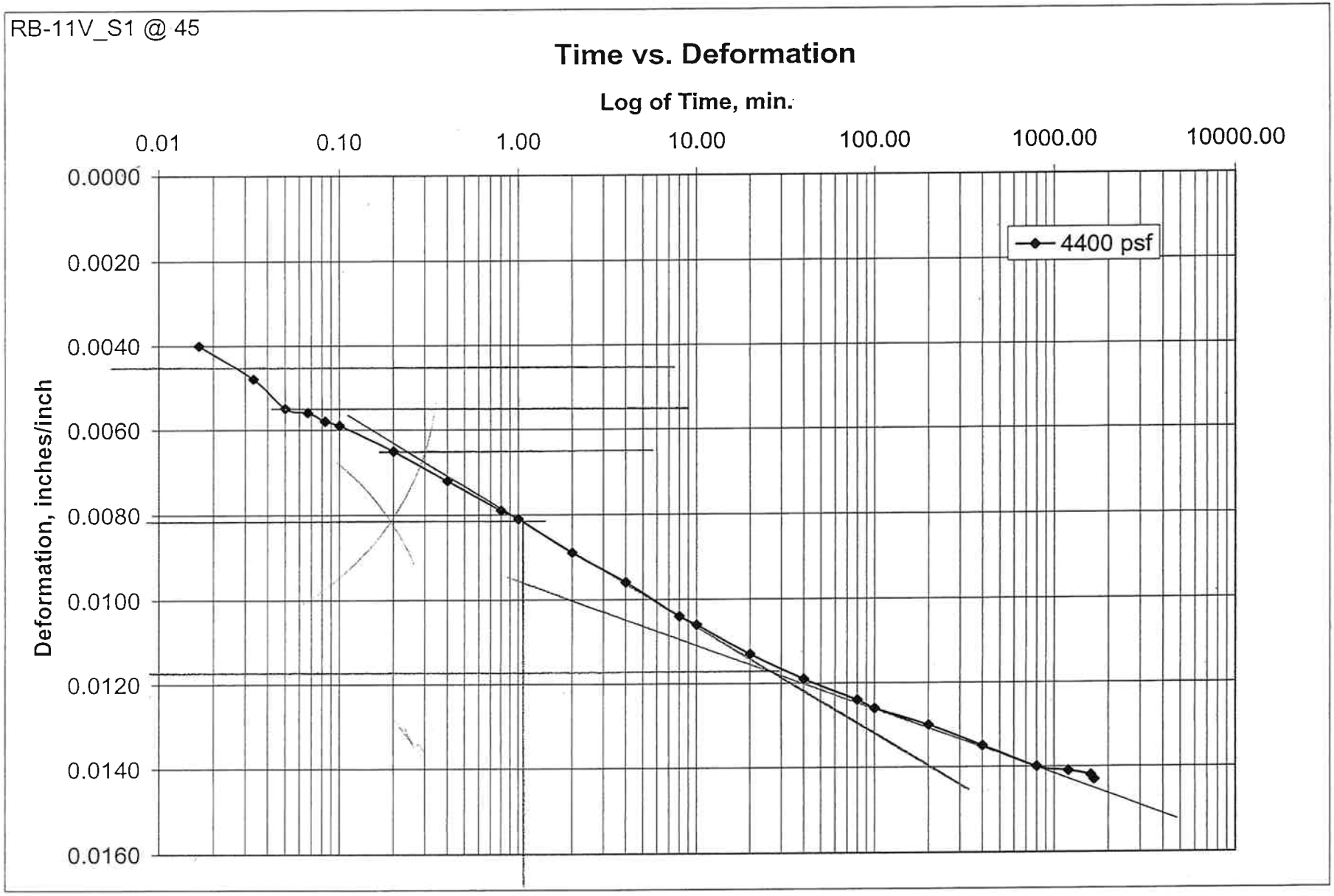
4.0

RB-11V_S1 @ 45



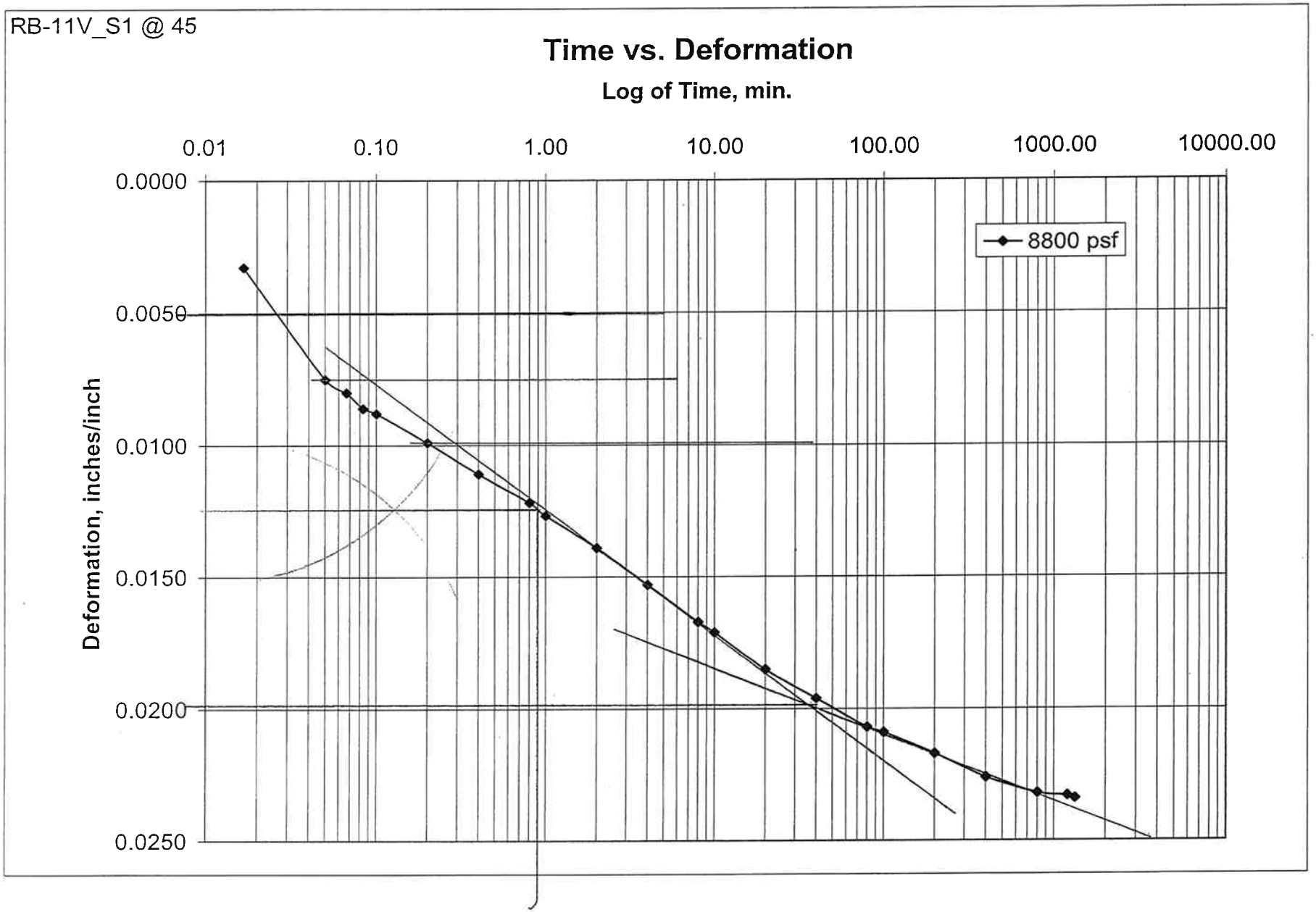
0.50

RB-11V_S1 @ 45

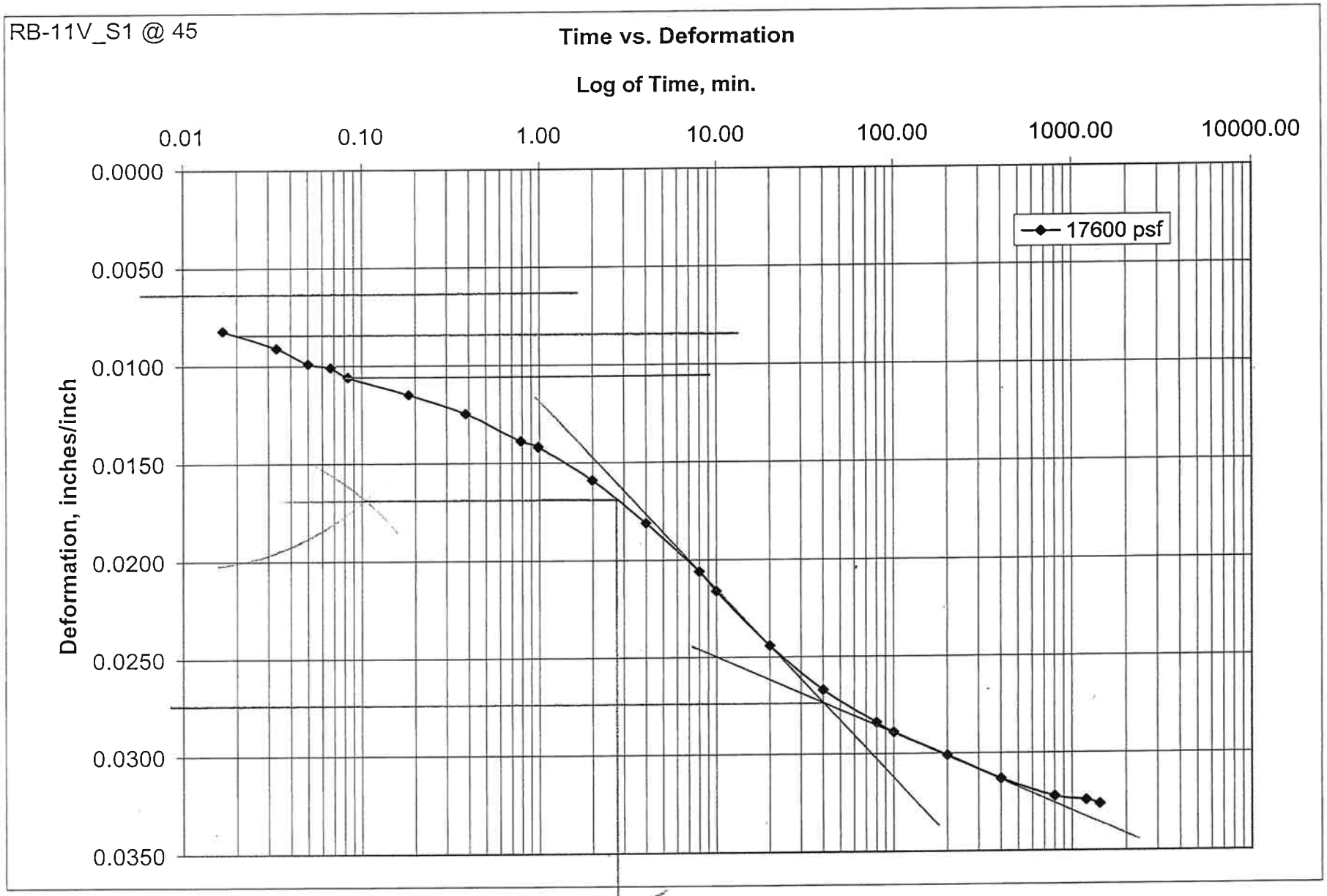


1.1

RB-11V_S1 @ 45

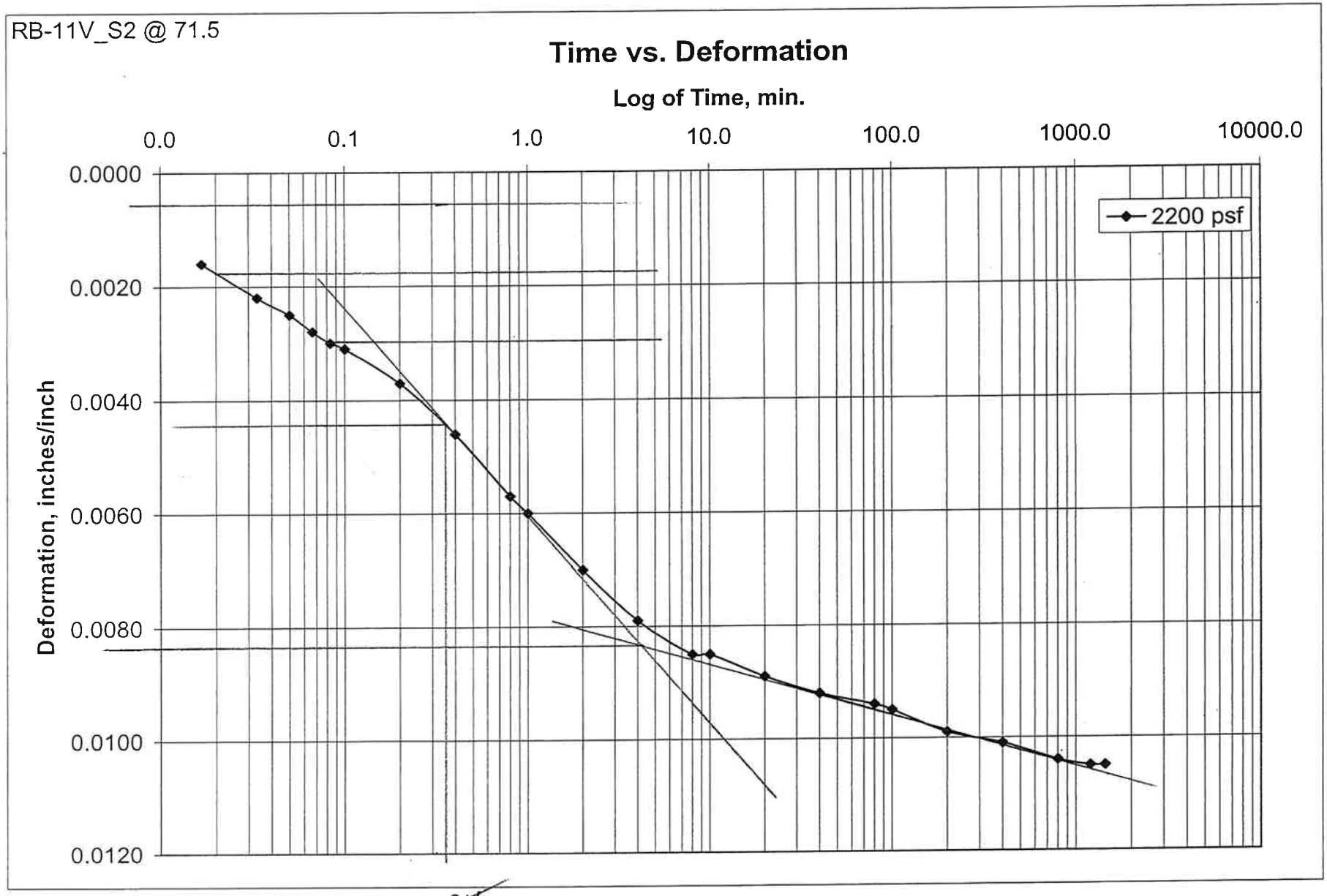


0.90


RB-11V_S1 @ 45
Time vs. Deformation
Log of Time, min.
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
0.0000
0.0050
0.0100
0.0150
0.0200
0.0250
0.0300
0.0350
Deformation, inches/inch
17600 psf

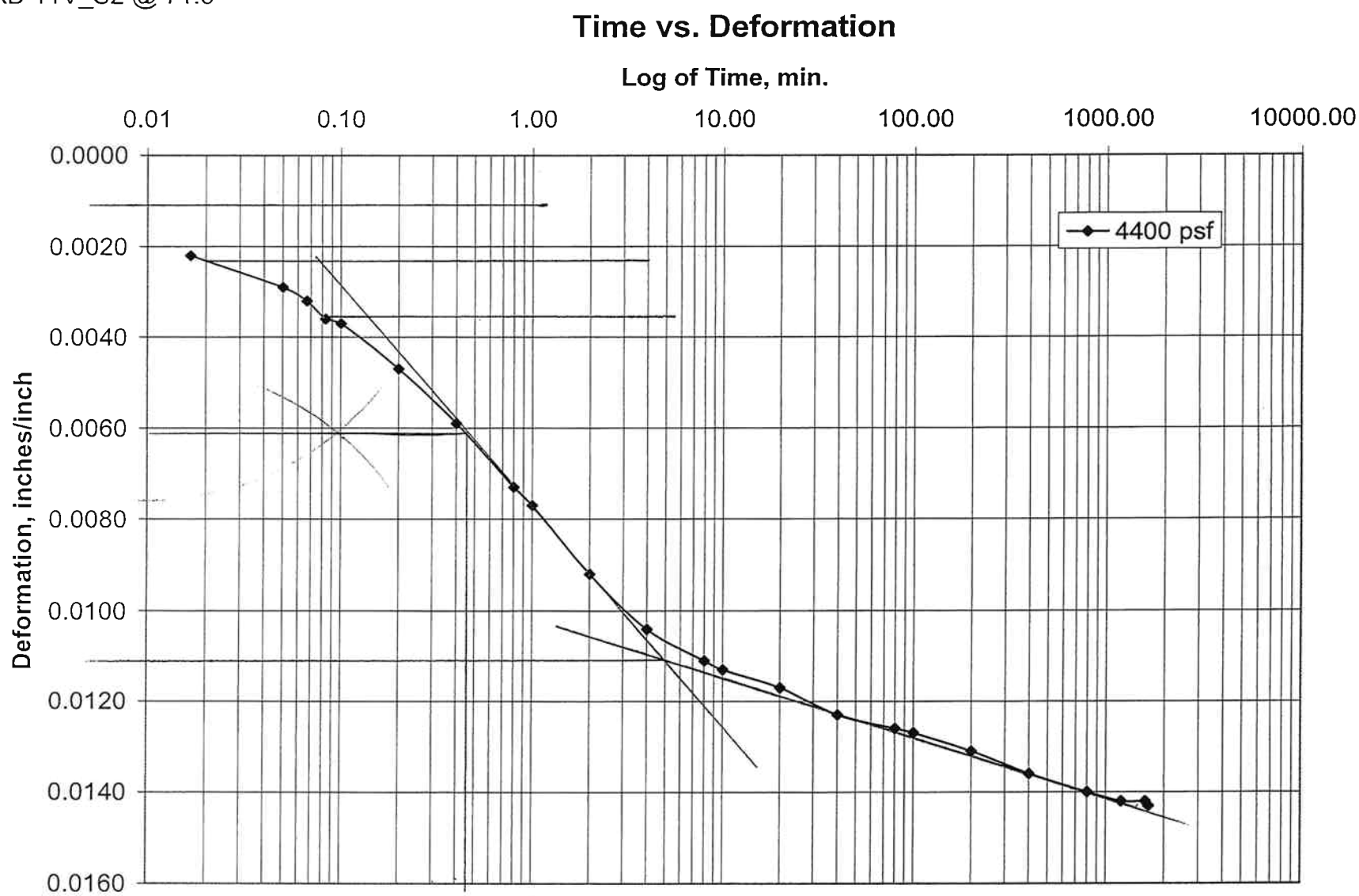
~~2.6~~ 2.7

RB-11V_S2 @ 71.5



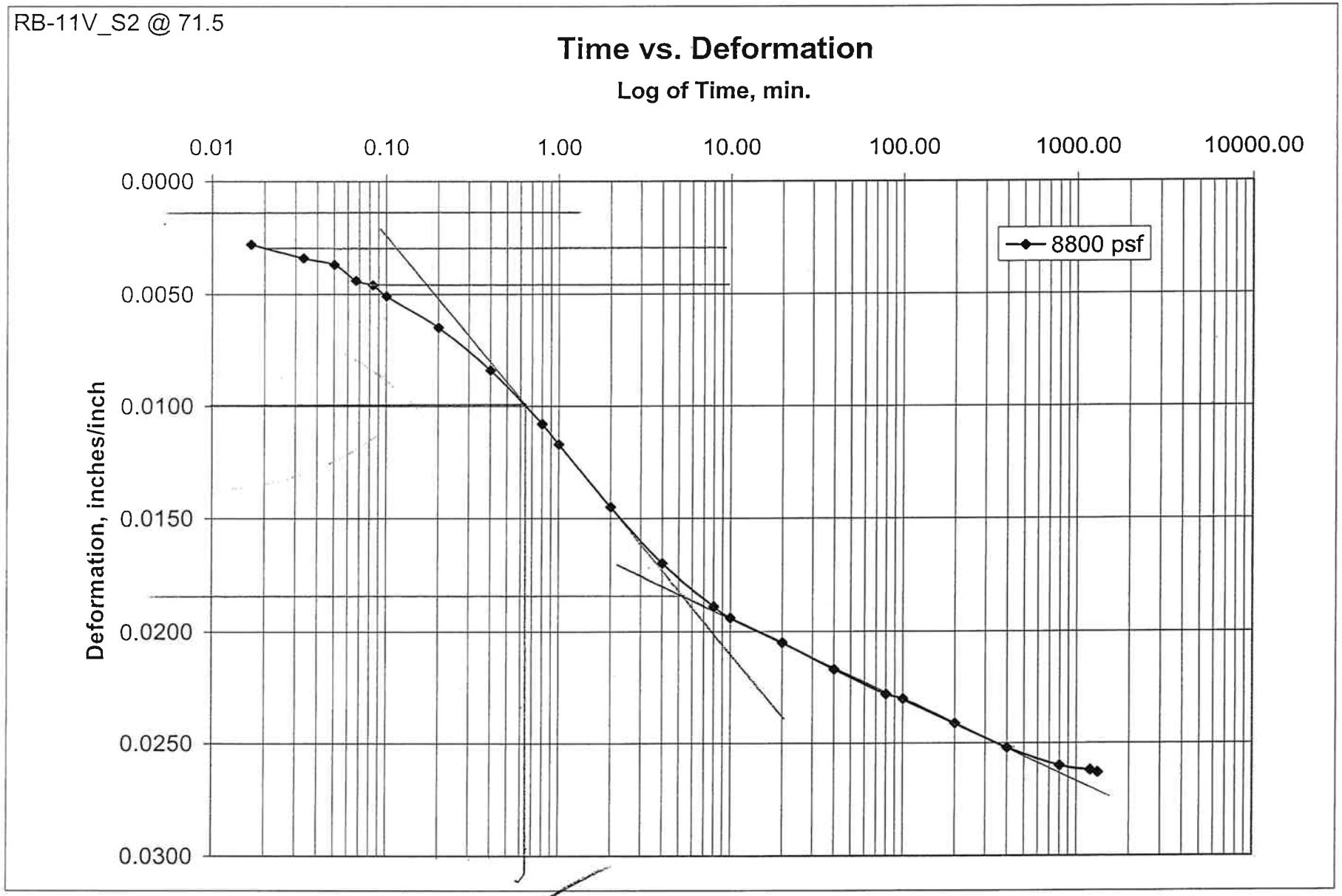
~~0.34~~
0.36

RB-11V_S2 @ 71.5

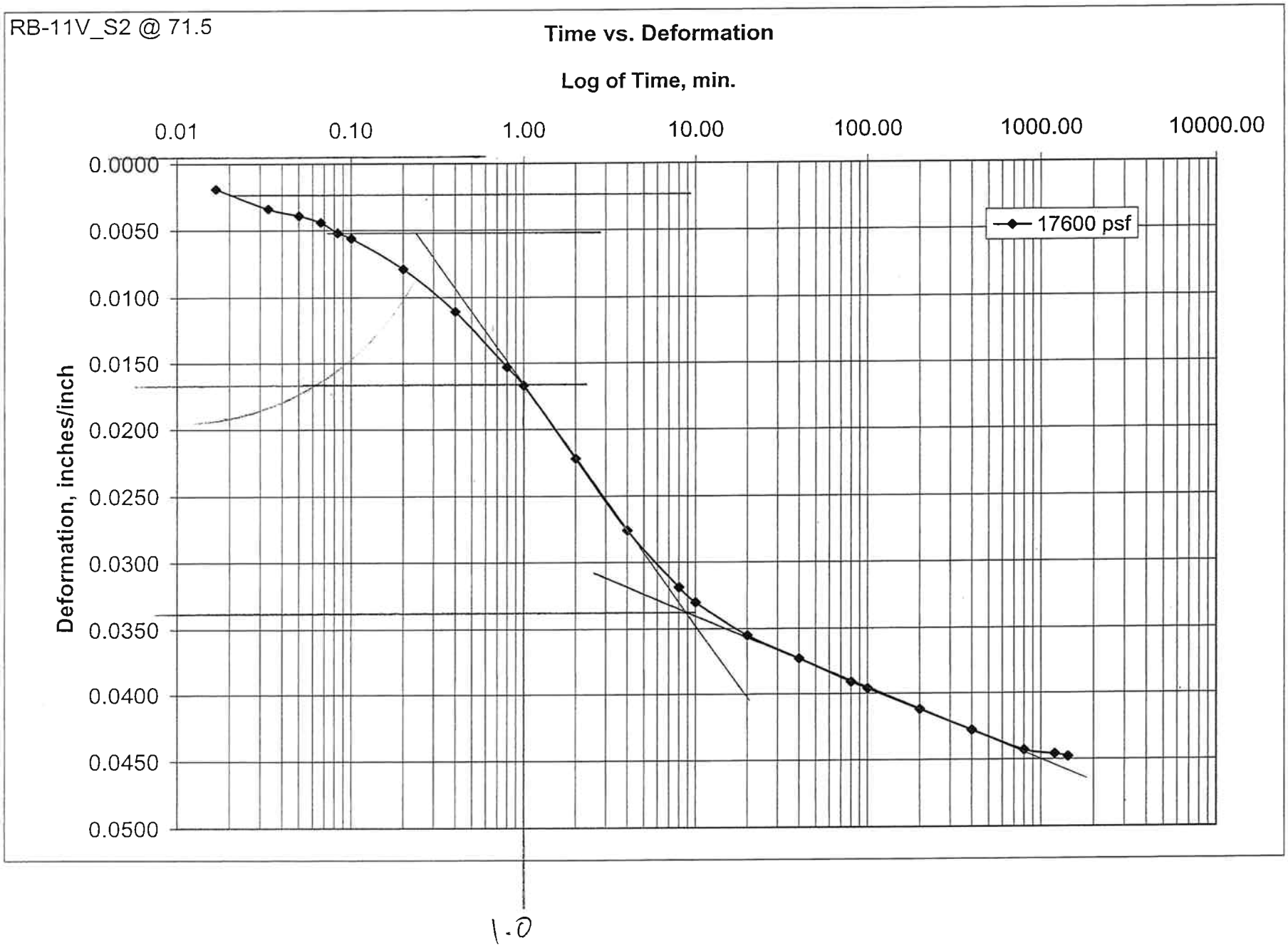


~~0.44~~
0.46

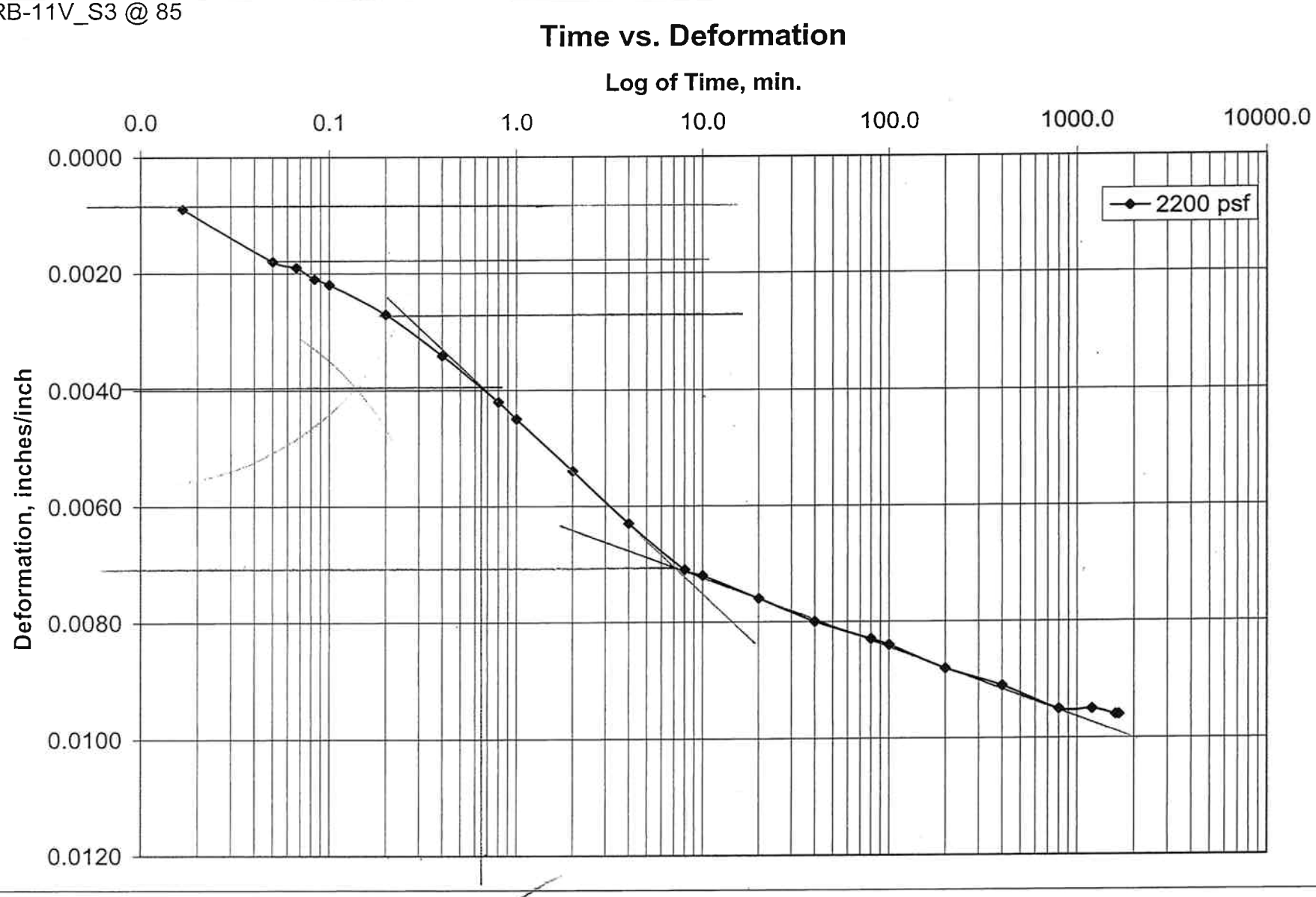
RB-11V_S2 @ 71.5



0.02

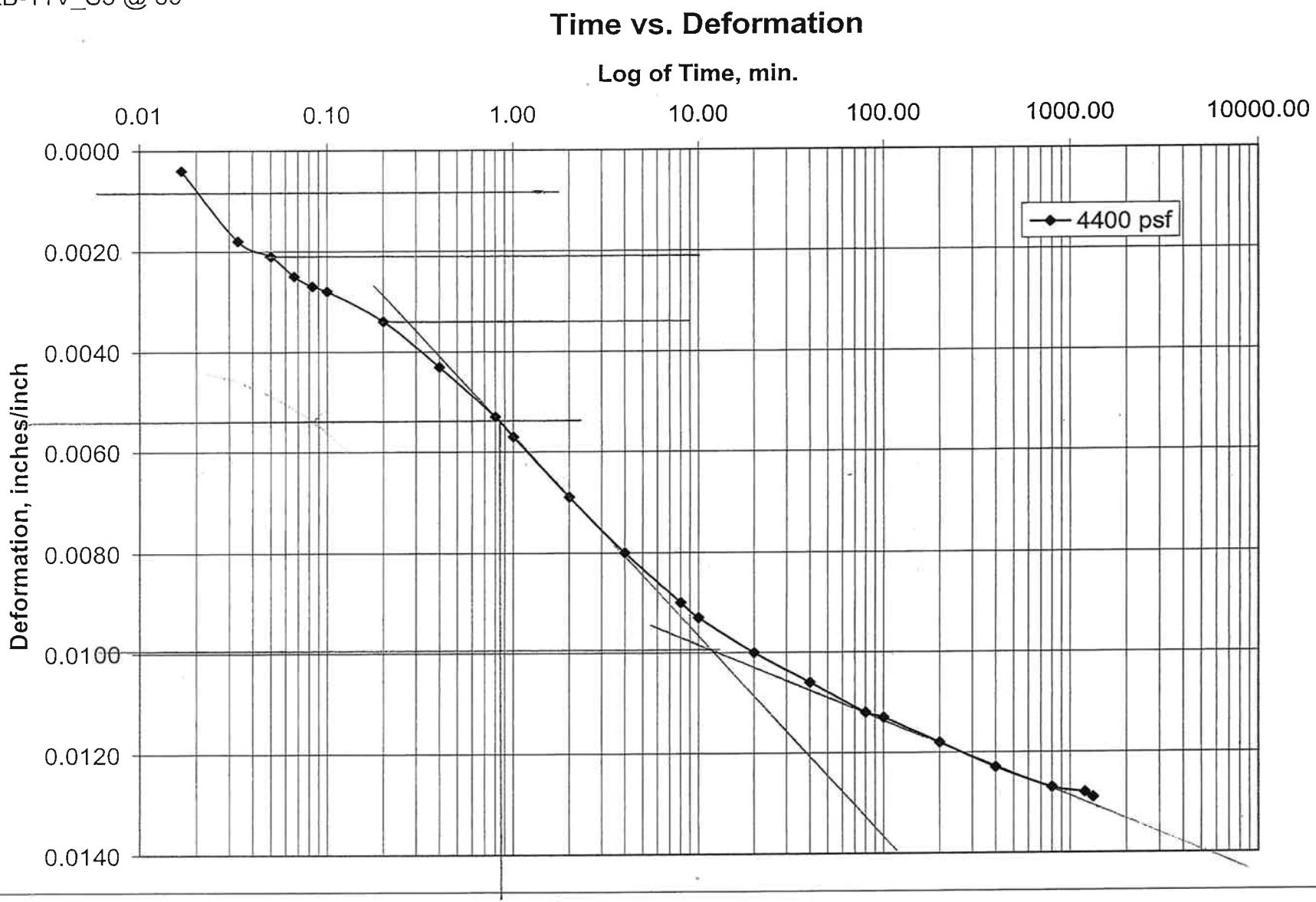

RB-11V_S2 @ 71.5
Time vs. Deformation
Log of Time, min.
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
Deformation, inches/inch
0.0000
0.0050
0.0100
0.0150
0.0200
0.0250
0.0300
0.0350
0.0400
0.0450
0.0500
17600 psf
1.0

RB-11V_S3 @ 85



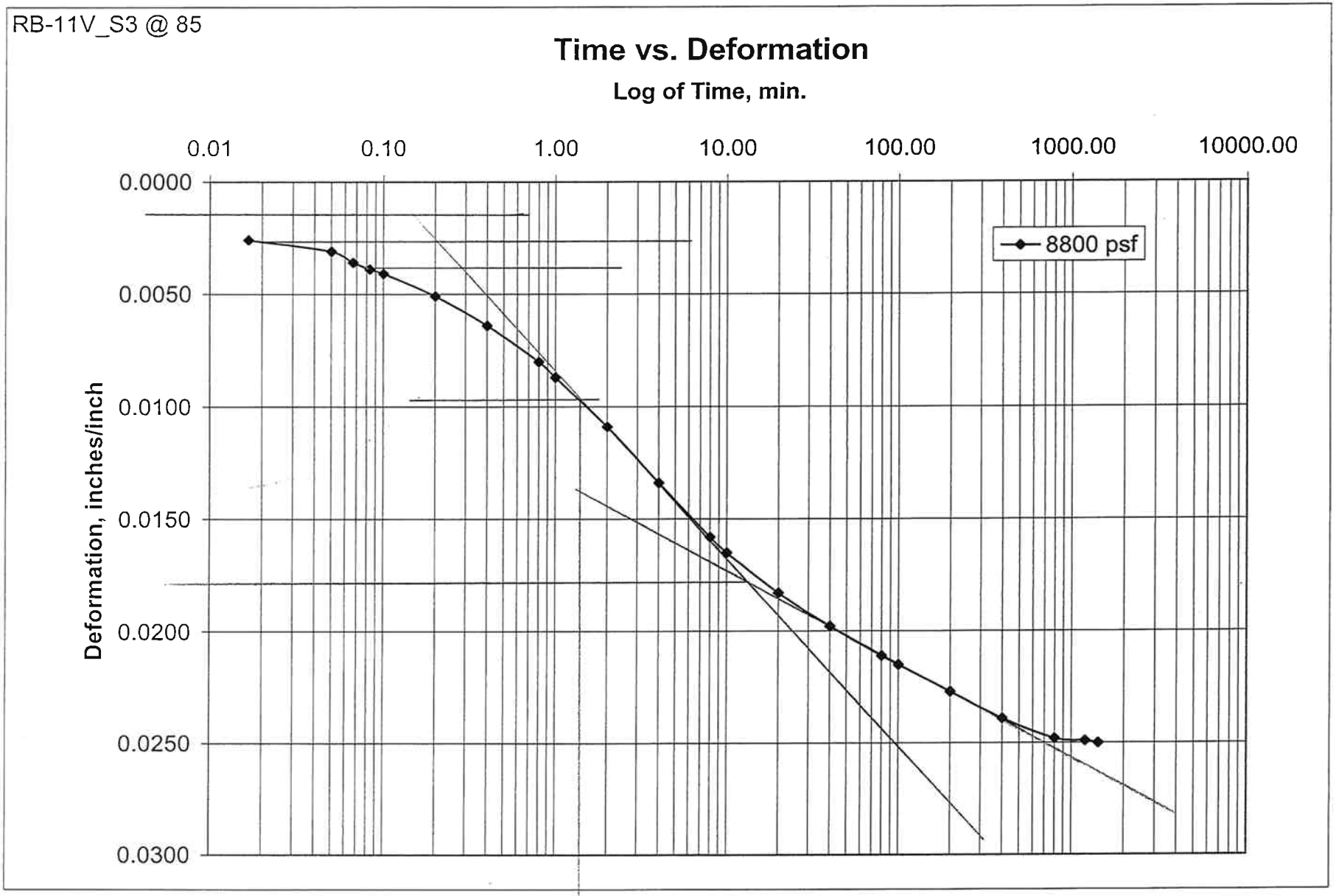
~~0.64~~
0.66

RB-11V_S3 @ 85

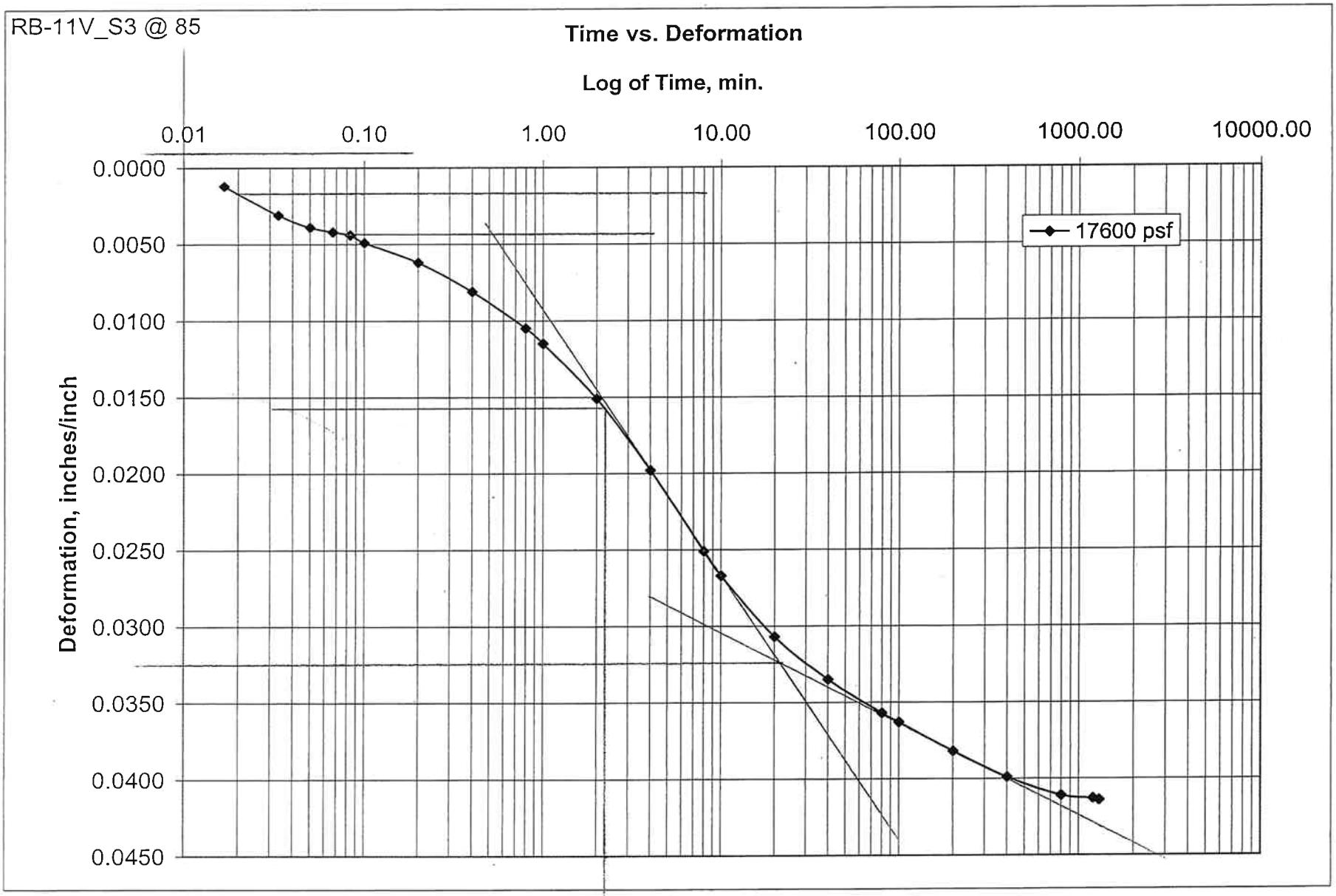


~~0.86~~ 0.87

RB-11V_S3 @ 85



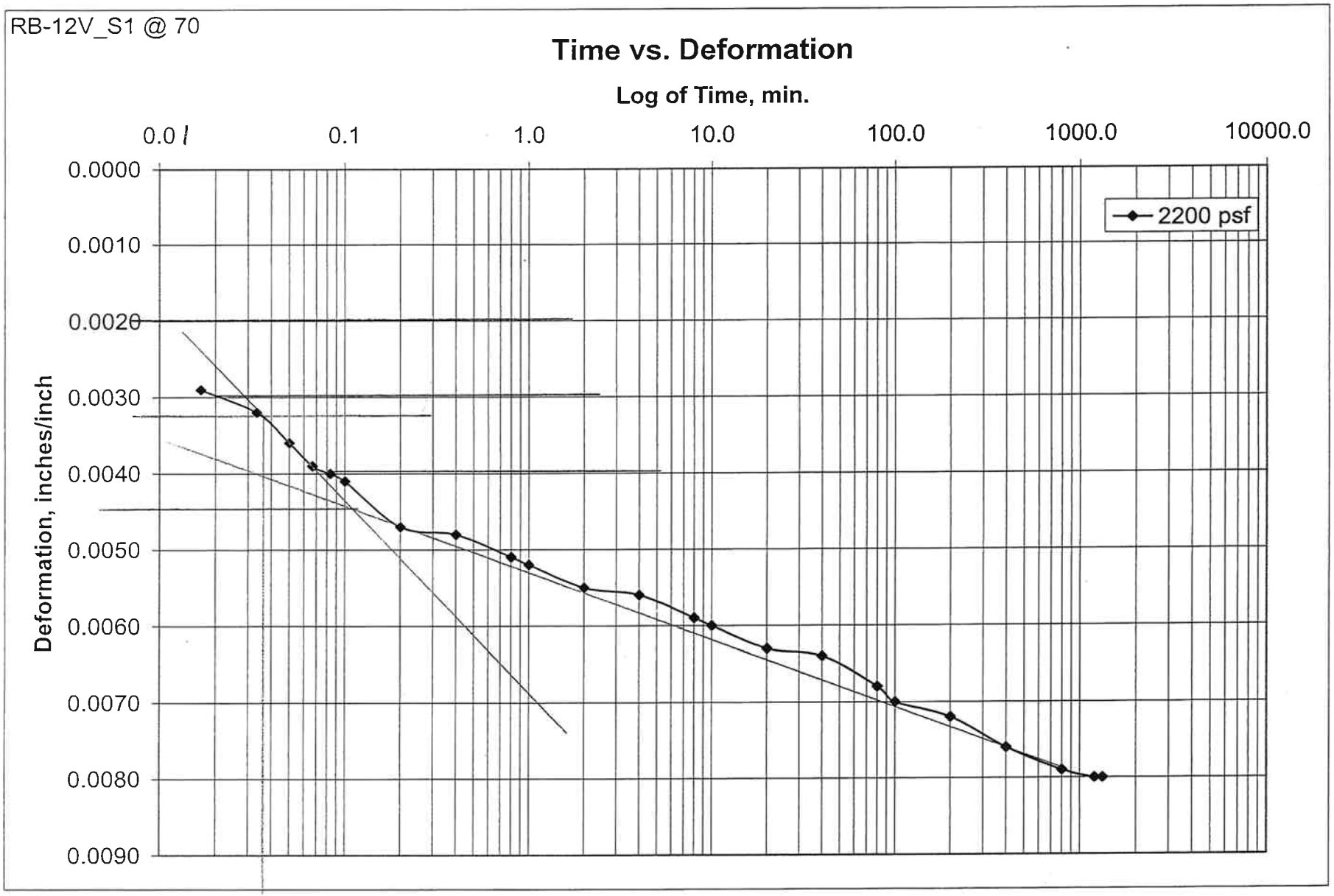
~~1.3~~ 1.4


RB-11V_S3 @ 85
Time vs. Deformation
Log of Time, min.
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
Deformation, inches/inch
0.0000
0.0050
0.0100
0.0150
0.0200
0.0250
0.0300
0.0350
0.0400
0.0450
17600 psf

2.2

?

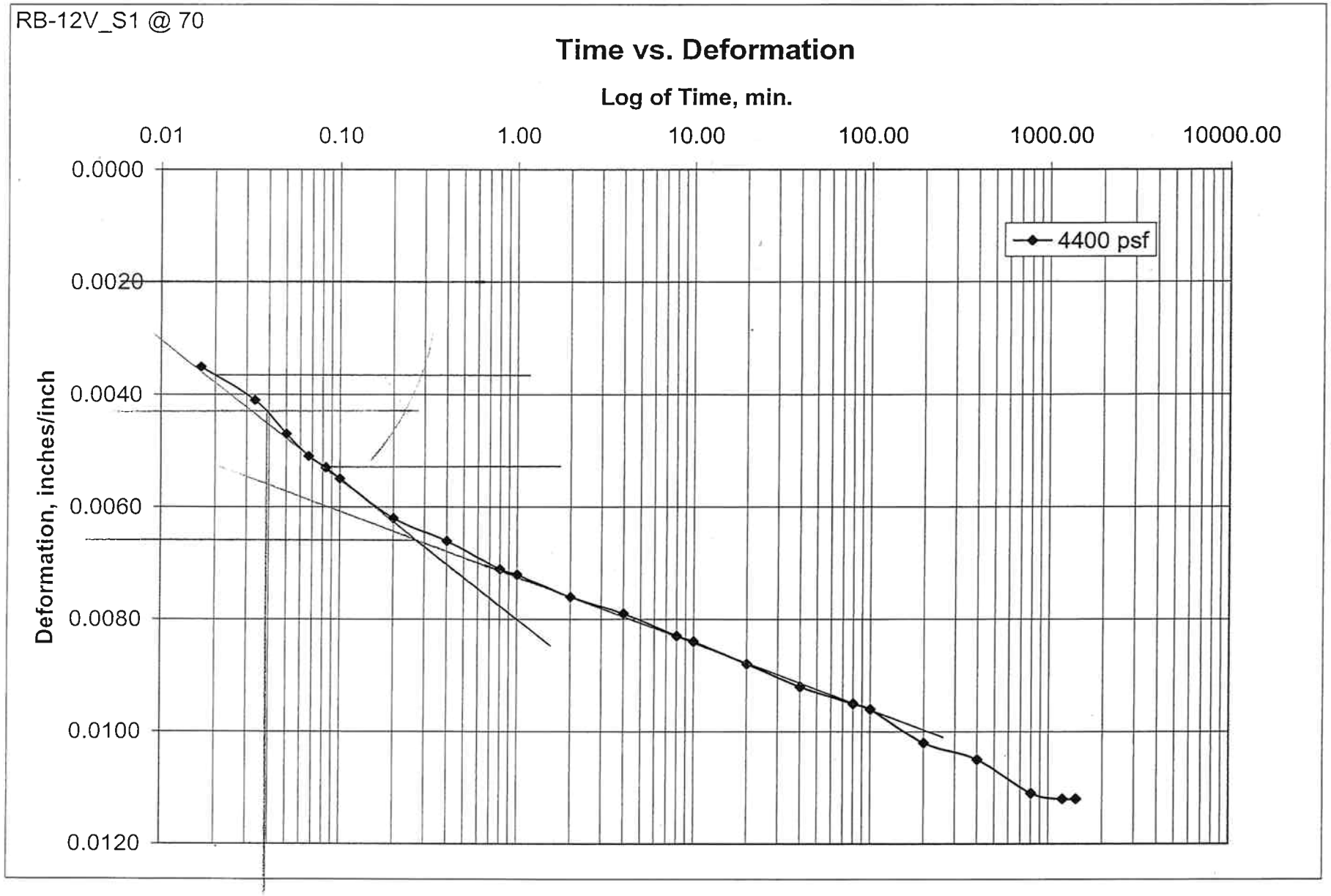
RB-12V_S1 @ 70



0.034 ?

?

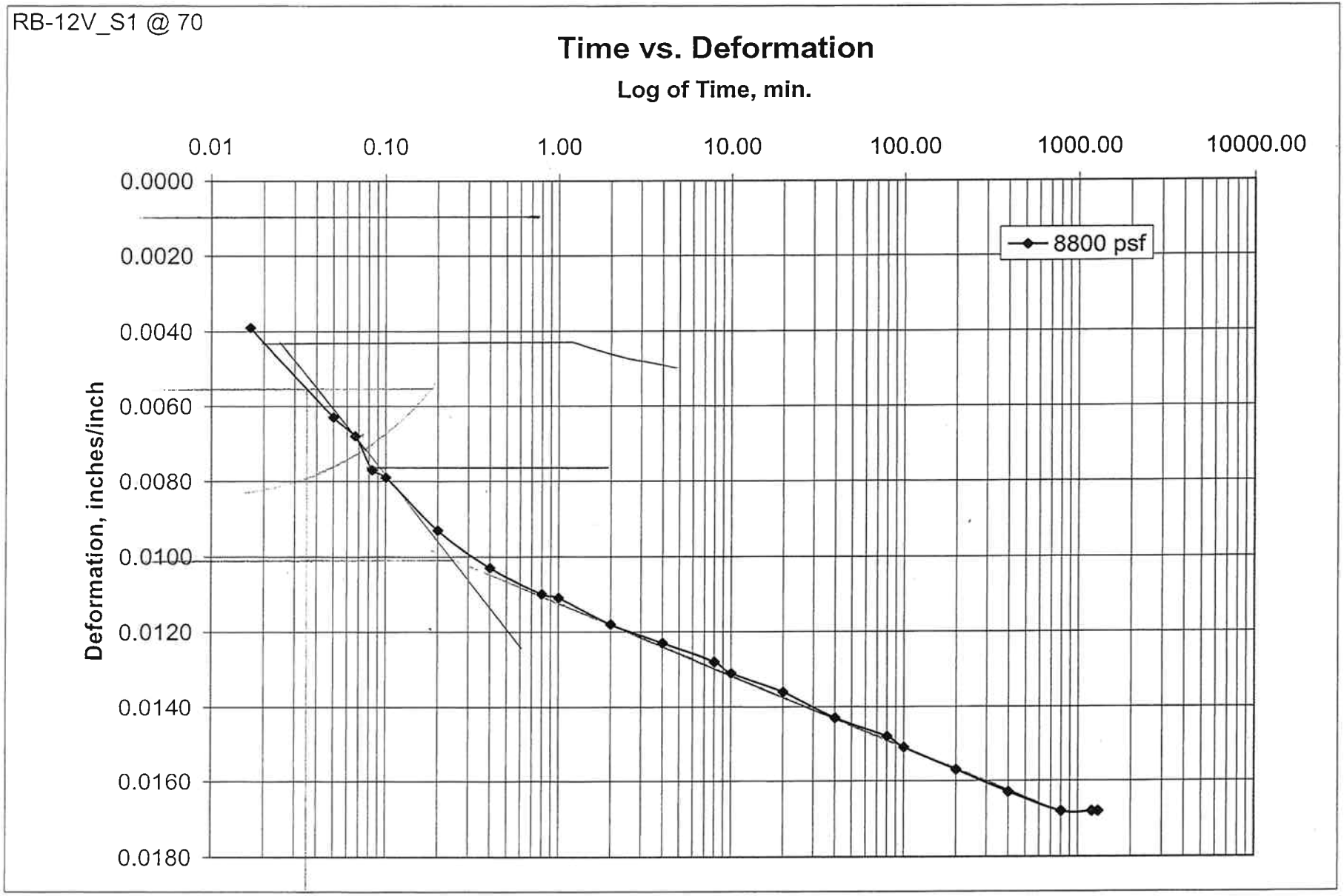
RB-12V_S1 @ 70



0.038 ?

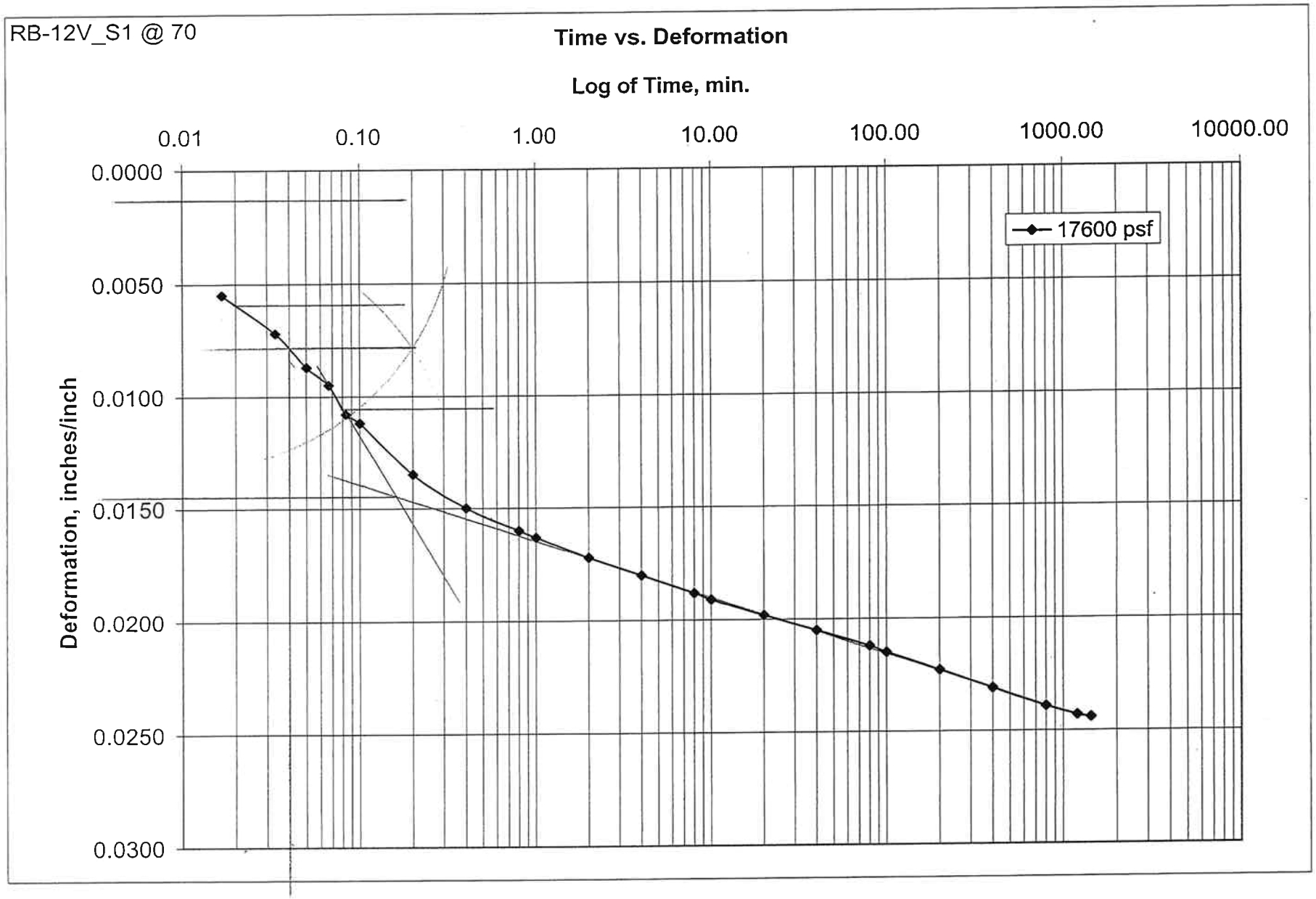
?

RB-12V_S1 @ 70



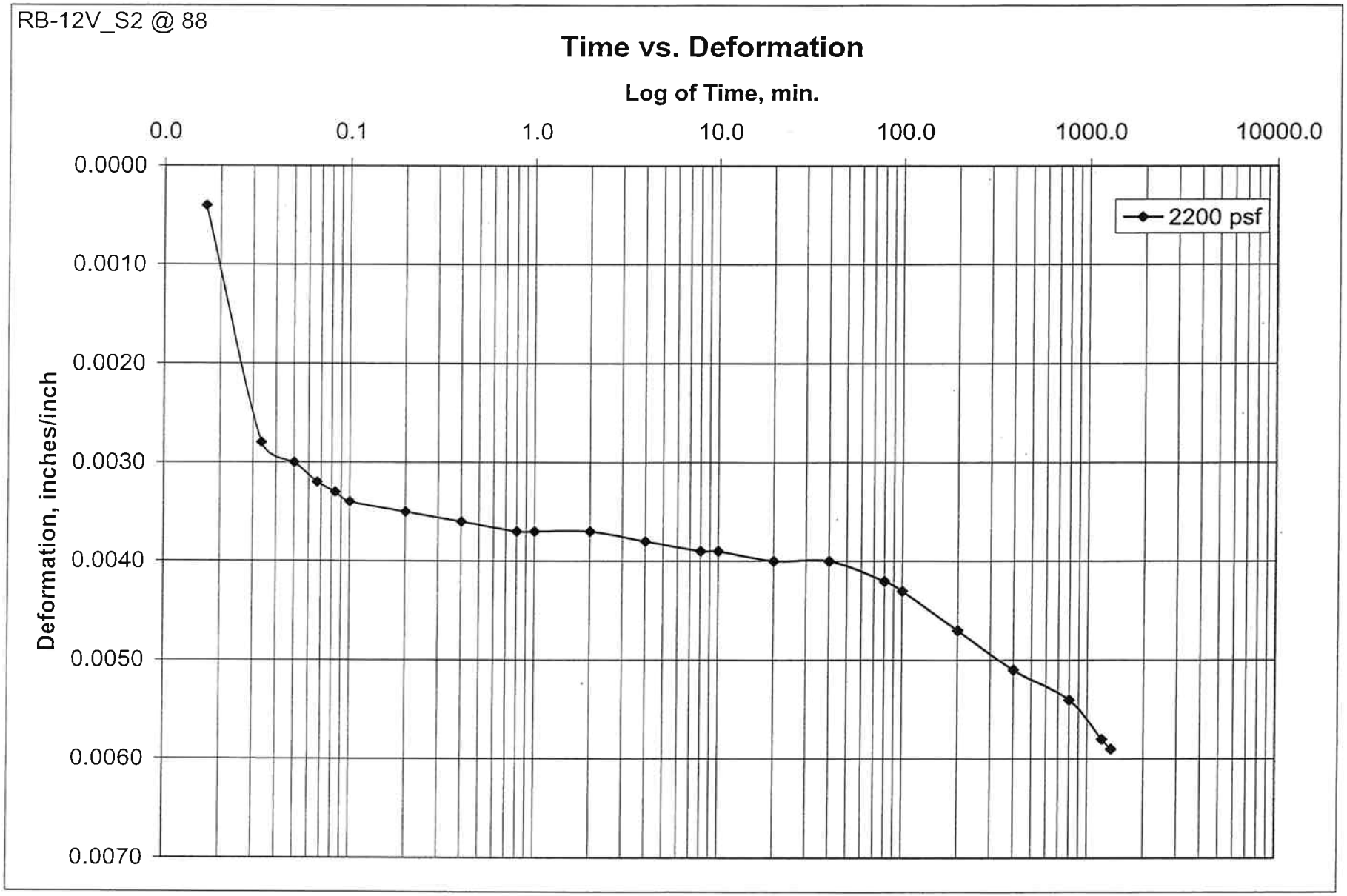
0.034 ?

?

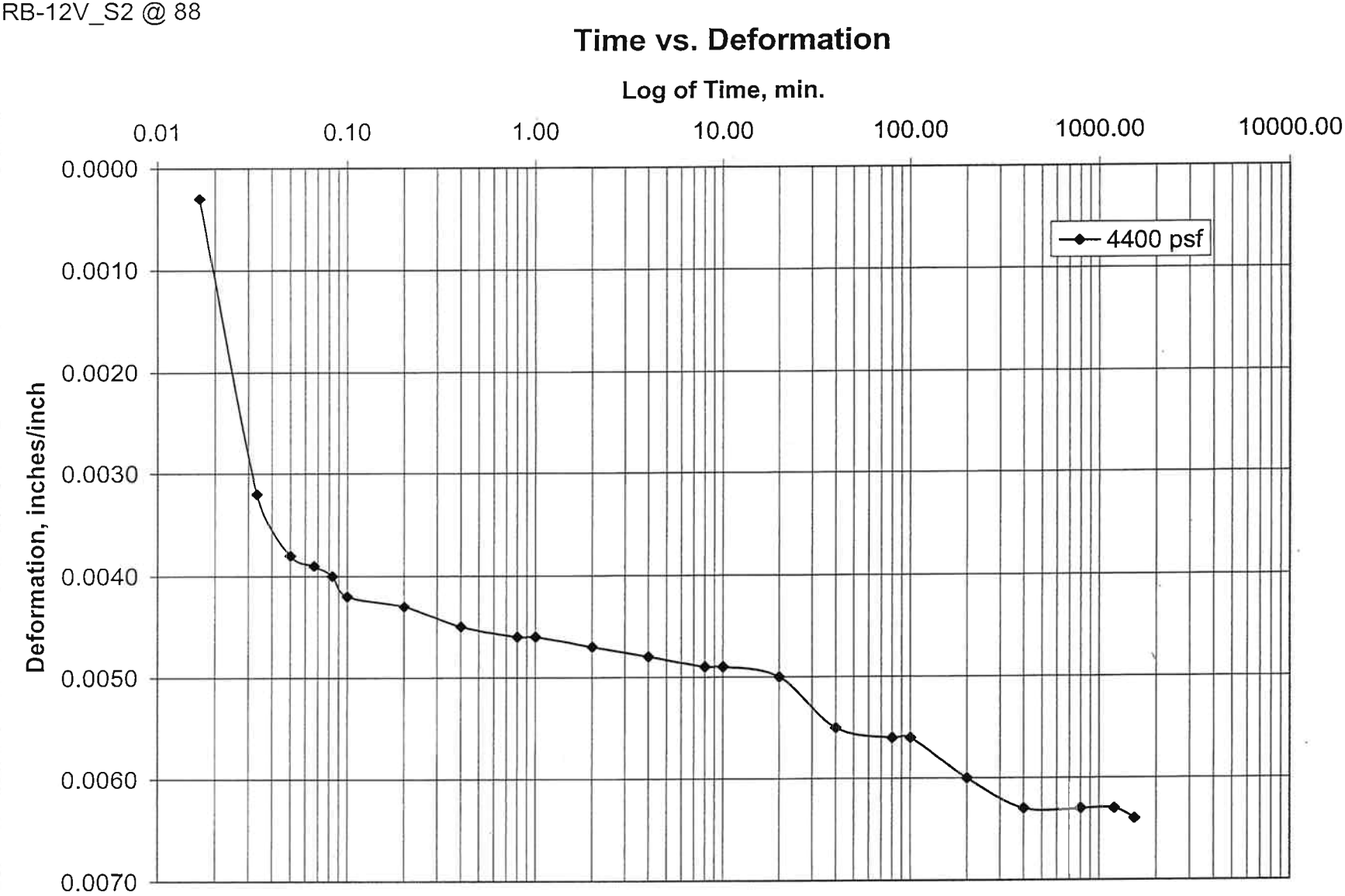

RB-12V_S1 @ 70
Time vs. Deformation
Log of Time, min.
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
0.0000
0.0050
0.0100
0.0150
0.0200
0.0250
0.0300
Deformation, inches/inch
17600 psf

0.040

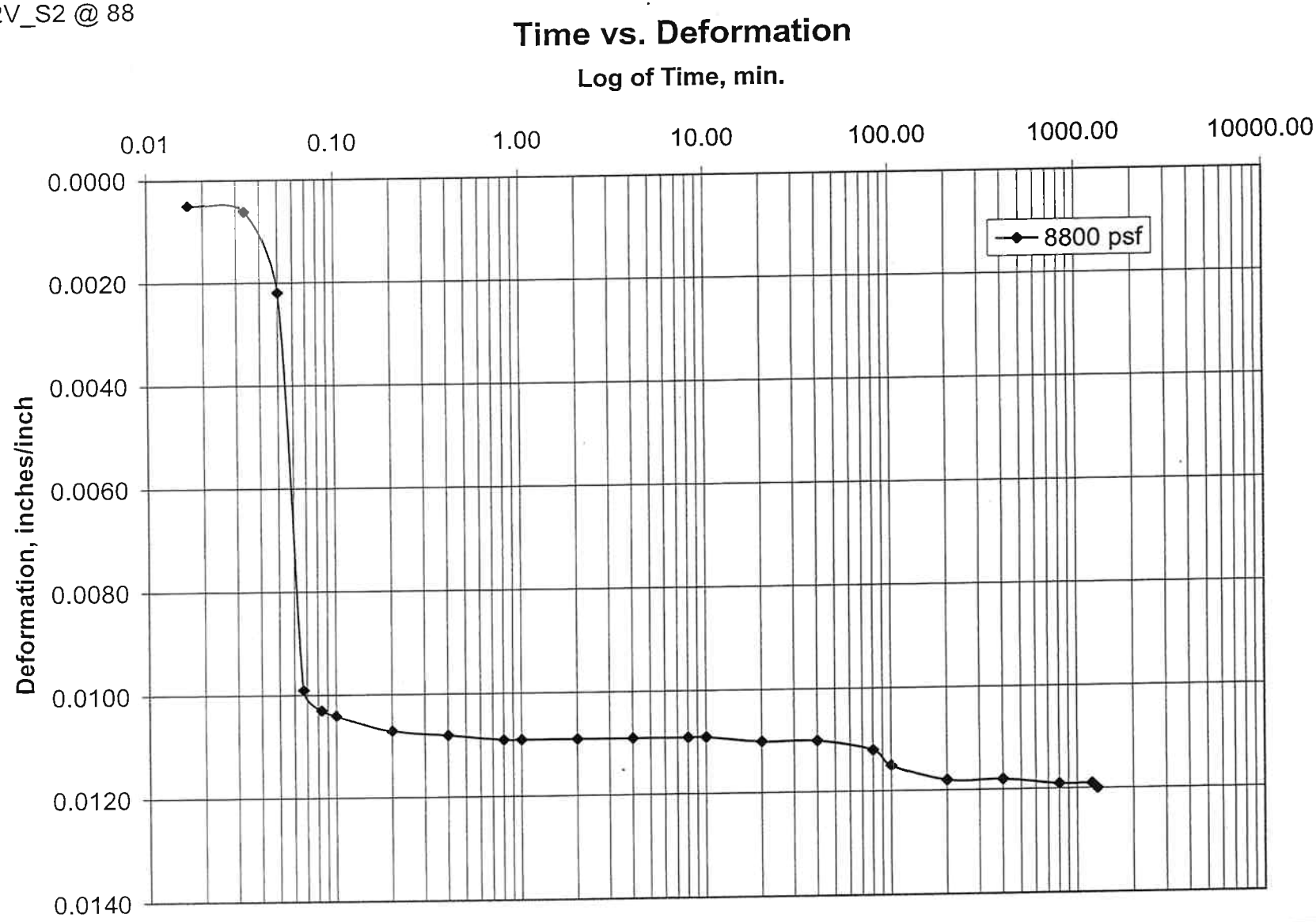
RB-12V_S2 @ 88

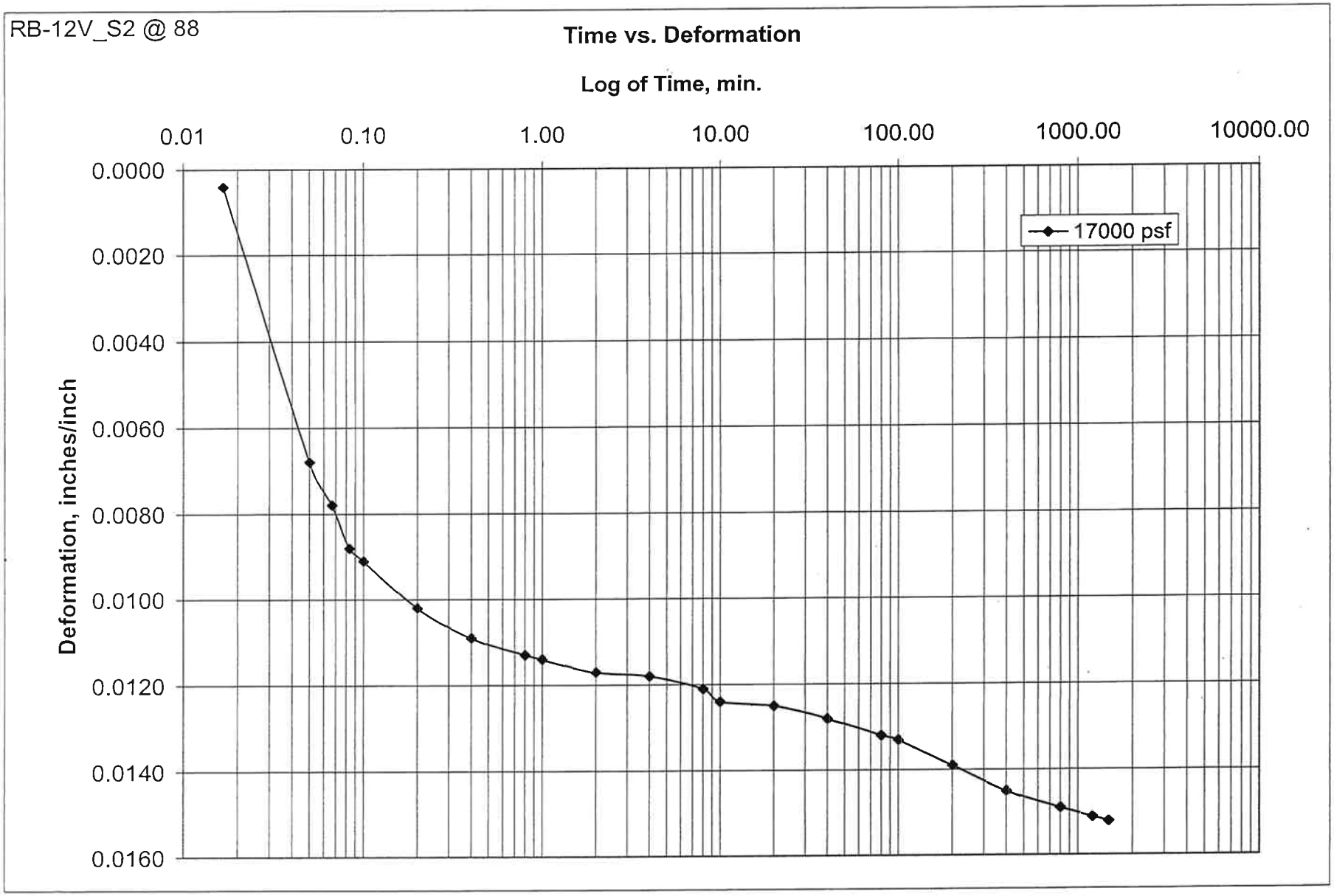

Time vs. Deformation
Log of Time, min.
0.0
0.1
1.0
10.0
100.0
1000.0
10000.0
0.0000
0.0010
0.0020
0.0030
0.0040
0.0050
0.0060
0.0070
Deformation, inches/inch
2200 psf

RB-12V_S2 @ 88

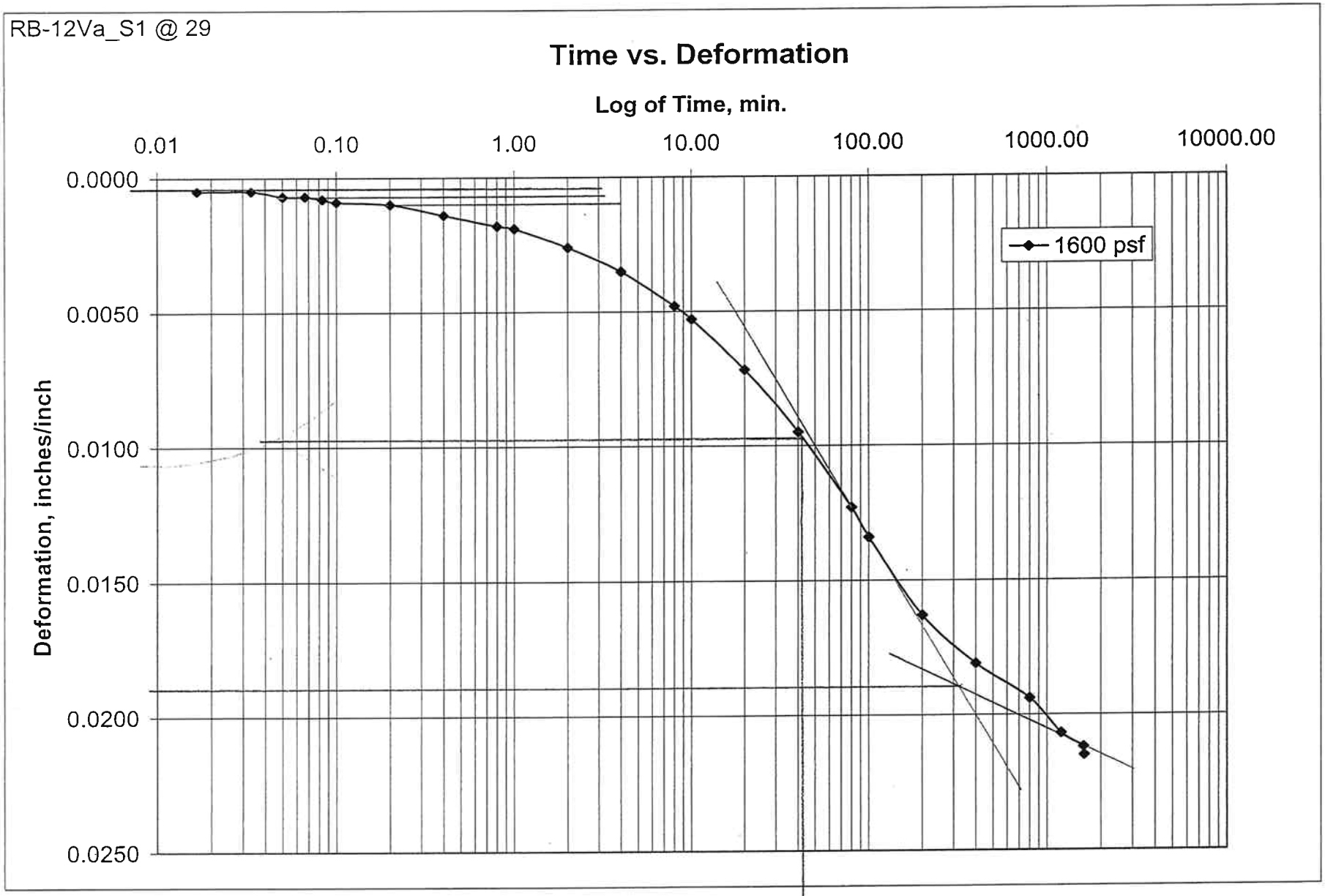

Time vs. Deformation
Log of Time, min.
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
Deformation, inches/inch
0.0000
0.0010
0.0020
0.0030
0.0040
0.0050
0.0060
0.0070
4400 psf

RB-12V_S2 @ 88


Time vs. Deformation
Log of Time, min.
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
0.0000
0.0020
0.0040
0.0060
0.0080
0.0100
0.0120
0.0140
Deformation, inches/inch
8800 psf

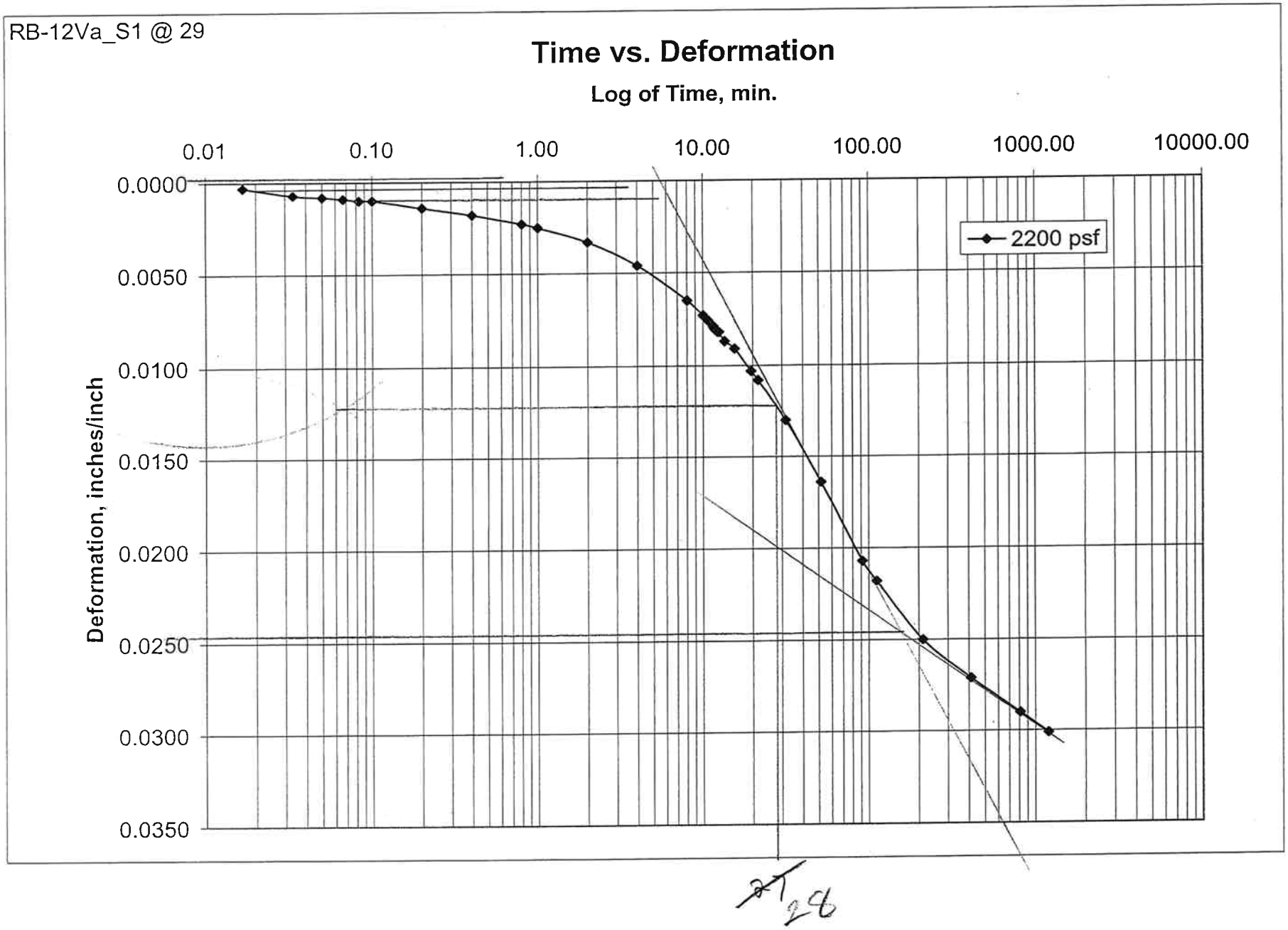

RB-12V_S2 @ 88
Time vs. Deformation
Log of Time, min.
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
0.0000
0.0020
0.0040
0.0060
0.0080
0.0100
0.0120
0.0140
0.0160
Deformation, inches/inch
17000 psf

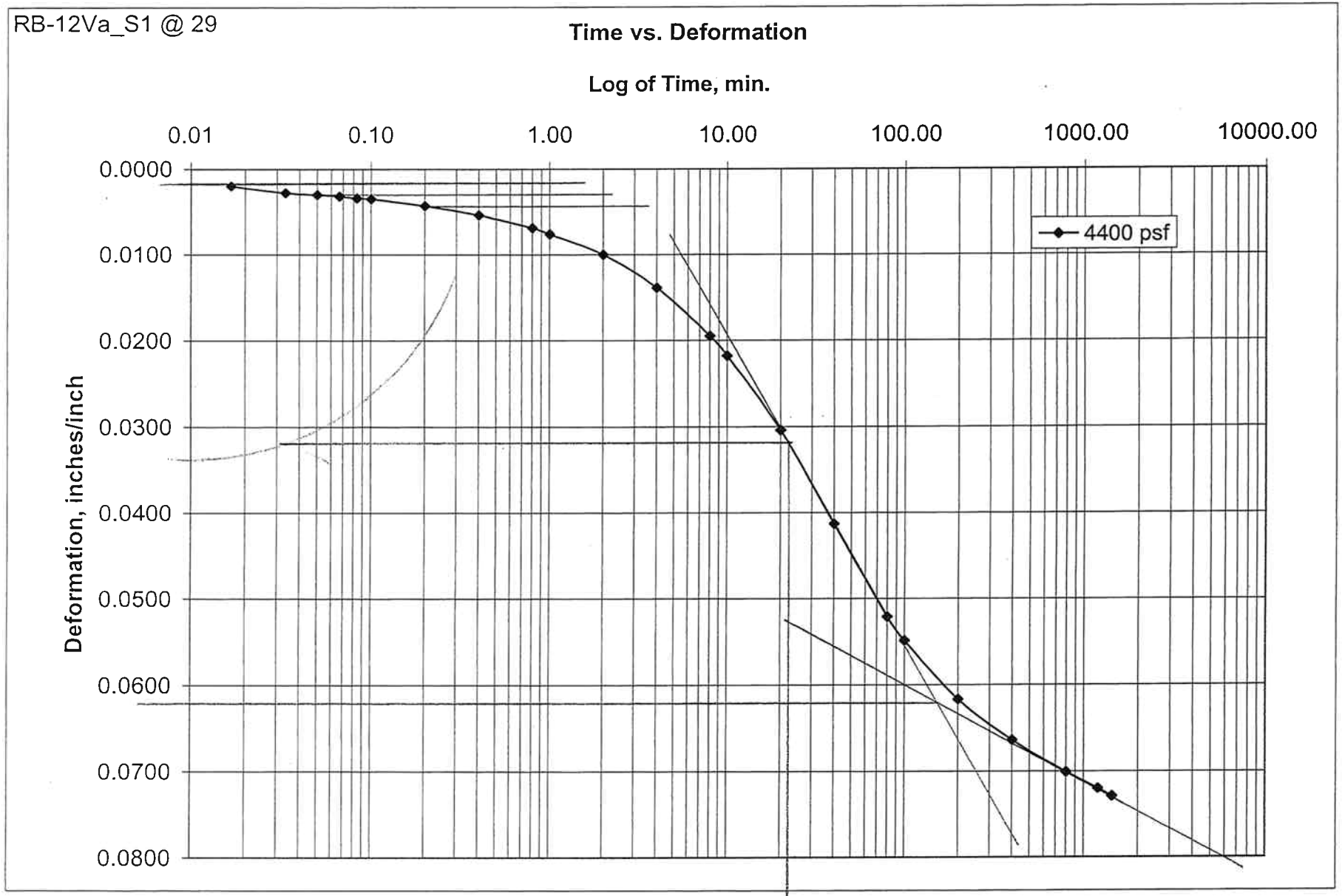
RB-12Va_S1 @ 29



42

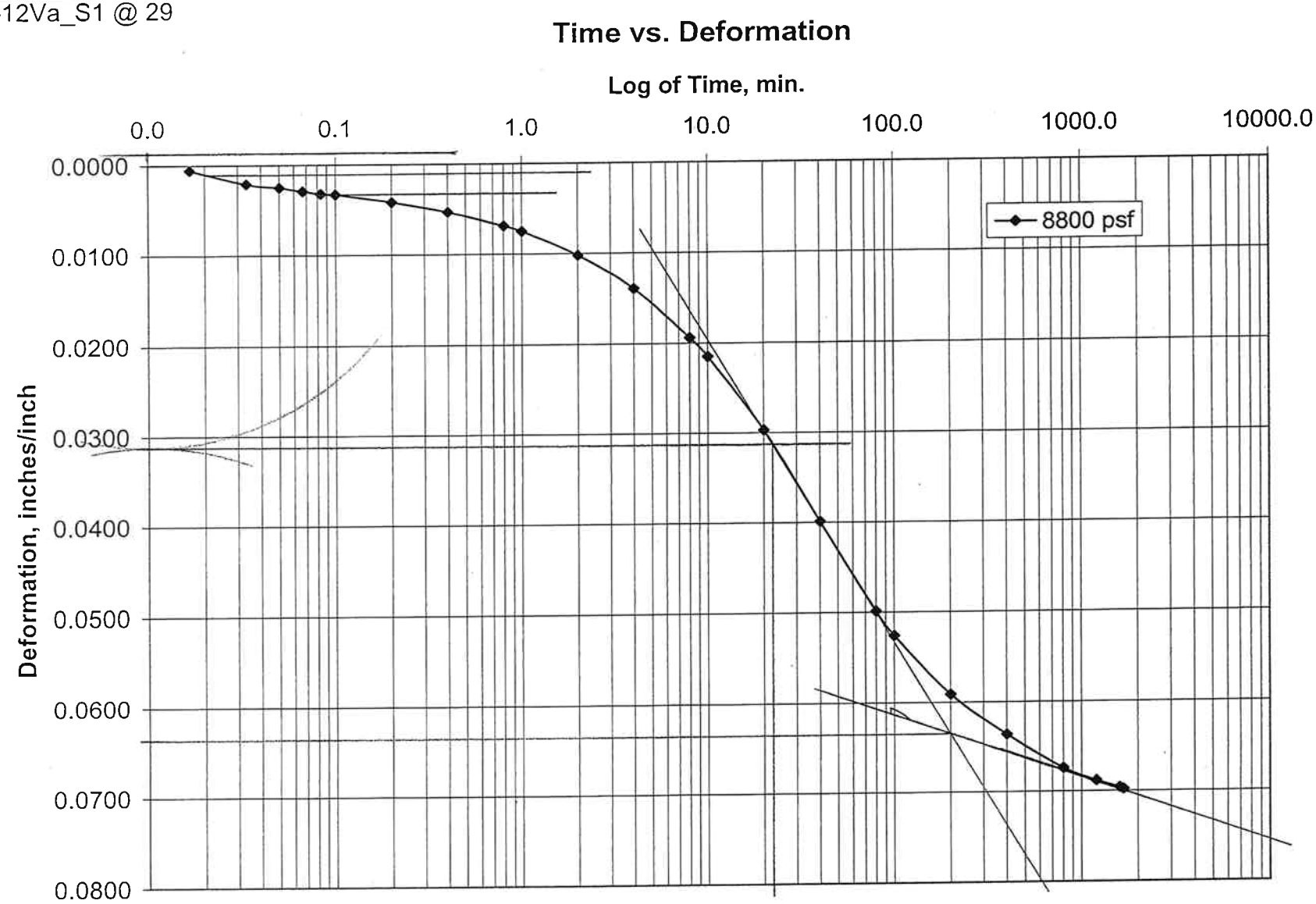
RB-12Va_S1 @ 29


Time vs. Deformation
Log of Time, min.
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
0.0000
0.0050
0.0100
0.0150
0.0200
0.0250
0.0300
0.0350
Deformation, inches/inch
2200 psf
~~27~~ 26

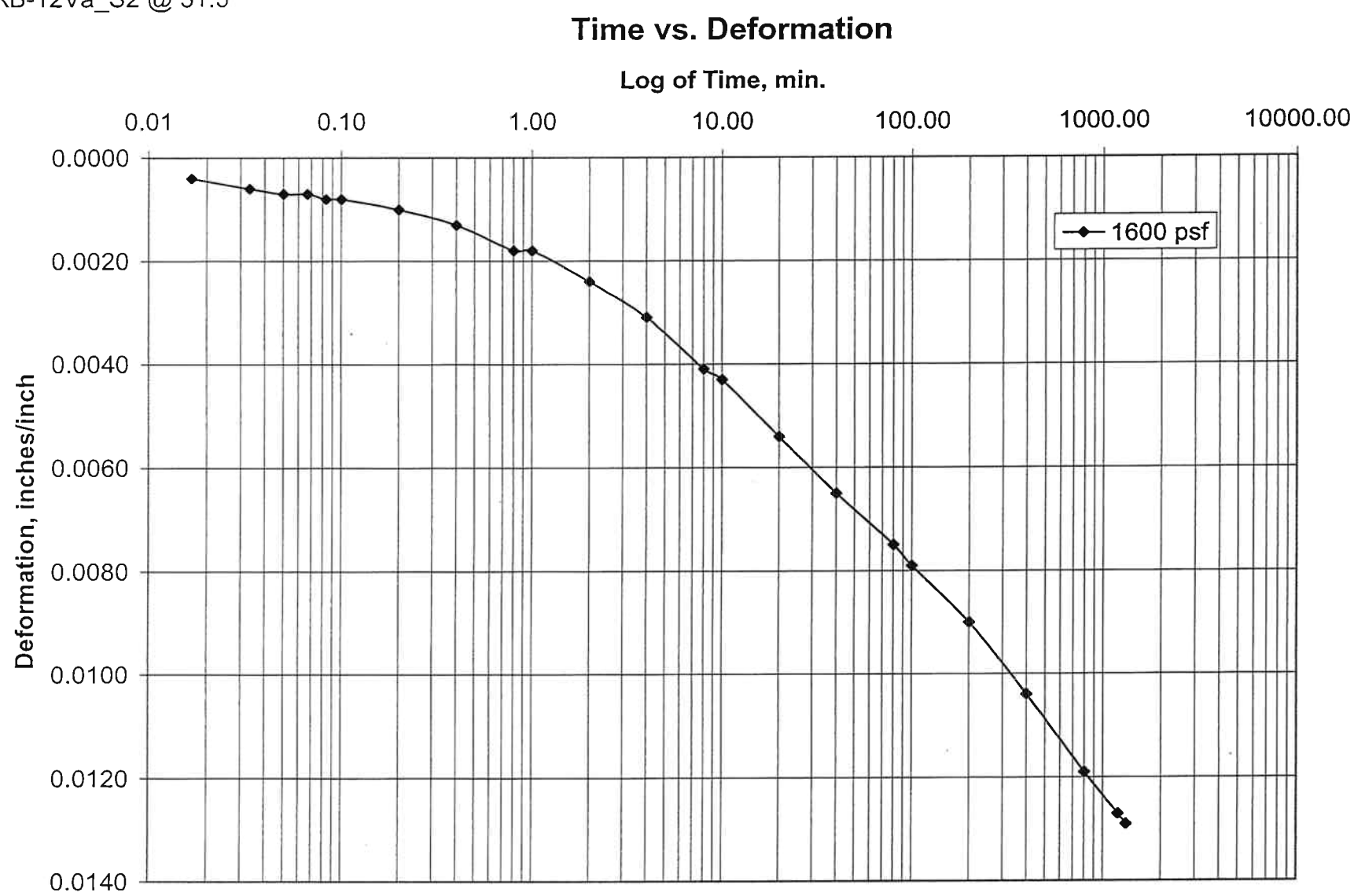

RB-12Va_S1 @ 29
Time vs. Deformation
Log of Time, min.
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
0.0000
0.0100
0.0200
0.0300
0.0400
0.0500
0.0600
0.0700
0.0800
Deformation, inches/inch
4400 psf

a2

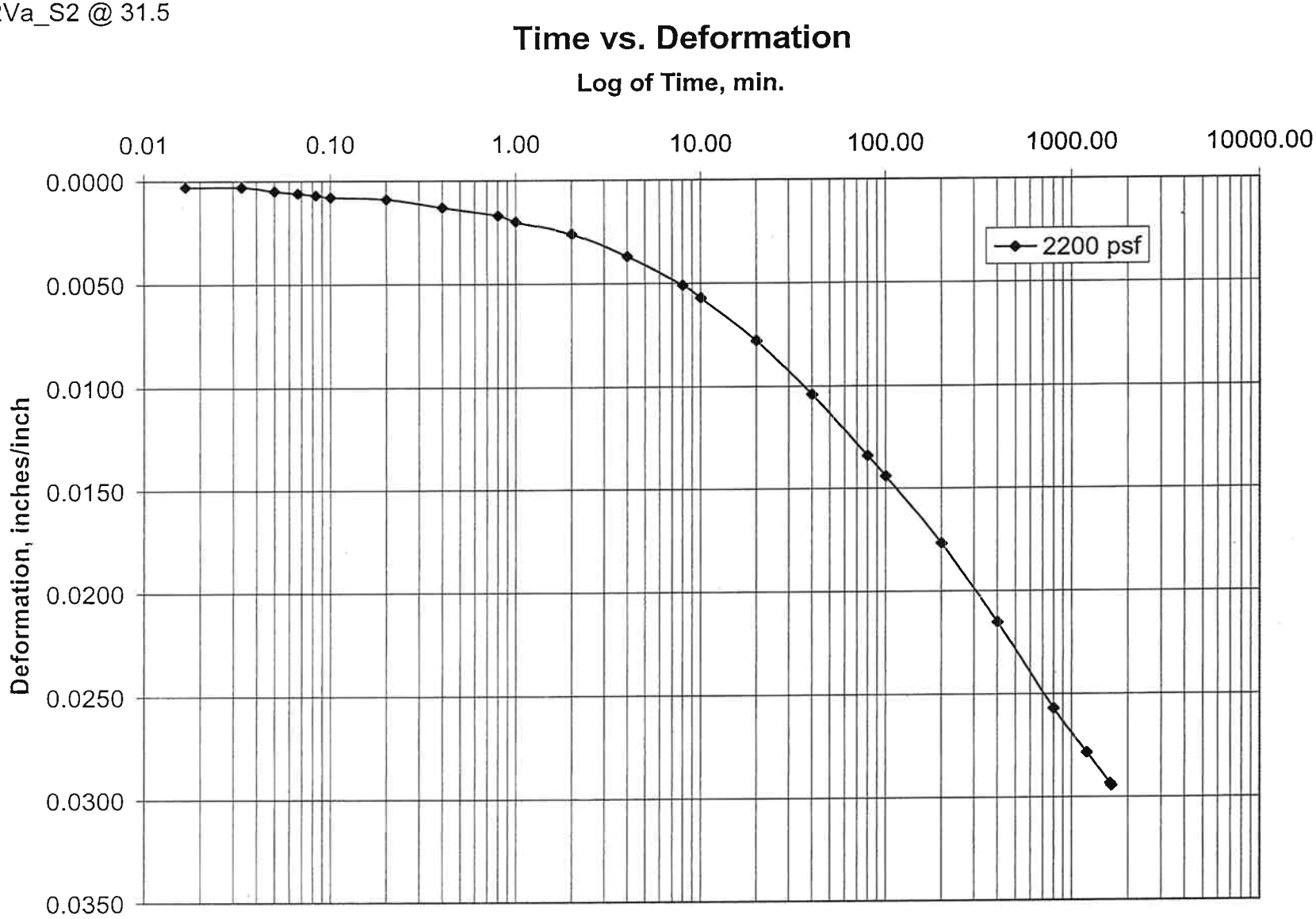
RB-12Va_S1 @ 29


Time vs. Deformation
Log of Time, min.
0.0
0.1
1.0
10.0
100.0
1000.0
10000.0
Deformation, inches/inch
0.0000
0.0100
0.0200
0.0300
0.0400
0.0500
0.0600
0.0700
0.0800
8800 psf

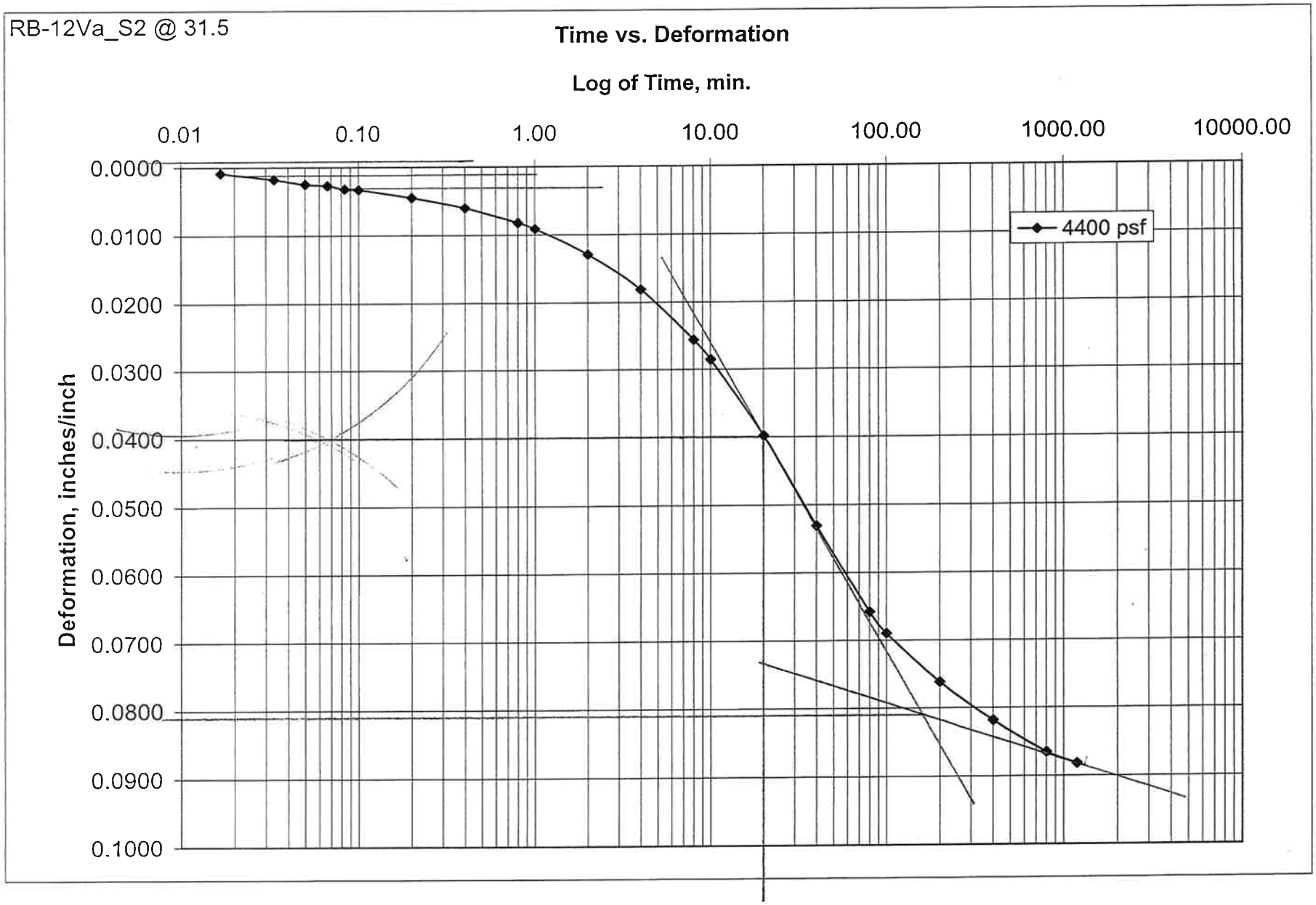
RB-12Va_S2 @ 31.5



RB-12Va_S2 @ 31.5

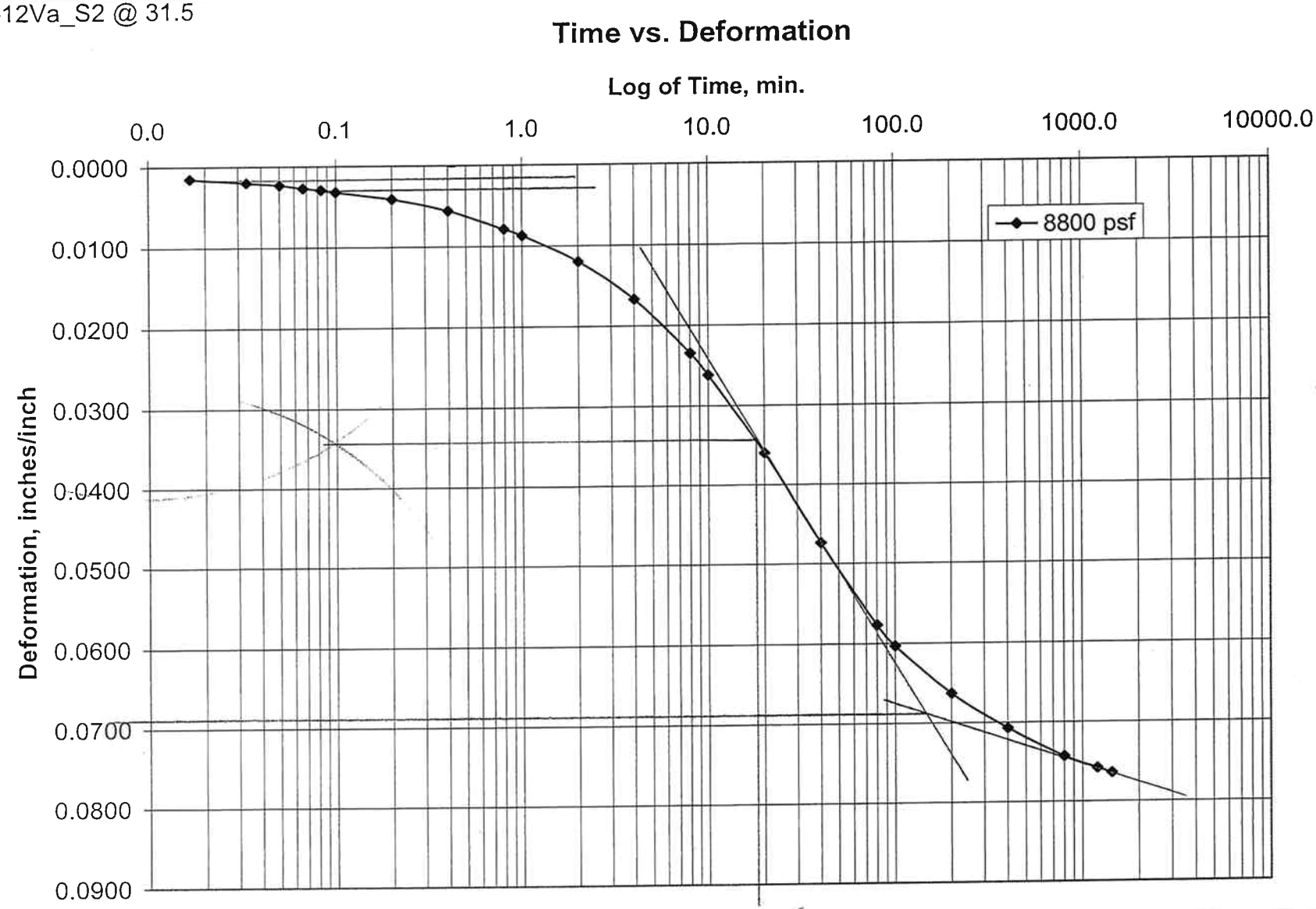


RB-12Va_S2 @ 31.5



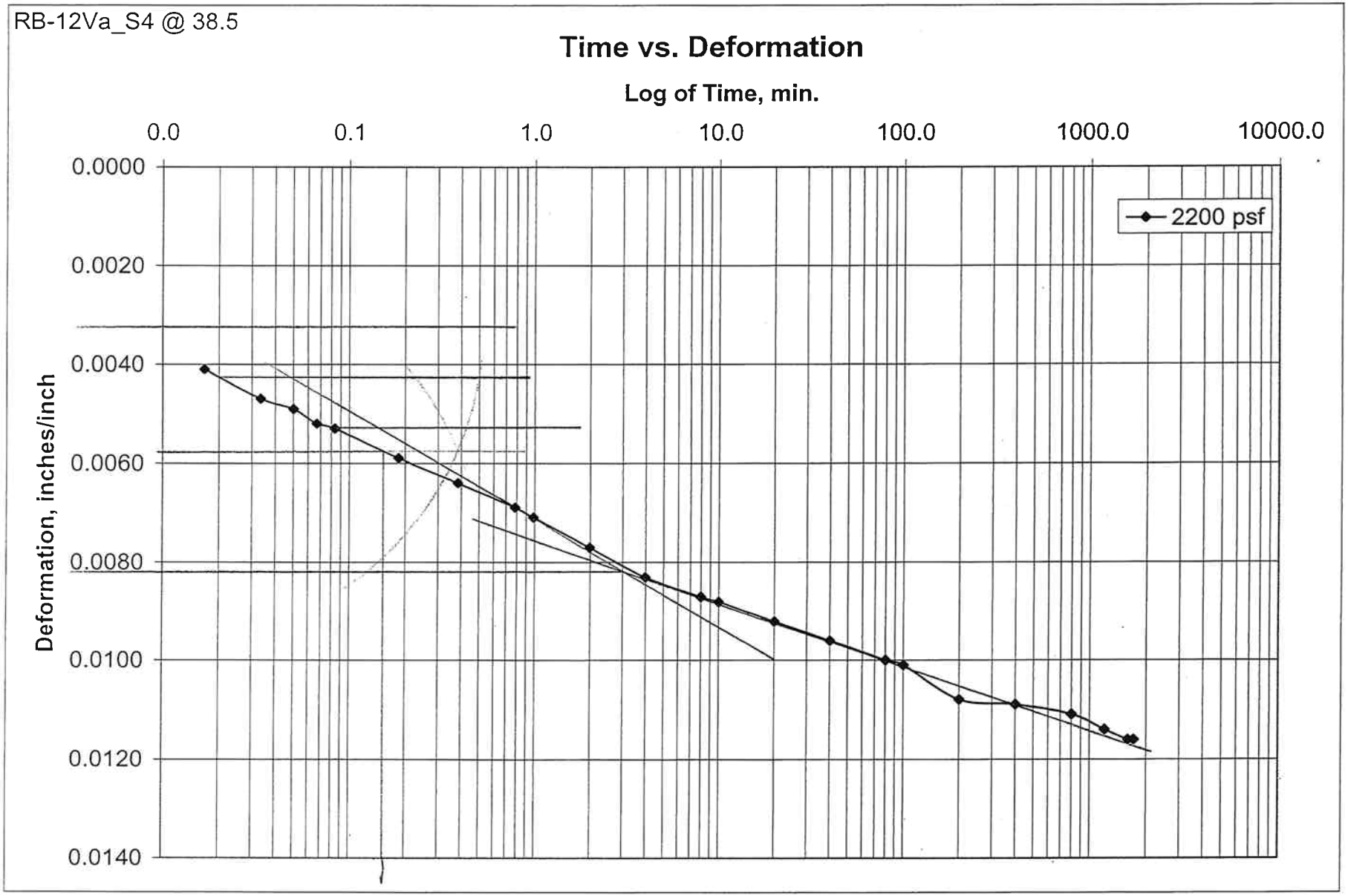
70

RB-12Va_S2 @ 31.5



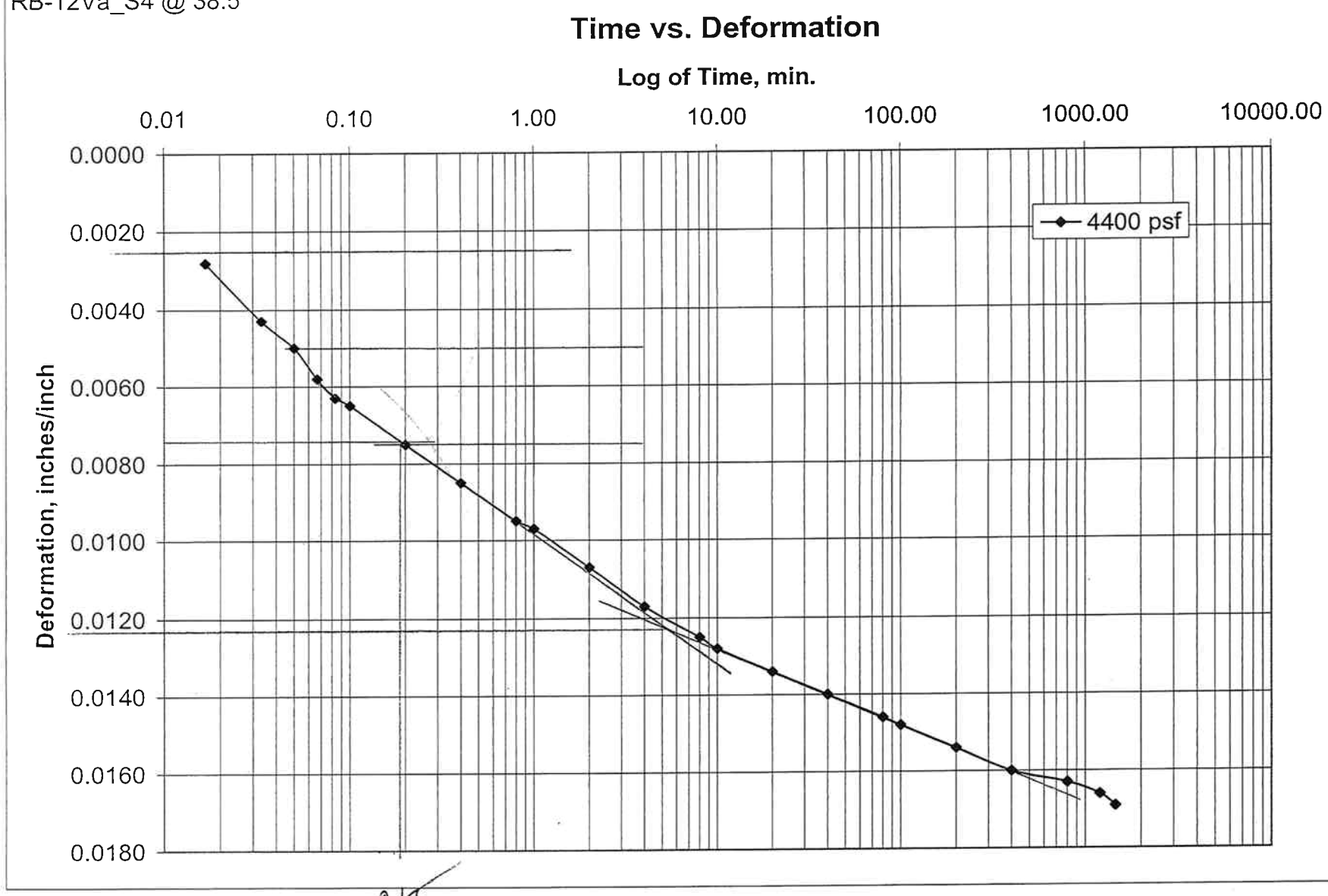
17
18

RB-12Va_S4 @ 38.5



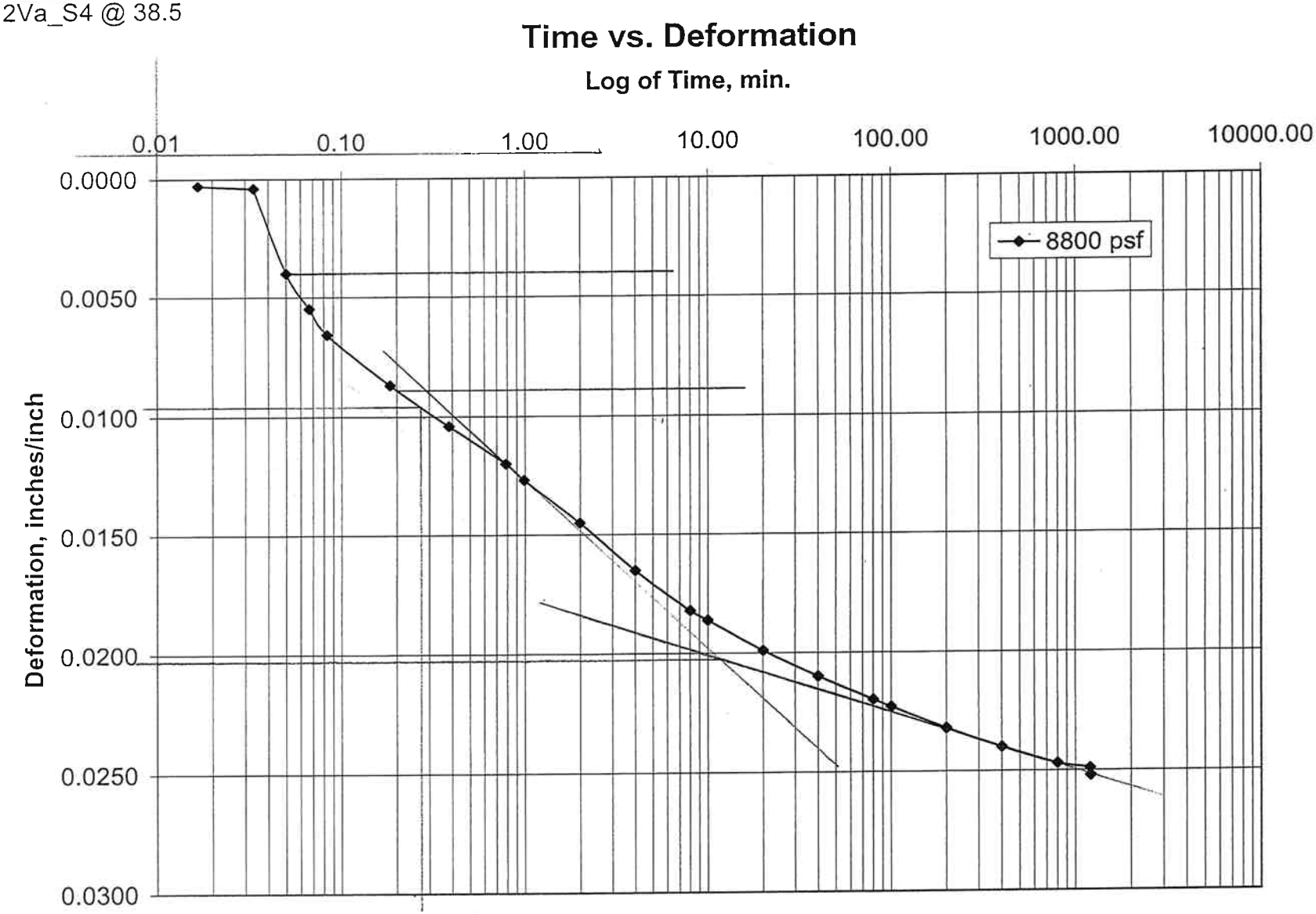
~~0.19~~ 0.15

RB-12Va_S4 @ 38.5



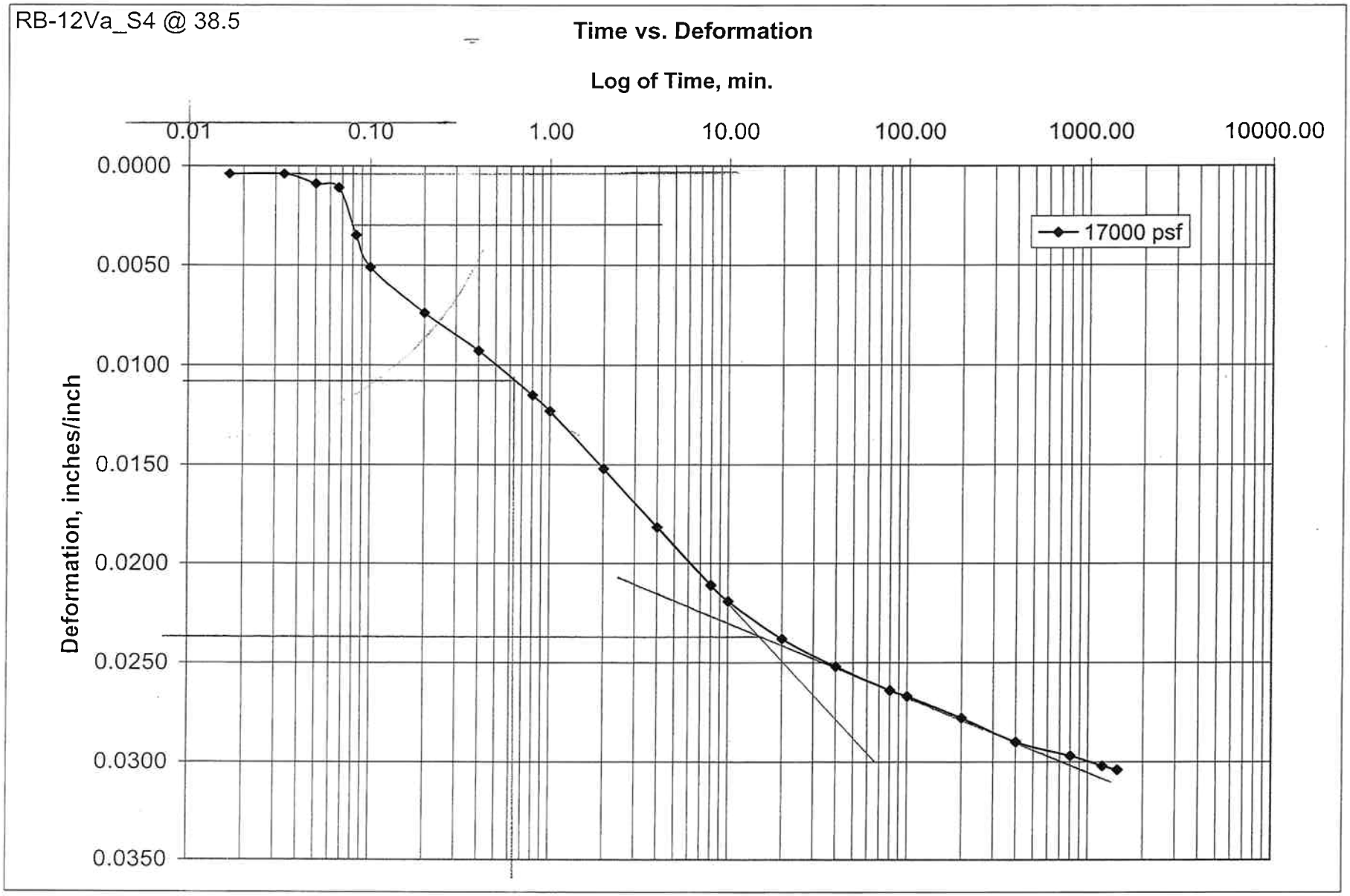
~~0.16~~ 0.19

RB-12Va_S4 @ 38.5

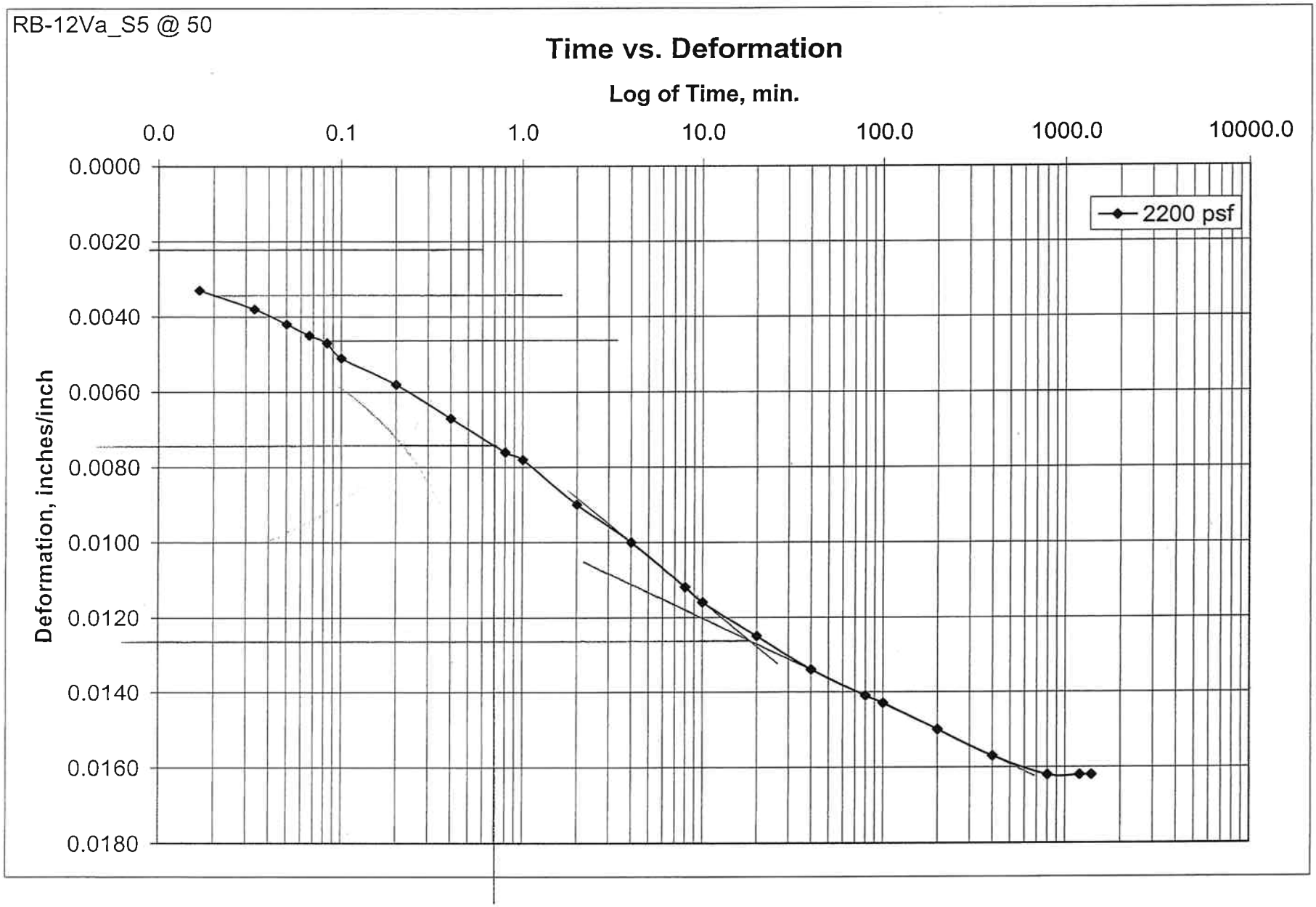


~~0.25~~ 0.27

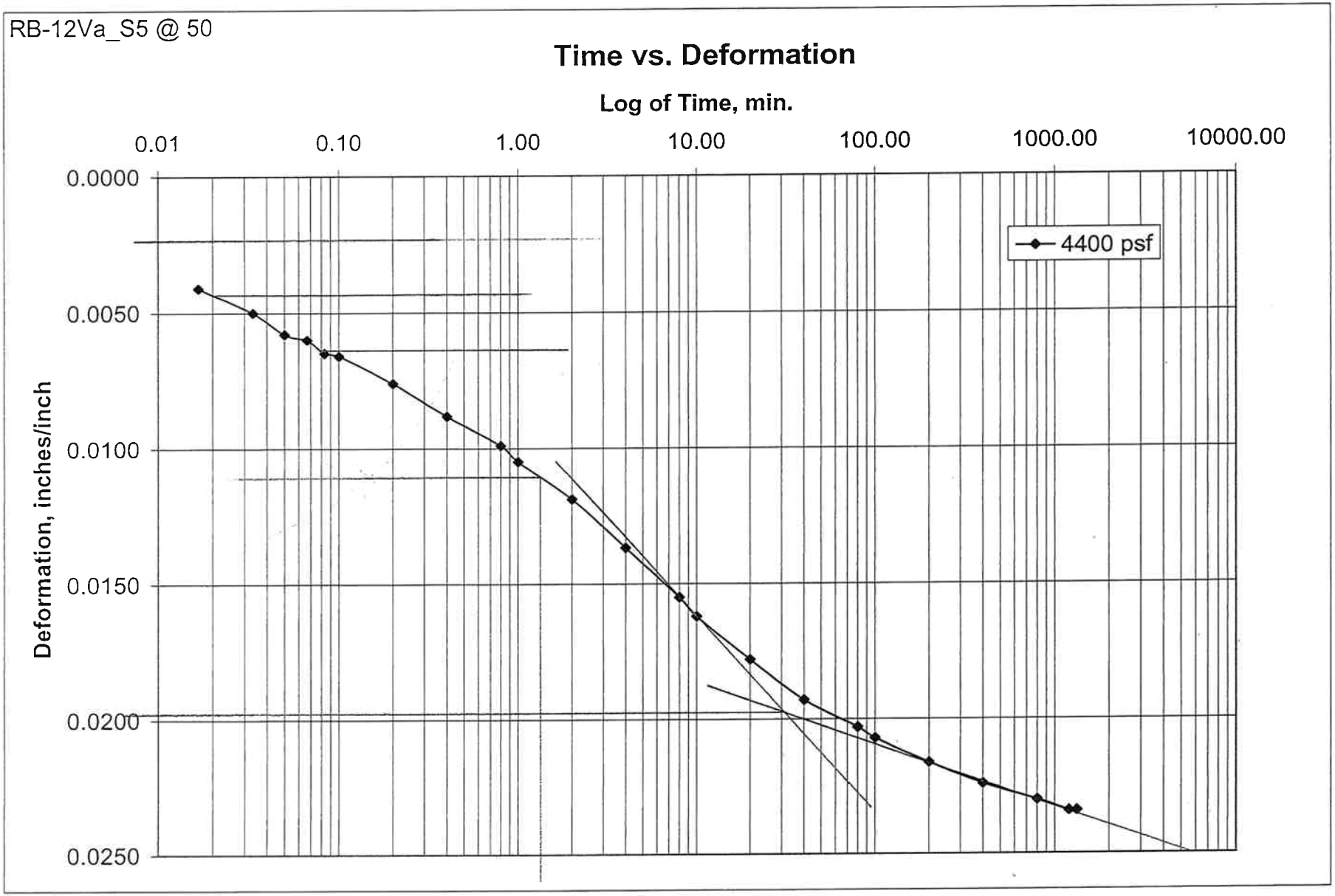
RB-12Va_S4 @ 38.5



0.63

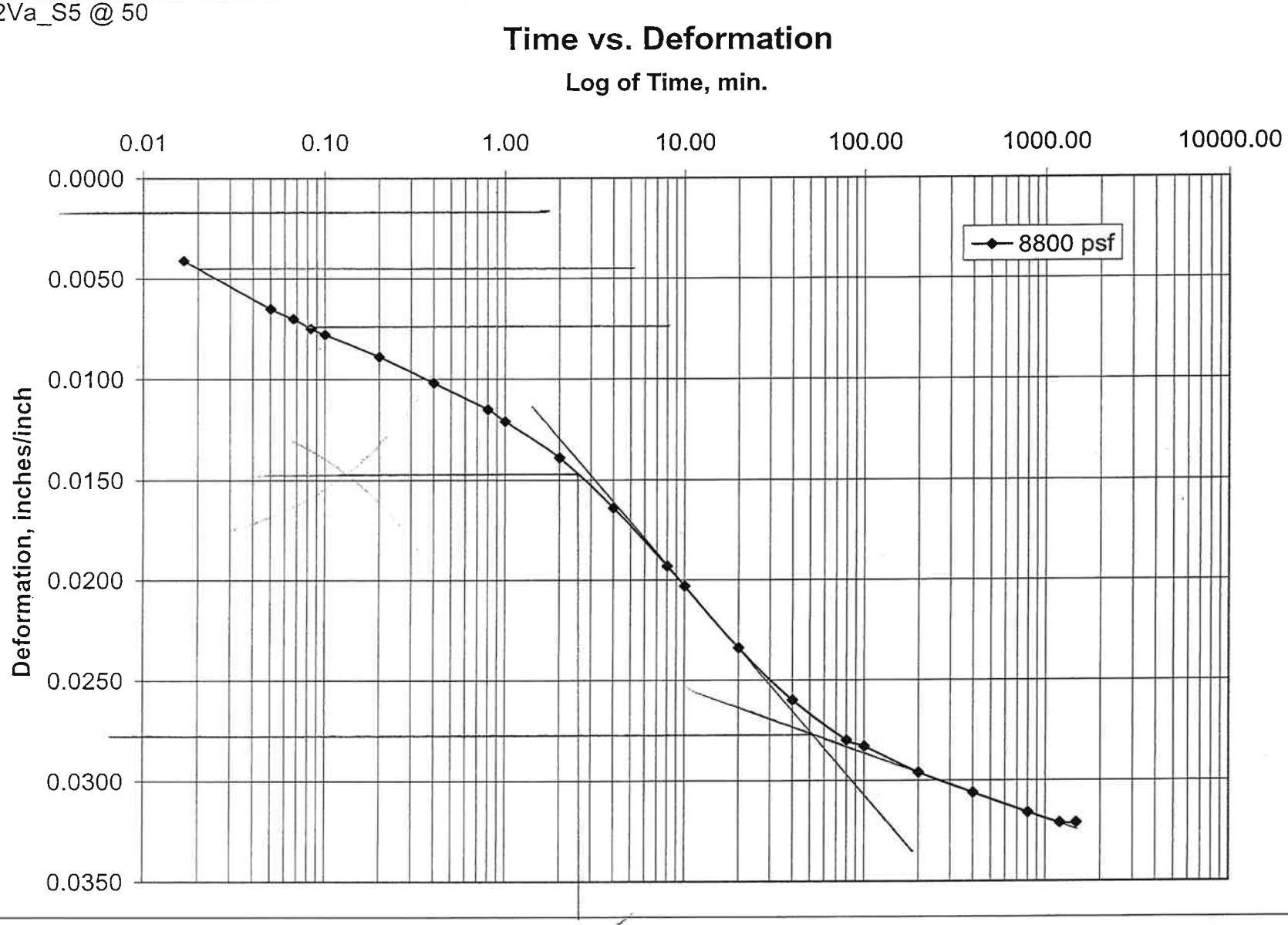

RB-12Va_S5 @ 50
Time vs. Deformation
Log of Time, min.
0.0
0.1
1.0
10.0
100.0
1000.0
10000.0
Deformation, inches/inch
0.0000
0.0020
0.0040
0.0060
0.0080
0.0100
0.0120
0.0140
0.0160
0.0180
2200 psf

0.70

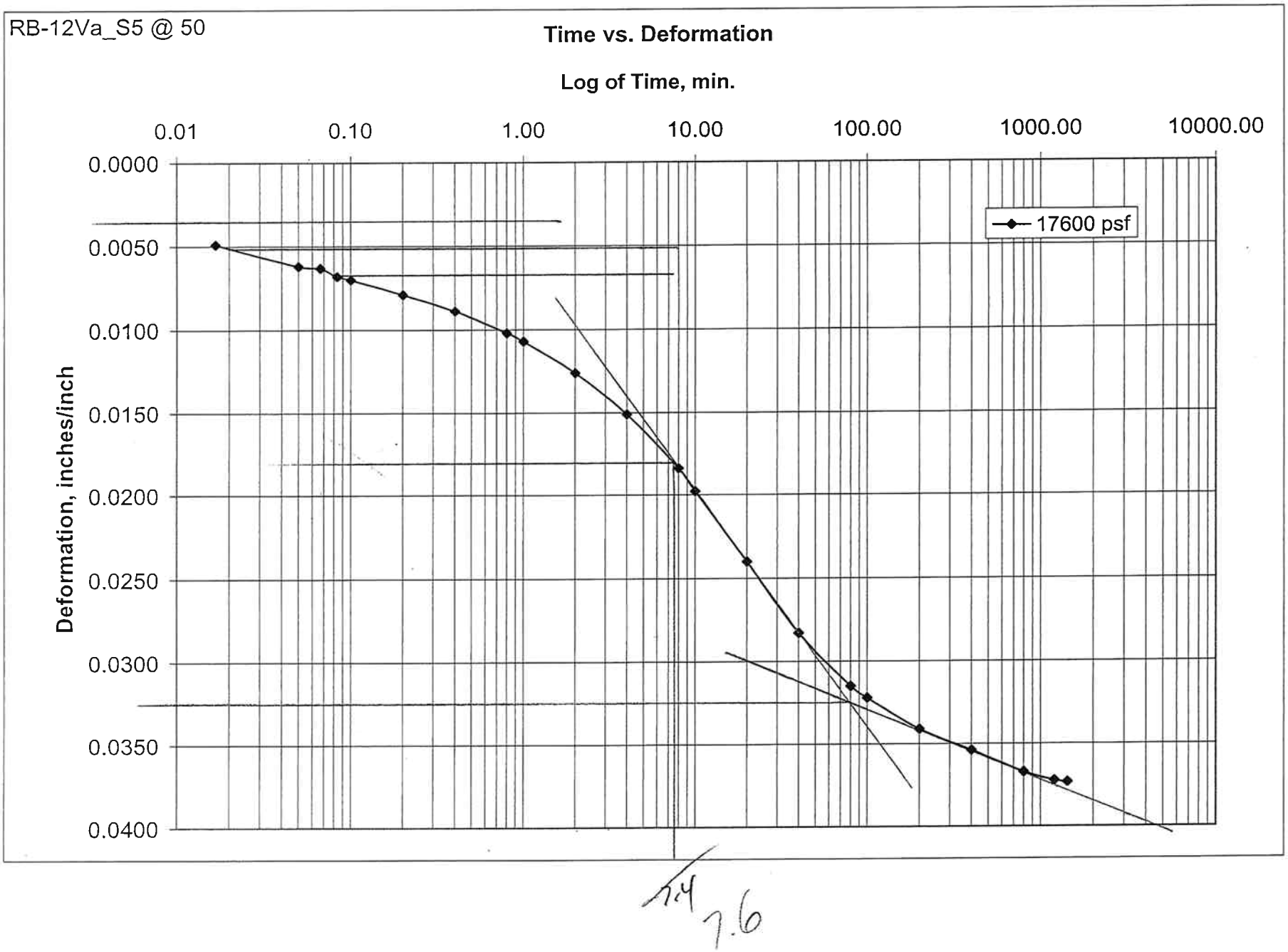

RB-12Va_S5 @ 50
Time vs. Deformation
Log of Time, min.
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
0.0000
0.0050
0.0100
0.0150
0.0200
0.0250
Deformation, inches/inch
4400 psf

1.3

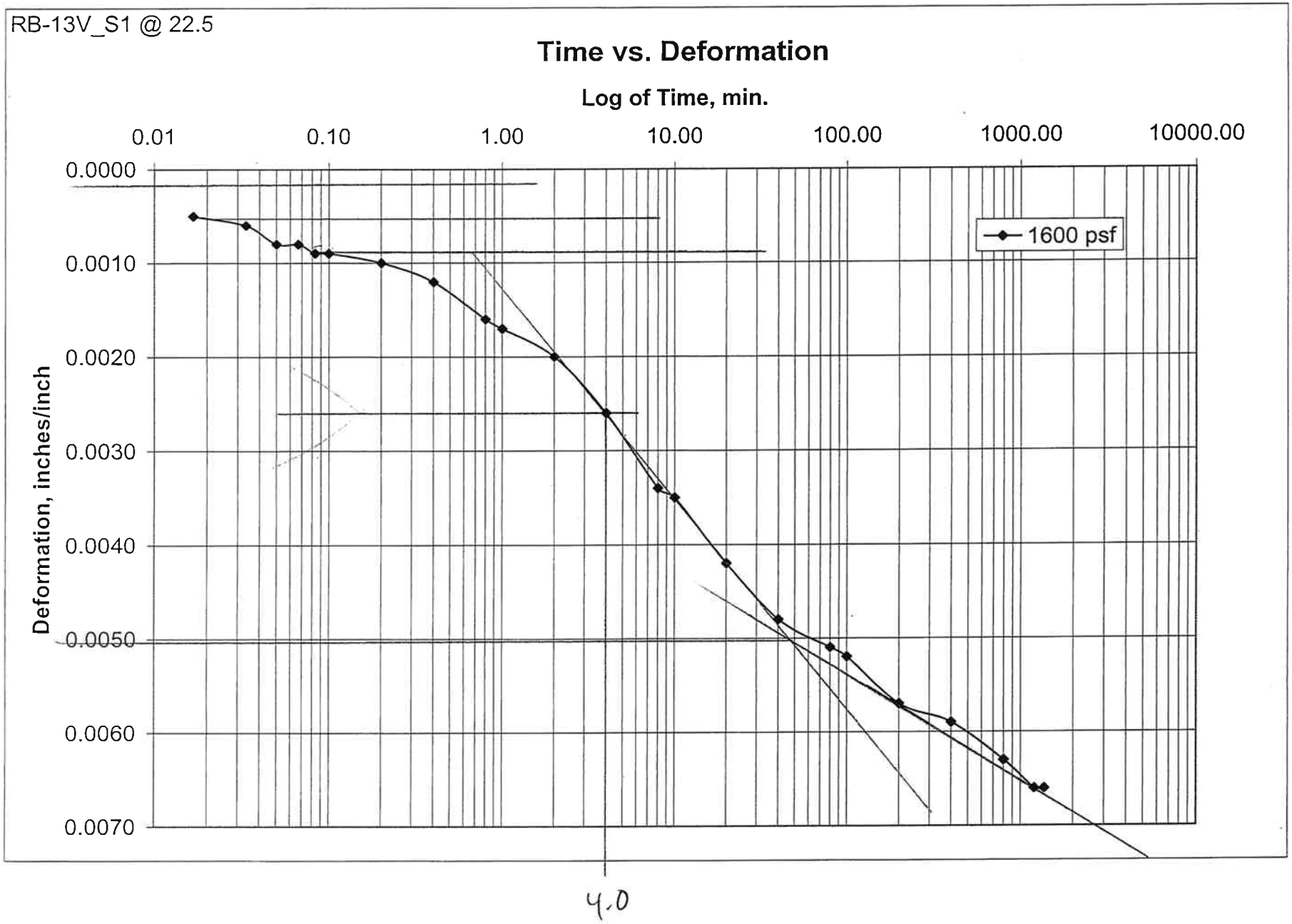
RB-12Va_S5 @ 50



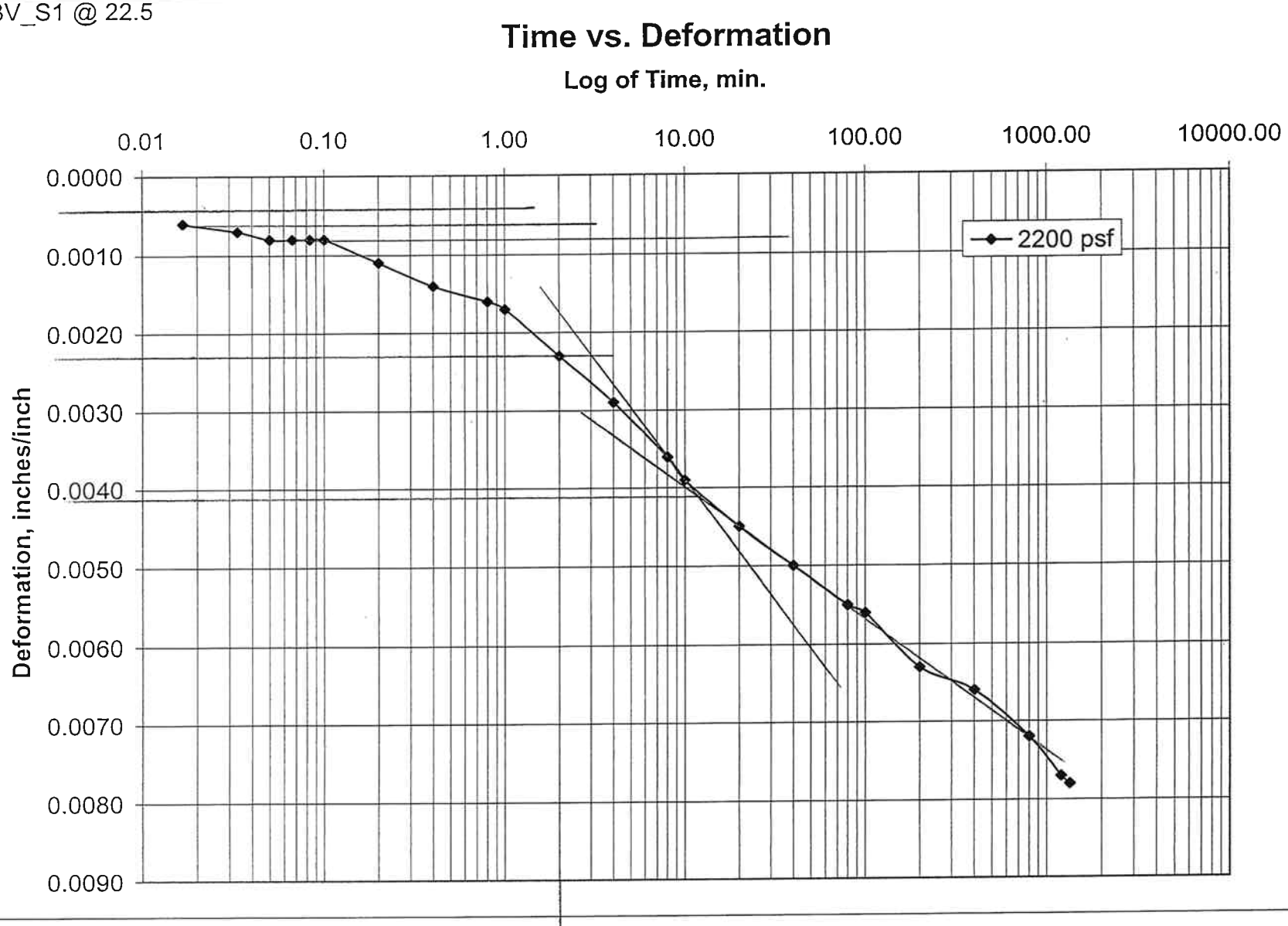
~~2.4~~
2.6


RB-12Va_S5 @ 50
Time vs. Deformation
Log of Time, min.
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
0.0000
0.0050
0.0100
0.0150
0.0200
0.0250
0.0300
0.0350
0.0400
Deformation, inches/inch
17600 psf
7.4
7.6

RB-13V_S1 @ 22.5

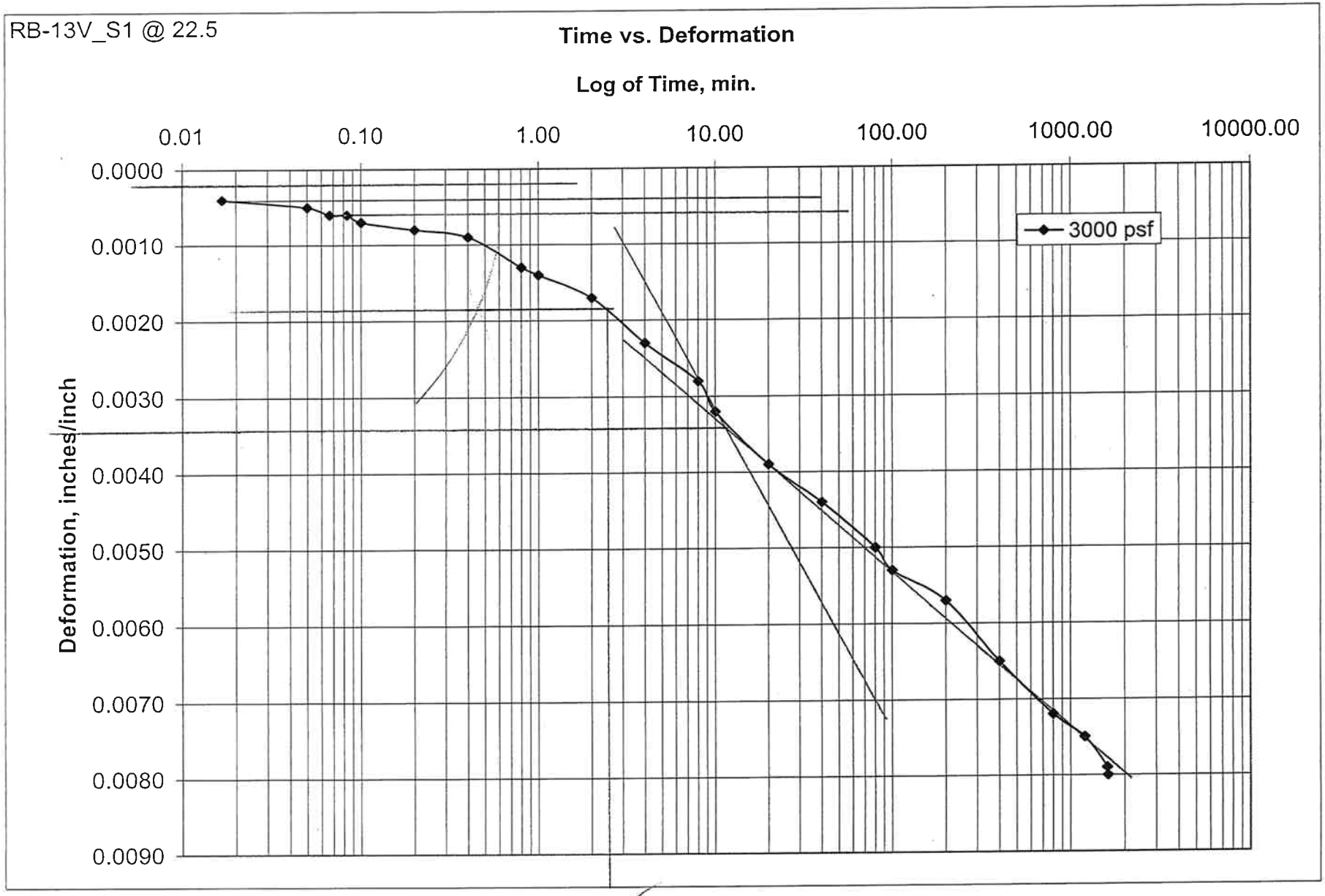

Time vs. Deformation
Log of Time, min.
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
0.0000
0.0010
0.0020
0.0030
0.0040
0.0050
0.0060
0.0070
Deformation, inches/inch
1600 psf
4.0

RB-13V_S1 @ 22.5



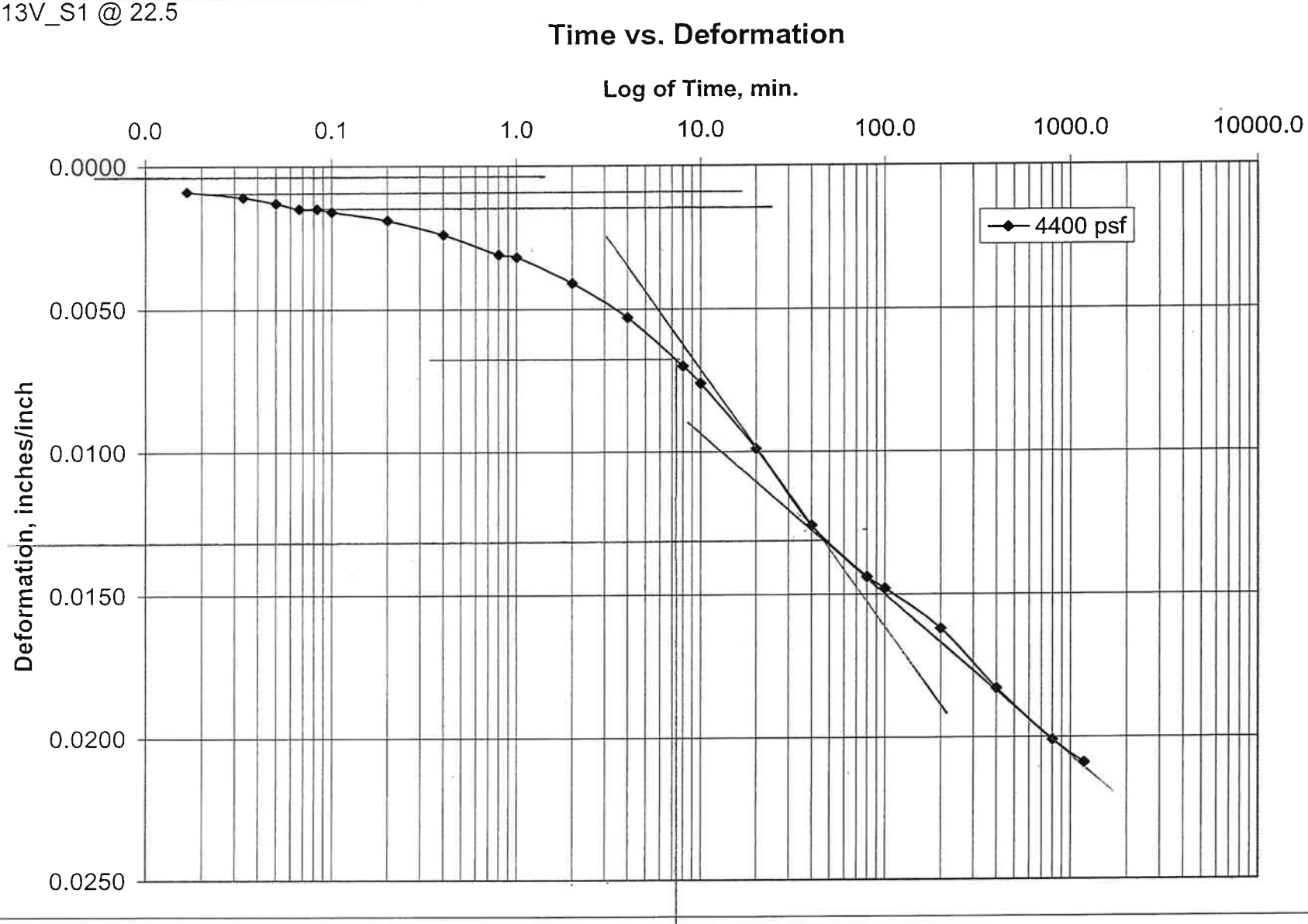
2.0

RB-13V_S1 @ 22.5



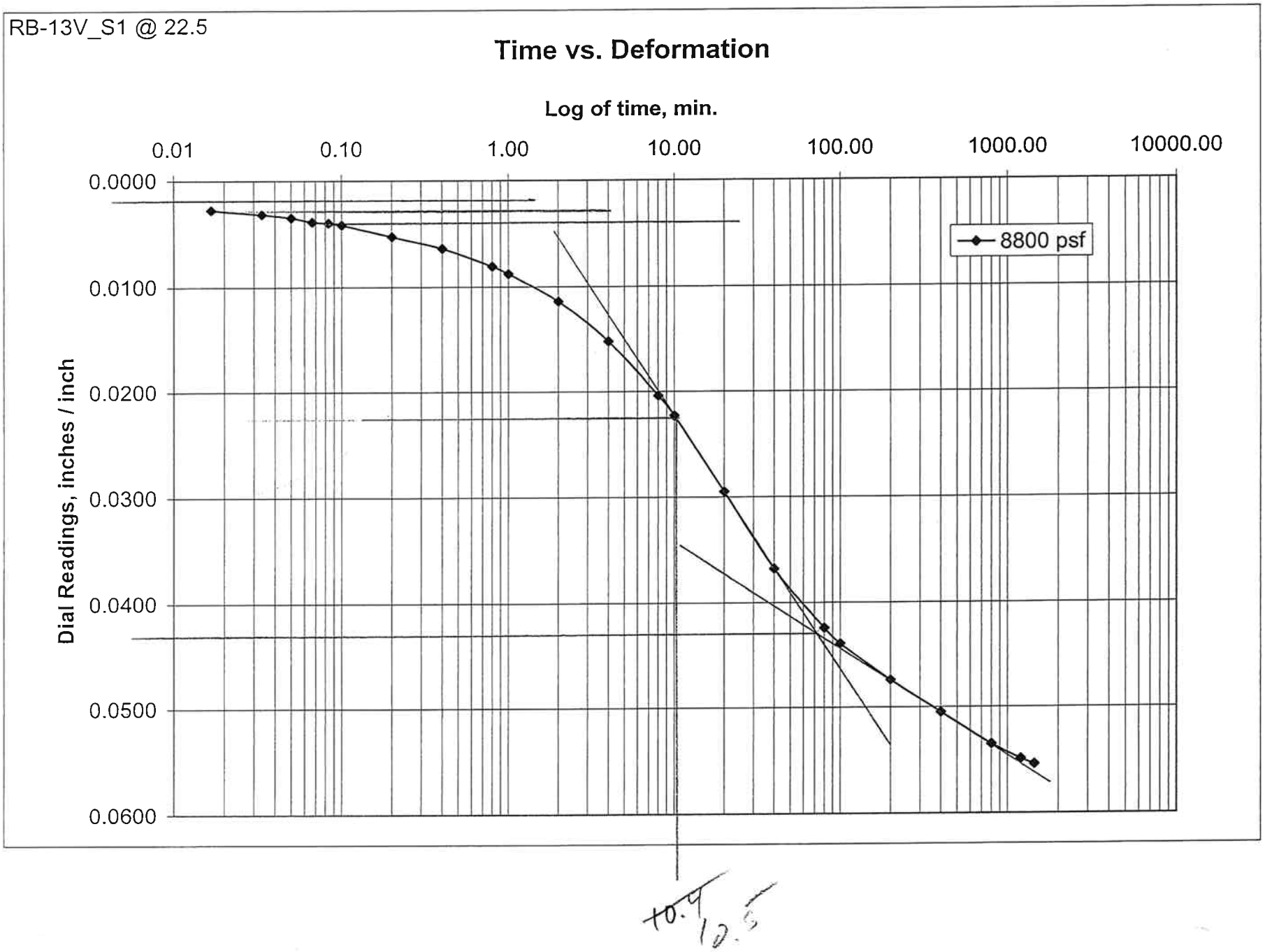
~~2.4~~ 2.5

RB-13V_S1 @ 22.5

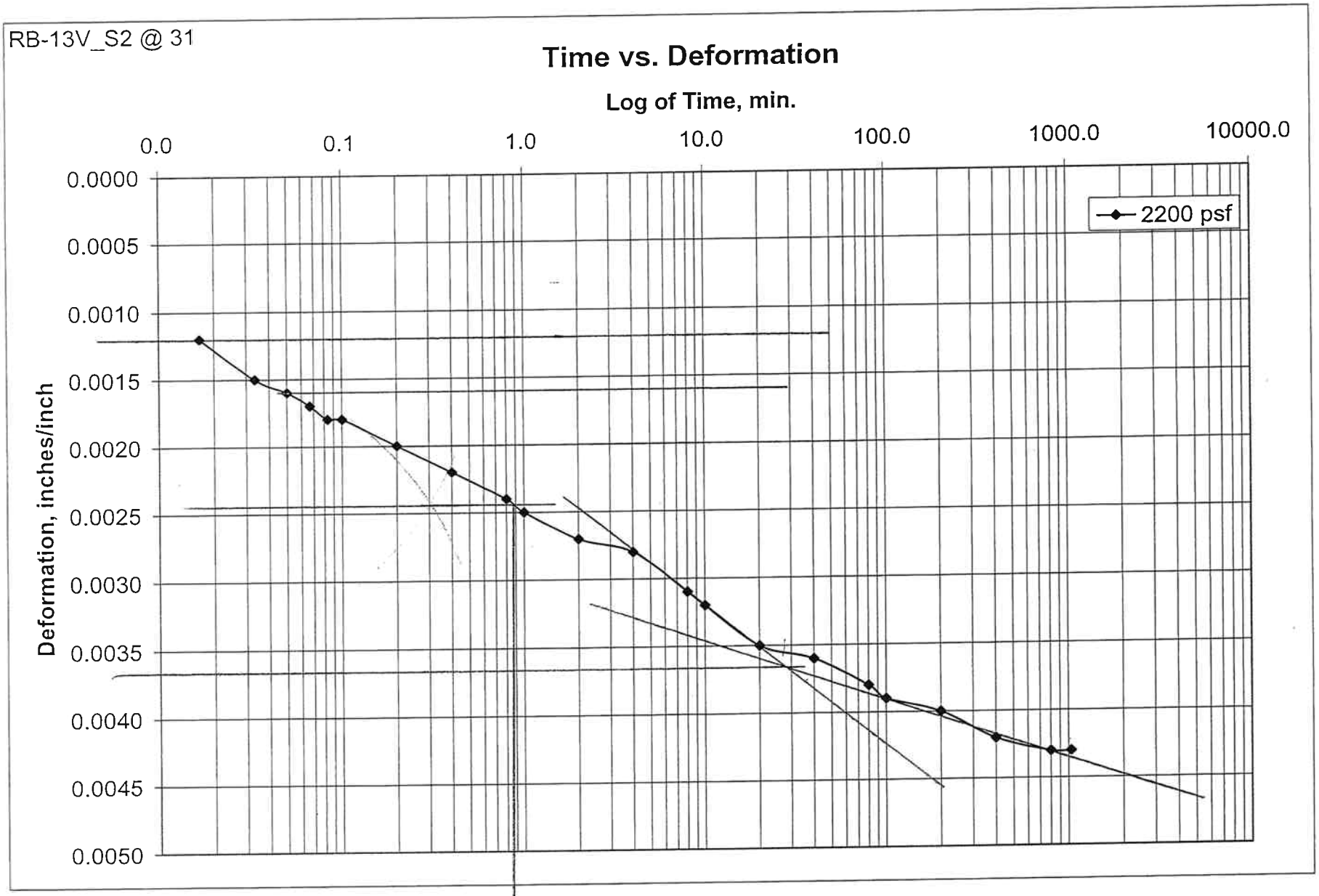


t_{50} 7.3

RB-13V_S1 @ 22.5

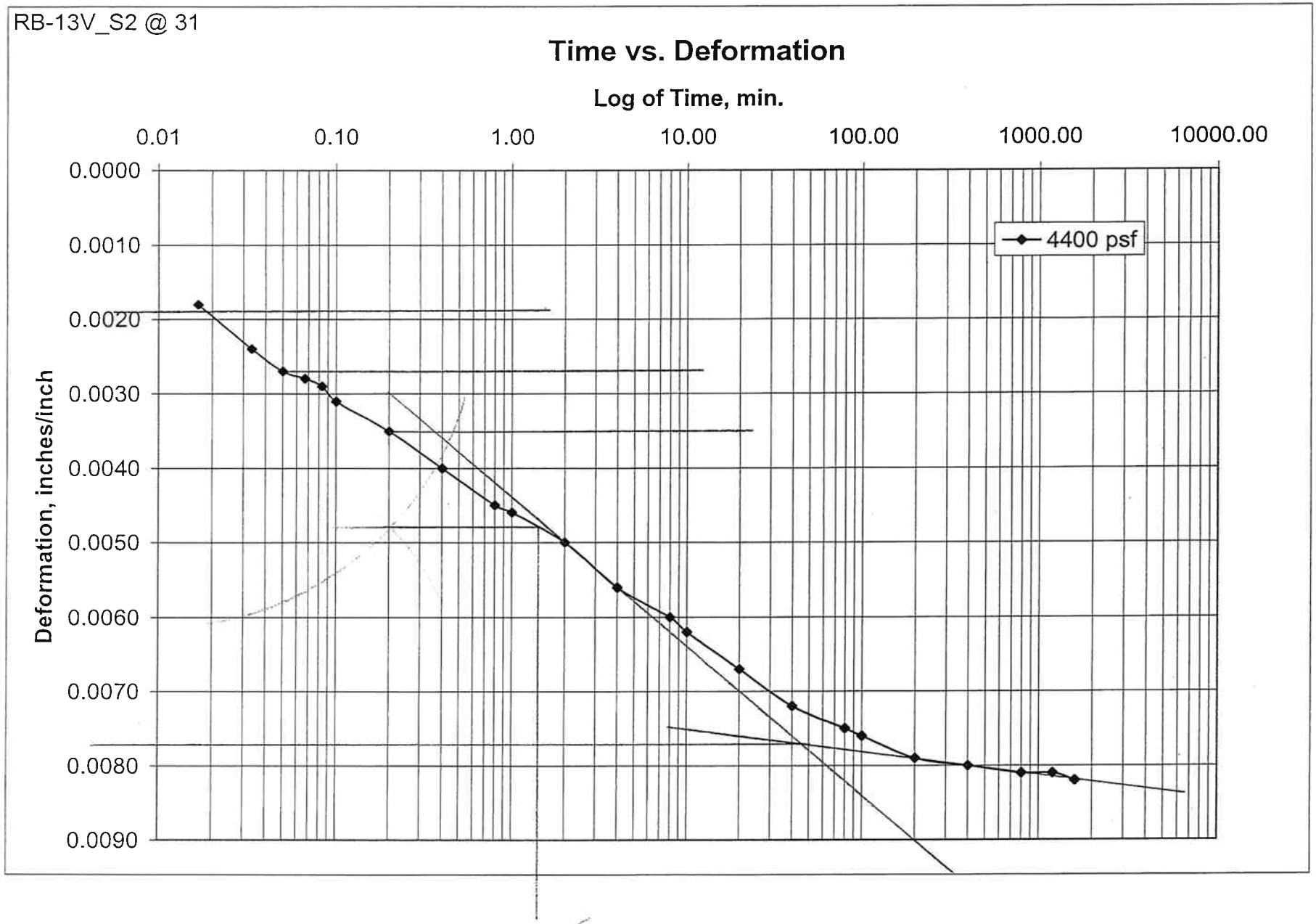

Time vs. Deformation
Log of time, min.
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
Dial Readings, inches / inch
0.0000
0.0100
0.0200
0.0300
0.0400
0.0500
0.0600
8800 psf
~~10.4~~
10.5

RB-13V_S2 @ 31



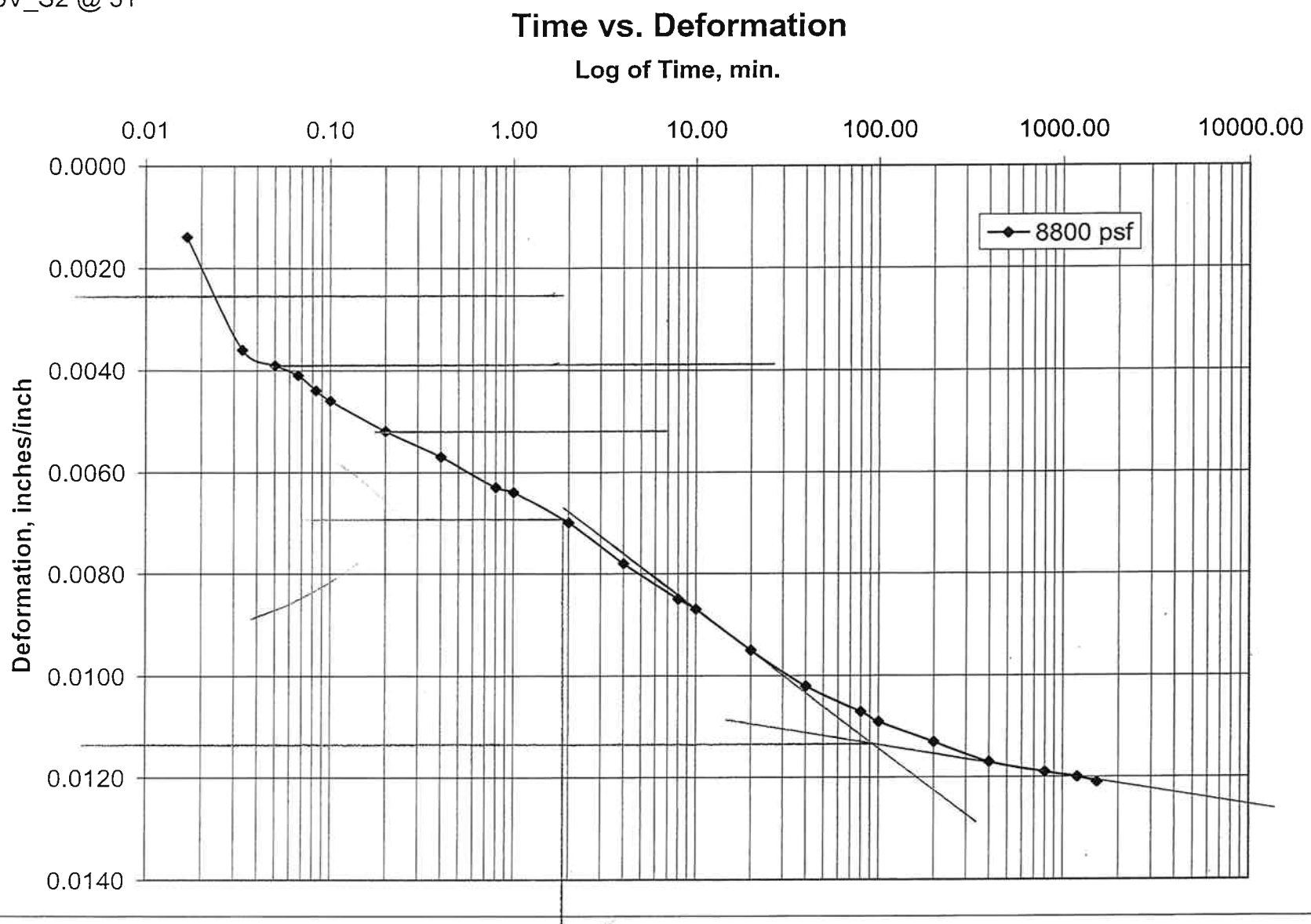
~~0.84~~ 0.86

RB-13V_S2 @ 31

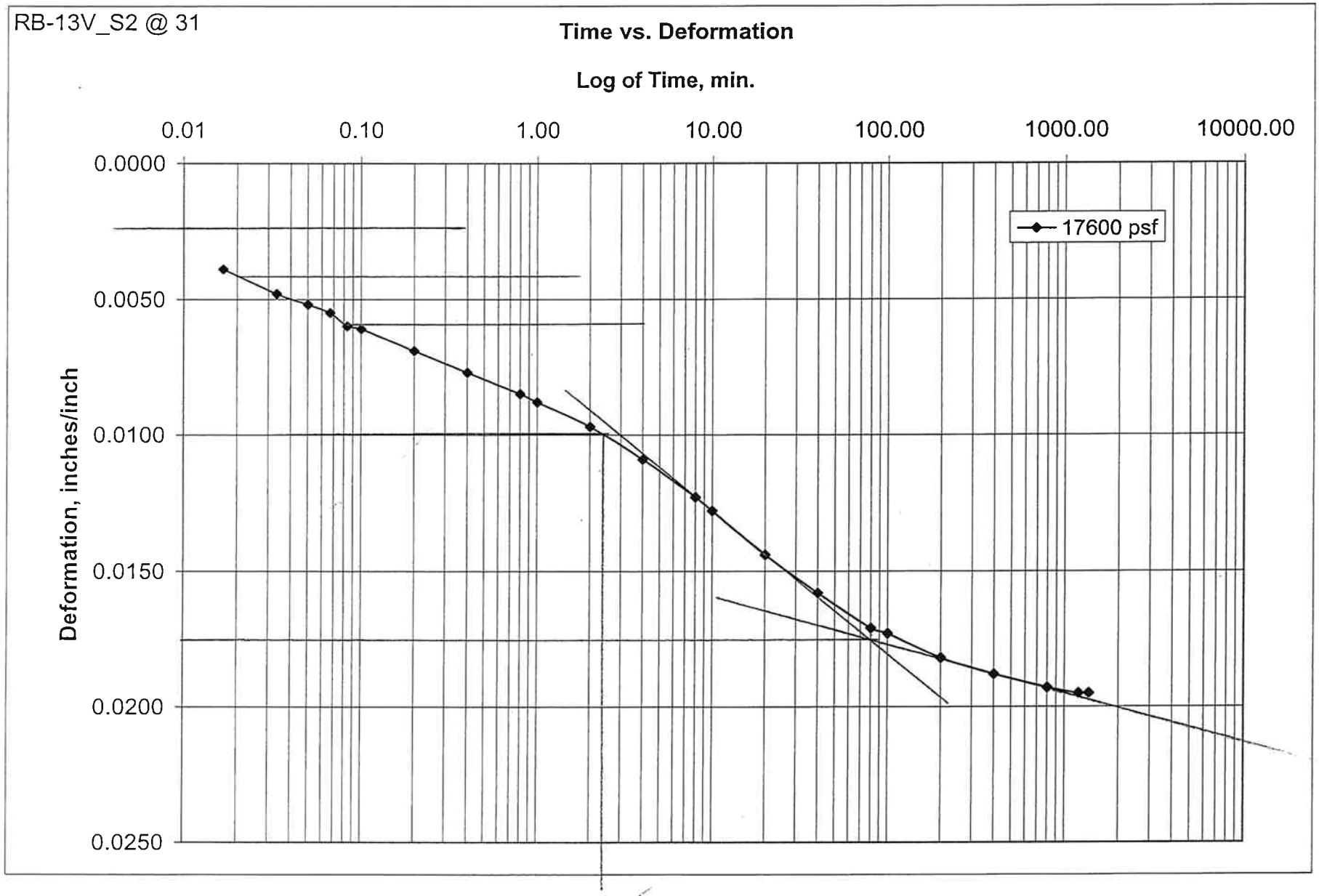


1.3, 1.4

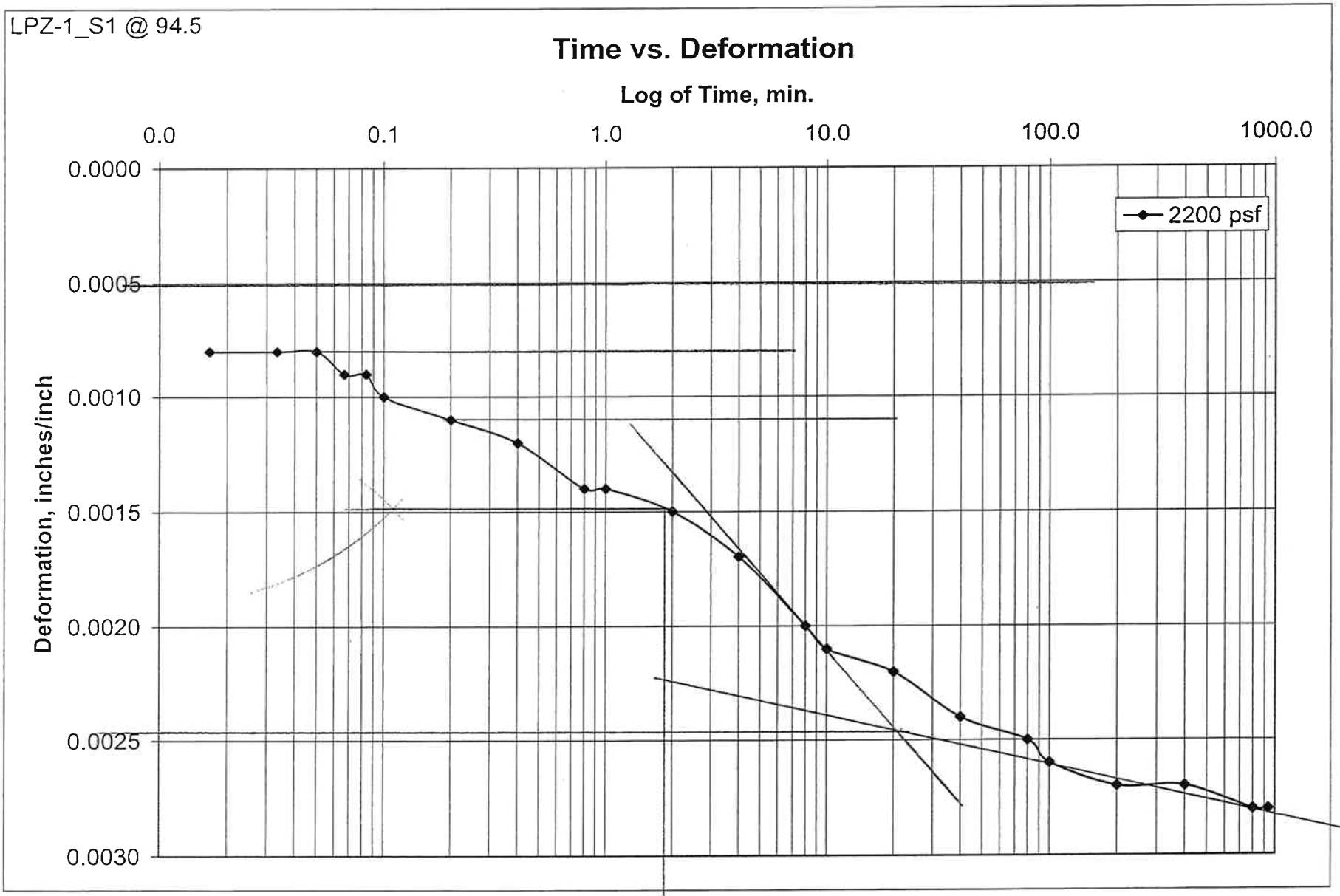
RB-13V_S2 @ 31



~~1.7~~ 1.6

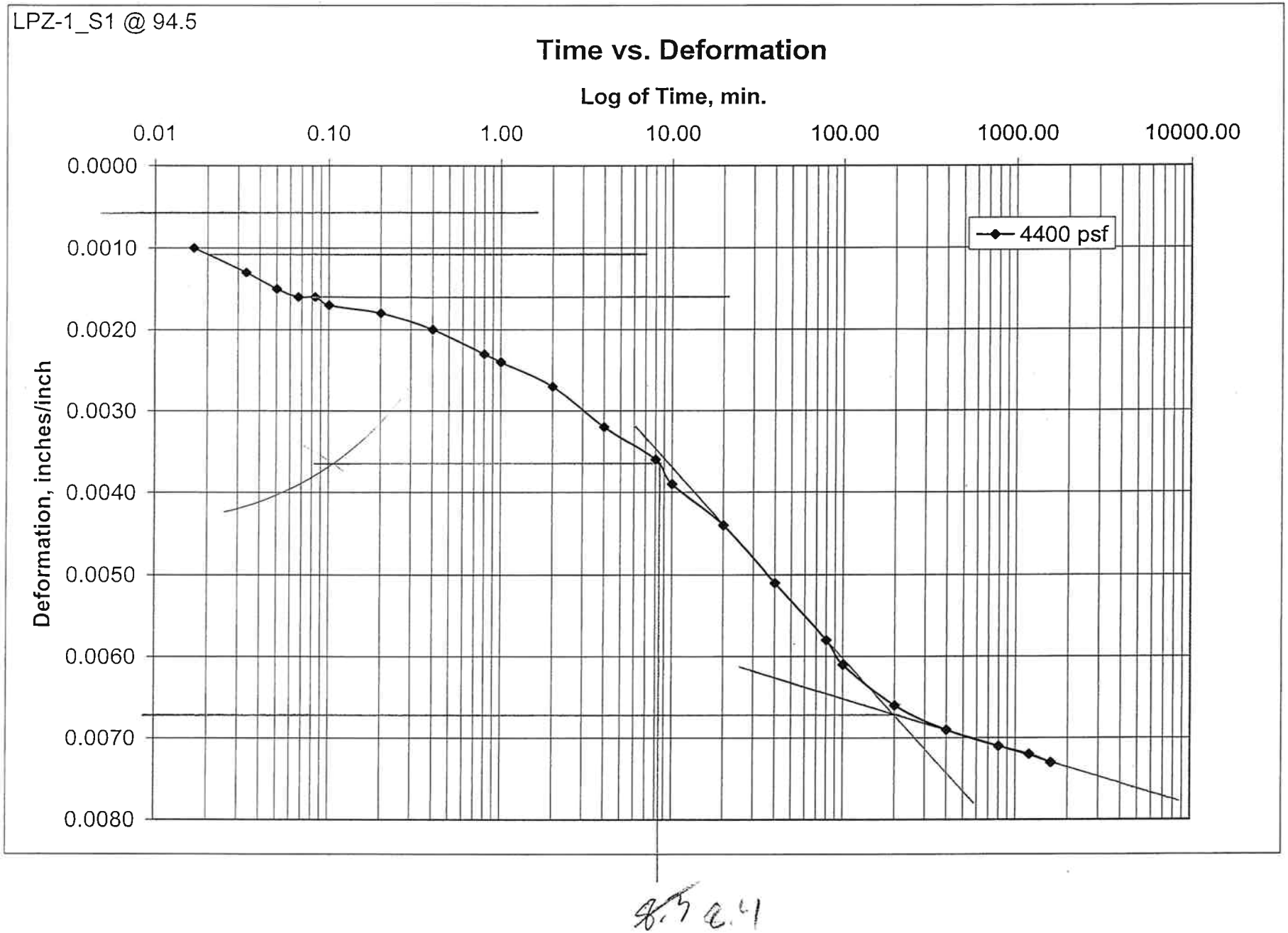

RB-13V_S2 @ 31
Time vs. Deformation
Log of Time, min.
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
0.0000
0.0050
0.0100
0.0150
0.0200
0.0250
Deformation, inches/inch
17600 psf

2.3 2.1

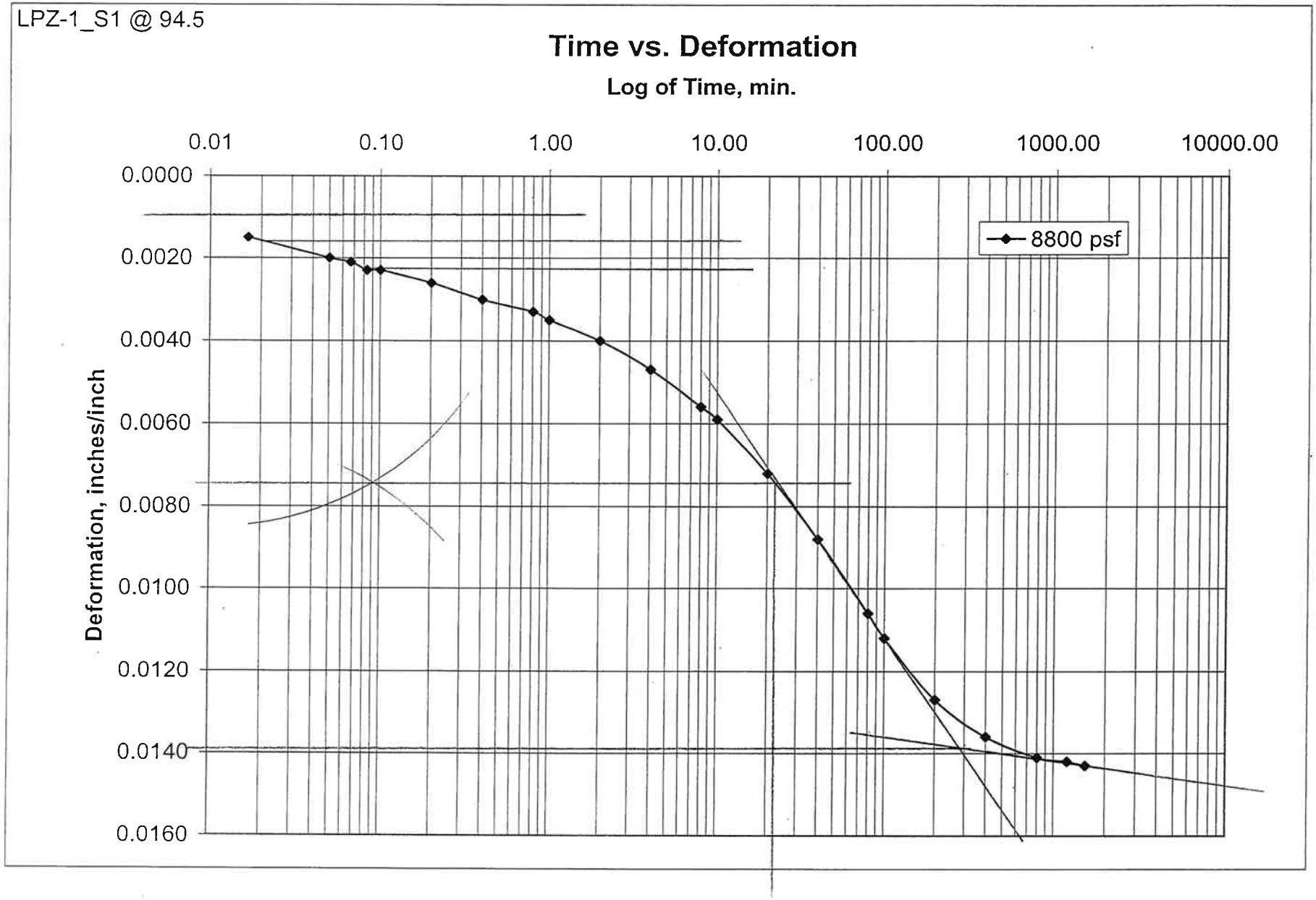

LPZ-1_S1 @ 94.5
Time vs. Deformation
Log of Time, min.
0.0
0.1
1.0
10.0
100.0
1000.0
0.0000
0.0005
0.0010
0.0015
0.0020
0.0025
0.0030
Deformation, inches/inch
2200 psf

1.6

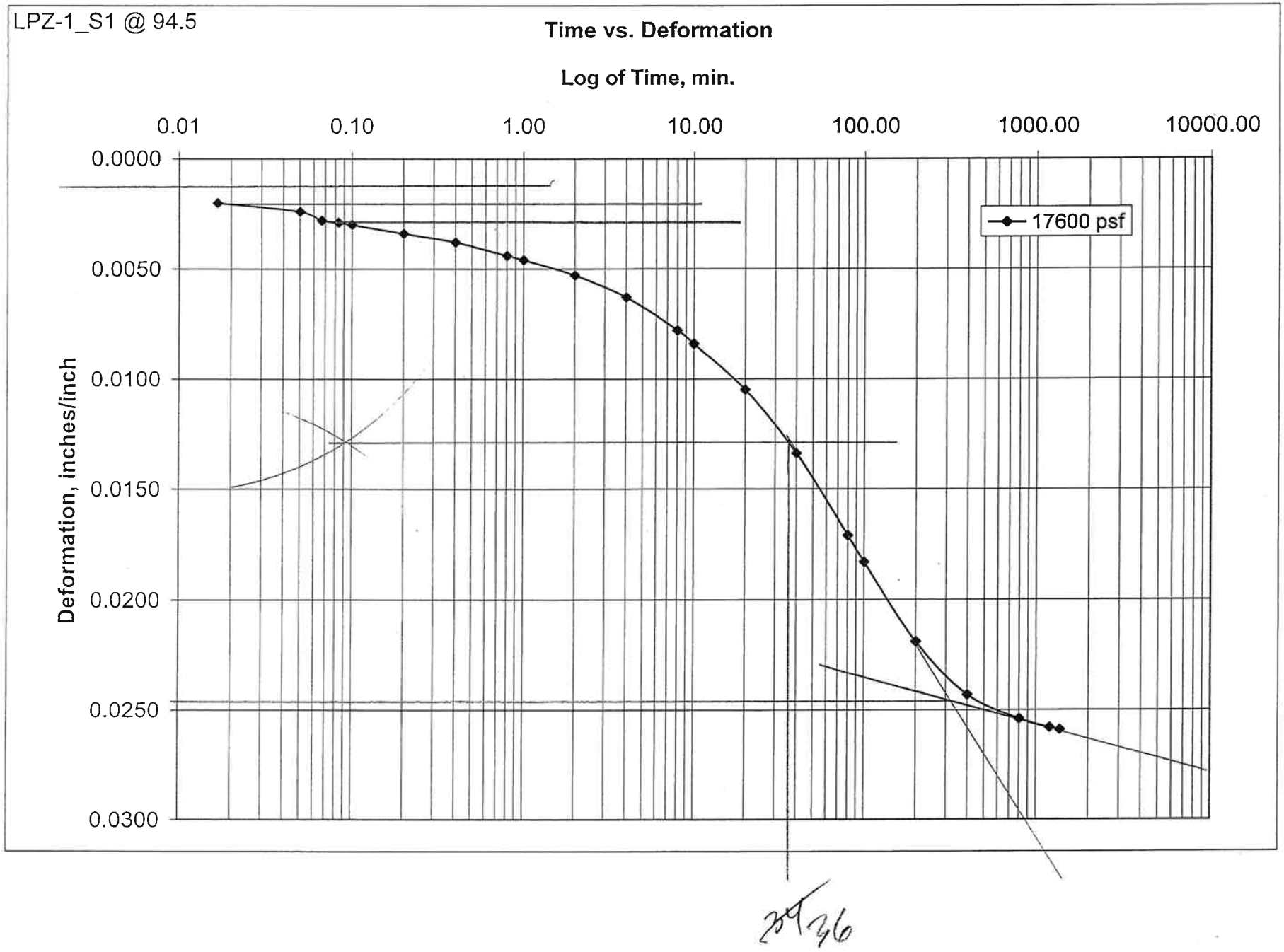
LPZ-1_S1 @ 94.5

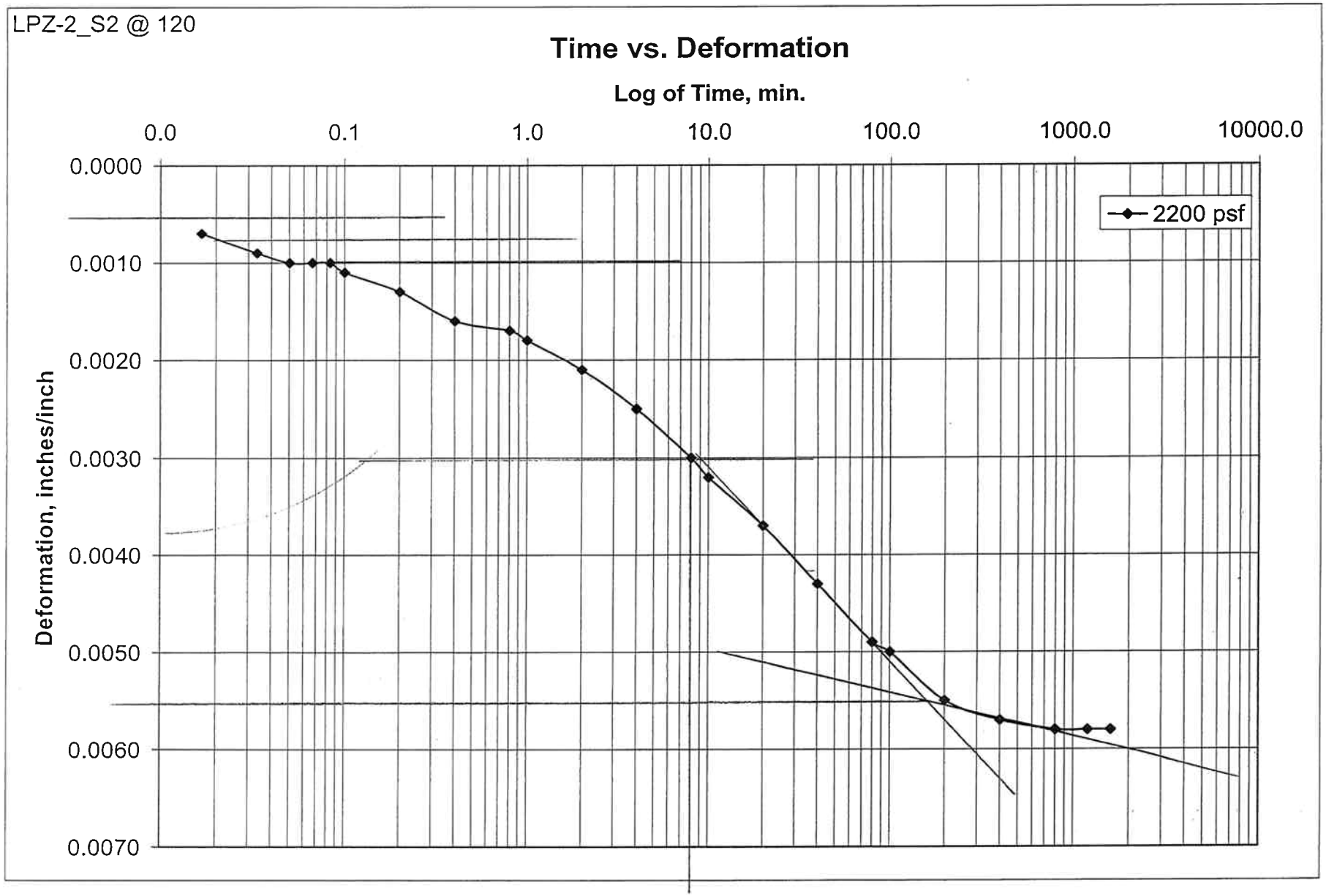

Time vs. Deformation
Log of Time, min.
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
0.0000
0.0010
0.0020
0.0030
0.0040
0.0050
0.0060
0.0070
0.0080
Deformation, inches/inch
4400 psf
8.3 a.4

LPZ-1_S1 @ 94.5



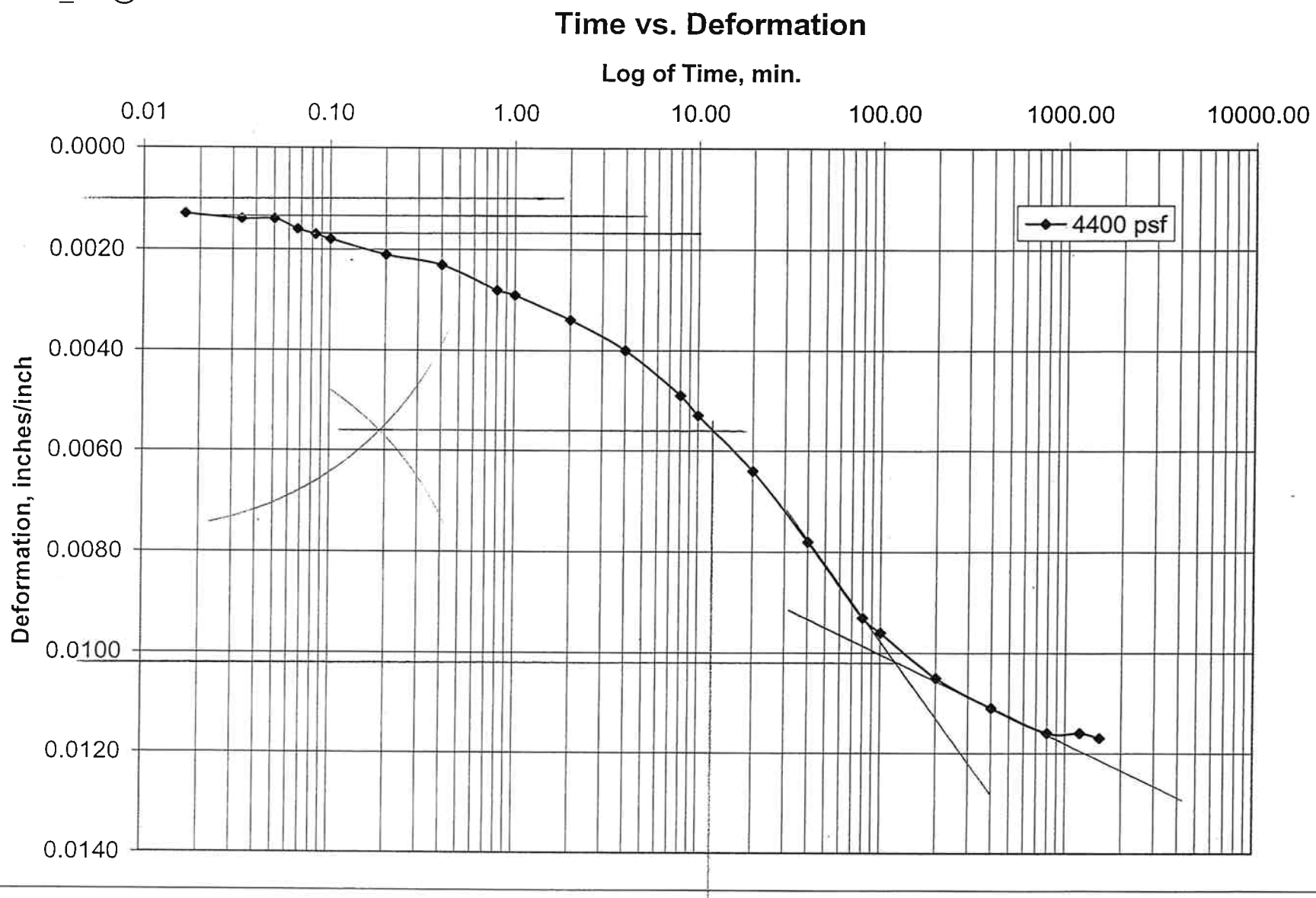
22


LPZ-1_S1 @ 94.5
Time vs. Deformation
Log of Time, min.
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
0.0000
0.0050
0.0100
0.0150
0.0200
0.0250
0.0300
Deformation, inches/inch
17600 psf
25/36


LPZ-2_S2 @ 120
Time vs. Deformation
Log of Time, min.
0.0
0.1
1.0
10.0
100.0
1000.0
10000.0
0.0000
0.0010
0.0020
0.0030
0.0040
0.0050
0.0060
0.0070
Deformation, inches/inch
2200 psf

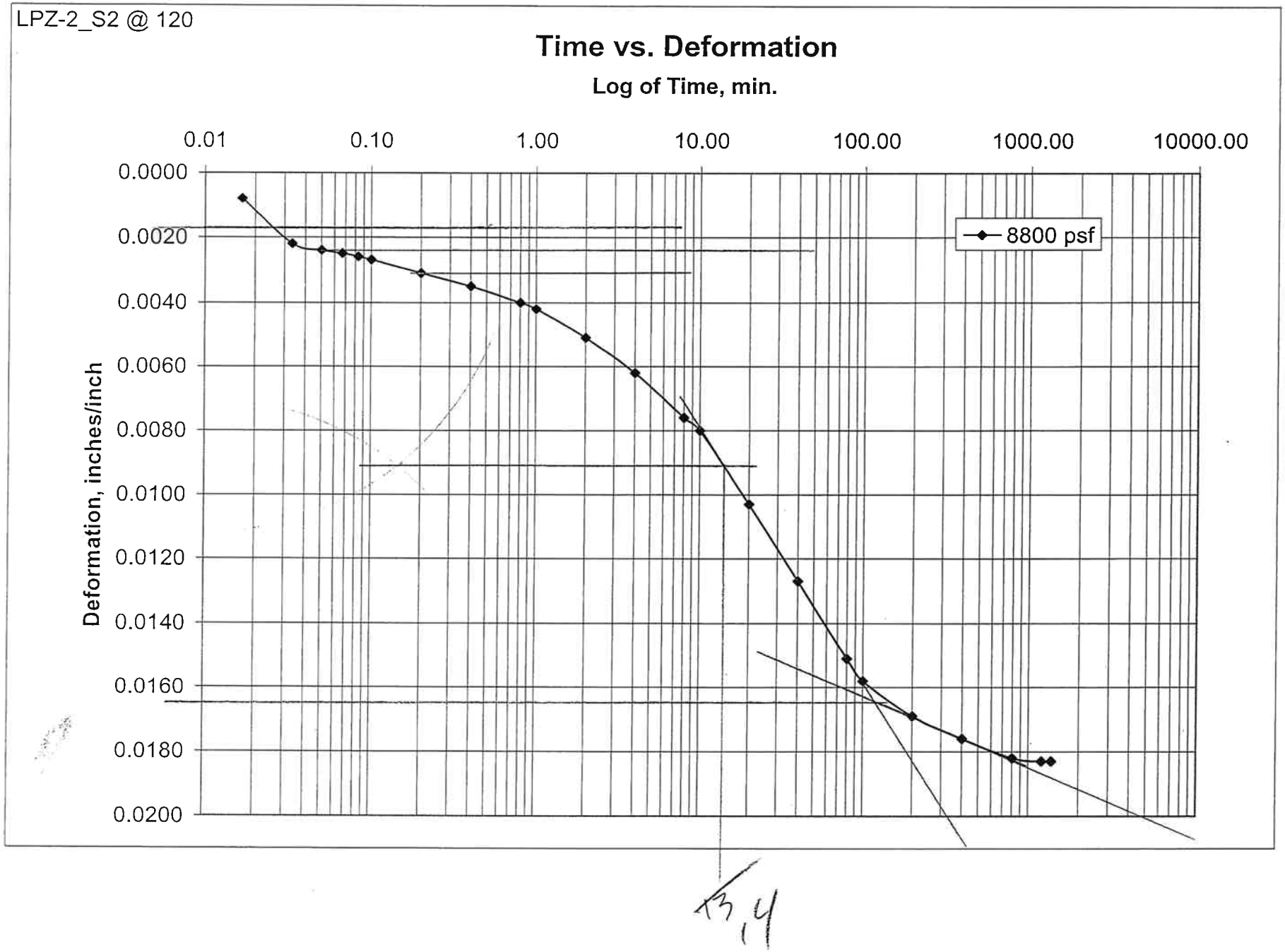
4.0

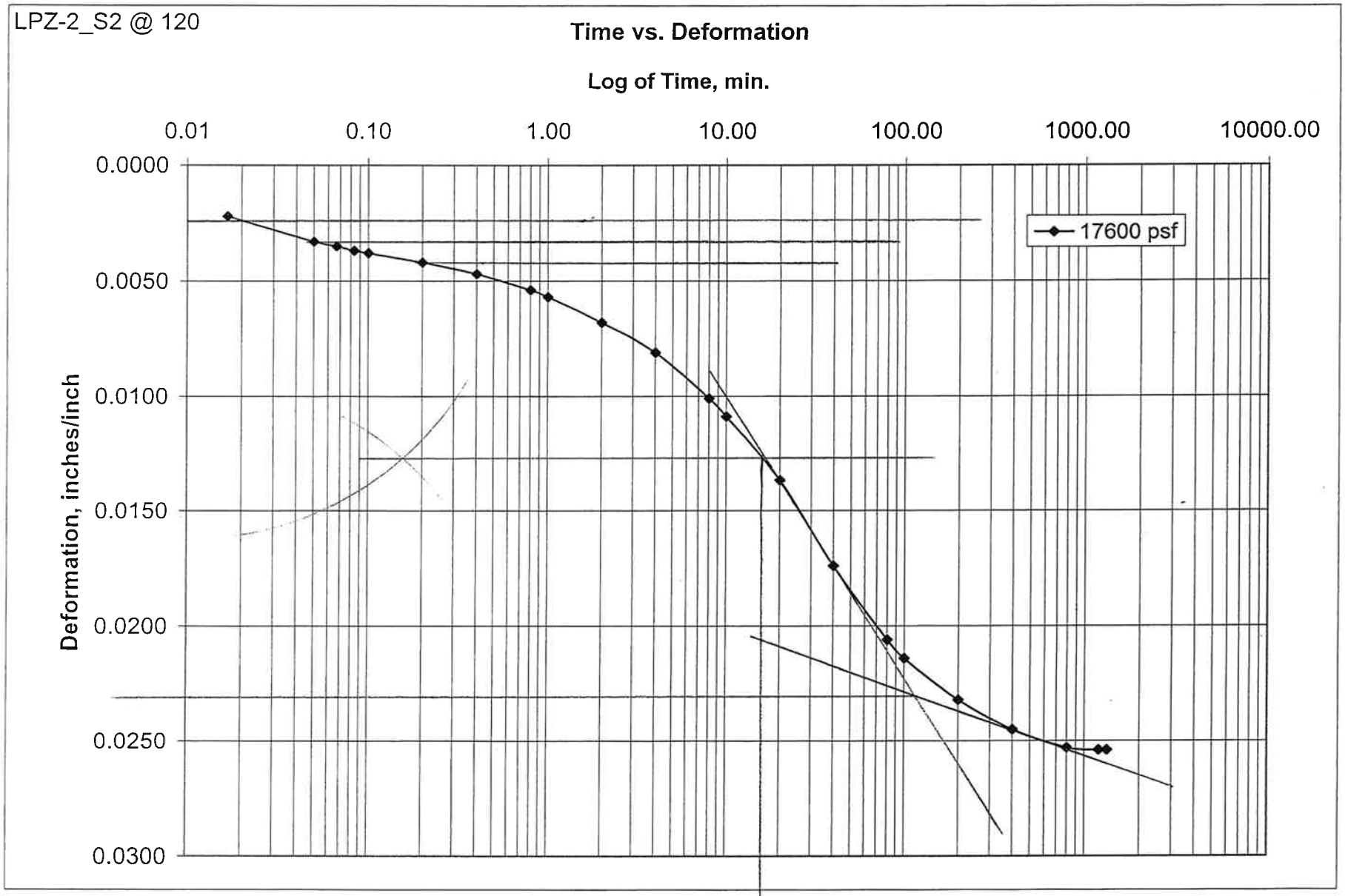
LPZ-2_S2 @ 120



12

LPZ-2_S2 @ 120


Time vs. Deformation
Log of Time, min.
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
0.0000
0.0020
0.0040
0.0060
0.0080
0.0100
0.0120
0.0140
0.0160
0.0180
0.0200
Deformation, inches/inch
8800 psf
13,4


LPZ-2_S2 @ 120
Time vs. Deformation
Log of Time, min.
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
0.0000
0.0050
0.0100
0.0150
0.0200
0.0250
0.0300
Deformation, inches/inch
17600 psf

t_{90} 16

LABORATORY DATA

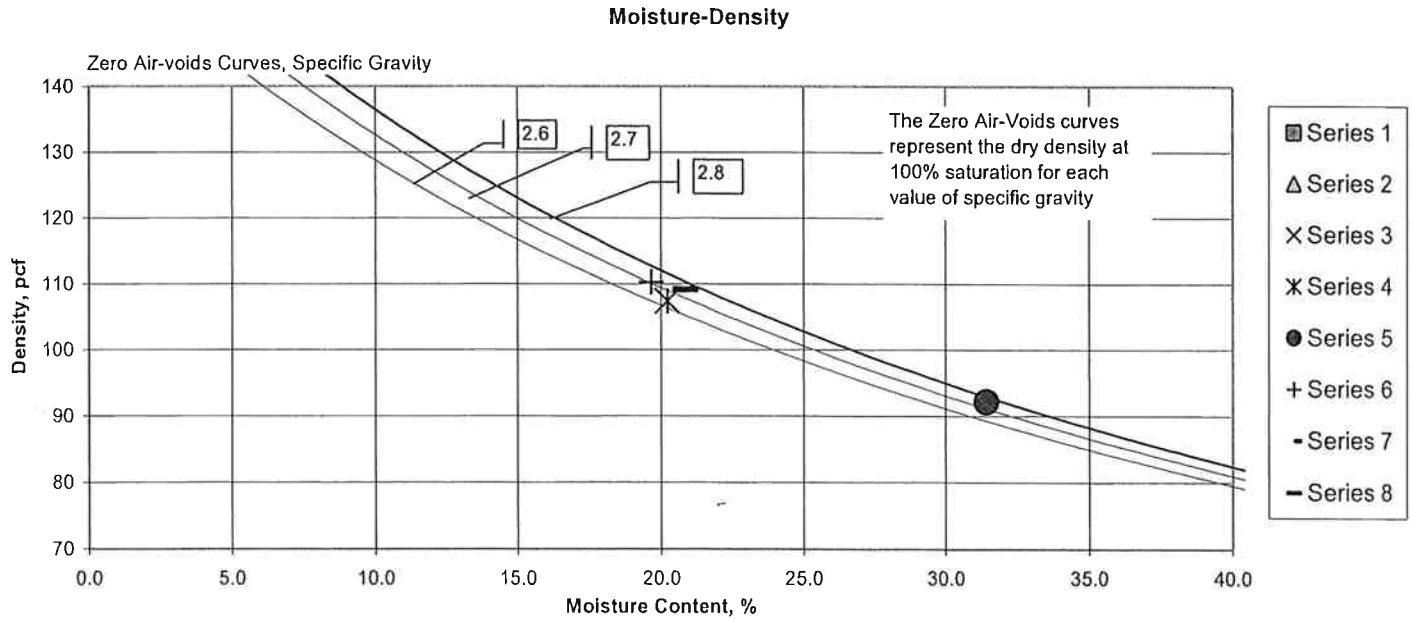
- **Moisture-Density Test**

Moisture-Density-Porosity Report

Cooper Testing Labs, Inc.

Job No:	516-003a	**Date:**	11/19/04
Client:	GeoLogic Associates	**By:**	MJ
Project:	Newby Island - 2004-049	**Remarks:**	

Boring:	RB-1	RB-1	RB-1	RB-1	RB-1	RB-2	RB-2	RB-2
Sample:	6	8	12	14	20	2	6	7
Depth, ft:	24.5	27.5	41.5	44.5	76.5	6.5	29	31.5
Visual Description:	Gray Silty SAND, slightly plastic	Gray Poorly Graded SAND with Silt	Brown Poorly Graded SAND with Silt	Brown Lean CLAY	Olive Gray CLAY	Brown Lean CLAY	Gray Silty SAND with shells	Gray Silty SAND with shell fragments and Clay lense
Actual G_s								
Assumed G_s				2.70	2.75	2.75		2.75
Total Vol cc				148.25	149.83	413.17		453.35
Vol Solids,cc				94.36	80.35	265.21		288.02
Vol Voids,cc				53.88	69.48	147.96		165.33
Moisture, %	29.8	27.6	22.1	20.2	31.4	19.7	22.1	20.9
Wet Unit wt, pcf				129.1	121.1	132.0		131.9
Dry Unit wt, pcf				107.4	92.1	110.3		109.2
Saturation, %				95.6	99.9	96.9		100.0
Porosity, %				36.3	46.4	35.8		36.5
Void Ratio				0.571	0.865	0.558		0.574
Series	1	2	3	4	5	6	7	8

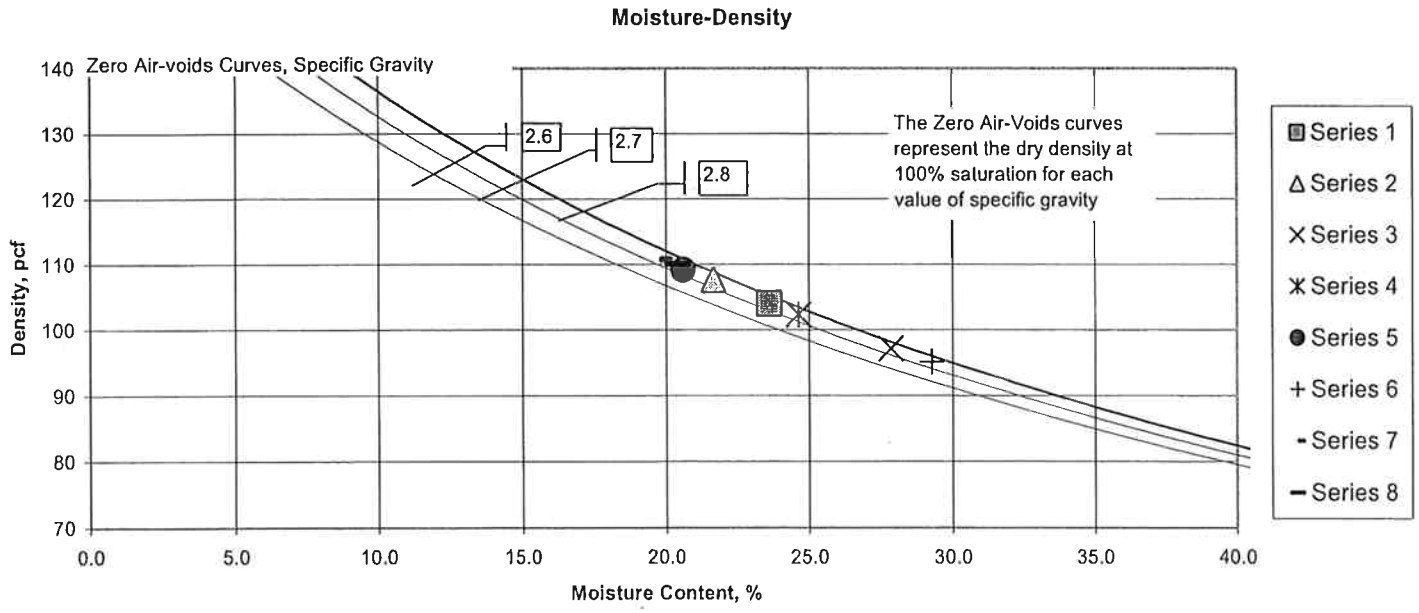


Moisture-Density-Porosity Report

Cooper Testing Labs, Inc.

Job No:	516-003b	**Date:**	11/19/04
Client:	GeoLogic Associates	**By:**	MJ
Project:	Newby Island - 2004-049	**Remarks:**	

Boring:	RB-2	RB-2	RB-2	RB-2	RB-2	RB-4	RB-4	RB-4
Sample:	10	11	12	14	15	1	2	3b
Depth, ft:	52	59	67	82	88	30	35	40
Visual Description:	Brown CLAY, trace Sand & nodules	Brown Sandy SILT	Brown CLAY	Brown CLAY	Olive Gray Lean CLAY	Brown Fat CLAY	Brown CLAY, trace Sand	Brown Lean CLAY with Sand
Actual G_s								
Assumed G_s	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75
Total Vol cc	149.83	452.20	149.22	149.22	227.41	228.02	149.22	227.03
Vol Solids,cc	90.69	283.21	84.35	88.84	144.44	126.23	96.16	145.41
Vol Voids,cc	59.15	168.99	64.87	60.38	82.97	101.79	53.06	81.63
Moisture, %	23.6	21.7	27.9	24.6	20.6	29.3	19.8	20.4
Wet Unit wt, pcf	128.6	130.9	124.2	127.5	131.6	123.0	132.6	132.5
Dry Unit wt, pcf	104.0	107.6	97.1	102.3	109.1	95.1	110.7	110.0
Saturation, %	99.6	99.9	99.7	99.7	98.7	99.9	98.7	100.0
Porosity, %	39.5	37.4	43.5	40.5	36.5	44.6	35.6	36.0
Void Ratio	0.652	0.597	0.769	0.680	0.574	0.806	0.552	0.561
Series	1	2	3	4	5	6	7	8

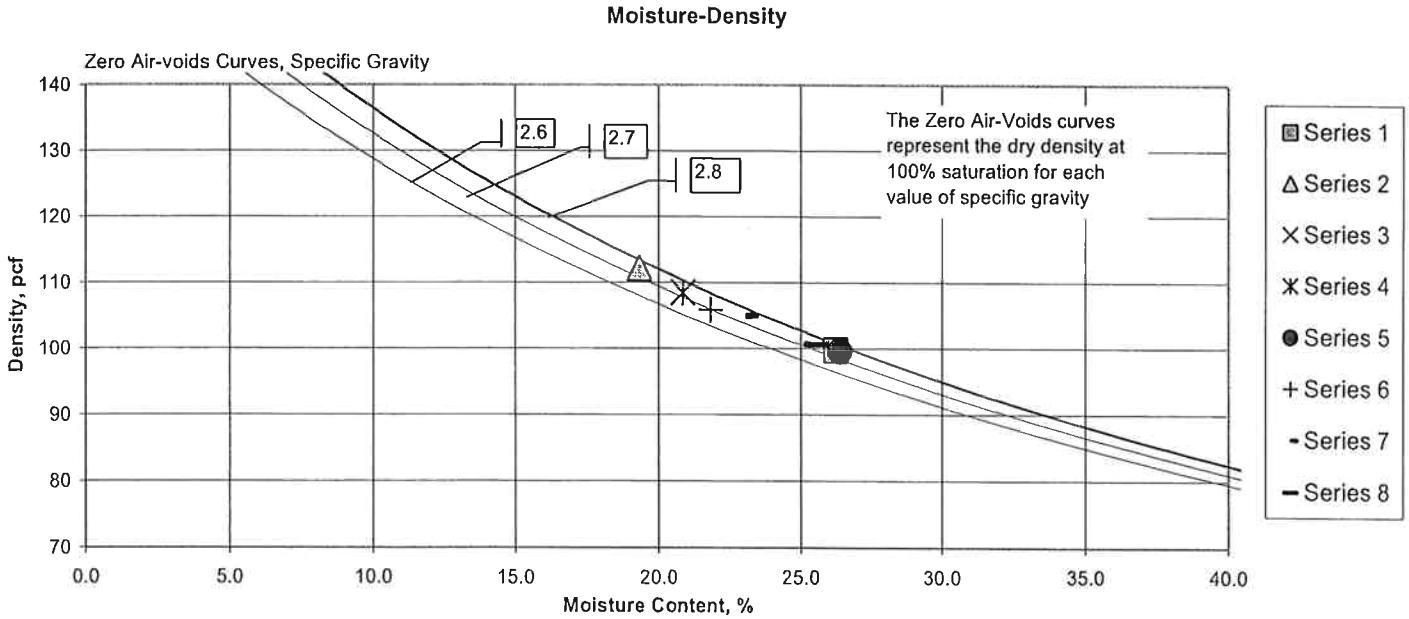


Moisture-Density-Porosity Report

Cooper Testing Labs, Inc.

Job No:	516-003c	**Date:**	11/19/04
Client:	GeoLogic Associates	**By:**	MJ
Project:	Newby Island - 2004-049	**Remarks:**	

Boring:	RB-4	RB-4	RB-4	RB-4	RB-4	RB-4	RB-4	RB-5
Sample:	4a	6	11	13	15	16	18	3
Depth, ft:	45	55	62.5	75	85	90	100	35.5
Visual Description:	Brown CLAY (silty) close to Silty CLAY	Brown Silty SAND	Brown CLAY (silty)	Brown CLAY (silty) with Sand	Brown Lean CLAY	Brown CLAY (silty)	Brown CLAY	Brown Lean CLAY
Actual G_s								
Assumed G_s	2.75	2.75		2.75	2.75	2.70	2.75	2.75
Total Vol cc	149.83	225.18		149.36	227.41	149.98	149.07	225.72
Vol Solids,cc	87.05	146.99		94.29	131.86	94.16	91.12	132.25
Vol Voids,cc	62.78	78.19		55.07	95.56	55.81	57.95	93.47
Moisture, %	26.2	19.3	27.5	20.9	26.4	21.9	23.1	25.5
Unit wt, pcf	126.0	133.8		131.1	125.9	129.1	129.2	126.4
Dry Unit wt, pcf	99.8	112.1		108.5	99.6	105.9	105.0	100.7
Saturation, %	100.0	99.9		98.3	100.0	99.5	99.8	99.4
Porosity, %	41.9	34.7		36.9	42.0	37.2	38.9	41.4
Void Ratio	0.721	0.532		0.584	0.725	0.593	0.636	0.707
Series	1	2	3	4	5	6	7	8

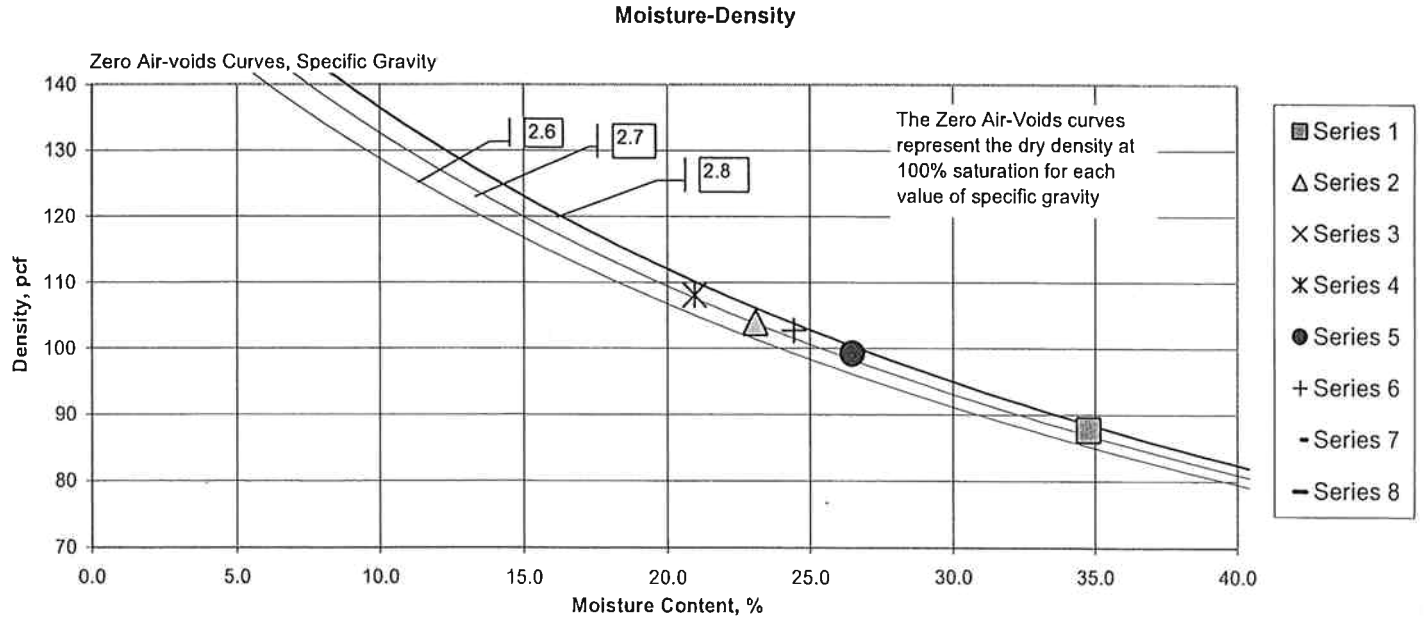


Moisture-Density-Porosity Report

Cooper Testing Labs, Inc.

Job No:	516-003d	**Date:**	11/19/04
Client:	GeoLogic Associates	**By:**	MJ
Project:	Newby Island - 2004-049	**Remarks:**	

Boring:	RB-5	RB-5	RB-5	RB-5	RB-5	RB-5		
Sample:	5	7	12	16	18	20		
Depth, ft:	45.5	55.5	65	80.5	90.5	100.5		
Visual Description:	Brown CLAY, trace nodules	Brown Lean CLAY	Brown Silty SAND	Brown CLAY with Sand grading to Sandy SILT	Olive Gray Lean CLAY	Olive Gray CLAY, trace nodules		
Actual G_s								
Assumed G_s	2.75	2.70		2.75	2.75	2.75		
Total Vol cc	150.22	225.72		450.69	228.94	148.85		
Vol Solids,cc	76.71	139.01		283.45	132.20	88.96		
Vol Voids,cc	73.50	86.71		167.24	96.73	59.89		
Moisture, %	34.8	23.1	21.1	21.0	26.5	24.4		
Wet Unit wt, pcf	118.2	127.9		130.7	125.5	127.8		
Dry Unit wt, pcf	87.7	103.9		108.1	99.2	102.7		
Saturation, %	99.8	100.0		97.7	99.5	99.8		
Porosity, %	48.9	38.4		37.1	42.3	40.2		
Void Ratio	0.958	0.624		0.590	0.732	0.673		
Series	1	2	3	4	5	6	7	8

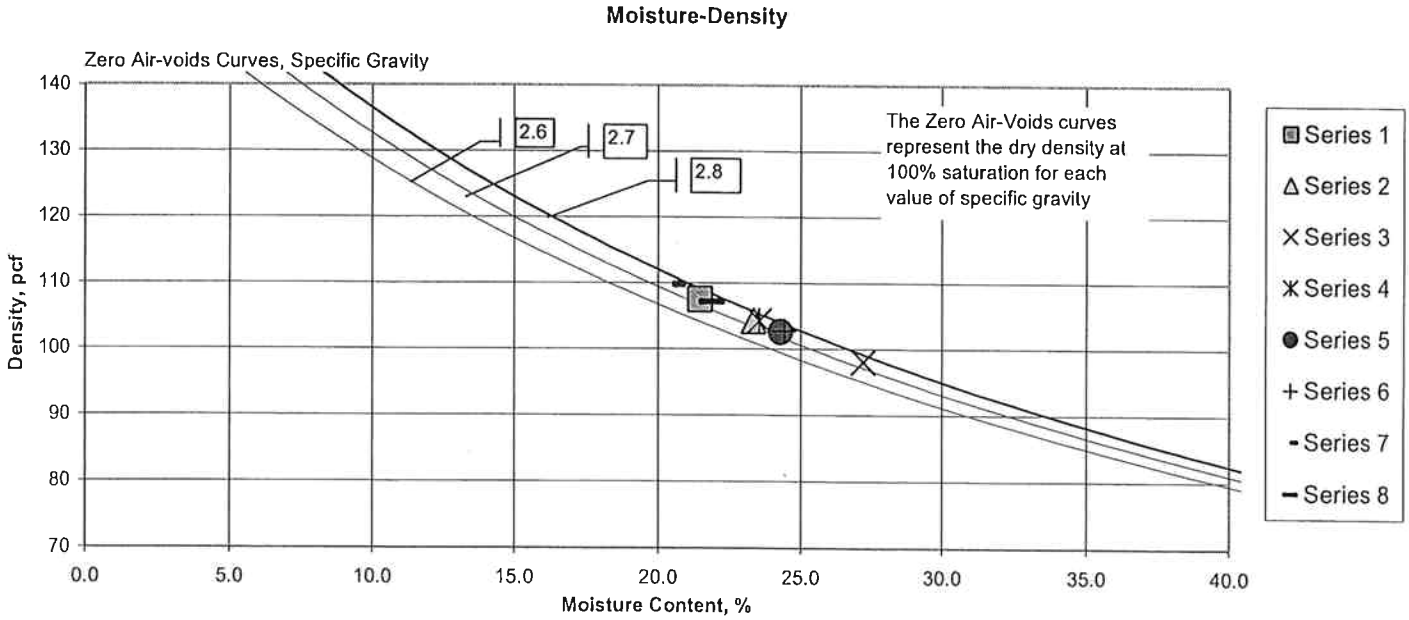


Moisture-Density-Porosity Report

Cooper Testing Labs, Inc.

Job No:	516-004a	**Date:**	11/19/04
Client:	GeoLogic Associates	**By:**	MJ
Project:	Newby Island - 2004-049	**Remarks:**	

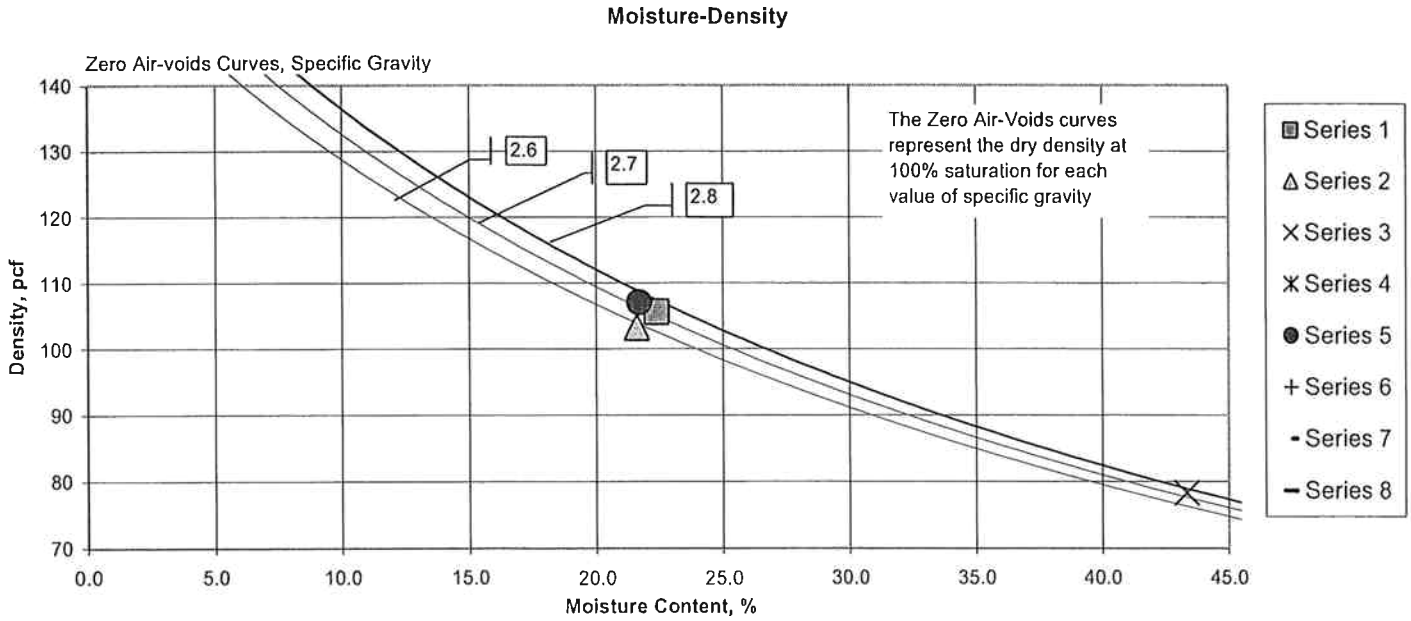
Boring:	RB-6	RB-6	RB-6	RB-6	RB-6	RB-7	RB-7	RB-7
Sample:	1	5	7	11	13	3	8	11
Depth, ft:	31-32.5	49-50.5	59-60.5	79-80.5	89-90.5	23-24.5	48-49.5	79-80.5
Visual Description:	Gray Lean CLAY	Brown CLAY	Brown CLAY	Brown SILT with Sand	Brown CLAY	Brown Fat CLAY	Brown Sandy SILT	Gray CLAY
Actual G_s								
Assumed G_s	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75
Total Vol cc	146.90	151.49	151.49	150.99	151.49	226.48	150.98	151.37
Vol Solids,cc	91.93	91.92	86.45	91.63	90.46	135.45	96.47	94.42
Vol Voids,cc	54.97	59.57	65.04	59.36	61.03	91.03	54.51	56.94
Moisture, %	21.5	23.3	27.2	23.5	24.3	24.4	20.5	21.9
Unit wt, pcf	130.6	128.6	124.7	128.8	127.5	127.8	132.3	130.6
Dry Unit wt, pcf	107.5	104.3	98.0	104.3	102.6	102.8	109.8	107.2
Saturation, %	98.8	99.1	99.4	99.9	99.0	99.9	99.8	99.8
Porosity, %	37.4	39.3	42.9	39.3	40.3	40.2	36.1	37.6
Void Ratio	0.598	0.648	0.752	0.648	0.675	0.672	0.565	0.603
Series	1	2	3	4	5	6	7	8



Moisture-Density-Porosity Report
Cooper Testing Labs, Inc.

Job No:	516-004b	**Date:**	11/19/04
Client:	GeoLogic Assoicates	**By:**	MJ
Project:	Newby Island	**Remarks:**	

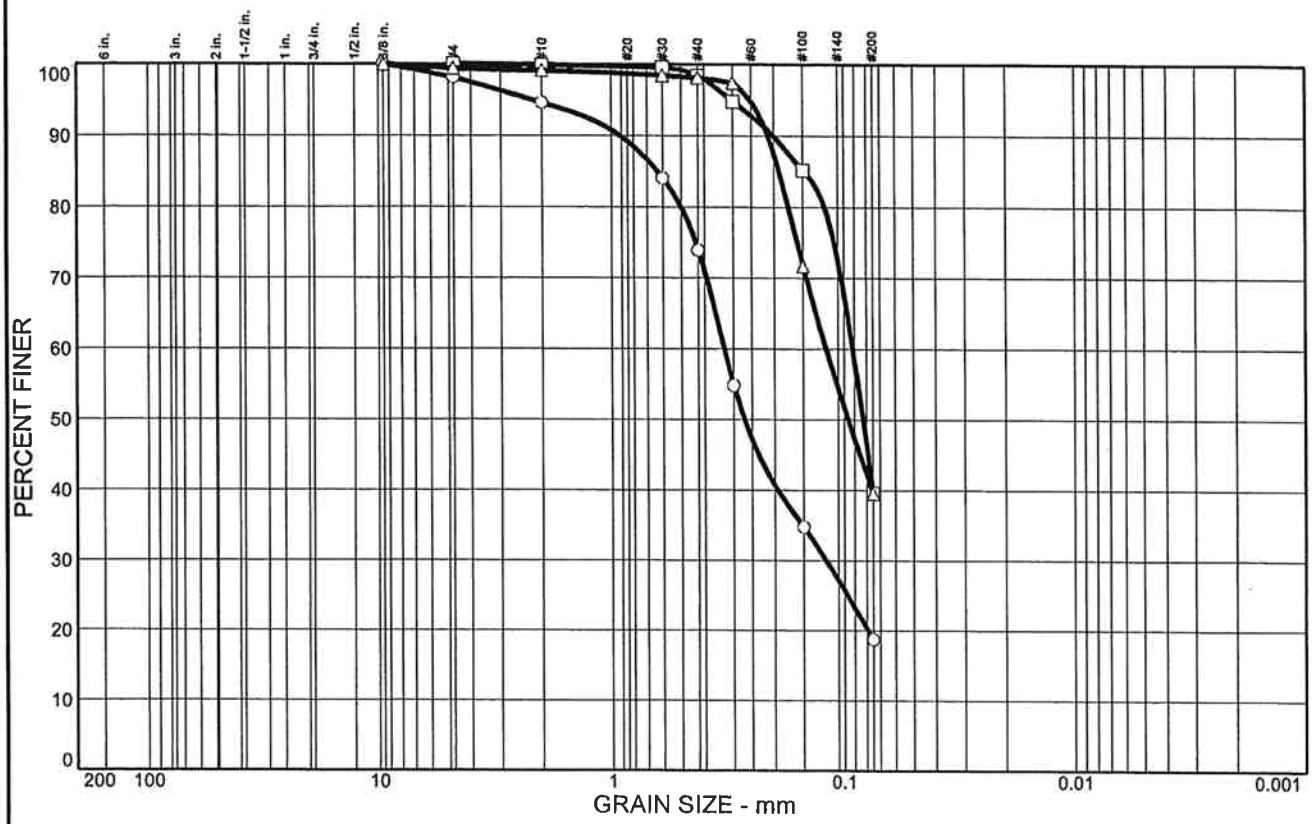
Boring:	RB-7	RB-8	RB-8	RB-8	RB-8			
Sample:	13	1	3	6	8			
Depth, ft:	89-90.5	4-6.5	15-16.5	26.5-28	34-35.5			
Visual Description:	Mottled Brown & Gray CLAY	Brown Lean CLAY	Gray CLAY with Sand changing to Brown Clayey SAND with Gravel, glass & brick fragments (slough end not tested)	Gray Silty SAND	Brown Lean CLAY			
Actual G_s								
Assumed G_s	2.75	2.70	2.75		2.75			
Total Vol cc	151.49	225.55	433.53		227.41			
Vol Solids,cc	93.12	138.01	197.48		141.64			
Vol Voids,cc	58.37	87.54	236.05		85.78			
Moisture, %	22.4	21.6	43.4	21.2	21.7			
Wet Unit wt, pcf	129.2	125.5	112.2		130.2			
Dry Unit wt, pcf	105.6	103.2	78.3		107.0			
Saturation, %	98.2	91.9	99.7		98.5			
Porosity, %	38.5	38.8	54.4		37.7			
Void Ratio	0.627	0.634	1.195		0.606			
Series	1	2	3	4	5	6	7	8



LABORATORY DATA

- **Particle Size Distribution Test**

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○		1.9	79.4						
□			60.4						
△		0.6	59.9						

SIEVE inches size	PERCENT FINER ○	□	△
3/8	100.0		100.0
GRAIN SIZE			
D_{60}	0.330	0.0917	0.120
D_{30}	0.120		
D_{10}			
COEFFICIENTS			
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	□	△
#4	98.1	100.0	99.4
#10	94.6	99.9	99.1
#30	84.0	99.6	98.4
#40	73.9	98.4	98.1
#50	54.8	94.8	97.4
#100	34.7	85.2	71.7
#200	18.7	39.6	39.5

SOIL DESCRIPTION

○ Gray Silty SAND, slightly plastic near Clayey SAND

□ Gray Clayey SAND

△ Gray Clayey SAND, trace shells

REMARKS:

○

□

△

○ Source: RB-1	Sample No.: 5	Elev./Depth: 23'
□ Source: RB-1	Sample No.: 7	Elev./Depth: 26'
△ Source: RB-1	Sample No.: 9	Elev./Depth: 29'

COOPER TESTING LABORATORY

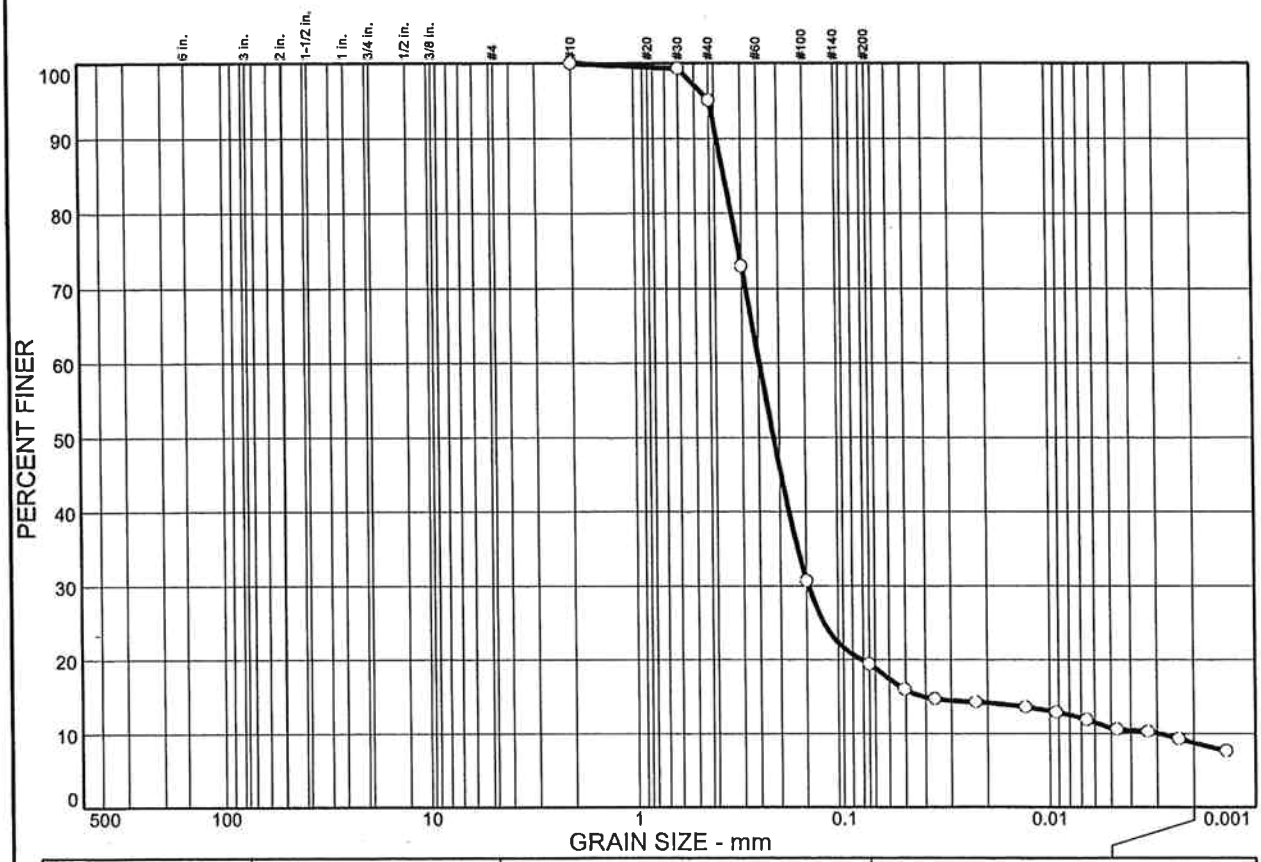
Client: GeoLogic Associates

Project: Newby Island - 2004-049

Project No.: 516-003

Figure

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	4.9	75.7	10.6	8.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#30	99.3		
#40	95.1		
#50	73.0		
#100	30.7		
#200	19.4		
0.0506 mm.	16.0		
0.0360 mm.	14.7		
0.0228 mm.	14.3		
0.0131 mm.	13.6		
0.0093 mm.	12.9		
0.0066 mm.	11.9		
0.0047 mm.	10.6		
0.0033 mm.	10.3		
0.0024 mm.	9.3		
0.0014 mm.	7.7		

* (no specification provided)

Soil Description

Gray Silty SAND, slightly plastic

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.361 D_{60}= 0.248 D_{50}= 0.214
D_{30}= 0.147 D_{15}= 0.0410 D_{10}= 0.0029
C_u= 85.62 C_c= 30.18

Classification

USCS= AASHTO=

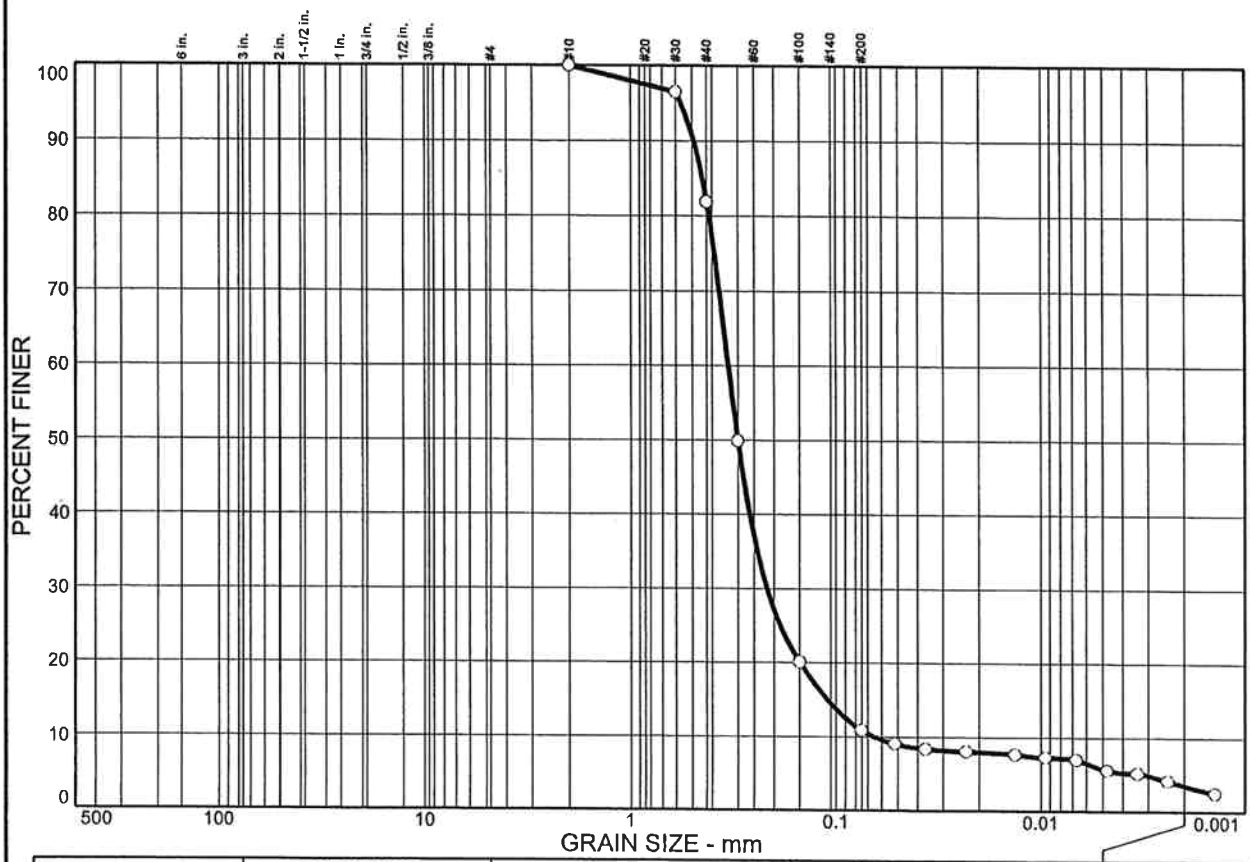
Remarks

Sample No.: 6 **Source of Sample:** RB-1 **Date:** 11/18/04
Location: **Elev./Depth:** 24.5'

COOPER TESTING LABORATORY

Client: GeoLogic Associates
Project: Newby Island - 2004-049
Project No: 516-003 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	18.1	71.0	7.3	3.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#30	96.5		
#40	81.9		
#50	49.9		
#100	20.1		
#200	10.9		
0.0517 mm.	9.1		
0.0366 mm.	8.4		
0.0232 mm.	8.1		
0.0134 mm.	7.7		
0.0095 mm.	7.3		
0.0067 mm.	7.0		
0.0048 mm.	5.6		
0.0034 mm.	5.2		
0.0024 mm.	4.2		
0.0014 mm.	2.5		

* (no specification provided)

Soil Description

Gray Poorly Graded SAND with Silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.445 D_{60}= 0.334 D_{50}= 0.300
D_{30}= 0.217 D_{15}= 0.110 D_{10}= 0.0649
C_u= 5.15 C_c= 2.16

Classification

USCS= AASHTO=

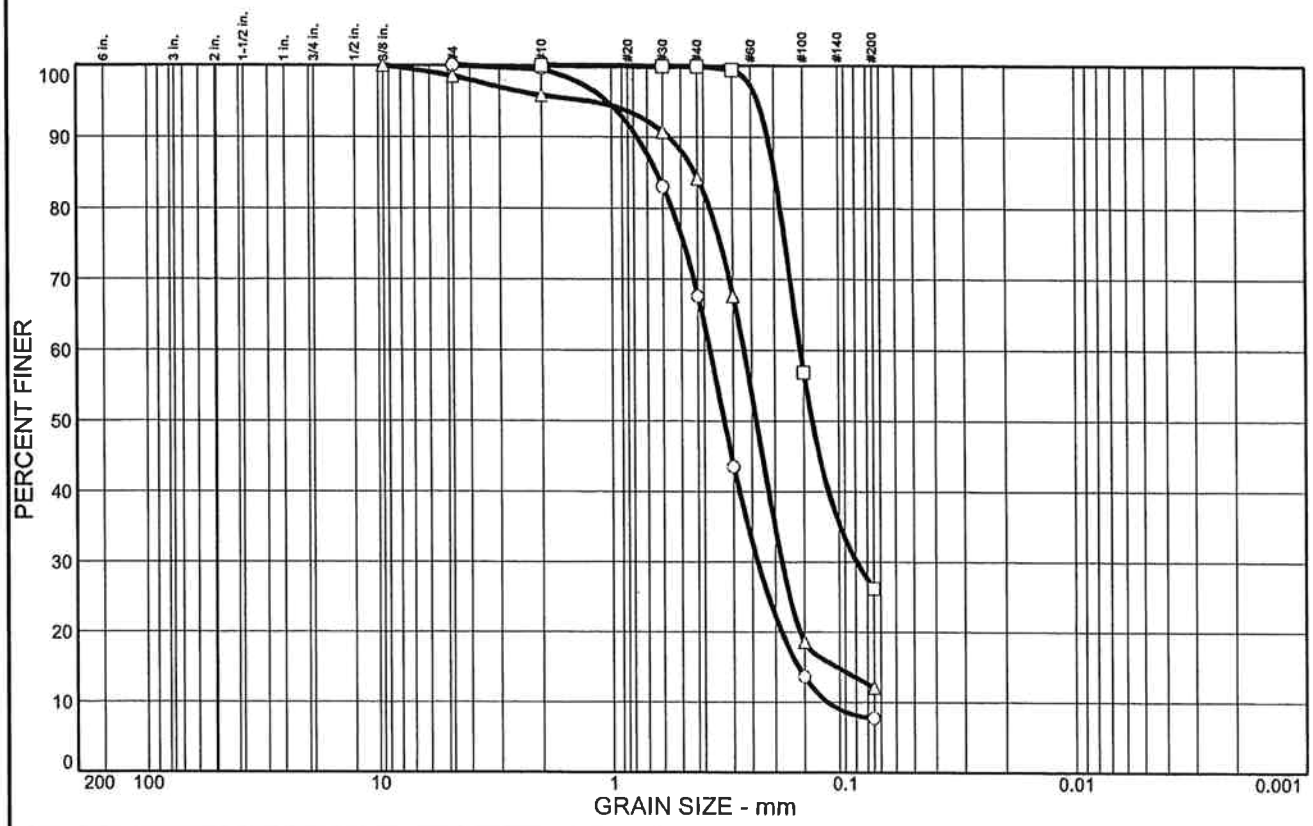
Remarks

Sample No.: 8 Source of Sample: RB-1 Date: 11/22/04
Location: Elev./Depth: 27.5'

COOPER TESTING LABORATORY

Client: GeoLogic Associates
Project: Newby Island - 2004-049
Project No: 516-003 Figure

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○			92.3						
□			73.8						
△		1.5	86.4						

SIEVE inches size	PERCENT FINER ○	□	△
3/8			100.0
GRAIN SIZE			
D_{60}	0.379	0.155	0.271
D_{30}	0.238	0.0889	0.188
D_{10}	0.119		
COEFFICIENTS			
C_c	1.26		
C_u	3.17		

SIEVE number size	PERCENT FINER ○	□	△
#4	100.0		98.5
#10	99.5	100.0	95.8
#30	83.0	99.9	90.7
#40	67.6	99.9	84.2
#50	43.5	99.4	67.6
#100	13.6	56.9	18.6
#200	7.7	26.2	12.1

SOIL DESCRIPTION

○ Brown Poorly Graded SAND with Silt

□ Brown Silty SAND

△ Brown Silty SAND

REMARKS:

○

□

△

○ Source: RB-1 Sample No.: 11 Elev./Depth: 40'

□ Source: RB-1 Sample No.: 16 Elev./Depth: 63.5'

△ Source: RB-1 Sample No.: 18 Elev./Depth: 66.5'

COOPER TESTING LABORATORY

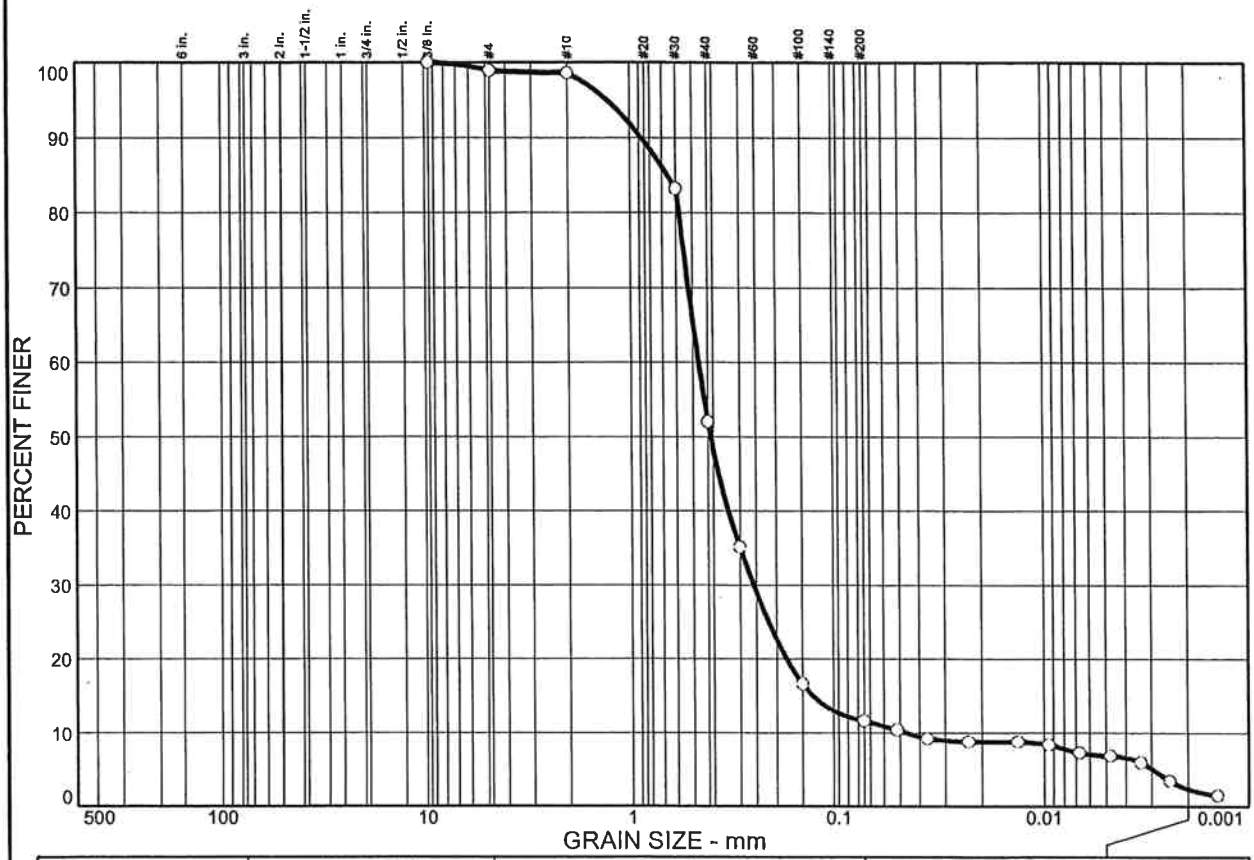
Client: GeoLogic Associates

Project: Newby Island - 2004-049

Project No.: 516-003

Figure

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	1.1	0.3	46.6	40.4	9.2	2.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8 in.	100.0		
#4	98.9		
#10	98.6		
#30	83.2		
#40	52.0		
#50	35.1		
#100	16.6		
#200	11.6		
0.0516 mm.	10.4		
0.0366 mm.	9.2		
0.0232 mm.	8.8		
0.0134 mm.	8.8		
0.0095 mm.	8.4		
0.0067 mm.	7.3		
0.0048 mm.	6.9		
0.0034 mm.	6.0		
0.0024 mm.	3.5		
0.0014 mm.	1.5		

* (no specification provided)

Soil Description

Brown Poorly Graded SAND with Silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.658 D_{60}= 0.470 D_{50}= 0.413
D_{30}= 0.258 D_{15}= 0.133 D_{10}= 0.0464
C_u= 10.13 C_c= 3.05

Classification

USCS= AASHTO=

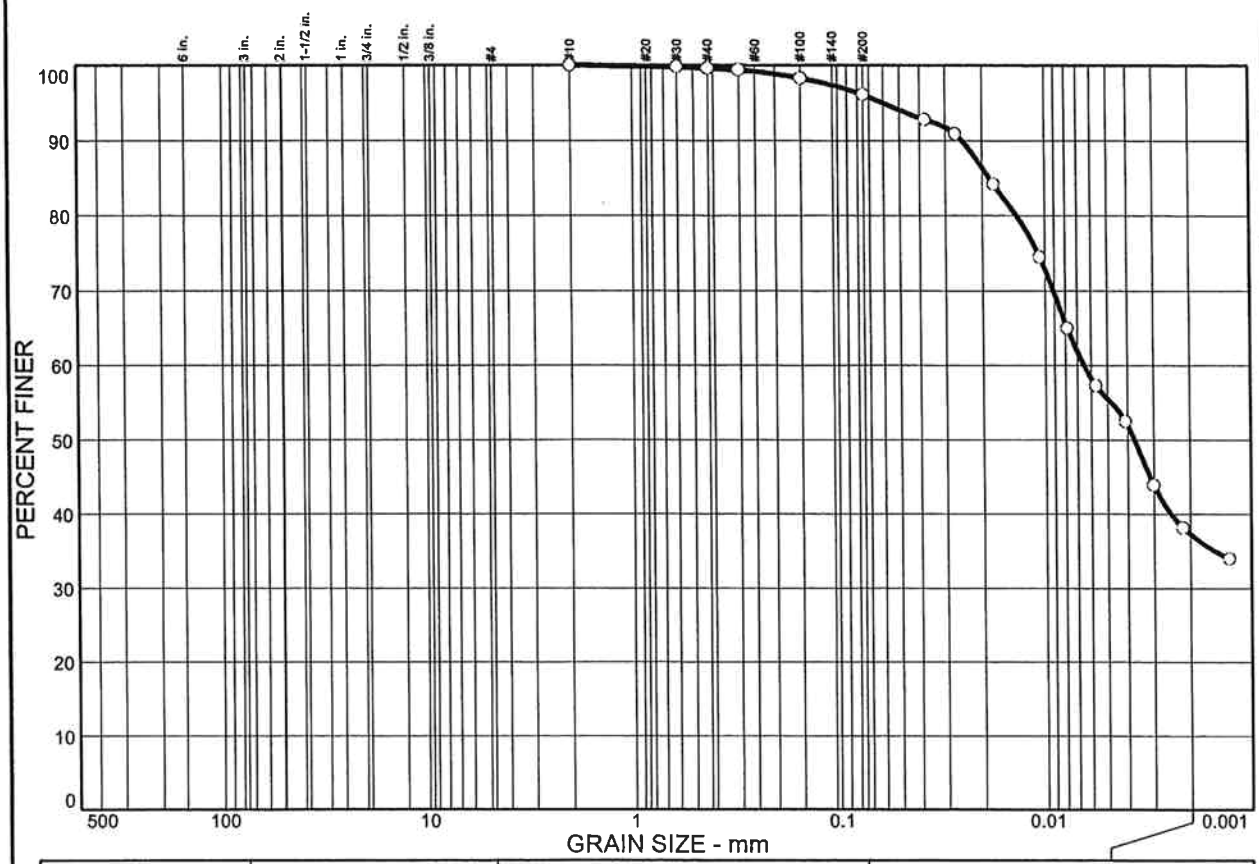
Remarks

Sample No.: 12 **Source of Sample:** RB-1 **Date:** 11/21/04
Location: **Elev./Depth:** 41.5'

COOPER TESTING LABORATORY

Client: GeoLogic Associates
Project: Newby Island - 2004-049
Project No: 516-003 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.4	3.5	58.8	37.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#30	99.8		
#40	99.6		
#50	99.4		
#100	98.3		
#200	96.1		
0.0377 mm.	92.8		
0.0270 mm.	90.9		
0.0177 mm.	84.2		
0.0106 mm.	74.5		
0.0078 mm.	65.0		
0.0057 mm.	57.3		
0.0041 mm.	52.5		
0.0030 mm.	43.9		
0.0022 mm.	38.2		
0.0013 mm.	34.0		

* (no specification provided)

Soil Description

Brown Lean CLAY

Atterberg Limits

PL= 21 LL= 44 PI= 23

Coefficients

D_{85}= 0.0185 D_{60}= 0.0065 D_{50}= 0.0037
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

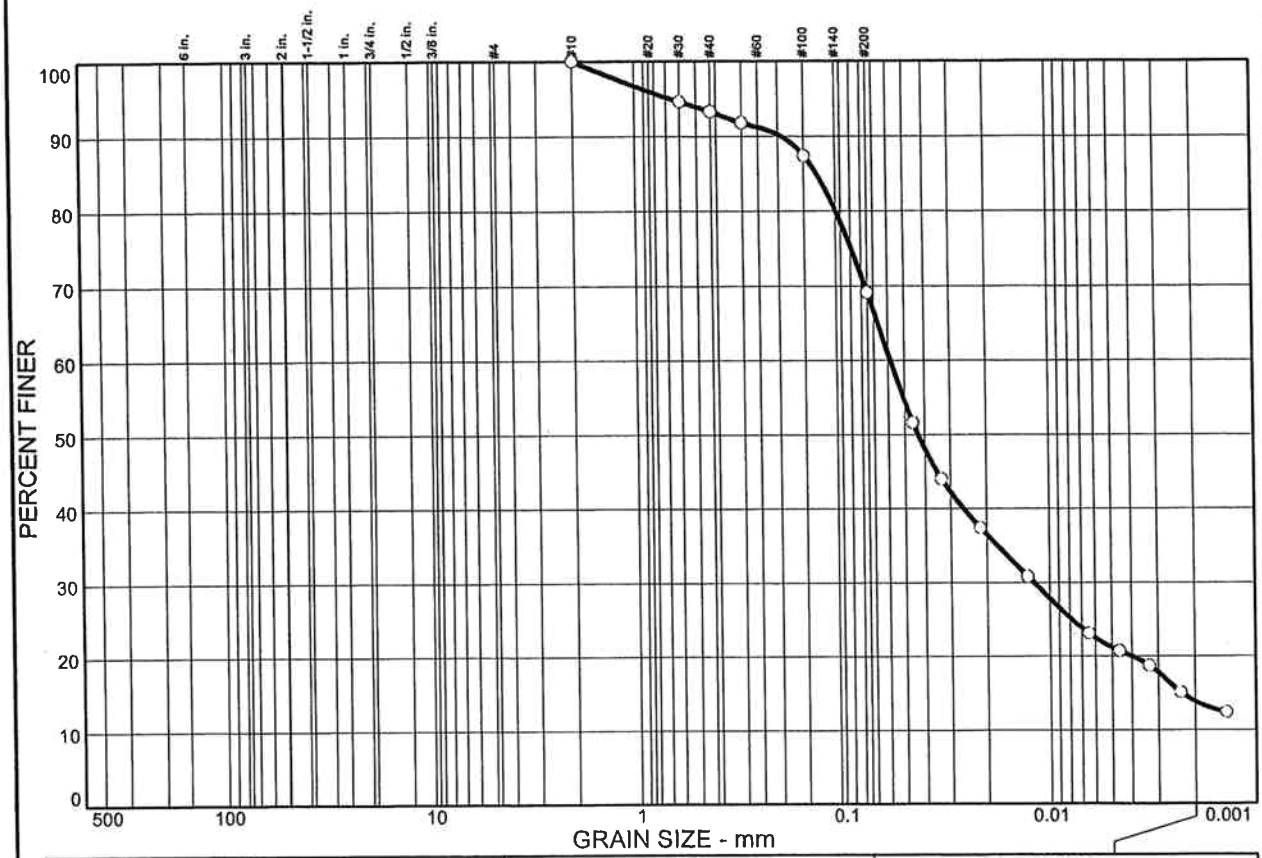
Remarks

Sample No.: 14 **Source of Sample:** RB-1 **Date:** 11/18/04
Location: **Elev./Depth:** 44.5'

COOPER TESTING LABORATORY

Client: GeoLogic Associates
Project: Newby Island - 2004-049
Project No: 516-003 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	6.7	24.2	55.2	13.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#30	94.6		
#40	93.3		
#50	91.8		
#100	87.4		
#200	69.1		
0.0457 mm.	51.6		
0.0332 mm.	44.0		
0.0215 mm.	37.4		
0.0127 mm.	30.8		
0.0064 mm.	23.1		
0.0046 mm.	20.7		
0.0033 mm.	18.7		
0.0023 mm.	15.1		
0.0014 mm.	12.4		

* (no specification provided)

Soil Description

Brown Sandy CLAY (silty) grading to Silty CLAY with Sand

Atterberg Limits

PL= 20 LL= 25 PI= 5

Coefficients

D_{85}= 0.131 D_{60}= 0.0585 D_{50}= 0.0432
D_{30}= 0.0119 D_{15}= 0.0023 D_{10}=
C_u= C_c=

Classification

USCS= CL-ML AASHTO=

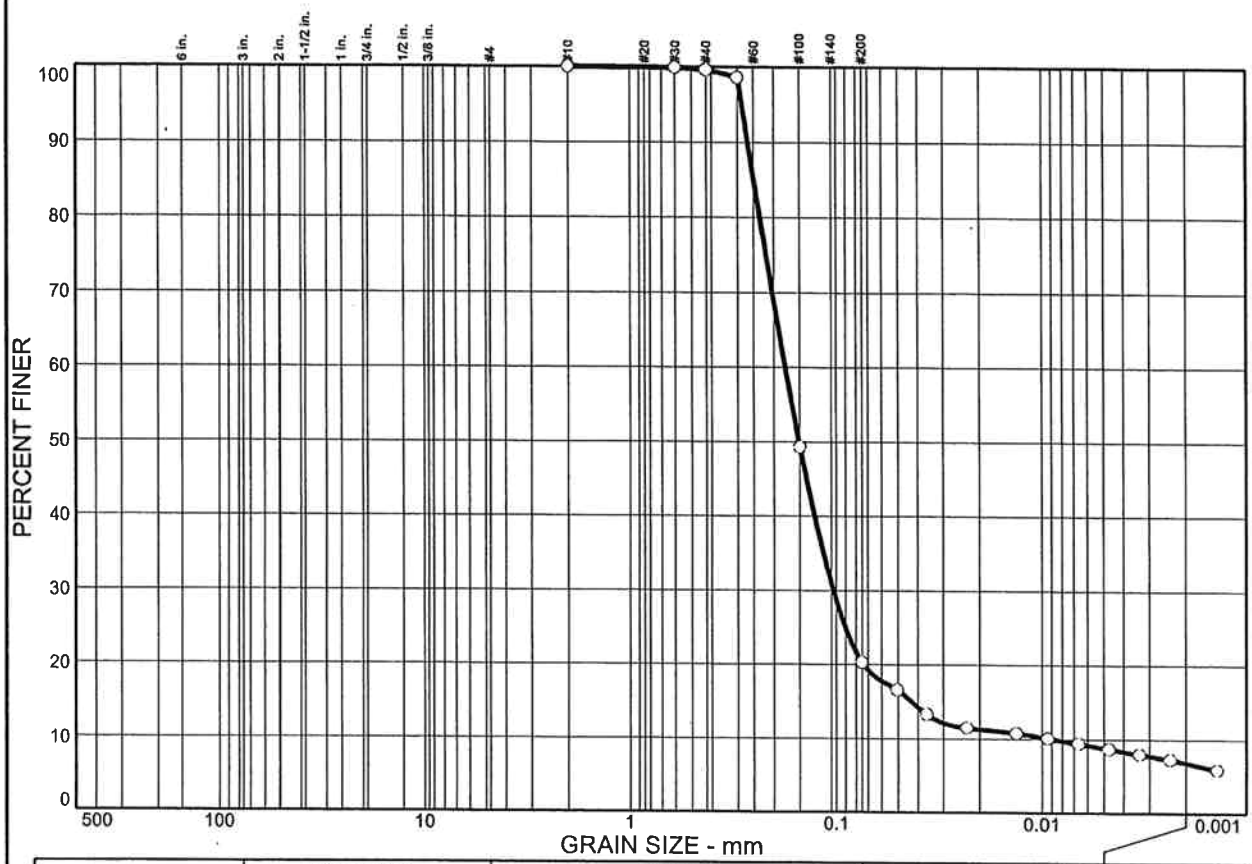
Remarks

Sample No.: 15 **Source of Sample:** RB-1 **Date:** 11/18/04
Location: **Elev./Depth:** 57.5'

COOPER TESTING LABORATORY

Client: GeoLogic Associates
Project: Newby Island - 2004-049
Project No: 516-003 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.4	79.3	13.4	6.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#30	99.9		
#40	99.6		
#50	98.6		
#100	49.3		
#200	20.3		
0.0506 mm.	16.6		
0.0363 mm.	13.3		
0.0231 mm.	11.5		
0.0132 mm.	10.8		
0.0094 mm.	10.1		
0.0067 mm.	9.4		
0.0047 mm.	8.7		
0.0033 mm.	8.0		
0.0024 mm.	7.3		
0.0014 mm.	5.9		

* (no specification provided)

Soil Description

Brown Silty SAND

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.250 D_{60}= 0.177 D_{50}= 0.152
D_{30}= 0.103 D_{15}= 0.0430 D_{10}= 0.0090
C_u= 19.75 C_c= 6.76

Classification

USCS= AASHTO=

Remarks

Sample No.: 17 Source of Sample: RB-1 Date: 11/18/04
Location: Elev./Depth: 65'

COOPER TESTING LABORATORY

Client: GeoLogic Associates
Project: Newby Island - 2004-049
Project No: 516-003 Figure

PARTICLE SIZE DISTRIBUTION TEST REPORT

% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.3	1.1	11.9	51.6	35.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.7		
#30	98.8		
#40	98.6		
#50	98.0		
#100	94.9		
#200	86.7		
0.0410 mm.	79.6		
0.0298 mm.	73.8		
0.0196 mm.	64.7		
0.0115 mm.	58.3		
0.0083 mm.	54.0		
0.0060 mm.	47.7		
0.0043 mm.	42.9		
0.0030 mm.	40.4		
0.0022 mm.	36.0		
0.0013 mm.	31.9		

* (no specification provided)

Soil Description

Brown Lean CLAY

Atterberg Limits

PL= 19 LL= 38 PI= 19

Coefficients

D_{85}= 0.0644 D_{60}= 0.0137 D_{50}= 0.0067
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

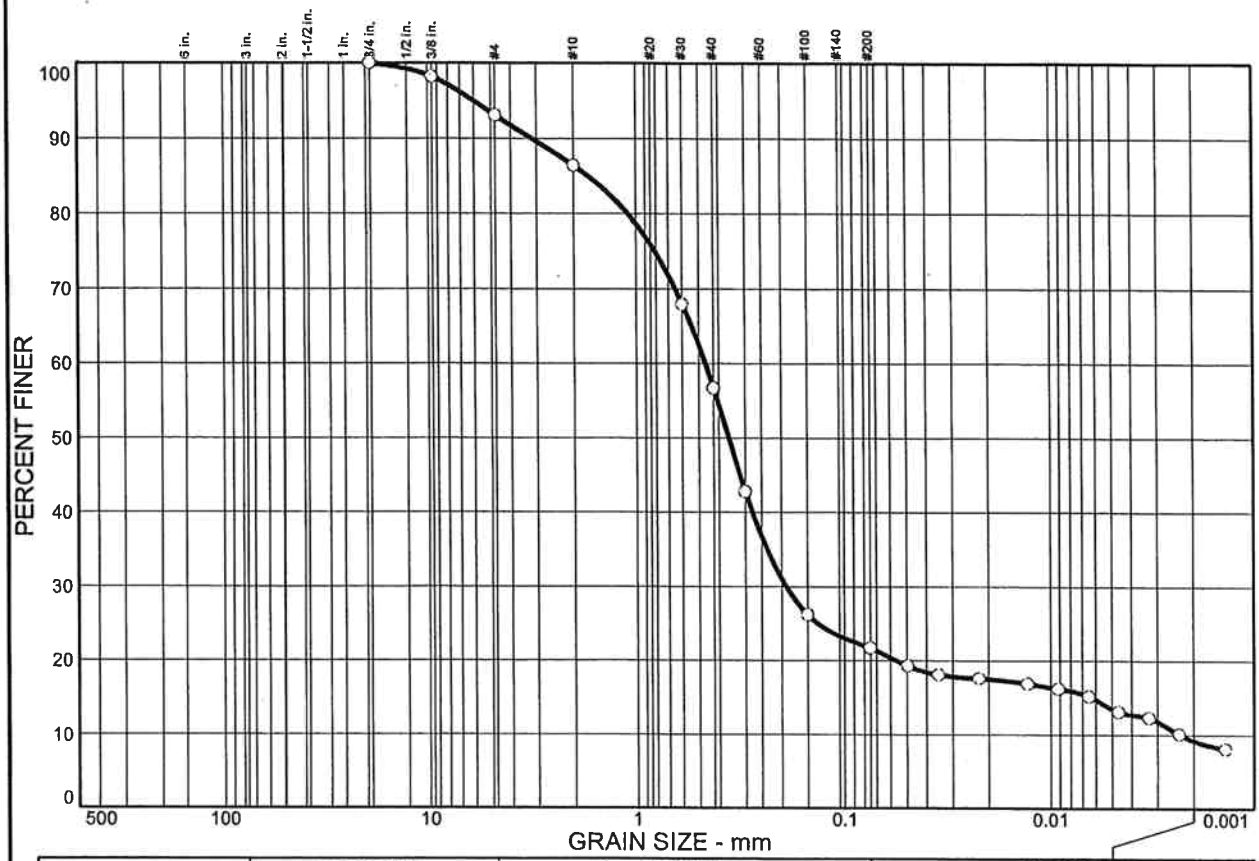
Remarks

Sample No.: 2 Source of Sample: RB-2 Date: 11/18/04
Location: Elev./Depth: 6.5'

COOPER TESTING LABORATORY

Client: GeoLogic Associates
Project: Newby Island - 2004-049
Project No: 516-003 Figure

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	6.9	6.7	29.7	35.0	12.5	9.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4 in.	100.0		
3/8 in.	98.2		
#4	93.1		
#10	86.4		
#30	67.9		
#40	56.7		
#50	42.8		
#100	26.2		
#200	21.7		
0.0495 mm.	19.3		
0.0352 mm.	18.1		
0.0223 mm.	17.6		
0.0129 mm.	16.9		
0.0092 mm.	16.2		
0.0065 mm.	15.2		
0.0046 mm.	13.1		
0.0033 mm.	12.3		
0.0023 mm.	10.1		
0.0014 mm.	8.1		

* (no specification provided)

Soil Description

Gray Silty SAND with shells

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 1.70 D_{60}= 0.465 D_{50}= 0.360
D_{30}= 0.190 D_{15}= 0.0063 D_{10}= 0.0023
C_u= 201.12 C_c= 33.69

Classification

USCS= AASHTO=

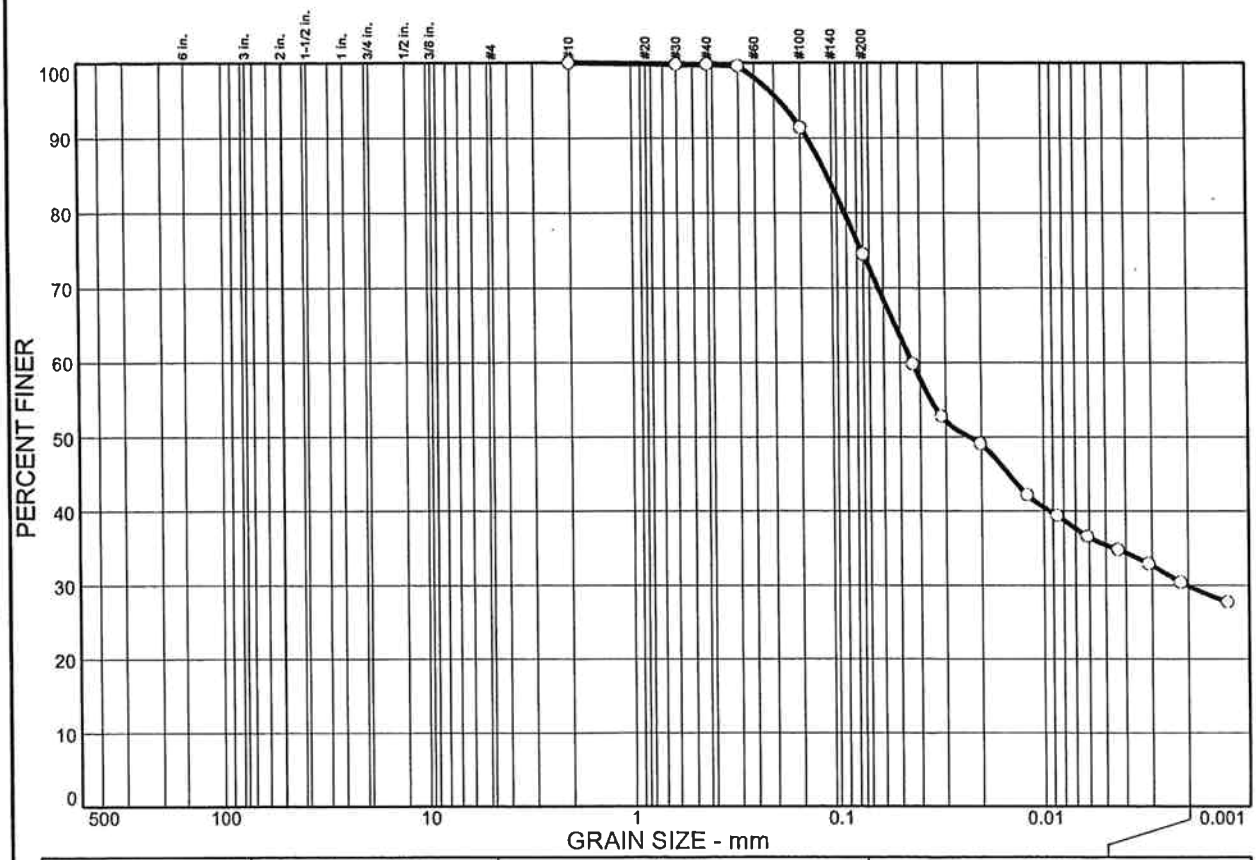
Remarks

Sample No.: 6 **Source of Sample:** RB-2 **Date:** 11/22/04
Location: **Elev./Depth:** 29'

COOPER TESTING LABORATORY

Client: GeoLogic Associates
Project: Newby Island - 2004-049
Project No: 516-003 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.2	25.3	44.6	29.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#30	99.8		
#40	99.8		
#50	99.6		
#100	91.4		
#200	74.5		
0.0434 mm.	59.8		
0.0316 mm.	52.8		
0.0203 mm.	49.1		
0.0120 mm.	42.2		
0.0086 mm.	39.4		
0.0061 mm.	36.6		
0.0044 mm.	34.8		
0.0031 mm.	32.9		
0.0022 mm.	30.4		
0.0013 mm.	27.7		

* (no specification provided)

Soil Description

Brown Lean CLAY with Sand

Atterberg Limits

PL= 16 LL= 35 PI= 19

Coefficients

D_{85}= 0.112 D_{60}= 0.0437 D_{50}= 0.0229
D_{30}= 0.0020 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

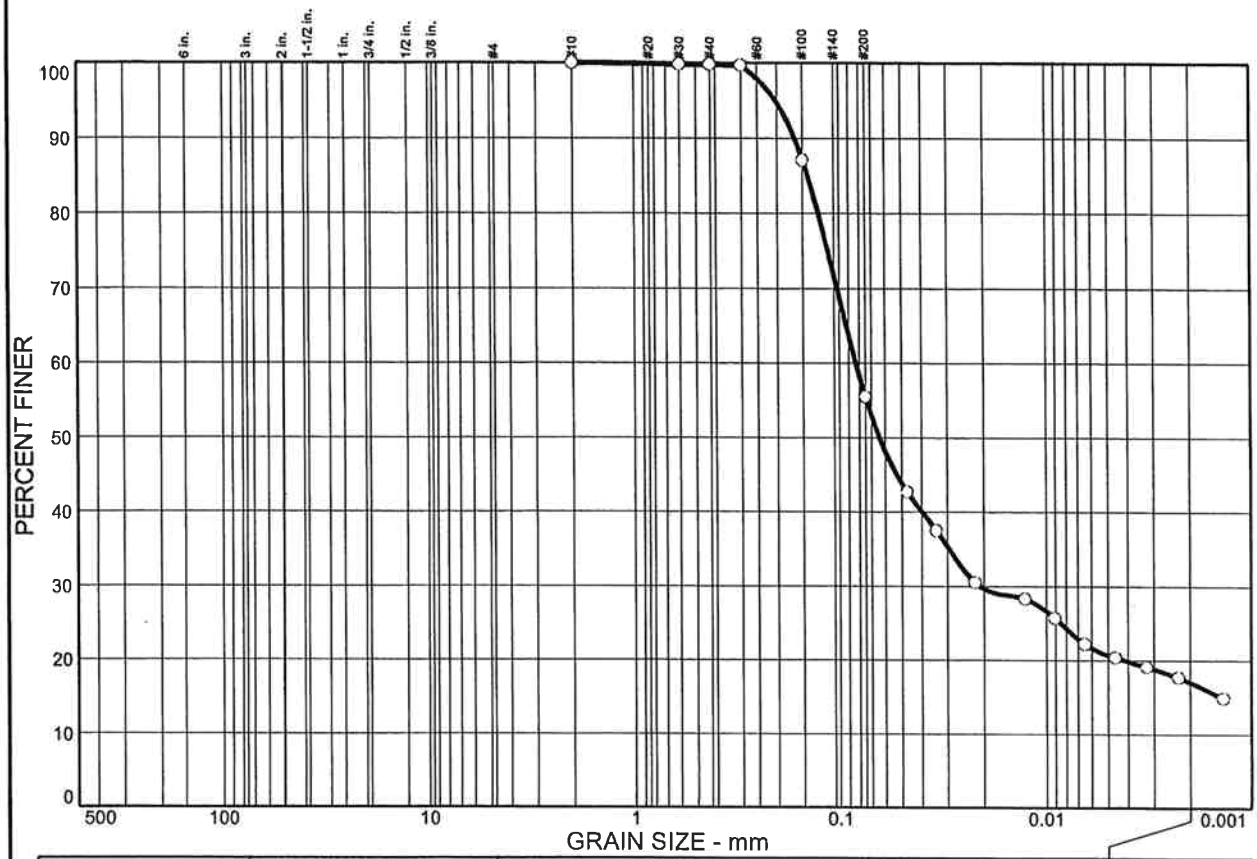
Remarks

Sample No.: 8 Source of Sample: RB-2 Date: 11/09/04
Location: Elev./Depth: 35'

COOPER TESTING LABORATORY

Client: GeoLogic Associates
Project: Newby Island - 2004-049
Project No: 516-002 Figure

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.2	44.3	38.5	17.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#30	99.8		
#40	99.8		
#50	99.7		
#100	87.1		
#200	55.5		
0.0471 mm.	42.7		
0.0340 mm.	37.5		
0.0221 mm.	30.5		
0.0127 mm.	28.3		
0.0091 mm.	25.7		
0.0065 mm.	22.2		
0.0046 mm.	20.4		
0.0032 mm.	19.1		
0.0023 mm.	17.7		
0.0014 mm.	14.9		

* (no specification provided)

Soil Description

Brown Sandy SILT

Atterberg Limits

PL= 19 LL= 22 PI= 3

Coefficients

D_{85}= 0.142 D_{60}= 0.0834 D_{50}= 0.0641
D_{30}= 0.0210 D_{15}= 0.0014 D_{10}=
C_u= C_c=

Classification

USCS= ML AASHTO=

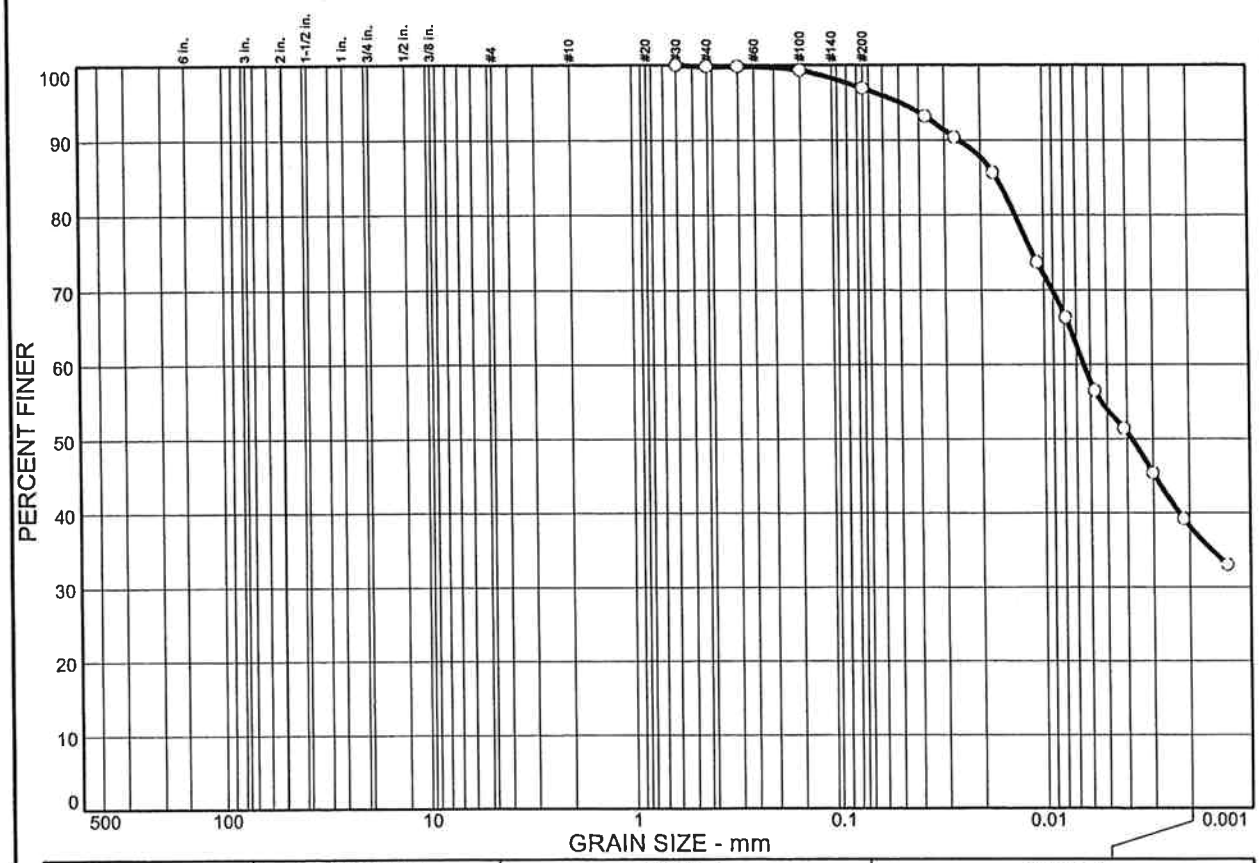
Remarks

Sample No.: 11 **Source of Sample:** RB-2 **Date:** 11/18/04
Location: **Elev./Depth:** 59'

COOPER TESTING LABORATORY

Client: GeoLogic Associates
Project: Newby Island - 2004-049
Project No: 516-003 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.2	2.9	58.7	38.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#30	100.0		
#40	99.8		
#50	99.8		
#100	99.3		
#200	96.9		
0.0373 mm.	93.2		
0.0268 mm.	90.4		
0.0174 mm.	85.7		
0.0107 mm.	73.7		
0.0079 mm.	66.3		
0.0057 mm.	56.5		
0.0042 mm.	51.4		
0.0030 mm.	45.4		
0.0021 mm.	39.2		
0.0013 mm.	33.0		

* (no specification provided)

Soil Description

Olive Brown Lean CLAY

Atterberg Limits

PL= 23 LL= 43 PI= 20

Coefficients

D_{85}= 0.0168 D_{60}= 0.0065 D_{50}= 0.0038
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

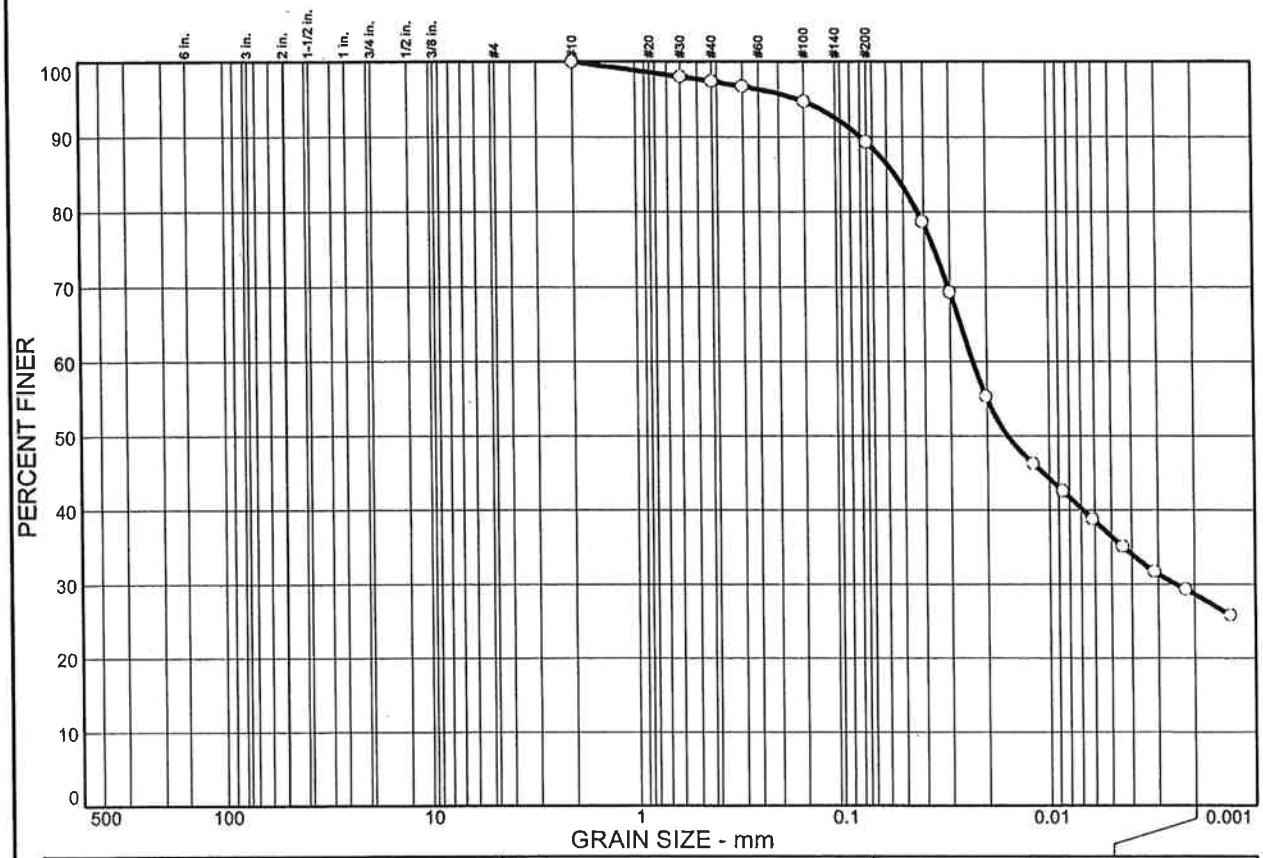
Remarks

Sample No.: 13 **Source of Sample:** RB-2 **Date:** 11/09/04
Location: **Elev./Depth:** 75'

COOPER TESTING LABORATORY

Client: GeoLogic Associates
Project: Newby Island - 2004-049
Project No: 516-002 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	2.6	8.1	60.6	28.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#30	98.0		
#40	97.4		
#50	96.7		
#100	94.7		
#200	89.3		
0.0407 mm.	78.7		
0.0302 mm.	69.3		
0.0203 mm.	55.3		
0.0120 mm.	46.3		
0.0086 mm.	42.6		
0.0062 mm.	38.8		
0.0044 mm.	35.1		
0.0031 mm.	31.7		
0.0022 mm.	29.3		
0.0013 mm.	25.8		

* (no specification provided)

Soil Description

Olive Gray Lean CLAY

Atterberg Limits

PL= 18 LL= 32 PI= 14

Coefficients

D_{85}= 0.0548 D_{60}= 0.0234 D_{50}= 0.0159
D_{30}= 0.0025 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

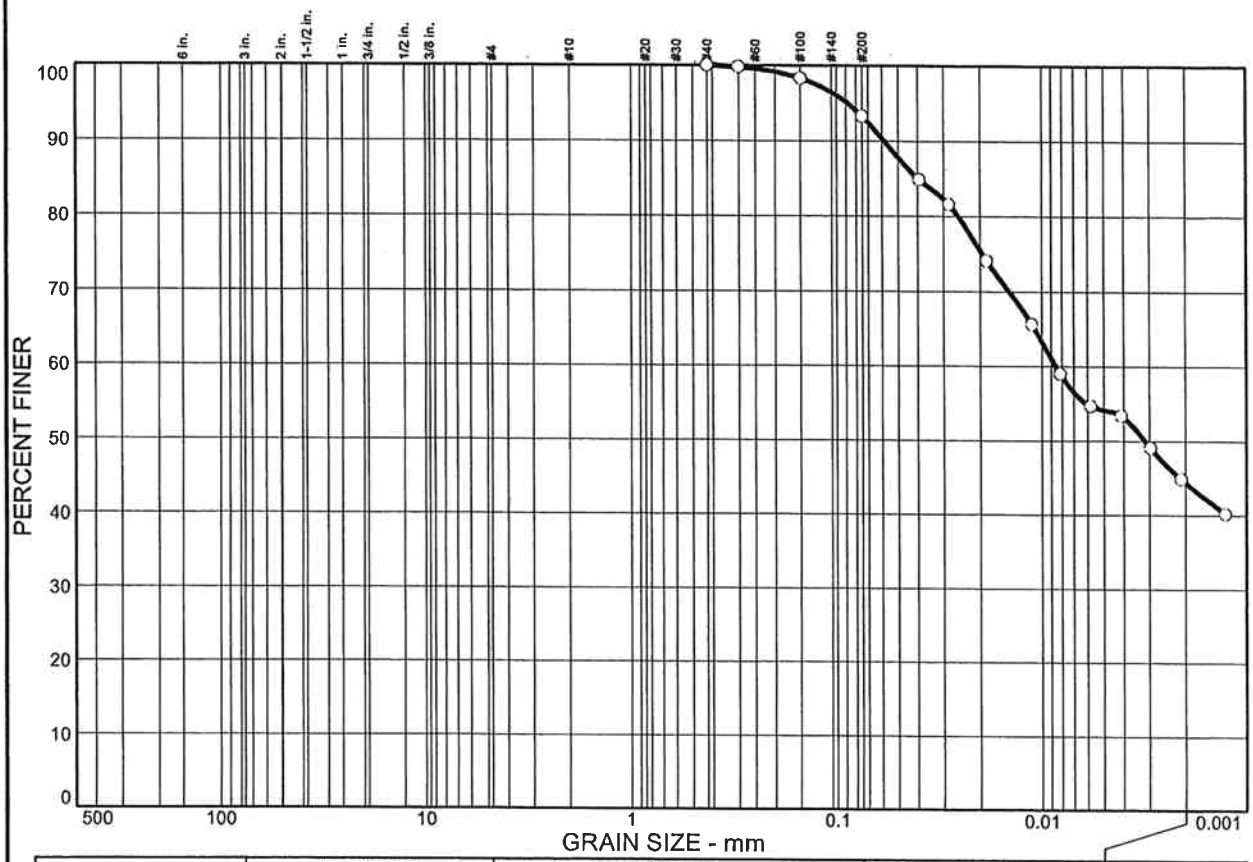
Remarks

Sample No.: 15 **Source of Sample:** RB-2 **Date:** 11/18/04
Location: **Elev./Depth:** 88'

COOPER TESTING LABORATORY

Client: GeoLogic Associates
Project: Newby Island - 2004-049
Project No: 516-003 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.0	6.7	48.9	44.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#40	100.0		
#50	99.8		
#100	98.3		
#200	93.3		
0.0394 mm.	84.9		
0.0283 mm.	81.6		
0.0186 mm.	74.1		
0.0112 mm.	65.6		
0.0081 mm.	59.0		
0.0058 mm.	54.7		
0.0041 mm.	53.4		
0.0030 mm.	49.1		
0.0021 mm.	44.9		
0.0013 mm.	40.2		

* (no specification provided)

Soil Description

Gray Fat CLAY (bay mud)

Atterberg Limits

PL= 23 LL= 51 PI= 28

Coefficients

D_{85}= 0.0398 D_{60}= 0.0086 D_{50}= 0.0032
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CH AASHTO=

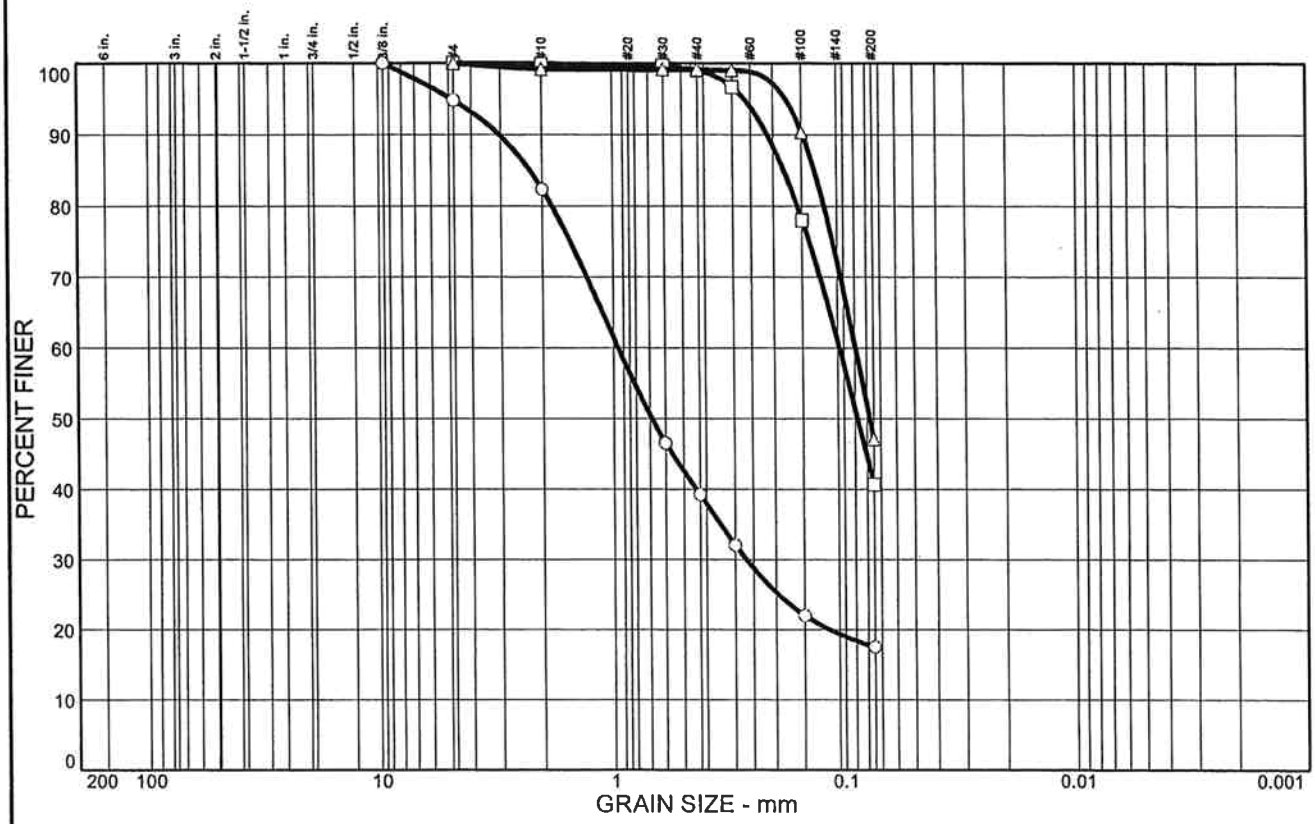
Remarks

Sample No.: 1 **Source of Sample:** RB-2A **Date:** 11/09/04
Location: **Elev./Depth:** 23'

COOPER TESTING LABORATORY

Client: GeoLogic Associates
Project: Newby Island - 2004-049
Project No: 516-002 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○		5.2	77.3						
□			59.3						
△			52.9						

SIEVE inches size	PERCENT FINER ○	□	△
3/8	100.0		
GRAIN SIZE			
D_{60}	0.956	0.105	0.0893
D_{30}	0.269		
D_{10}			
COEFFICIENTS			
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	□	△
#4	94.8	100.0	100.0
#10	82.3	99.9	99.2
#30	46.5	99.7	99.1
#40	39.2	99.0	99.1
#50	32.0	96.7	99.0
#100	22.0	78.0	90.3
#200	17.5	40.7	47.1

SOIL DESCRIPTION

○ Gray Silty SAND with shell fragments and Clay lense

□ Brown Silty SAND

△ Brown Silty SAND

REMARKS:

○

□

△

○ Source: RB-2 Sample No.: 7 Elev./Depth: 31.5'

□ Source: RB-4 Sample No.: 6 Elev./Depth: 55'

△ Source: RB-4 Sample No.: 7 Elev./Depth: 56.5'

COOPER TESTING LABORATORY

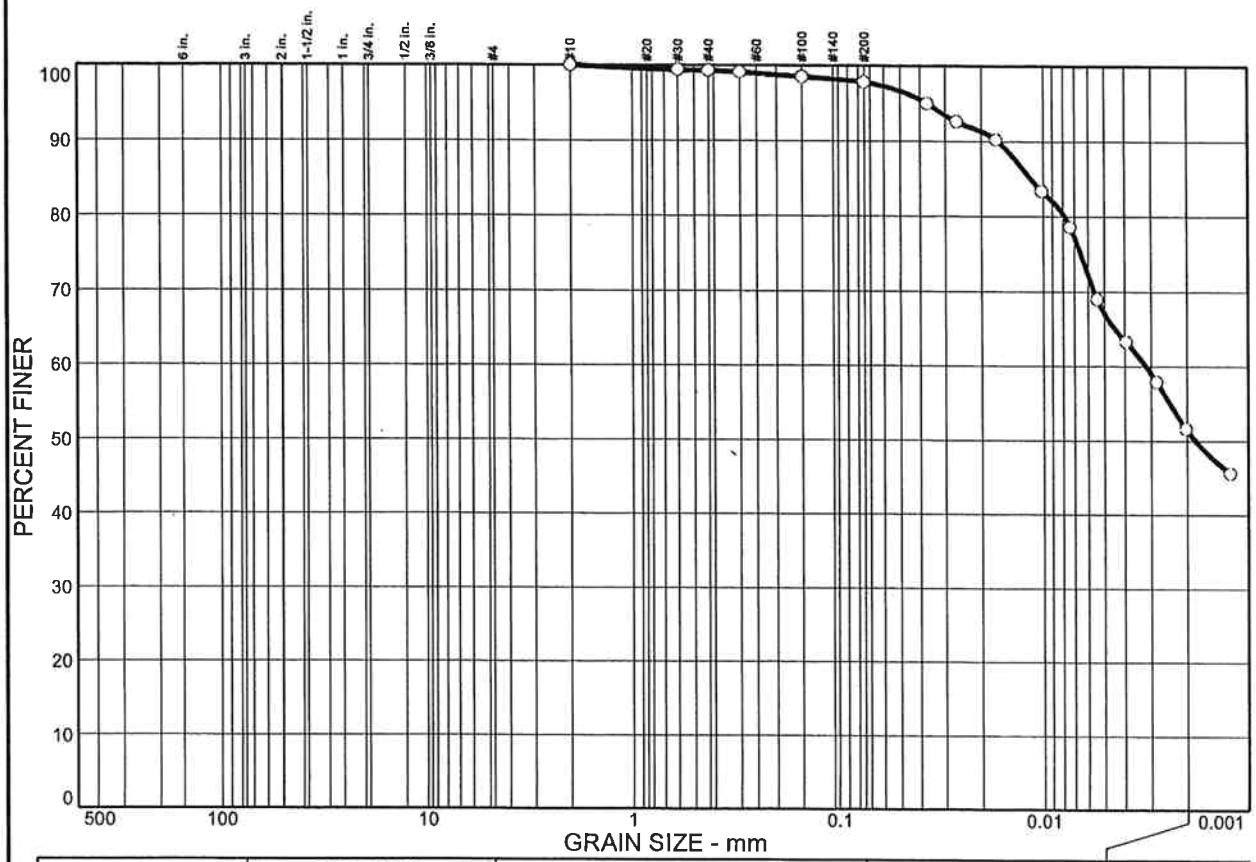
Client: GeoLogic Associates

Project: Newby Island - 2004-049

Project No.: 516-003

Figure

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.7	1.5	46.4	51.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#30	99.4		
#40	99.3		
#50	99.1		
#100	98.5		
#200	97.8		
0.0369 mm.	95.0		
0.0265 mm.	92.6		
0.0170 mm.	90.2		
0.0102 mm.	83.4		
0.0074 mm.	78.6		
0.0054 mm.	69.0		
0.0039 mm.	63.3		
0.0028 mm.	57.9		
0.0020 mm.	51.6		
0.0012 mm.	45.6		

* (no specification provided)

Soil Description

Brown Fat CLAY

Atterberg Limits

PL= 23 LL= 55 PI= 32

Coefficients

D_{85}= 0.0115 D_{60}= 0.0032 D_{50}= 0.0018
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CH AASHTO=

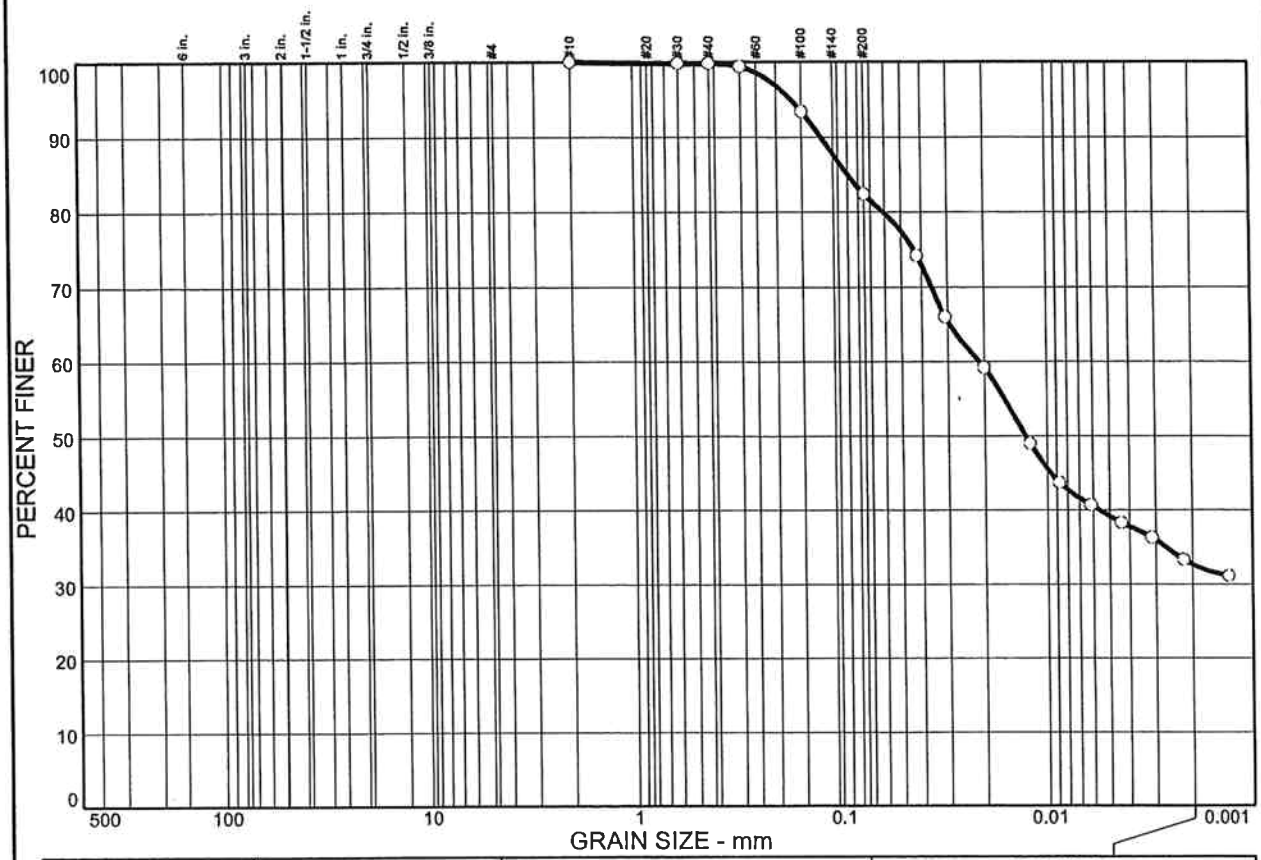
Remarks

Sample No.: 1 Source of Sample: RB-4 Date: 11/19/04
Location: Elev./Depth: 30'

COOPER TESTING LABORATORY

Client: GeoLogic Associates
Project: Newby Island - 2004-049
Project No: 516-003 Figure

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.2	17.4	49.7	32.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#30	99.8		
#40	99.8		
#50	99.4		
#100	93.4		
#200	82.4		
0.0422 mm.	74.2		
0.0309 mm.	66.0		
0.0201 mm.	59.2		
0.0121 mm.	49.0		
0.0087 mm.	43.7		
0.0062 mm.	40.7		
0.0044 mm.	38.3		
0.0031 mm.	36.3		
0.0022 mm.	33.3		
0.0013 mm.	31.1		

* (no specification provided)

Soil Description

Brown Lean CLAY with Sand

Atterberg Limits

PL= 16 LL= 34 PI= 18

Coefficients

D_{85}= 0.0898 D_{60}= 0.0212 D_{50}= 0.0127
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

Remarks

Sample No.: 3b **Source of Sample:** RB-4 **Date:** 11/19/04
Location: **Elev./Depth:** 40'

COOPER TESTING LABORATORY	**Client:** GeoLogic Associates **Project:** Newby Island - 2004-049 **Project No:** 516-003 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT

% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.6	4.4	42.7	52.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#30	99.6		
#40	99.4		
#50	99.3		
#100	97.8		
#200	95.0		
0.0378 mm.	92.9		
0.0269 mm.	91.4		
0.0174 mm.	88.1		
0.0104 mm.	80.4		
0.0076 mm.	75.6		
0.0055 mm.	69.4		
0.0040 mm.	63.7		
0.0029 mm.	57.0		
0.0020 mm.	52.5		
0.0012 mm.	47.3		

* (no specification provided)

Soil Description

Brown Lean CLAY

Atterberg Limits

PL= 21 LL= 48 PI= 27

Coefficients

D_{85}= 0.0139 D_{60}= 0.0034 D_{50}= 0.0016
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

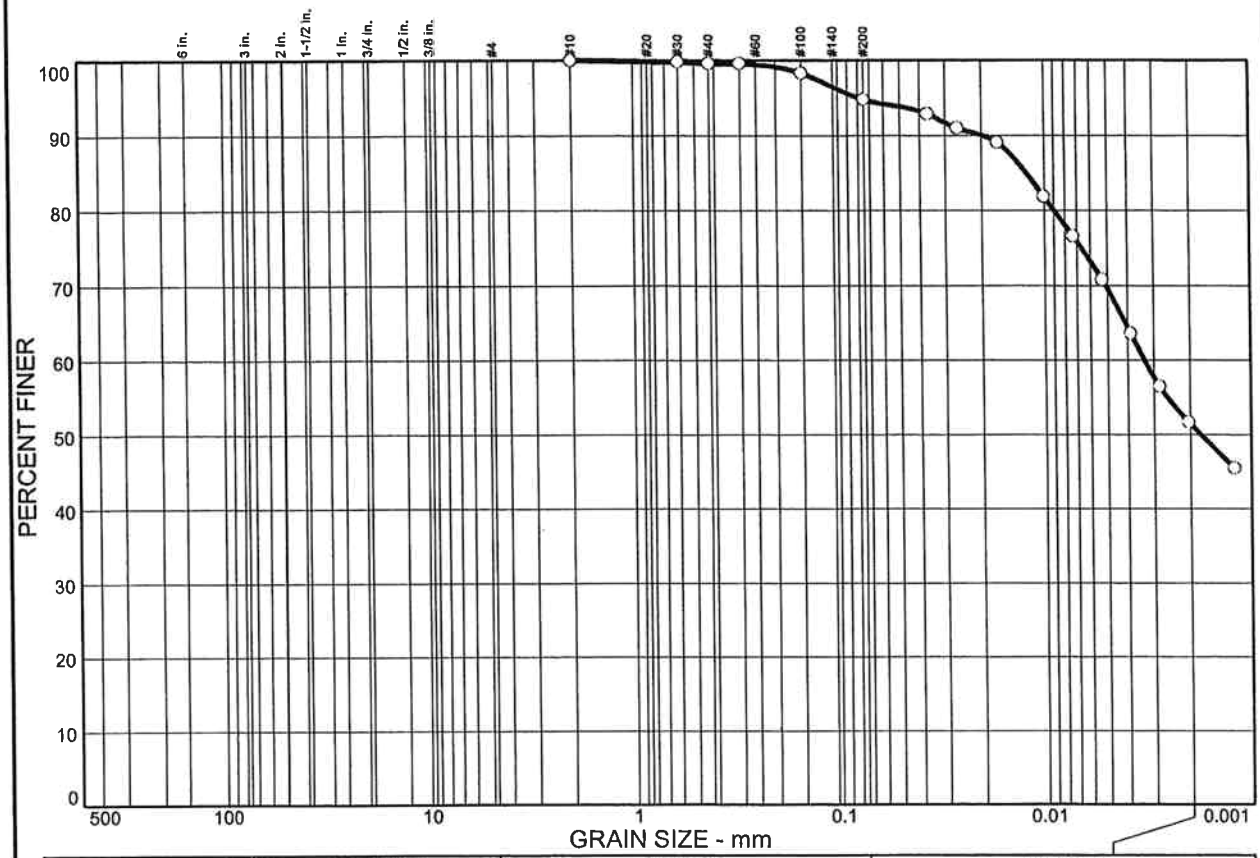
Remarks

Sample No.: 5 **Source of Sample:** RB-4 **Date:** 12/23/04
Location: **Elev./Depth:** 48'

COOPER TESTING LABORATORY

Client: GeoLogic Associates
Project: Newby Island - 2004-049
Project No: 516-006 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.4	4.8	43.3	51.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#30	99.8		
#40	99.6		
#50	99.6		
#100	98.3		
#200	94.8		
0.0368 mm.	92.9		
0.0263 mm.	91.0		
0.0168 mm.	89.1		
0.0101 mm.	81.9		
0.0073 mm.	76.6		
0.0053 mm.	70.8		
0.0039 mm.	63.6		
0.0028 mm.	56.5		
0.0020 mm.	51.7		
0.0012 mm.	45.5		

* (no specification provided)

Soil Description

Brown CLAY (silty)

Atterberg Limits

PL= 21 LL= 50 PI= 29

Coefficients

D_{85}= 0.0122 D_{60}= 0.0033 D_{50}= 0.0018
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

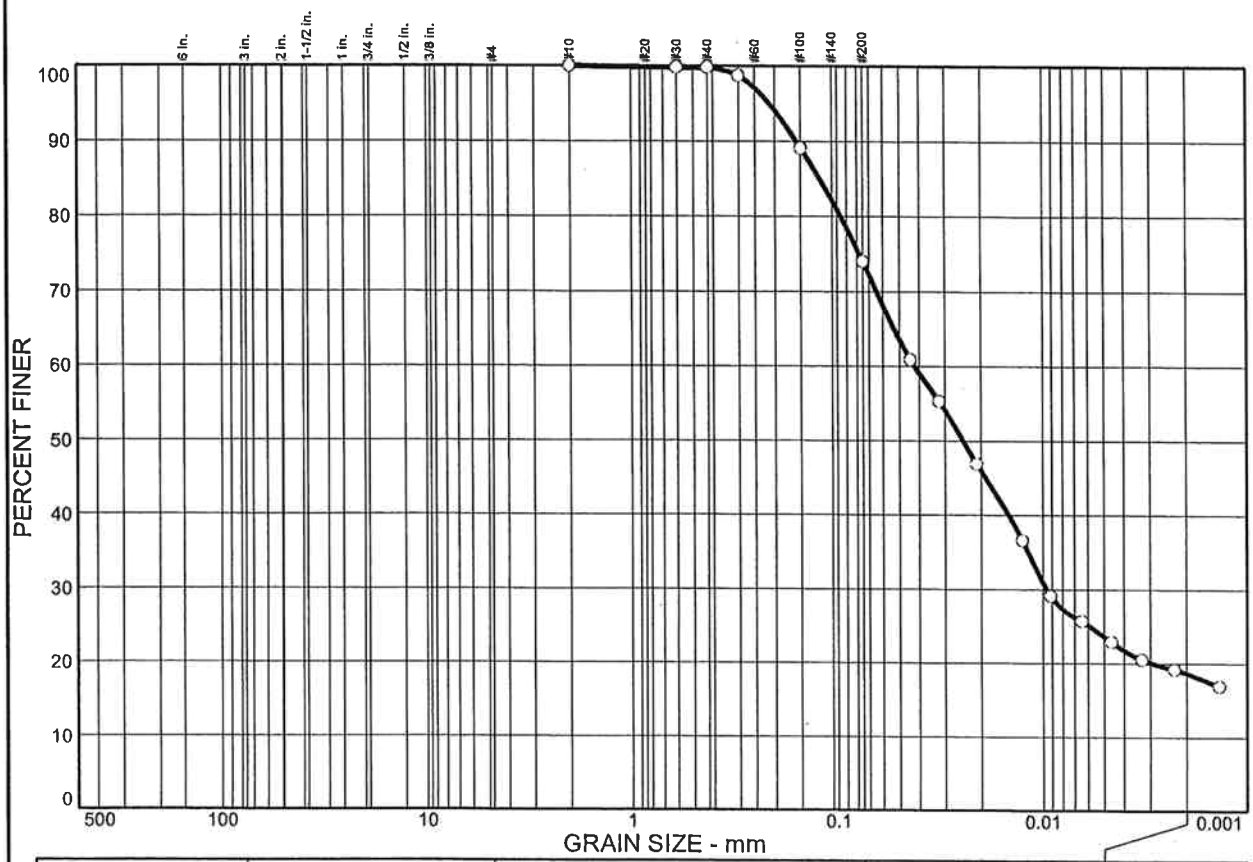
Remarks

Sample No.: 11 Source of Sample: RB-4 Date: 11/22/04
Location: Elev./Depth: 62.5'

COOPER TESTING LABORATORY

Client: GeoLogic Associates
Project: Newby Island - 2004-049
Project No: 516-003 Figure

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.2	25.8	55.3	18.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#30	99.8		
#40	99.8		
#50	98.7		
#100	89.1		
#200	74.0		
0.0443 mm.	60.9		
0.0321 mm.	55.3		
0.0210 mm.	46.9		
0.0126 mm.	36.6		
0.0091 mm.	29.1		
0.0065 mm.	25.7		
0.0046 mm.	22.9		
0.0033 mm.	20.5		
0.0023 mm.	19.2		
0.0014 mm.	16.9		

* (no specification provided)

Soil Description

Brown CLAY (silty) with Sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.122 D_{60}= 0.0423 D_{50}= 0.0245
D_{30}= 0.0096 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

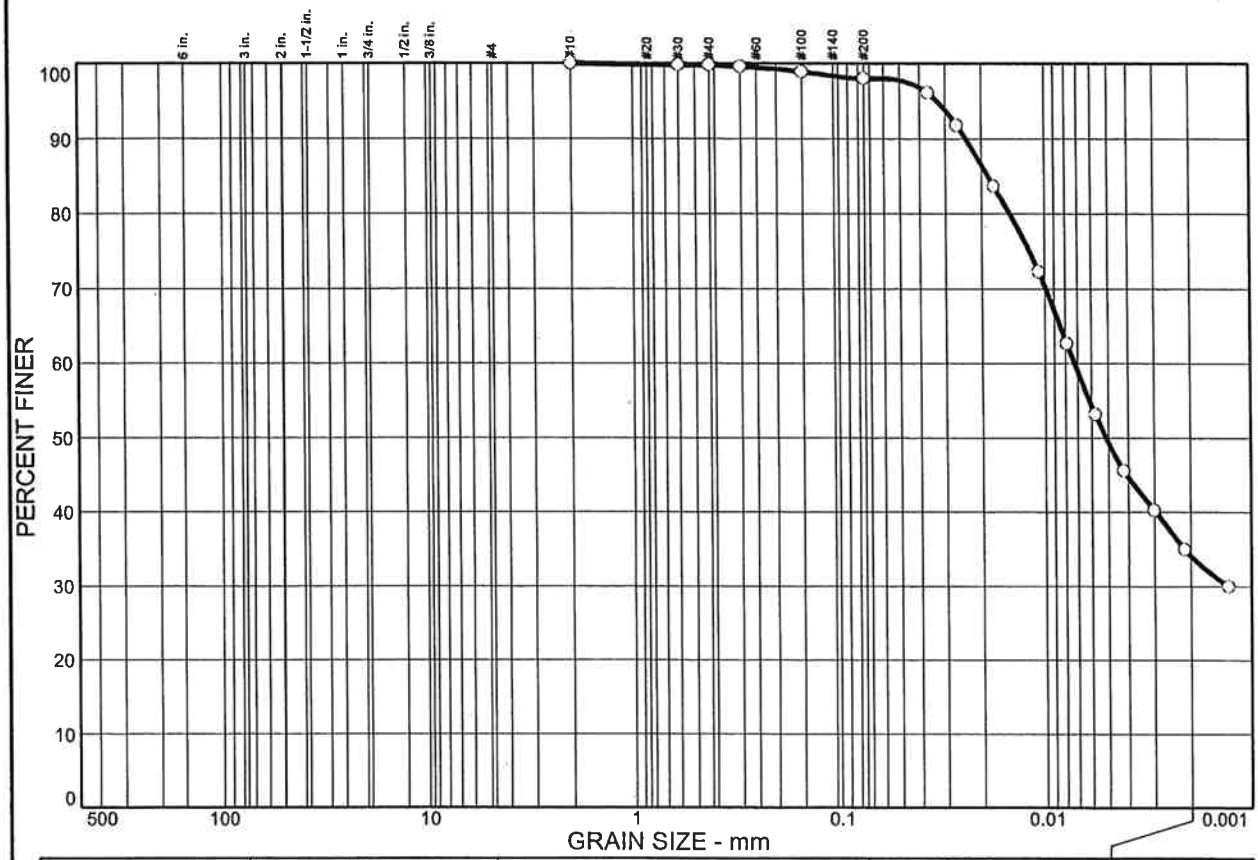
Remarks

Sample No.: 13 **Source of Sample:** RB-4 **Date:** 11/19/04
Location: **Elev./Depth:** 75'

COOPER TESTING LABORATORY

Client: GeoLogic Associates
Project: Newby Island - 2004-049
Project No: 516-003 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.2	1.8	63.9	34.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#30	99.8		
#40	99.8		
#50	99.6		
#100	98.9		
#200	98.0		
0.0365 mm.	96.1		
0.0265 mm.	91.8		
0.0175 mm.	83.7		
0.0107 mm.	72.3		
0.0079 mm.	62.7		
0.0058 mm.	53.2		
0.0042 mm.	45.6		
0.0030 mm.	40.3		
0.0021 mm.	35.0		
0.0013 mm.	30.0		

* (no specification provided)

Soil Description

Brown Lean CLAY

Atterberg Limits

PL= 22 LL= 40 PI= 18

Coefficients

D_{85}= 0.0186 D_{60}= 0.0073 D_{50}= 0.0051
D_{30}= 0.0013 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

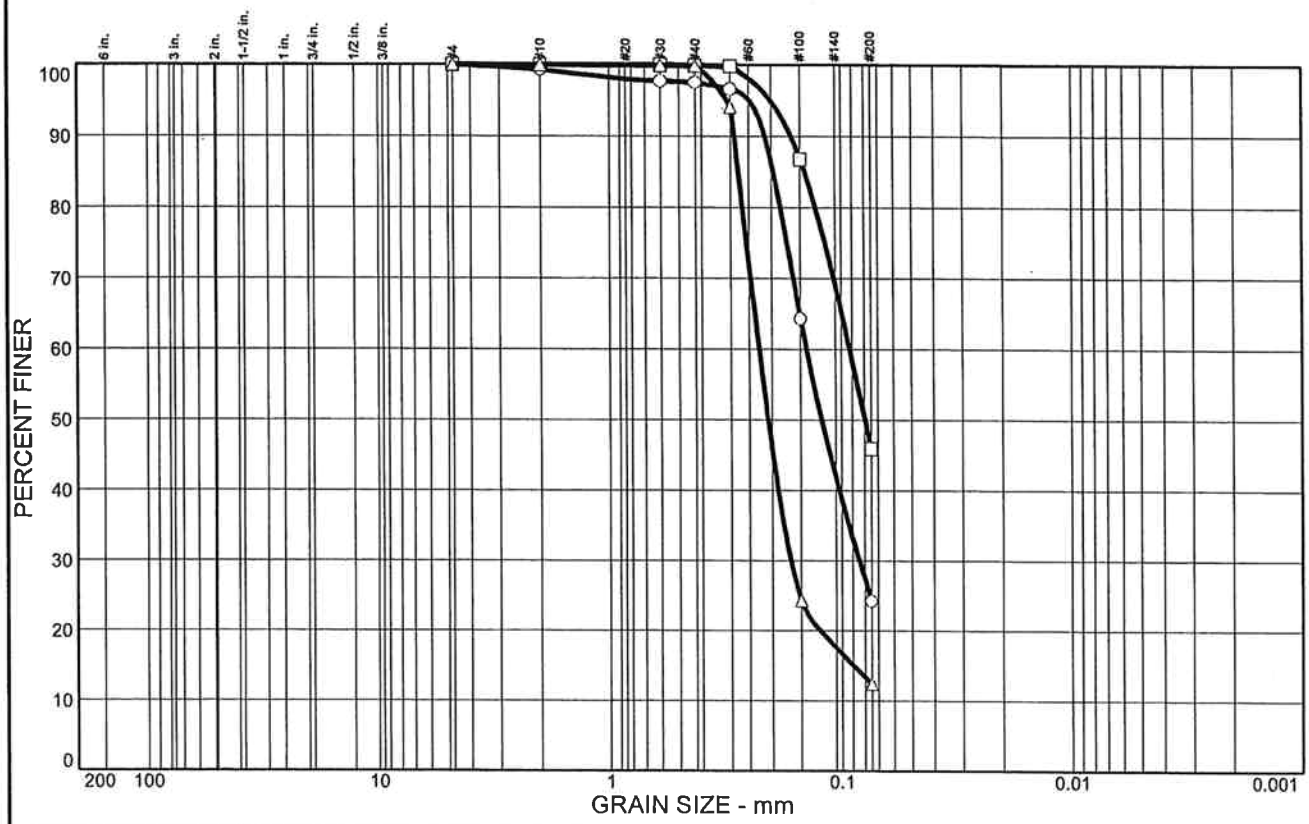
Remarks

Sample No.: 15 **Source of Sample:** RB-4 **Date:** 11/19/04
Location: **Elev./Depth:** 85'

COOPER TESTING LABORATORY

Client: GeoLogic Associates
Project: Newby Island - 2004-049
Project No: 516-003 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○			75.8						
□			54.1						
△			87.6						

SIEVE inches size	PERCENT FINER ○	PERCENT FINER □	PERCENT FINER △
GRAIN SIZE			
D_{60}	0.142	0.0922	0.228
D_{30}	0.0845		0.167
D_{10}			
COEFFICIENTS			
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	PERCENT FINER □	PERCENT FINER △
#4	100.0	100.0	100.0
#10	99.3	100.0	100.0
#30	97.7	100.0	99.9
#40	97.5	99.9	99.8
#50	96.6	99.8	94.1
#100	64.3	86.8	24.3
#200	24.2	45.9	12.4

SOIL DESCRIPTION

○ Brown Silty SAND

□ Brown Silty SAND

△ Brown Silty SAND

REMARKS:

○

□

△

○ Source: RB-4	Sample No.: 9	Elev./Depth: 59.5'
□ Source: RB-5	Sample No.: 9	Elev./Depth: 60.5'
△ Source: RB-5	Sample No.: 14	Elev./Depth: 68'

COOPER TESTING LABORATORY

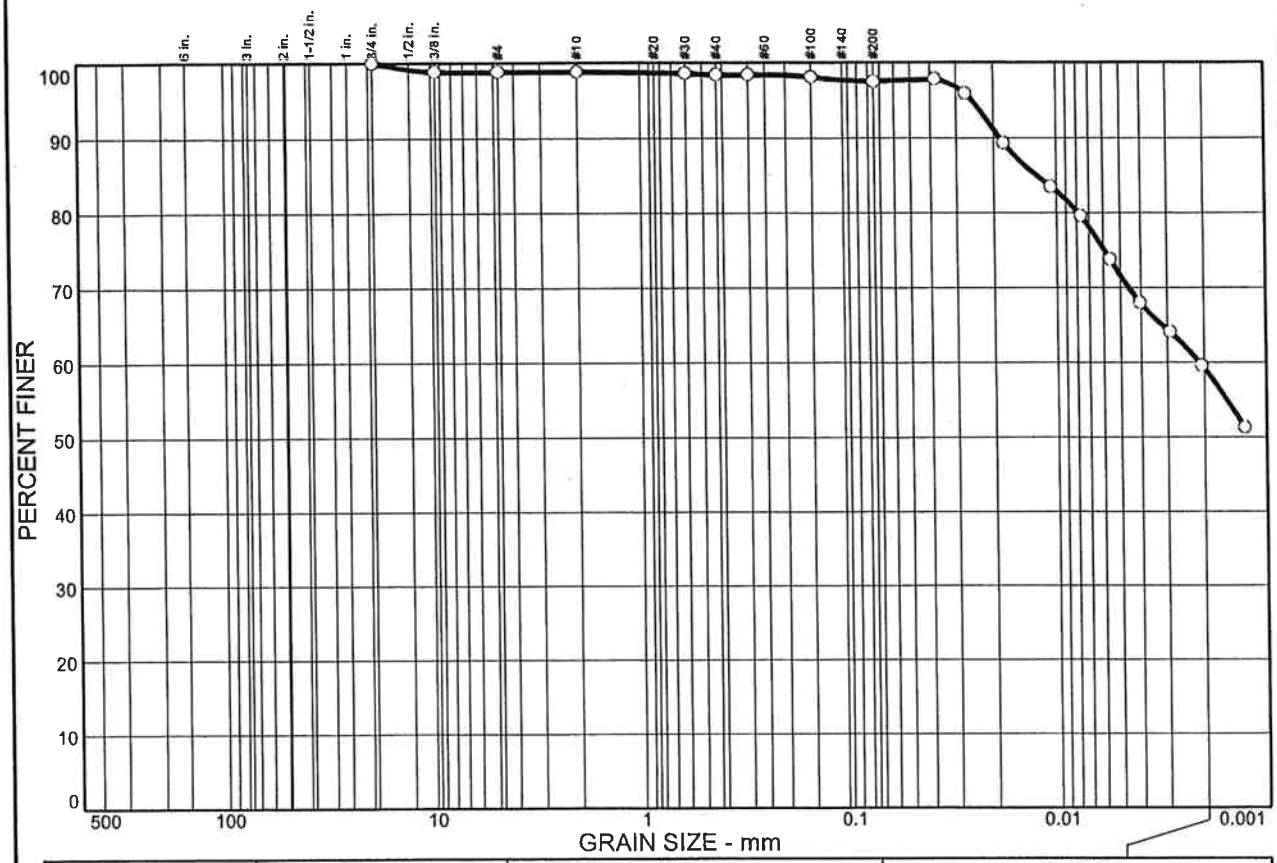
Client: GeoLogic Associates

Project: Newby Island - 2004-049

Project No.: 516-003

Figure

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	1.2	0.0	0.4	0.9	38.3	59.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4 in.	100.0		
3/8 in.	98.8		
#4	98.8		
#10	98.8		
#30	98.6		
#40	98.4		
#50	98.4		
#100	98.1		
#200	97.5		
0.0381 mm.	97.8		
0.0272 mm.	95.9		
0.0179 mm.	89.3		
0.0106 mm.	83.5		
0.0077 mm.	79.6		
0.0056 mm.	73.8		
0.0040 mm.	68.0		
0.0029 mm.	64.1		
0.0021 mm.	59.6		
0.0013 mm.	51.3		

* (no specification provided)

Soil Description

Gray Fat clay

Atterberg Limits

PL= 22 LL= 55 PI= 33

Coefficients

D_{85}= 0.0124 D_{60}= 0.0021 D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CH AASHTO=

Remarks

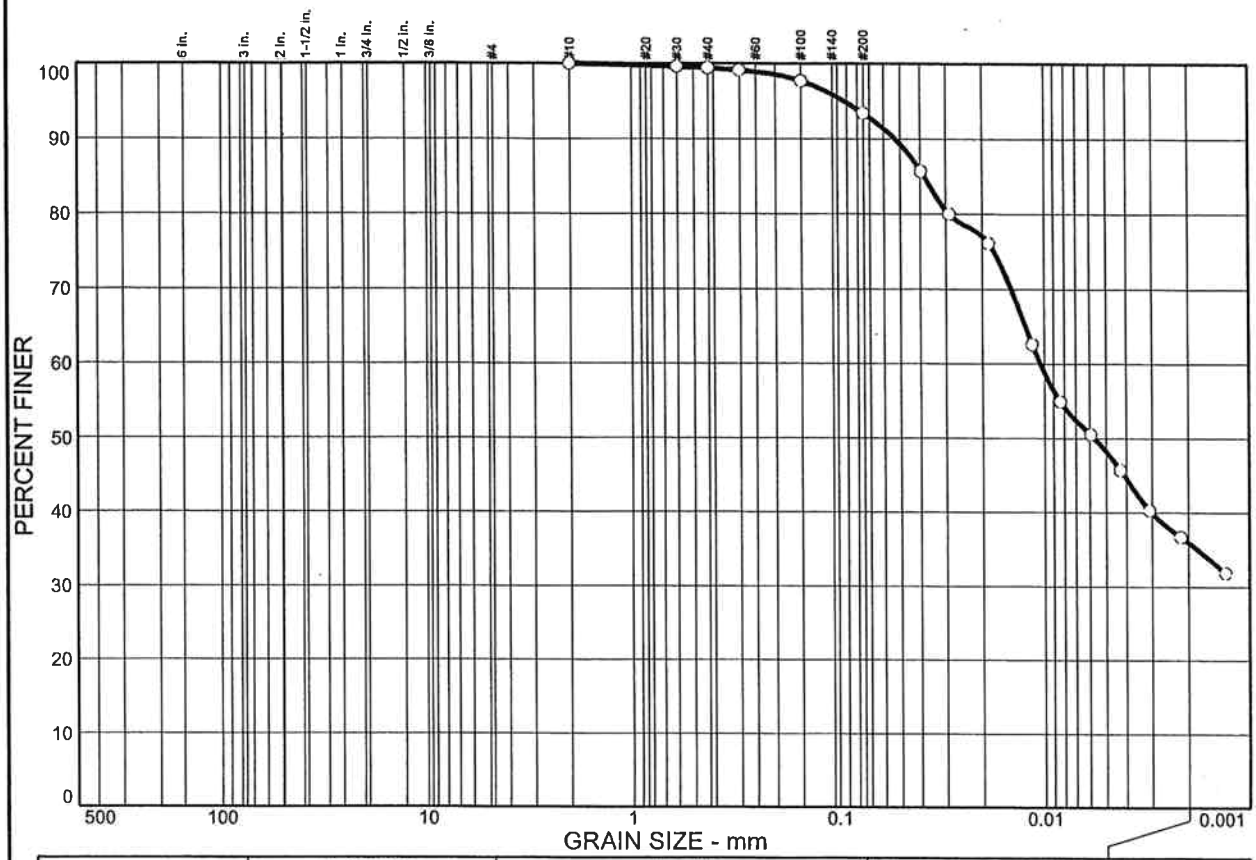
One piece of lead on 3/8" sieve.

Sample No.: 1 **Source of Sample:** RB-5 **Date:** 12/23/04
Location: **Elev./Depth:** 24'

COOPER TESTING LABORATORY

Client: GeoLogic Associates
Project: Newby Island - 2004-049
Project No: 516-006 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.6	6.0	57.4	36.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#30	99.6		
#40	99.4		
#50	99.1		
#100	97.7		
#200	93.4		
0.0397 mm.	85.7		
0.0289 mm.	80.0		
0.0186 mm.	76.1		
0.0114 mm.	62.6		
0.0083 mm.	54.9		
0.0059 mm.	50.5		
0.0043 mm.	45.7		
0.0031 mm.	40.3		
0.0022 mm.	36.7		
0.0013 mm.	31.8		

* (no specification provided)

Soil Description

Brown Lean CLAY

Atterberg Limits

PL= 20 LL= 37 PI= 17

Coefficients

D_{85}= 0.0383 D_{60}= 0.0104 D_{50}= 0.0057
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

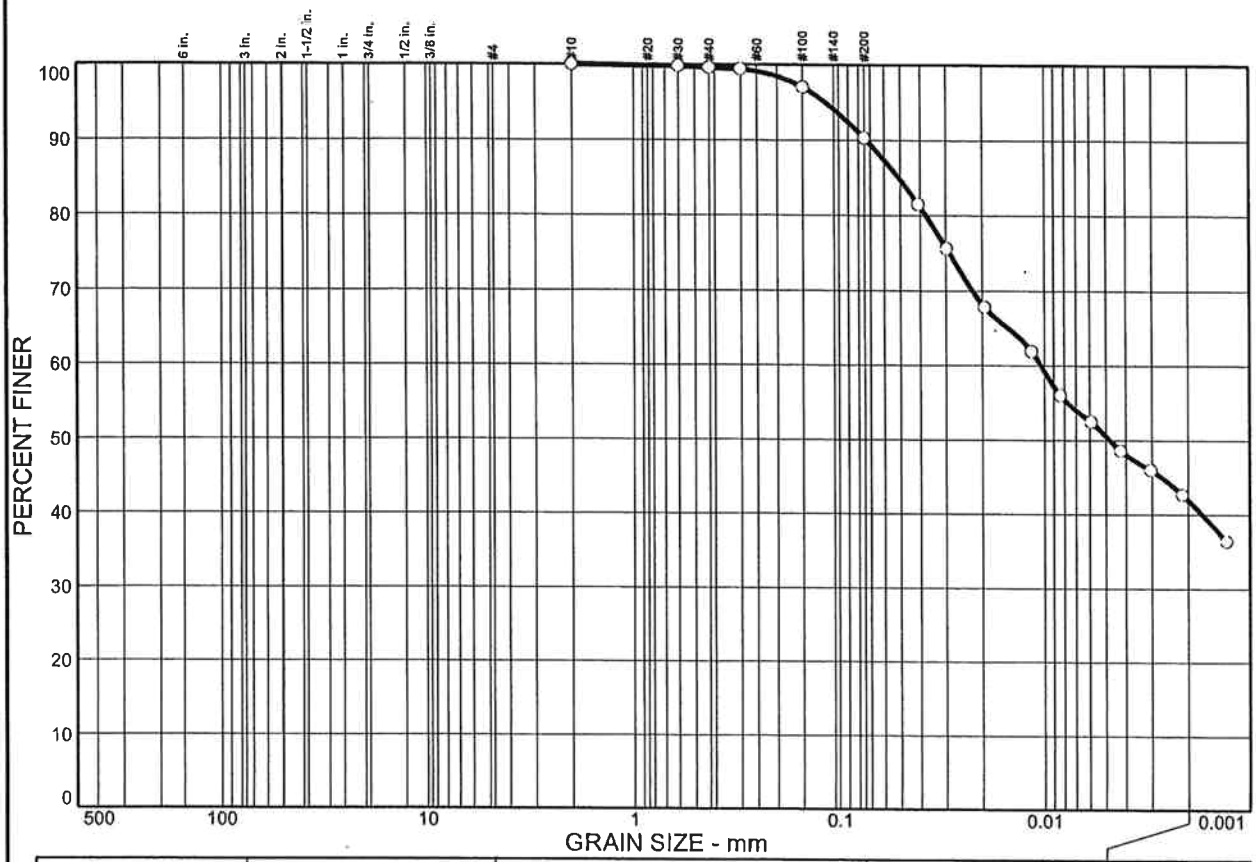
Remarks

Sample No.: 3 Source of Sample: RB-5 Date: 11/19/04
Location: Elev./Depth: 35.5'

COOPER TESTING LABORATORY

Client: GeoLogic Associates
Project: Newby Island - 2004-049
Project No: 516-003 Figure

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.4	9.3	48.3	42.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#30	99.8		
#40	99.6		
#50	99.4		
#100	97.0		
#200	90.3		
0.0409 mm.	81.5		
0.0298 mm.	75.6		
0.0195 mm.	67.8		
0.0115 mm.	61.9		
0.0083 mm.	56.0		
0.0059 mm.	52.5		
0.0042 mm.	48.6		
0.0030 mm.	46.0		
0.0021 mm.	42.7		
0.0013 mm.	36.4		

* (no specification provided)

Soil Description

Brown Lean CLAY

Atterberg Limits

PL= 18 LL= 40 PI= 22

Coefficients

D_{85}= 0.0509 D_{60}= 0.0104 D_{50}= 0.0048
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

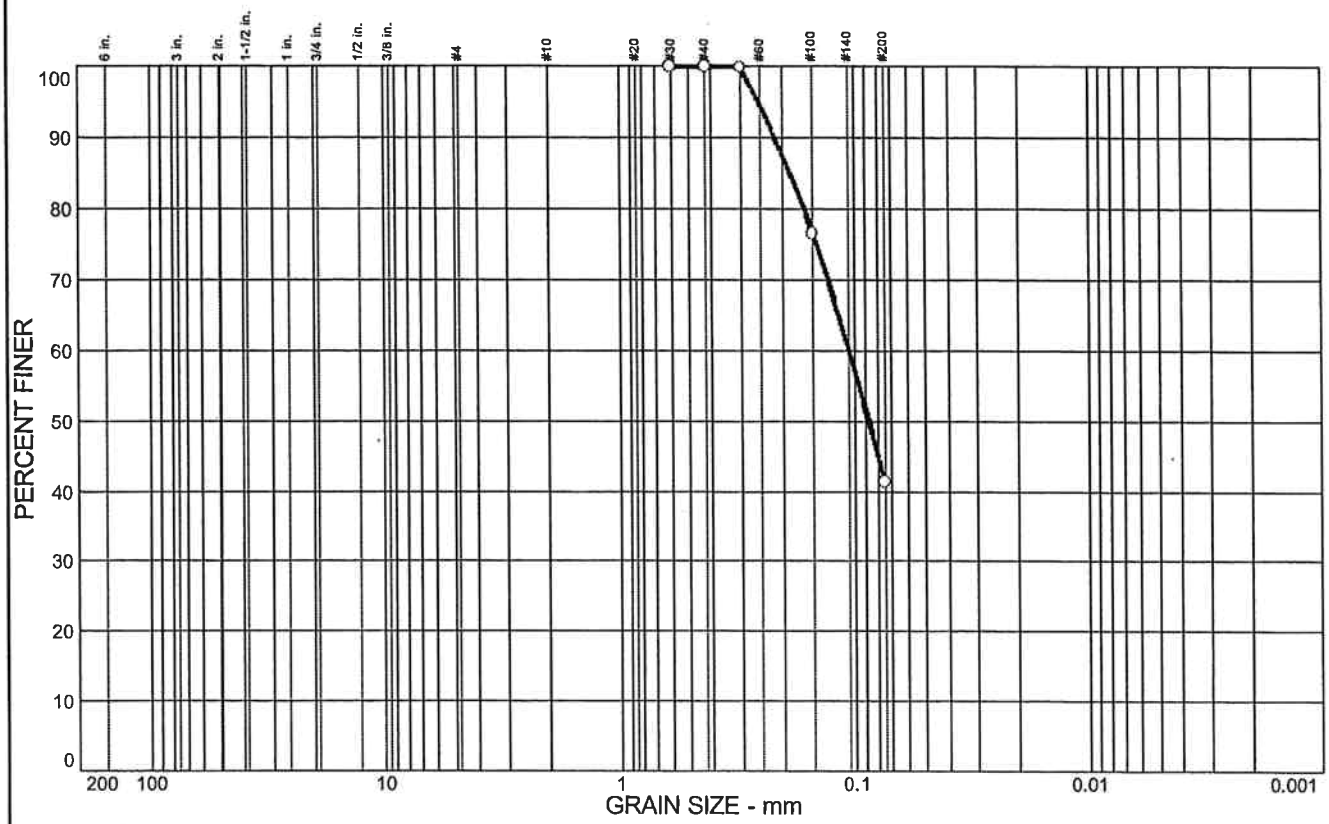
Remarks

Sample No.: 7 Source of Sample: RB-5 Date: 11/19/04
Location: Elev./Depth: 55.5'

COOPER TESTING LABORATORY

Client: GeoLogic Associates
Project: Newby Island - 2004-049
Project No: 516-003 Figure

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○			58.7	41.3		SM			

SIEVE inches size	PERCENT FINER ○		
	GRAIN SIZE		
D_{60}	0.106		
D_{30}			
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ○		
#30	100.0		
#40	100.0		
#50	99.9		
#100	76.5		
#200	41.3		

SOIL DESCRIPTION

○ Olive Brown Silty SAND

REMARKS:

○

○ Source: RB-5 Sample No.: 10 Elev./Depth: 62'

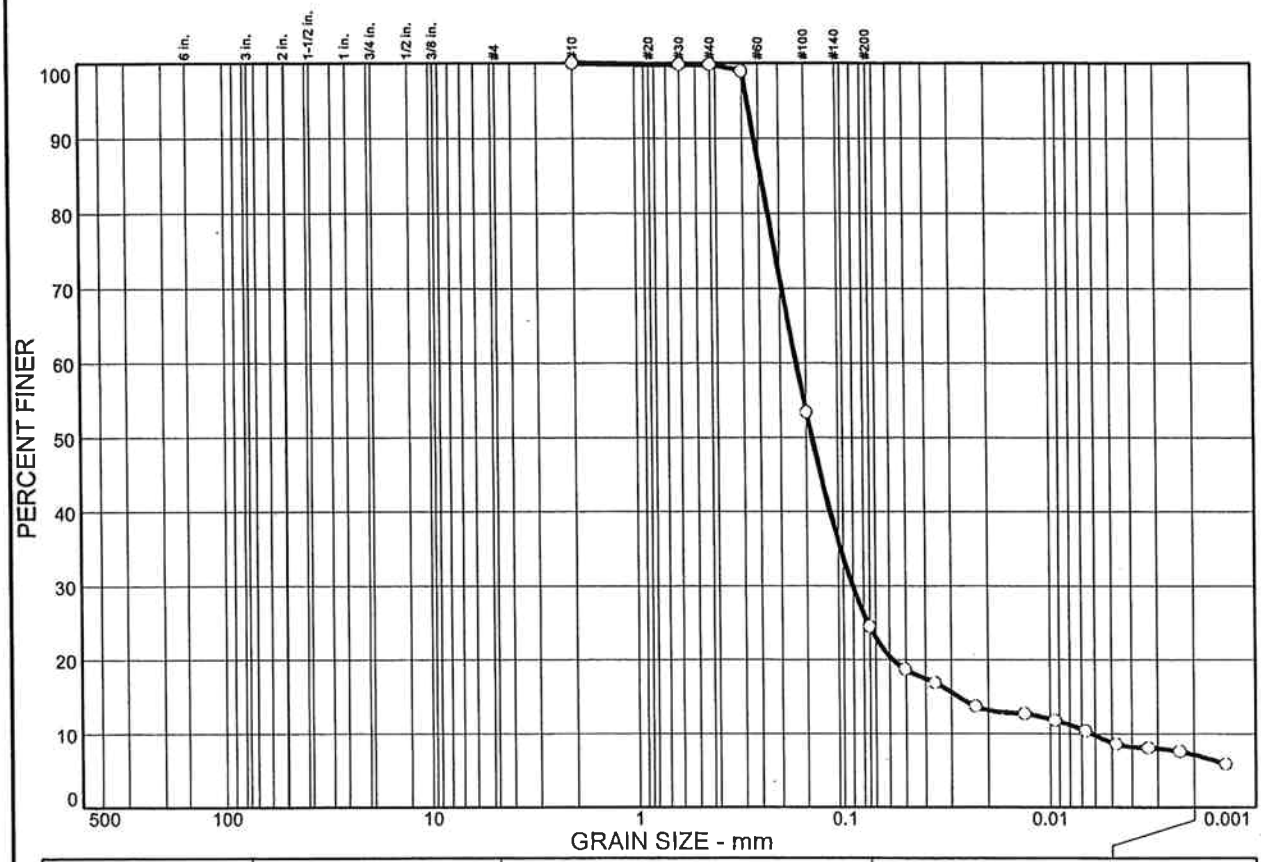
COOPER TESTING LABORATORY

Client: GeoLogic Associates

Project: Newby Island - 2004-049

Project No.: 516-010 Figure

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.2	75.3	17.3	7.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#30	99.8		
#40	99.8		
#50	98.9		
#100	53.4		
#200	24.5		
0.0506 mm.	18.7		
0.0360 mm.	16.9		
0.0230 mm.	13.7		
0.0133 mm.	12.7		
0.0094 mm.	11.8		
0.0067 mm.	10.4		
0.0048 mm.	8.6		
0.0033 mm.	8.1		
0.0023 mm.	7.6		
0.0014 mm.	5.9		

* (no specification provided)

Soil Description

Brown Silty SAND

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.245 D_{60}= 0.168 D_{50}= 0.141
D_{30}= 0.0905 D_{15}= 0.0278 D_{10}= 0.0062
C_u= 26.88 C_c= 7.84

Classification

USCS= AASHTO=

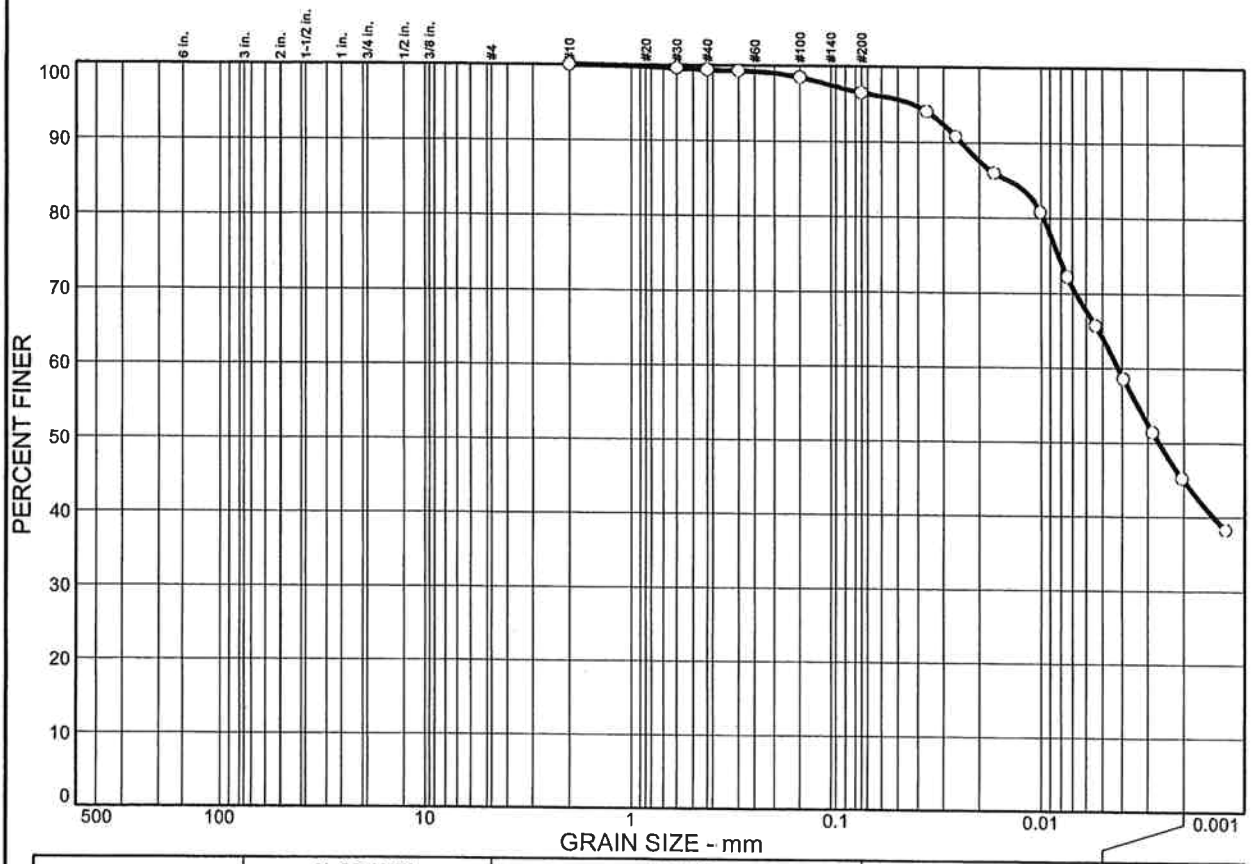
Remarks

Sample No.: 12 **Source of Sample:** RB-5 **Date:** 11/19/04
Location: **Elev./Depth:** 65'

COOPER TESTING LABORATORY

Client: GeoLogic Associates
Project: Newby Island - 2004-049
Project No: 516-003 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.6	2.9	51.6	44.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#30	99.6		
#40	99.4		
#50	99.3		
#100	98.5		
#200	96.5		
0.0363 mm.	94.1		
0.0262 mm.	90.8		
0.0170 mm.	86.0		
0.0101 mm.	80.8		
0.0074 mm.	72.2		
0.0054 mm.	65.7		
0.0039 mm.	58.6		
0.0028 mm.	51.4		
0.0020 mm.	45.2		
0.0012 mm.	38.3		

* (no specification provided)

Soil Description

Olive Gray Lean CLAY

Atterberg Limits

PL= 20 LL= 45 PI= 25

Coefficients

D_{85}= 0.0144 D_{60}= 0.0042 D_{50}= 0.0027
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

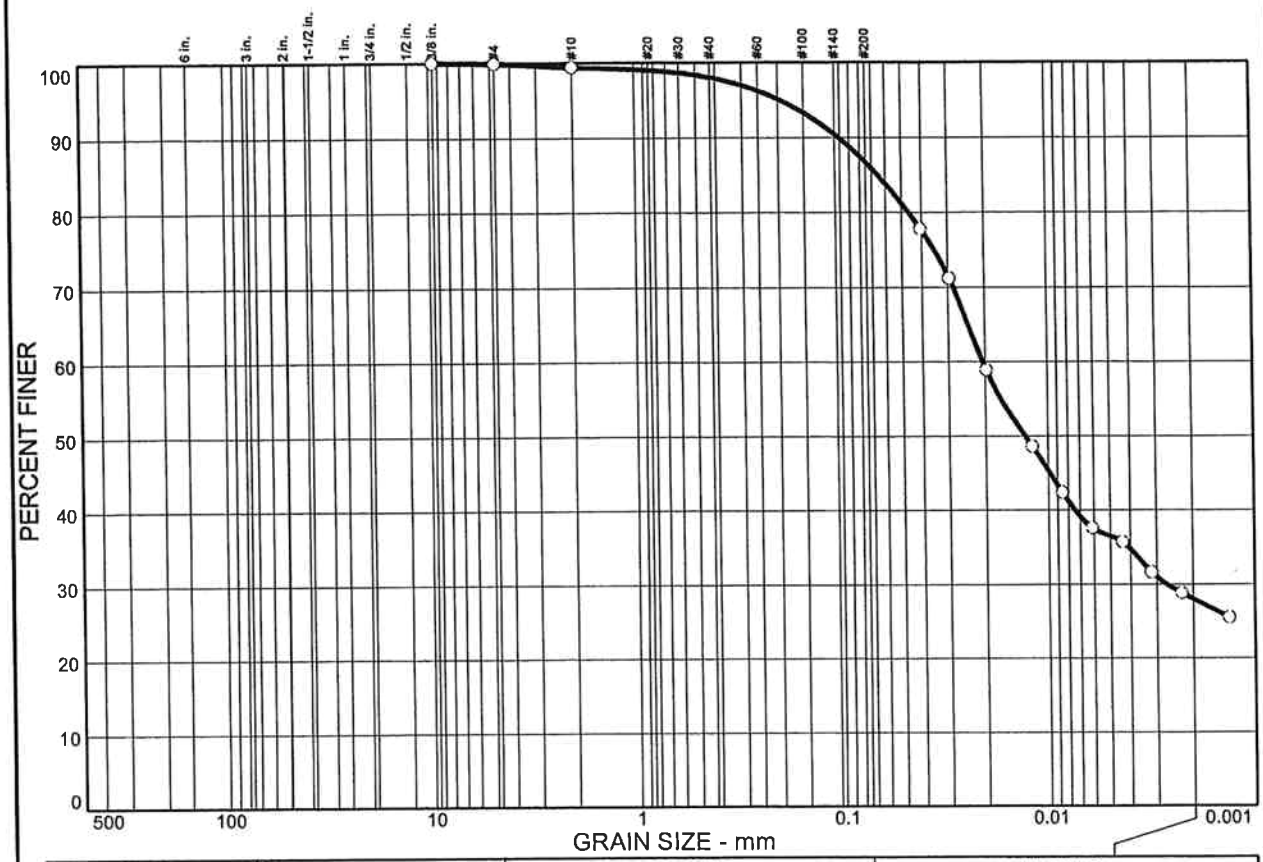
Remarks

Sample No.: 18 Source of Sample: RB-5 Date: 11/19/04
Location: Elev./Depth: 90.5'

COOPER TESTING LABORATORY

Client: GeoLogic Associates
Project: Newby Island - 2004-049
Project No: 516-003 Figure

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.1	0.5	1.4	11.3	58.7	28.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8 in.	100.0		
#4	99.9		
#10	99.4		
0.0406 mm.	77.8		
0.0296 mm.	71.2		
0.0198 mm.	58.9		
0.0119 mm.	48.6		
0.0085 mm.	42.4		
0.0061 mm.	37.6		
0.0044 mm.	35.7		
0.0032 mm.	31.6		
0.0023 mm.	28.8		
0.0013 mm.	25.5		

* (no specification provided)

Soil Description

Gray Lean CLAY

Atterberg Limits

PL= 20 LL= 37 PI= 17

Coefficients

D_{85}= 0.0653 D_{60}= 0.0206 D_{50}= 0.0129
D_{30}= 0.0027 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

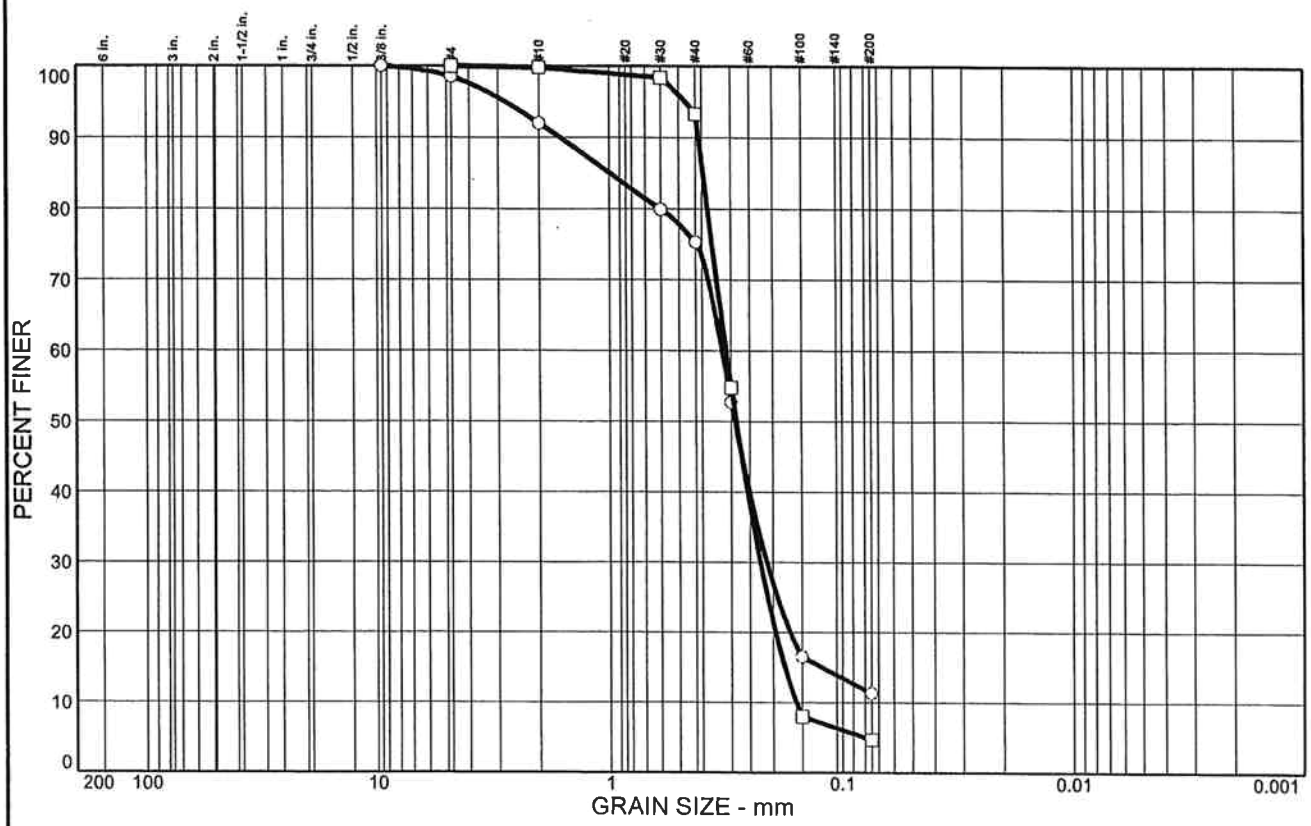
Remarks

Sample No.: 1 Source of Sample: RB-6 Date: 11/30/04
Location: Elev./Depth: 31-32.5'

COOPER TESTING LABORATORY

Client: GeoLogic Associates
Project: Newby Island - 2004-049
Project No: 516-004 Figure

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○		1.5	87.2						
□			95.3						

SIEVE inches size	PERCENT FINER ○	PERCENT FINER □	
3/8	100.0		
	GRAIN SIZE		
D_{60}	0.328	0.315	
D_{30}	0.213	0.226	
D_{10}		0.159	
	COEFFICIENTS		
C_c		1.02	
C_u		1.98	

SIEVE number size	PERCENT FINER ○	PERCENT FINER □	
#4	98.5	100.0	
#10	92.0	99.8	
#30	79.9	98.4	
#40	75.3	93.3	
#50	52.7	54.8	
#100	16.5	8.0	
#200	11.3	4.7	

SOIL DESCRIPTION

○ Brown Poorly Graded SAND with Silt

□ Brown Poorly Graded SAND

REMARKS:

○

□

○ Source: RB-6 Sample No.: 3 Elev./Depth: 36.5-38'

□ Source: RB-6 Sample No.: 15 Elev./Depth: 97'

COOPER TESTING LABORATORY

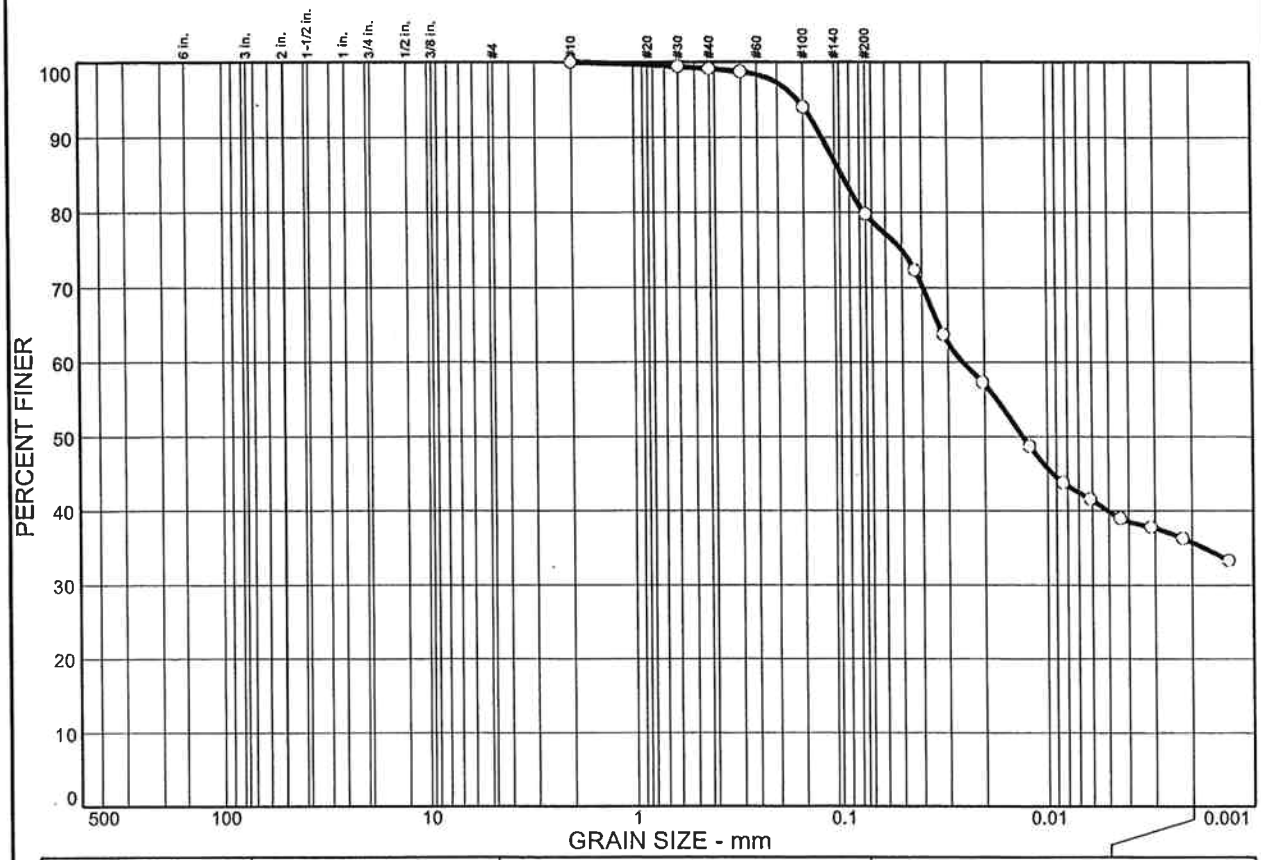
Client: GeoLogic Associates

Project: Newby Island - 2004-049

Project No.: 516-004

Figure

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.9	19.3	44.0	35.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#30	99.4		
#40	99.1		
#50	98.7		
#100	94.0		
#200	79.8		
0.0434 mm.	72.3		
0.0317 mm.	63.7		
0.0205 mm.	57.3		
0.0122 mm.	48.7		
0.0084 mm.	43.8		
0.0062 mm.	41.6		
0.0044 mm.	39.0		
0.0031 mm.	37.8		
0.0022 mm.	36.3		
0.0013 mm.	33.3		

* (no specification provided)

Soil Description

Brown Lean CLAY with Sand

Atterberg Limits

PL= 16 LL= 36 PI= 20

Coefficients

D_{85}= 0.0981 D_{60}= 0.0256 D_{50}= 0.0132
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

Remarks

Sample No.: 4 Source of Sample: RB-6 Date: 11/30/04
Location: Elev./Depth: 43.5'

COOPER TESTING LABORATORY

Client: GeoLogic Associates
Project: Newby Island - 2004-049
Project No: 516-004 Figure

PARTICLE SIZE DISTRIBUTION TEST REPORT

% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.2	2.0	43.1	54.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#30	99.8		
#40	99.8		
#50	99.8		
#100	99.4		
#200	97.8		
0.0362 mm.	95.5		
0.0259 mm.	93.4		
0.0168 mm.	88.9		
0.0100 mm.	84.1		
0.0072 mm.	79.3		
0.0053 mm.	72.6		
0.0038 mm.	66.5		
0.0028 mm.	60.5		
0.0020 mm.	54.8		
0.0012 mm.	47.9		

* (no specification provided)

Soil Description

Brown CLAY

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.0108 D_{60}= 0.0027 D_{50}= 0.0015
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

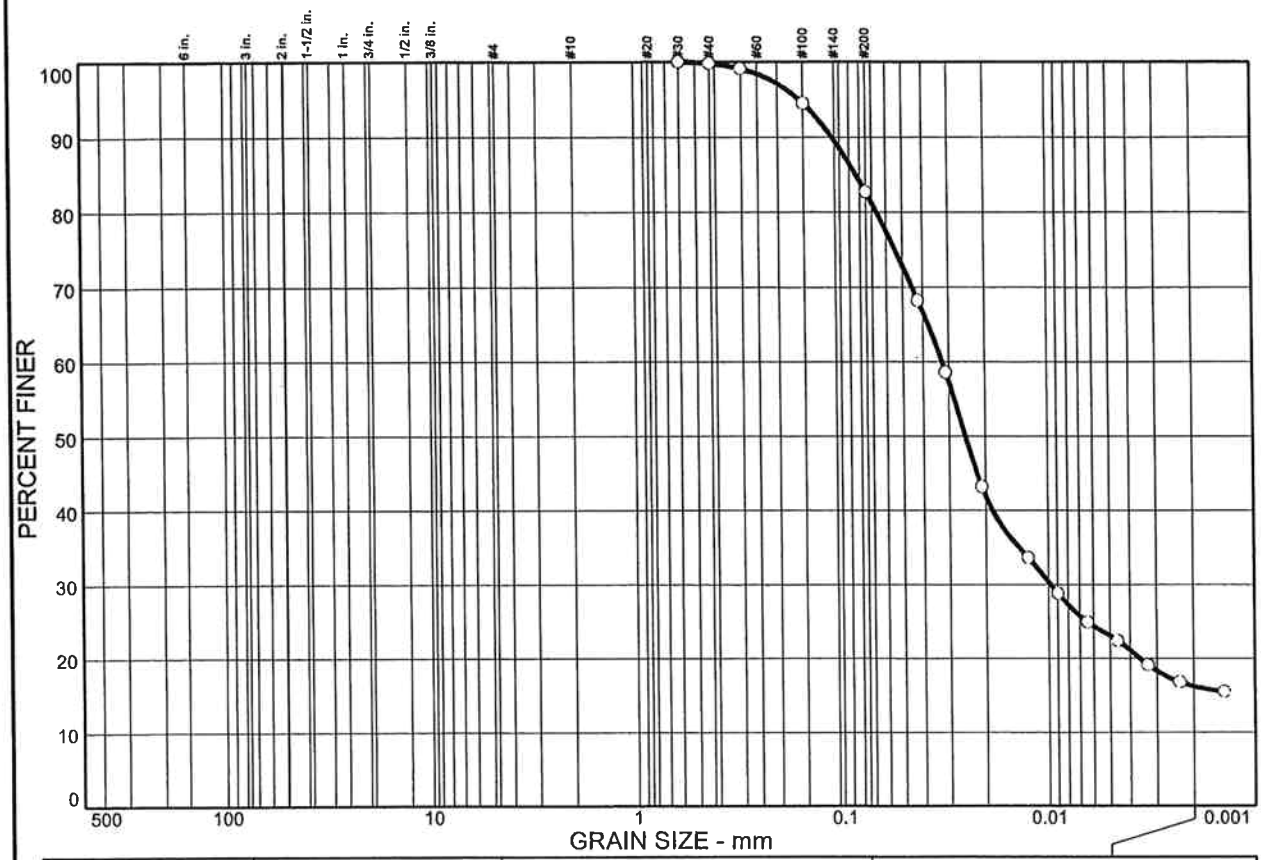
Remarks

Sample No.: 5 Source of Sample: RB-6 Date: 11/30/04
Location: Elev./Depth: 50.5'

COOPER TESTING LABORATORY

Client: GeoLogic Associates
Project: Newby Island - 2004-049
Project No: 516-004 Figure

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.2	17.1	66.5	16.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#30	100.0		
#40	99.8		
#50	99.1		
#100	94.5		
#200	82.7		
0.0423 mm.	68.2		
0.0312 mm.	58.6		
0.0209 mm.	43.2		
0.0125 mm.	33.6		
0.0090 mm.	28.8		
0.0064 mm.	24.9		
0.0046 mm.	22.4		
0.0033 mm.	19.1		
0.0023 mm.	16.8		
0.0014 mm.	15.5		

* (no specification provided)

Soil Description

Brown SILT with Sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.0835 D_{60}= 0.0324 D_{50}= 0.0251
D_{30}= 0.0097 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

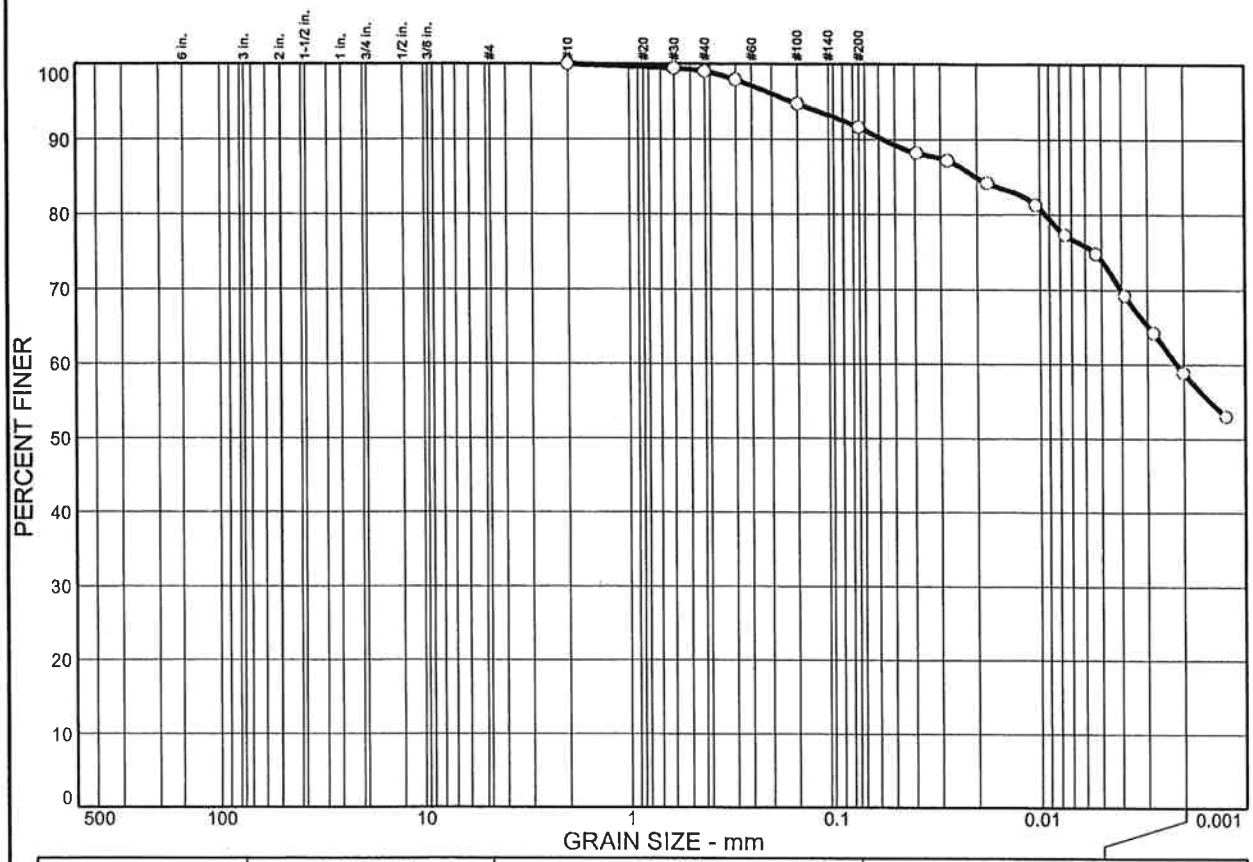
Remarks

Sample No.: 11 **Source of Sample:** RB-6 **Date:** 11/30/04
Location: **Elev./Depth:** 80.5'

COOPER TESTING LABORATORY

Client: GeoLogic Associates
Project: Newby Island - 2004-049
Project No: 516-004 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	1.0	7.4	32.8	58.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#30	99.4		
#40	99.0		
#50	97.9		
#100	94.7		
#200	91.6		
0.0392 mm.	88.2		
0.0278 mm.	87.2		
0.0179 mm.	84.2		
0.0105 mm.	81.3		
0.0075 mm.	77.3		
0.0053 mm.	74.8		
0.0039 mm.	69.2		
0.0028 mm.	64.2		
0.0020 mm.	58.9		
0.0012 mm.	53.0		

* (no specification provided)

Soil Description

Brown Fat CLAY

Atterberg Limits

PL= 21 LL= 53 PI= 32

Coefficients

D_{85}= 0.0202 D_{60}= 0.0022 D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CH AASHTO=

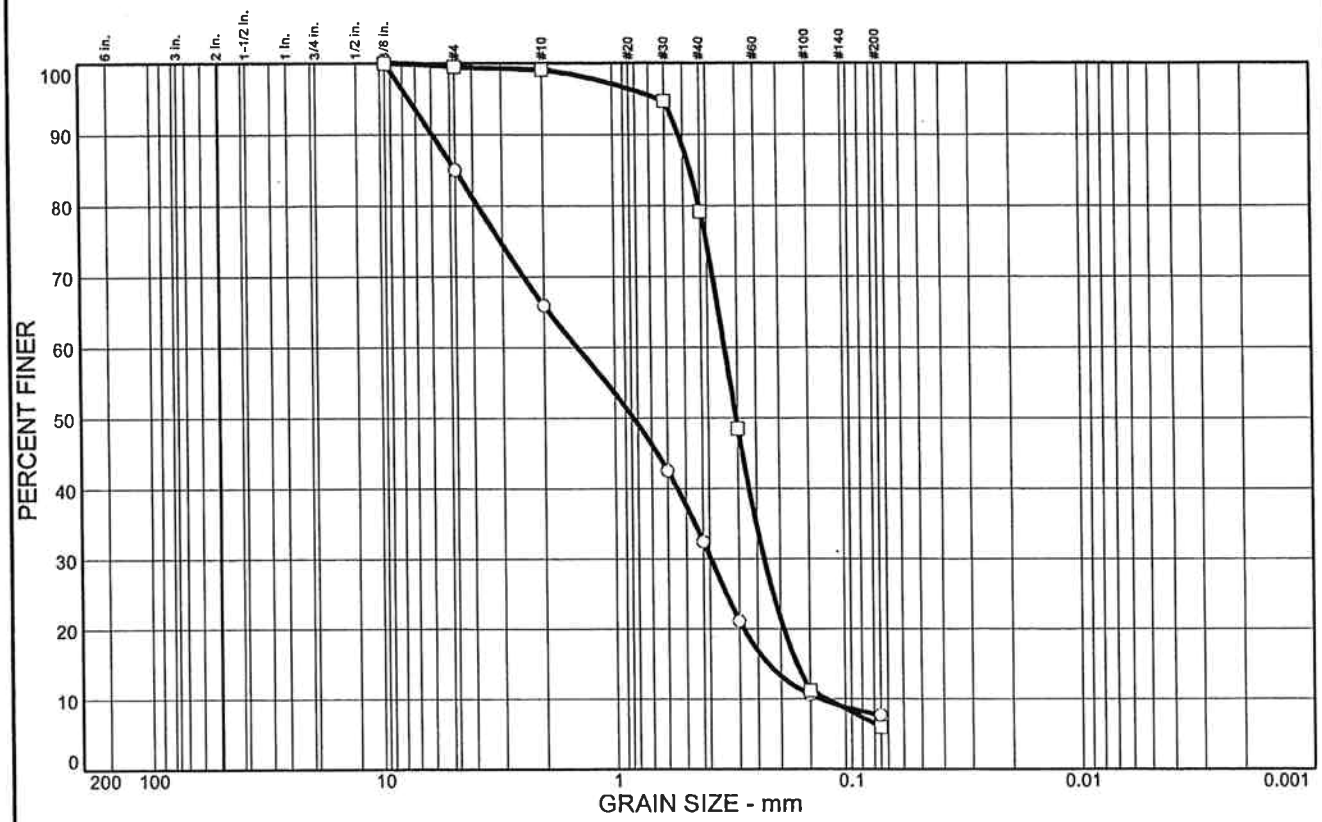
Remarks

Sample No.: 3 Source of Sample: RB-7 Date: 11/30/04
Location: Elev./Depth: 24.5'

COOPER TESTING LABORATORY

Client: GeoLogic Associates
Project: Newby Island - 2004-049
Project No: 516-004 Figure

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○		15.0	77.3						
□		0.5	93.5						

SIEVE inches size	PERCENT FINER ○	PERCENT FINER □
3/8	100.0	100.0
GRAIN SIZE		
D_{60}	1.45	0.340
D_{30}	0.396	0.234
D_{10}	0.136	0.128
COEFFICIENTS		
C_c	0.79	1.26
C_u	10.62	2.66

SIEVE number size	PERCENT FINER ○	PERCENT FINER □
#4	85.0	99.5
#10	65.9	99.1
#30	42.5	94.7
#40	32.4	79.2
#50	21.1	48.5
#100	10.6	11.2
#200	7.7	6.0

SOIL DESCRIPTION

○ Grayish Brown Poorly Graded SAND with Silt and Gravel

□ Grayish Brown Poorly Graded SAND with Silt

REMARKS:

○

□

○ Source: RB-7 Sample No.: 5 Elev./Depth: 36.5-38'

□ Source: RB-7 Sample No.: 7 Elev./Depth: 39.5-41'

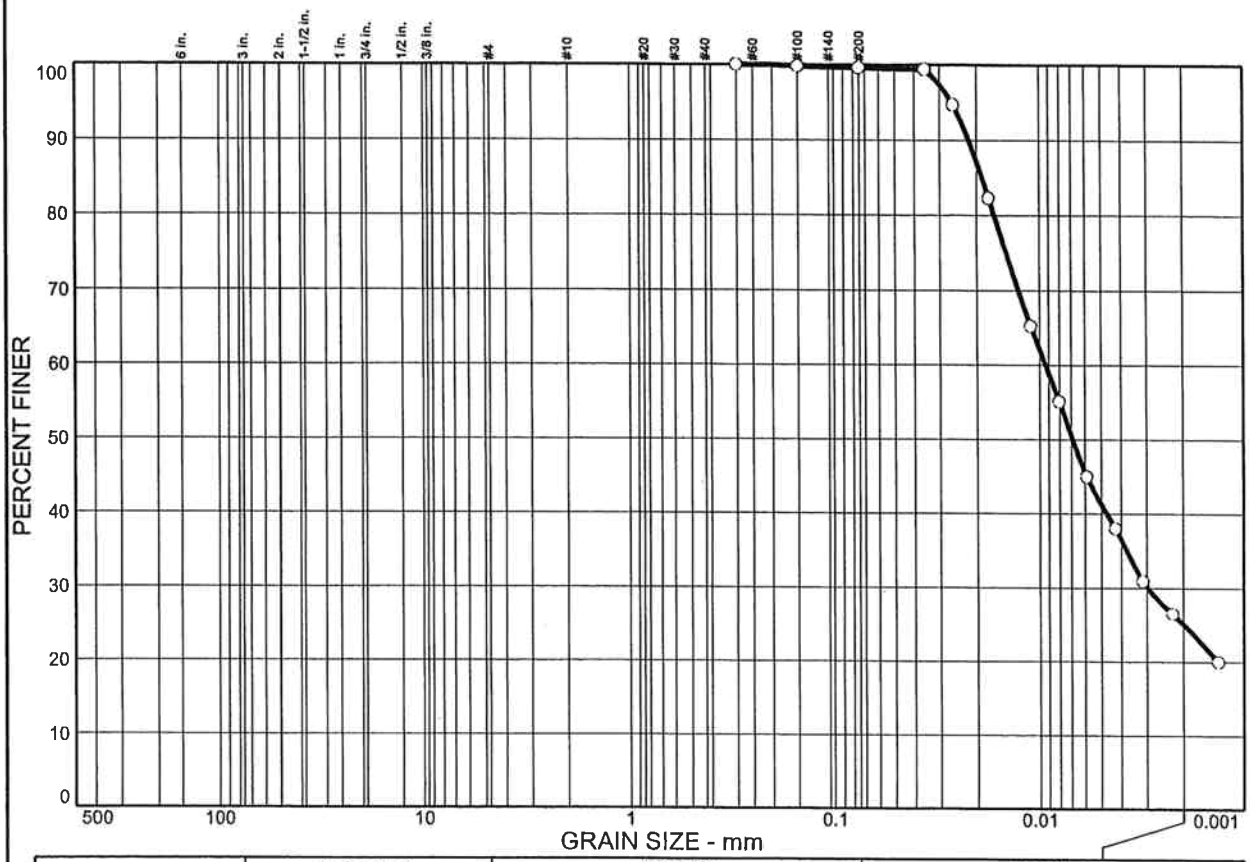
COOPER TESTING LABORATORY

Client: GeoLogic Associates

Project: Newby Island - 2004-049

Project No.: 516-004 Figure

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.0	0.4	74.5	25.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#50	100.0		
#100	99.8		
#200	99.6		
0.0356 mm.	99.4		
0.0259 mm.	94.7		
0.0176 mm.	82.3		
0.0110 mm.	65.2		
0.0080 mm.	55.1		
0.0059 mm.	45.0		
0.0043 mm.	38.0		
0.0031 mm.	30.9		
0.0022 mm.	26.5		
0.0013 mm.	20.0		

* (no specification provided)

Soil Description

Olive Gray Lean CLAY

Atterberg Limits

PL= 25 LL= 40 PI= 15

Coefficients

D_{85}= 0.0189 D_{60}= 0.0093 D_{50}= 0.0069
D_{30}= 0.0030 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

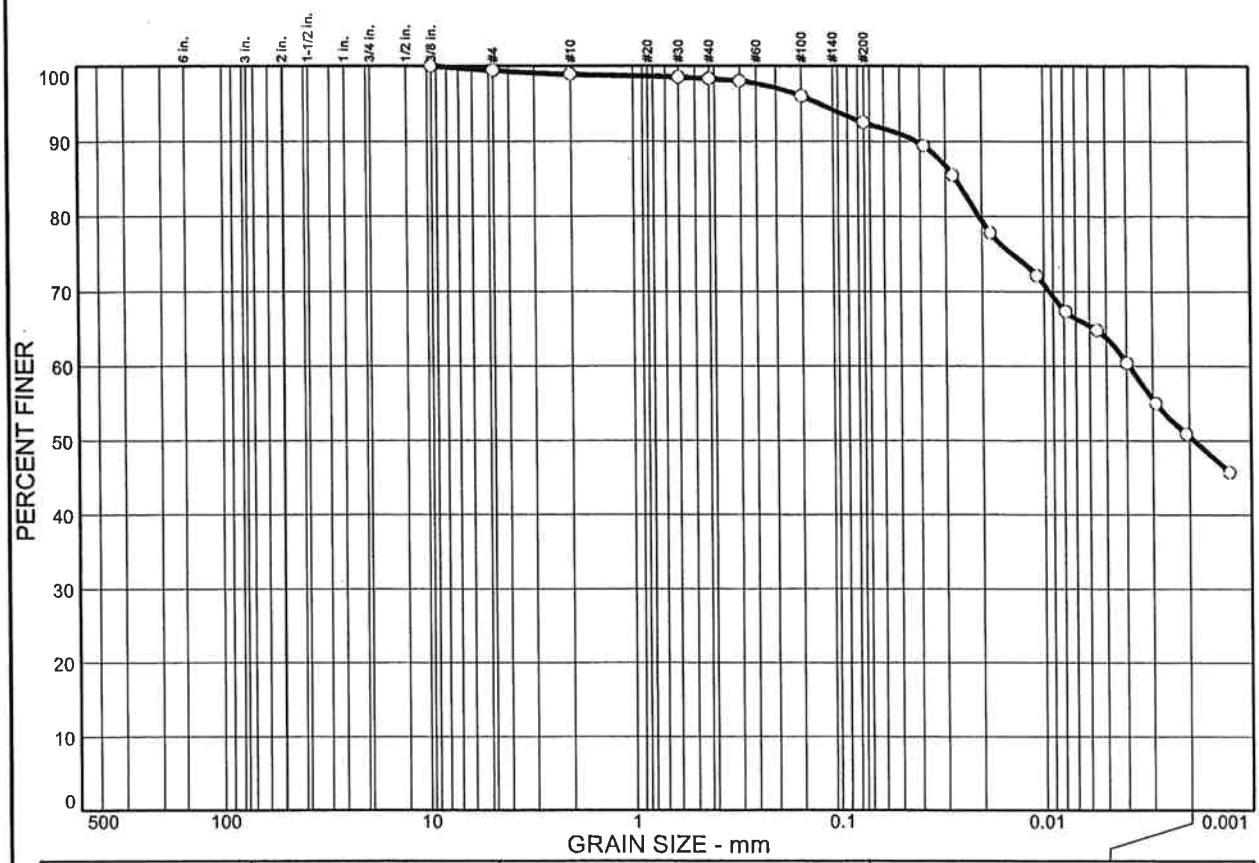
Remarks

Sample No.: 9 **Source of Sample:** RB-7 **Date:** 11/30/04
Location: **Elev./Depth:** 61.5'

COOPER TESTING LABORATORY

Client: GeoLogic Associates
Project: Newby Island - 2004-049
Project No: 516-004 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.6	0.5	0.6	5.8	41.9	50.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8 in.	100.0		
#4	99.4		
#10	98.9		
#30	98.5		
#40	98.3		
#50	98.0		
#100	96.0		
#200	92.5		
0.0384 mm.	89.4		
0.0277 mm.	85.5		
0.0182 mm.	77.8		
0.0108 mm.	72.1		
0.0078 mm.	67.3		
0.0055 mm.	64.8		
0.0040 mm.	60.4		
0.0029 mm.	55.0		
0.0021 mm.	50.9		
0.0013 mm.	45.7		

* (no specification provided)

Soil Description

Brown Lean CLAY

Atterberg Limits

PL= 23 LL= 47 PI= 24

Coefficients

D_{85}= 0.0269 D_{60}= 0.0039 D_{50}= 0.0019
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

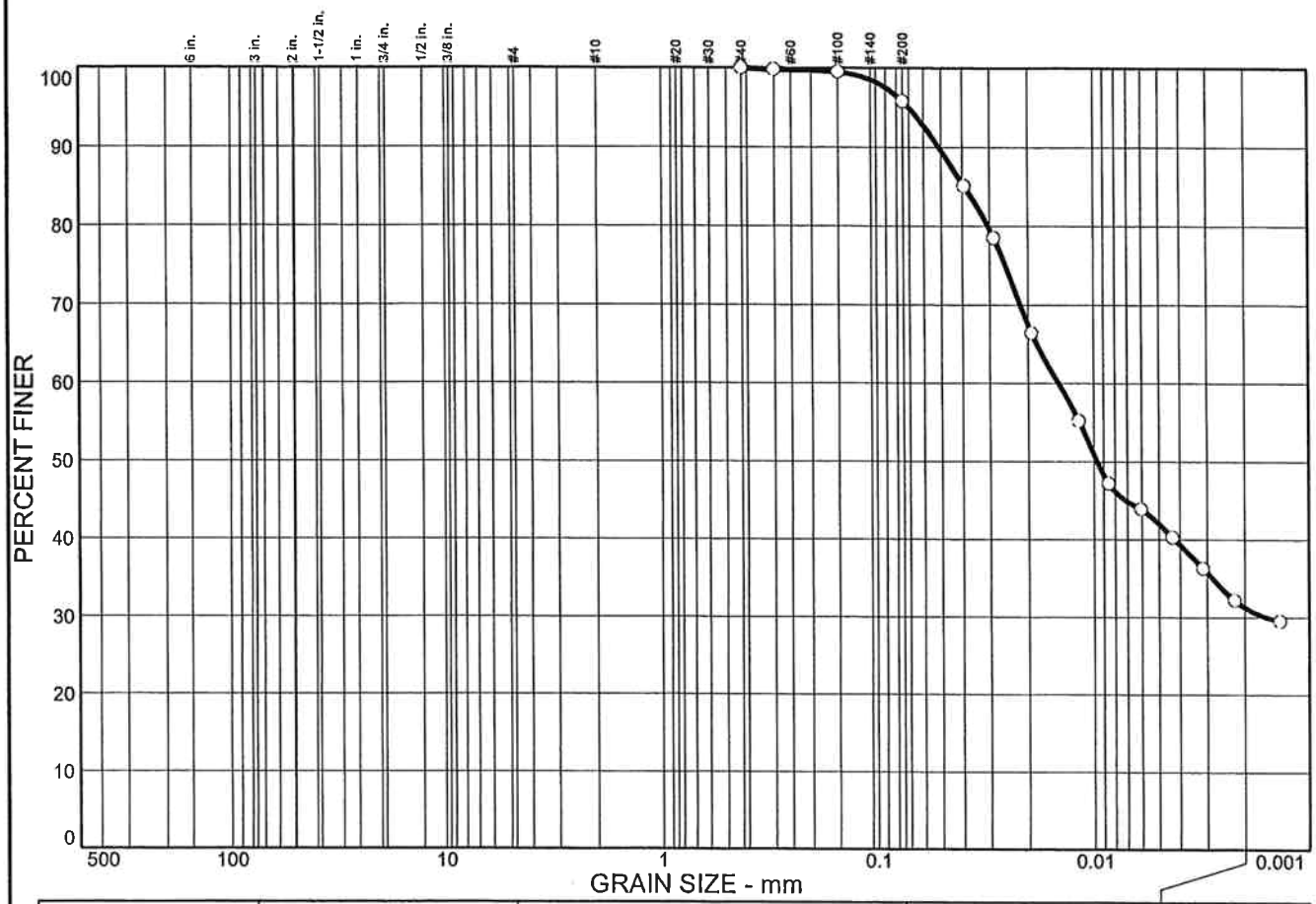
Remarks

Sample No.: 1 **Source of Sample:** RB-8 **Date:** 11/30/04
Location: **Elev./Depth:** 6.5'

COOPER TESTING LABORATORY

Client: GeoLogic Associates
Project: Newby Island - 2004-049
Project No: 516-004 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.0	4.2	64.5	31.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#40	100.0		
#50	99.8		
#100	99.5		
#200	95.8		
0.0393 mm.	85.1		
0.0288 mm.	78.5		
0.0193 mm.	66.4		
0.0117 mm.	55.2		
0.0086 mm.	47.2		
0.0061 mm.	43.9		
0.0043 mm.	40.3		
0.0031 mm.	36.3		
0.0022 mm.	32.2		
0.0014 mm.	29.5		

* (no specification provided)

Soil Description

Dark Gray Lean CLAY

Atterberg Limits

PL= 24 LL= 47 PI= 23

Coefficients

D_{85}= 0.0391 D_{60}= 0.0145 D_{50}= 0.0097
D_{30}= 0.0016 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

Remarks

Sample No.: 2 **Source of Sample:** RB-8 **Date:** 11/24/04
Location: **Elev./Depth:** 10'

COOPER TESTING LABORATORY

Client: GeoLogic Associates
Project: Newby Island - 2004-049
Project No: 516-002 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT

% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.2	11.7	59.1	29.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#30	99.8		
#40	99.8		
#50	99.8		
#100	96.4		
#200	88.1		
0.0408 mm.	78.8		
0.0294 mm.	75.5		
0.0191 mm.	69.7		
0.0117 mm.	55.3		
0.0085 mm.	48.6		
0.0061 mm.	43.3		
0.0044 mm.	39.0		
0.0031 mm.	33.7		
0.0022 mm.	30.0		
0.0013 mm.	24.6		

* (no specification provided)

Soil Description

Dark Gray Fat CLAY

Atterberg Limits

PL= 24 LL= 50 PI= 26

Coefficients

D_{85}= 0.0618 D_{60}= 0.0137 D_{50}= 0.0092
D_{30}= 0.0022 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CH AASHTO=

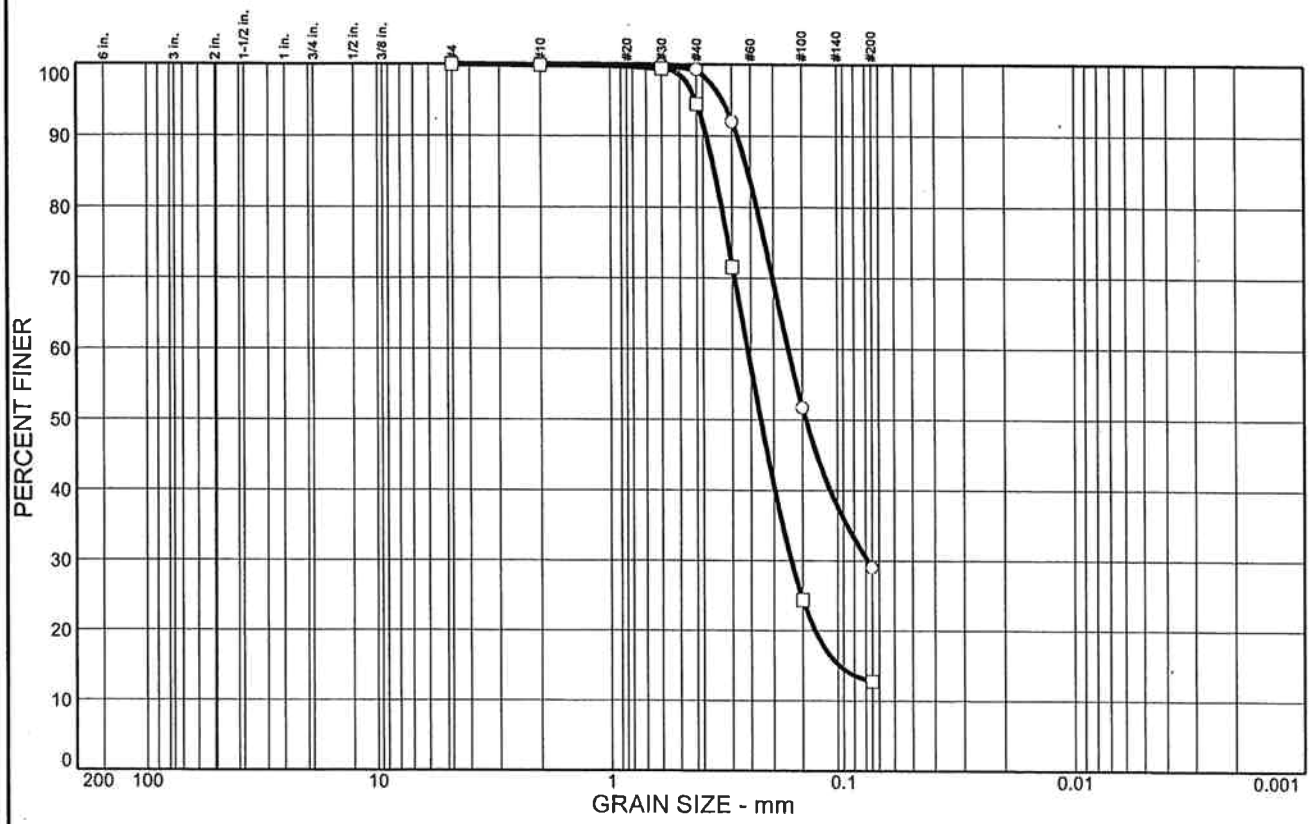
Remarks

Sample No.: 4 **Source of Sample:** RB-8 **Date:** 11/09/04
Location: **Elev./Depth:** 22.5'

COOPER TESTING LABORATORY

Client: GeoLogic Associates
Project: Newby Island - 2004-049
Project No: 516-002 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○			71.0						
□			87.2						

SIEVE inches size	PERCENT FINER ○	PERCENT FINER □	
	GRAIN SIZE		
D_{60}	0.173	0.259	
D_{30}	0.0784	0.168	
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	PERCENT FINER □	
#4		100.0	
#10	100.0	99.9	
#30	99.9	99.4	
#40	99.3	94.5	
#50	92.0	71.6	
#100	51.7	24.4	
#200	29.0	12.8	

SOIL DESCRIPTION

○ Gray Silty SAND (slightly plastic) near Clayey SAND

□ Gray Silty SAND

REMARKS:

○

□

○ Source: RB-8 Sample No.: 5 Elev./Depth: 25-26.5'

□ Source: RB-8 Sample No.: 6 Elev./Depth: 28'

COOPER TESTING LABORATORY

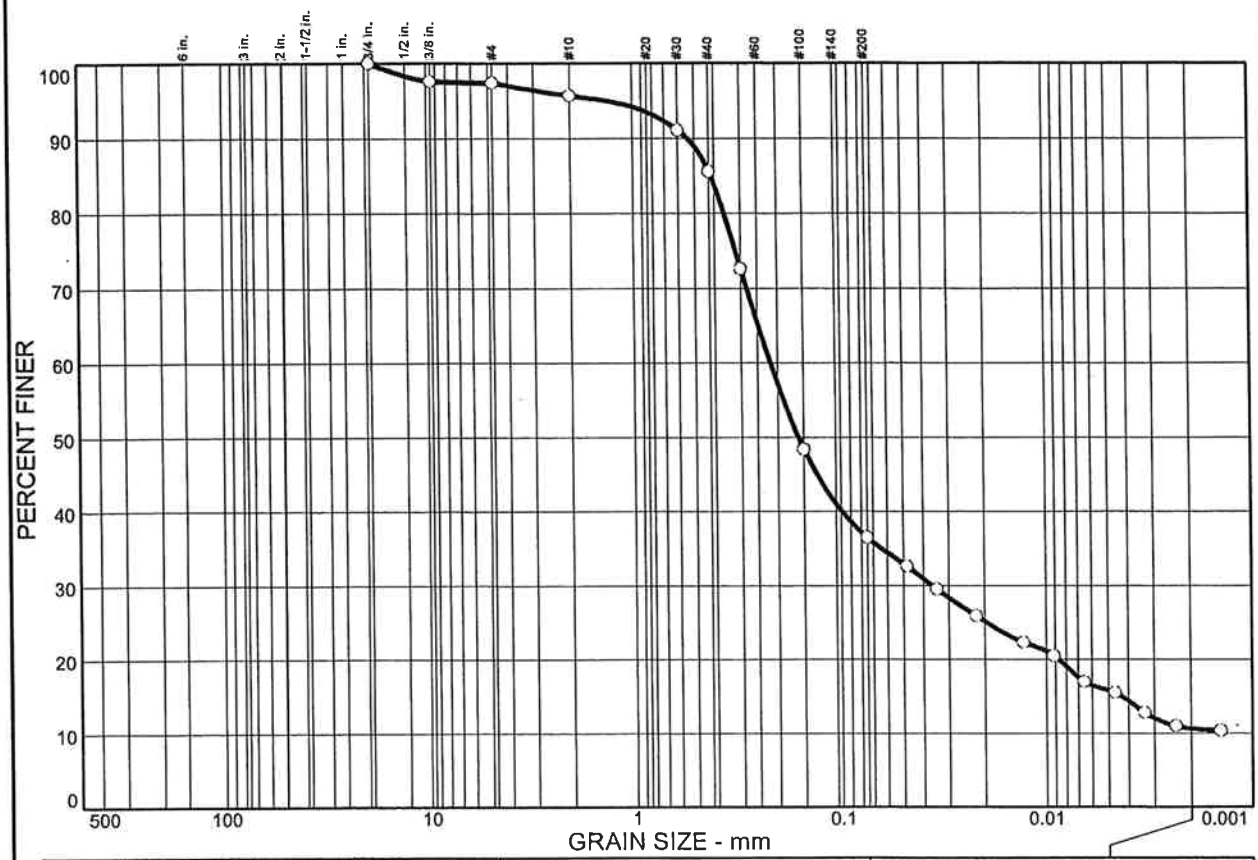
Client: GeoLogic Associates

Project: Newby Island - 2004-049

Project No.: 516-004

Figure

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	2.6	1.7	10.1	49.1	25.9	10.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4 in.	100.0		
3/8 in.	97.6		
#4	97.4		
#10	95.7		
#30	91.1		
#40	85.6		
#50	72.6		
#100	48.4		
#200	36.5		
0.0481 mm.	32.6		
0.0344 mm.	29.5		
0.0220 mm.	25.9		
0.0129 mm.	22.3		
0.0092 mm.	20.5		
0.0066 mm.	17.0		
0.0047 mm.	15.5		
0.0033 mm.	12.8		
0.0024 mm.	11.0		
0.0014 mm.	10.4		

* (no specification provided)

Soil Description

Gray Clayey SAND (with glass)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.416 D_{60}= 0.217 D_{50}= 0.159
D_{30}= 0.0363 D_{15}= 0.0043 D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

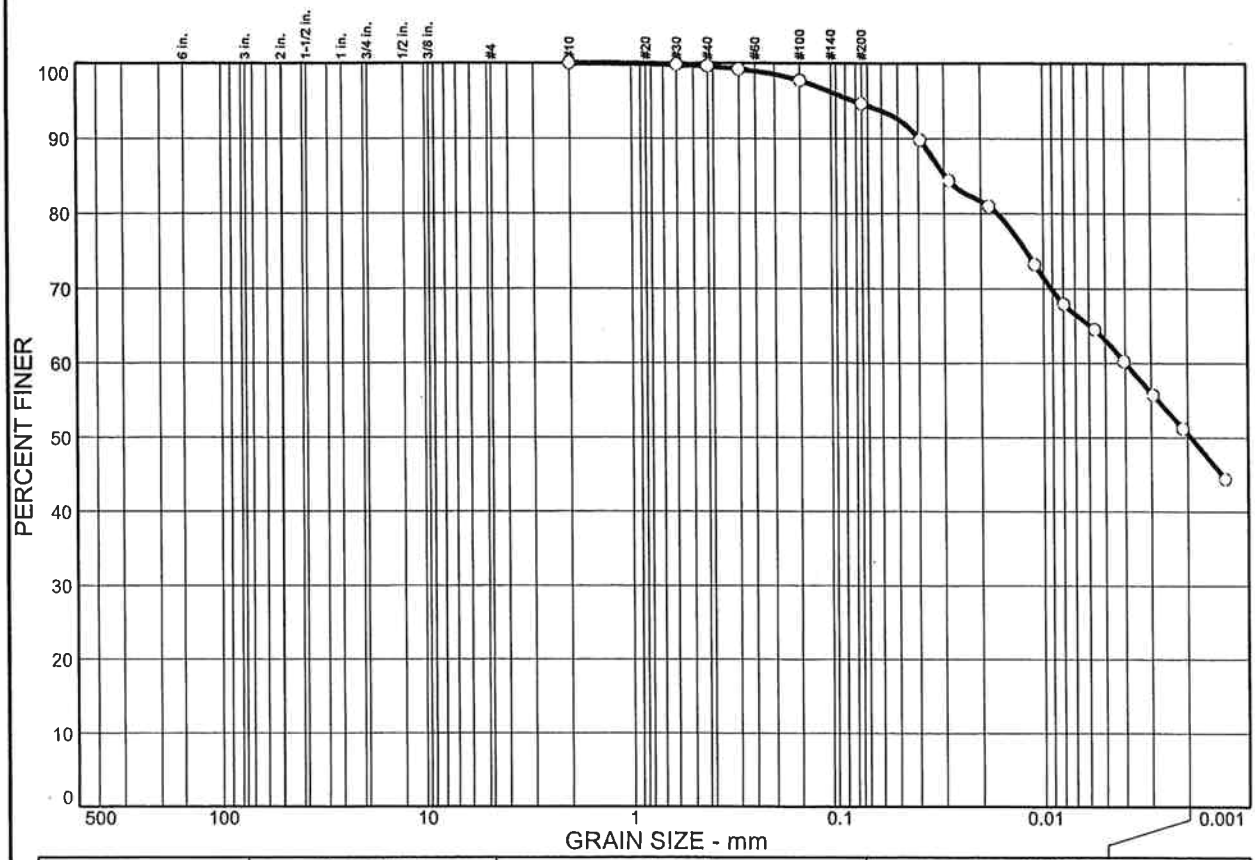
Remarks

Sample No.: 7 Source of Sample: RB-8 Date: 11/30/04
Location: Elev./Depth: 29.5'

COOPER TESTING LABORATORY

Client: GeoLogic Associates
Project: Newby Island - 2004-049
Project No: 516-004 Figure

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.4	5.0	44.1	50.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#30	99.8		
#40	99.6		
#50	99.2		
#100	97.7		
#200	94.6		
0.0391 mm.	89.8		
0.0284 mm.	84.4		
0.0183 mm.	81.0		
0.0110 mm.	73.2		
0.0079 mm.	67.9		
0.0056 mm.	64.5		
0.0041 mm.	60.2		
0.0029 mm.	55.7		
0.0021 mm.	51.2		
0.0013 mm.	44.4		

* (no specification provided)

Soil Description

Brown Lean CLAY

Atterberg Limits

PL= 18 LL= 46 PI= 28

Coefficients

D_{85}= 0.0297 D_{60}= 0.0040 D_{50}= 0.0019
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

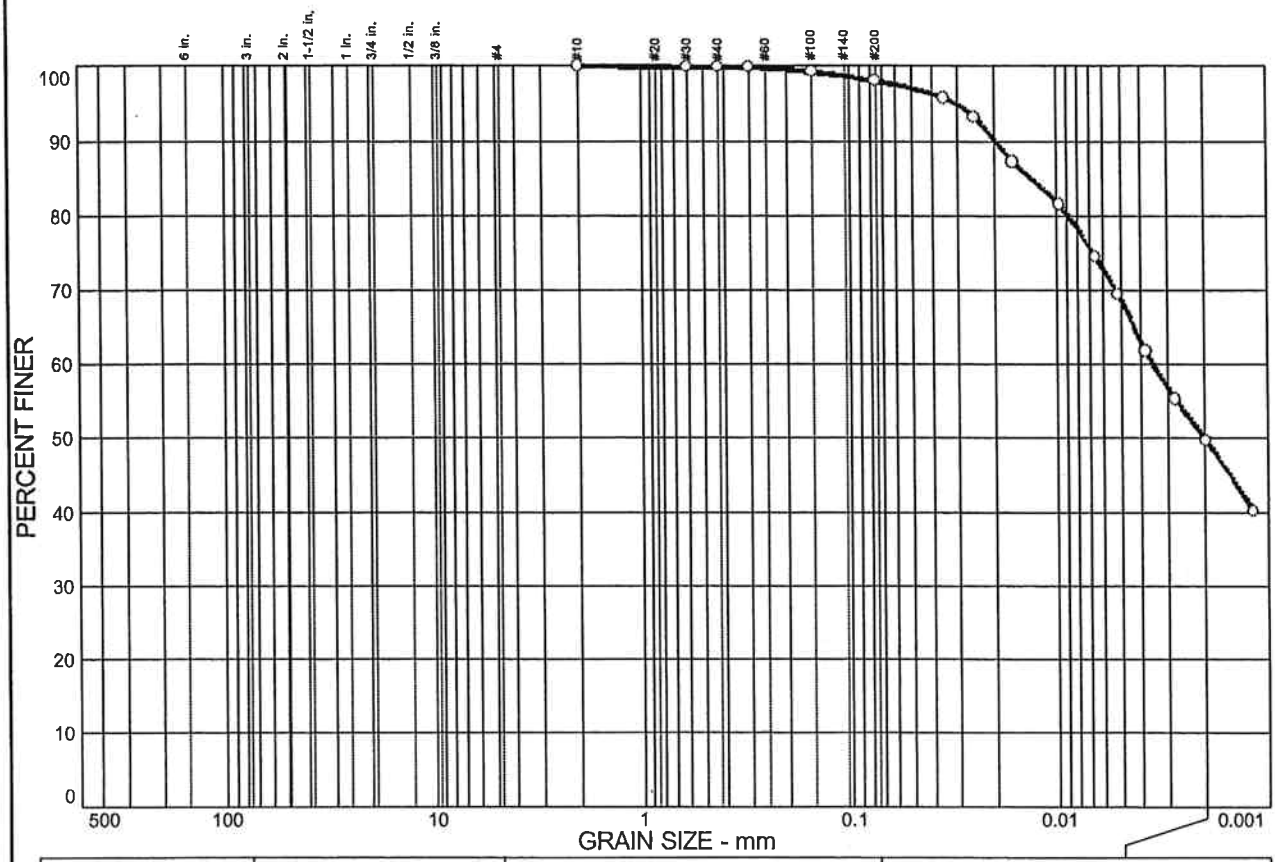
Remarks

Sample No.: 8 Source of Sample: RB-8 Date: 11/30/04
Location: Elev./Depth: 35.5

COOPER TESTING LABORATORY

Client: GeoLogic Associates
Project: Newby Island - 2004-049
Project No: 516-004 Figure

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.2	1.8	48.1	49.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#30	99.8		
#40	99.8		
#50	99.8		
#100	99.2		
#200	98.0		
0.0350 mm.	95.7		
0.0250 mm.	93.2		
0.0163 mm.	87.2		
0.0098 mm.	81.5		
0.0066 mm.	74.5		
0.0051 mm.	69.4		
0.0038 mm.	61.8		
0.0027 mm.	55.3		
0.0020 mm.	49.7		
0.0012 mm.	40.1		

* (no specification provided)

Soil Description

Brown Lean CLAY

Atterberg Limits

PL= 23 LL= 47 PI= 24

Coefficients

D_{85}= 0.0133 D_{60}= 0.0035 D_{50}= 0.0020
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

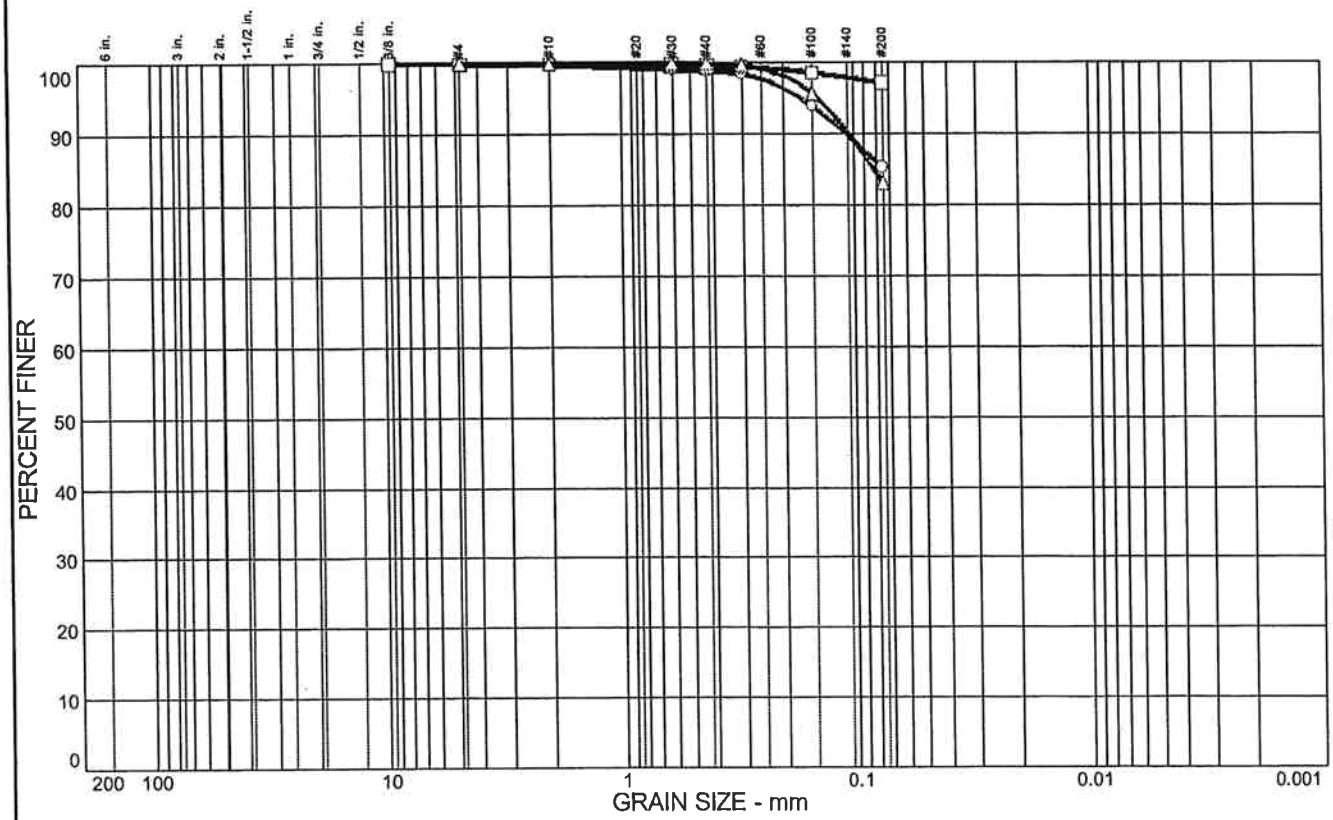
Remarks

Sample No.: 10/3 **Source of Sample:** RB-10, Sta. 30+00 **Date:** 9/19/05
Location: **Elev./Depth:** 33-35.5'

COOPER TESTING LABORATORY

Client: GeoLogic Associates
Project: Newby Island Landfill; Phase II Borings - 2004-049
Project No: 516-011 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○			14.8	85.2		CL		17	44
□		0.1	2.7	97.2		CL		23	48
△			16.9	83.1		CL		17	30

SIEVE inches size	PERCENT FINER ○	□	△
3/8		100.0	
GRAIN SIZE			
D_{60}			
D_{30}			
D_{10}			
COEFFICIENTS			
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	□	△
#4	100.0	99.9	100.0
#10	99.7	99.8	99.9
#30	99.0	99.7	99.9
#40	98.8	99.5	99.8
#50	98.4	99.4	99.7
#100	93.9	98.6	95.7
#200	85.2	97.2	83.1

SOIL DESCRIPTION

○ Brown Lean CLAY

□ Brown Lean CLAY

△ Brown Lean CLAY w/ Sand

REMARKS:

○

□

△

○ Source: RB-10, Sta. 30+00 — Sample No.: 10/4 — Elev./Depth: 44-46.5'

□ Source: RB-10, Sta. 30+00 — Sample No.: 10/5 — Elev./Depth: 53-55.5'

△ Source: RB-10Va, Sta. 30+00 — Sample No.: 10Va/1 — Elev./Depth: 61-63.5'

COOPER TESTING LABORATORY

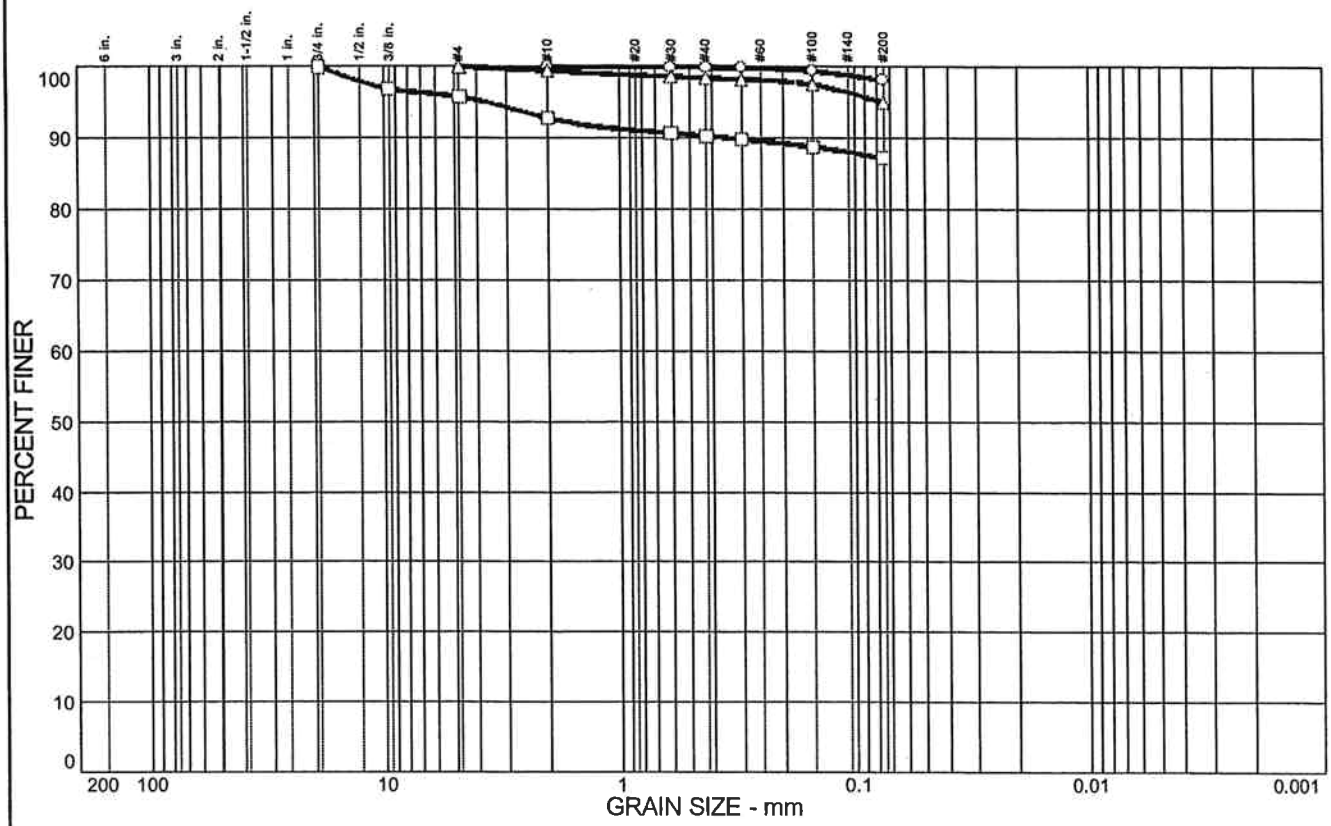
Client: GeoLogic Associates

Project: Newby Island Landfill; Phase II Borings - 2004-049

Project No.: 516-011

Figure

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○			1.9	98.1		CL		22	45
□		4.2	8.6	87.2		CL		21	44
△			5.0	95.0		CL		23	45

SIEVE inches size	PERCENT FINER ○	□	△
3/4		100.0	
3/8		96.9	
GRAIN SIZE			
D_{60}			
D_{30}			
D_{10}			
COEFFICIENTS			
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	□	△
#4		95.8	100.0
#10	100.0	92.8	99.4
#30	99.9	90.7	98.6
#40	99.9	90.3	98.4
#50	99.8	89.8	98.2
#100	99.4	88.8	97.5
#200	98.1	87.2	95.0

SOIL DESCRIPTION

○ Greenish Gray Lean CLAY

□ Brown Lean CLAY (with Claystone)

△ Gray Lean CLAY

REMARKS:

○

□

△

○ Source: RB-10Va, Sta. 30+00 Sample No.: 10Va/2 Elev./Depth: 95-97.5'

□ Source: RB-11V, Sta. 60+00 Sample No.: 11V/1 Elev./Depth: 45-47.5'

△ Source: RB-11V, Sta. 60+00 Sample No.: 11V/3 Elev./Depth: 85-87.5'

COOPER TESTING LABORATORY

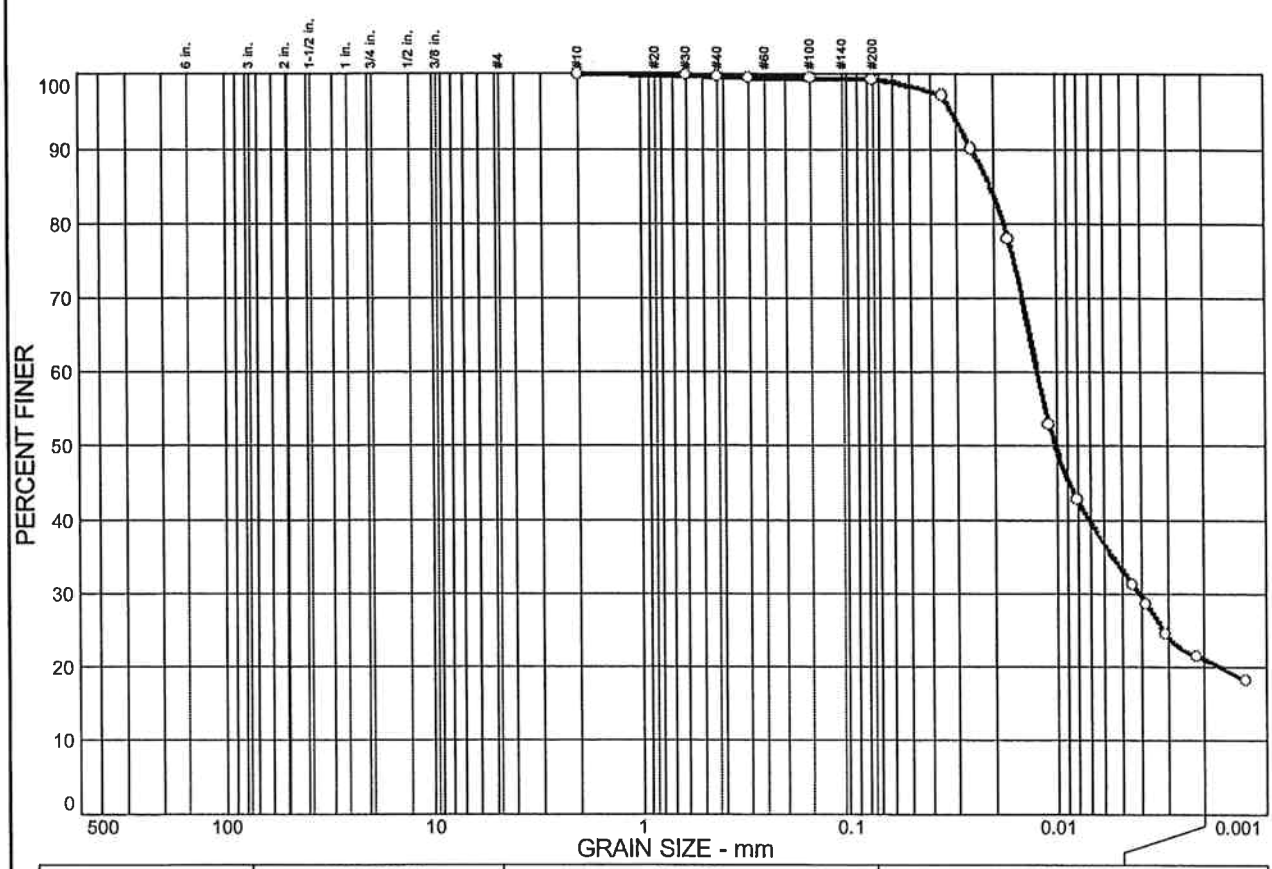
Client: GeoLogic Associates

Project: Newby Island Landfill; Phase II Borings - 2004-049

Project No.: 516-011

Figure

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.4	0.3	78.3	21.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#30	99.8		
#40	99.6		
#50	99.5		
#100	99.4		
#200	99.3		
0.0350 mm.	97.1		
0.0257 mm.	90.0		
0.0172 mm.	77.9		
0.0110 mm.	52.9		
0.0081 mm.	42.8		
0.0044 mm.	31.2		
0.0038 mm.	28.6		
0.0031 mm.	24.5		
0.0022 mm.	21.5		
0.0012 mm.	18.2		

* (no specification provided)

Soil Description

Brown Lean CLAY

Atterberg Limits

PL= 25 LL= 45 PI= 20

Coefficients

D_{85}= 0.0208 D_{60}= 0.0126 D_{50}= 0.0103
D_{30}= 0.0041 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

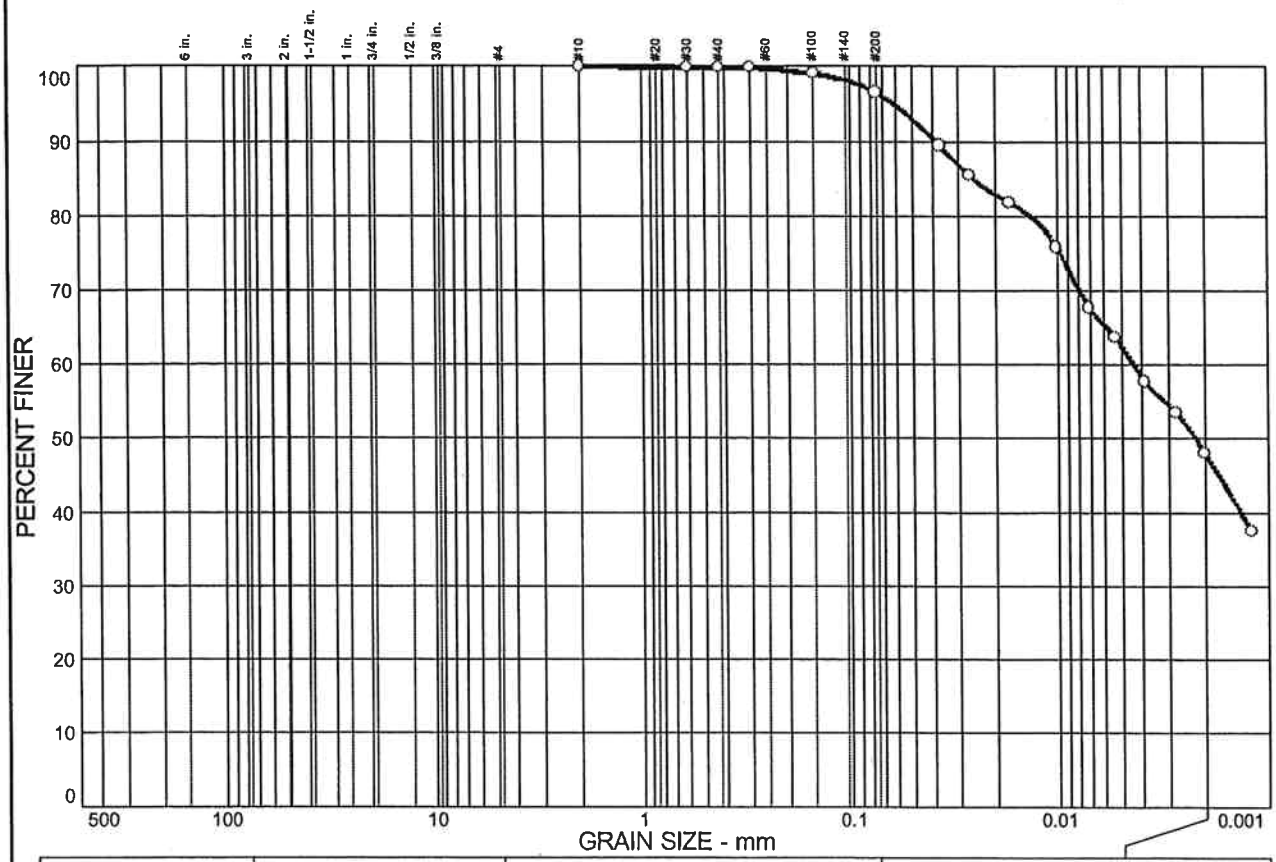
Remarks

Sample No.: 11V/2 **Source of Sample:** RB-11V, Sta. 60+00 **Date:** 9/19/05
Location: **Elev./Depth:** 71.5-74'

COOPER TESTING LABORATORY

Client: GeoLogic Associates
Project: Newby Island Landfill; Phase II Borings - 2004-049
Project No: 516-011 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.2	3.3	48.6	47.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#30	99.8		
#40	99.8		
#50	99.8		
#100	99.0		
#200	96.5		
0.0370 mm.	89.4		
0.0267 mm.	85.4		
0.0172 mm.	81.8		
0.0102 mm.	75.8		
0.0071 mm.	67.7		
0.0053 mm.	63.7		
0.0039 mm.	57.7		
0.0028 mm.	53.6		
0.0020 mm.	48.1		
0.0012 mm.	37.5		

* (no specification provided)

Soil Description

Gray Fat CLAY

Atterberg Limits

PL= 29 LL= 71 PI= 42

Coefficients

D_{85}= 0.0257 D_{60}= 0.0044 D_{50}= 0.0022
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CH AASHTO=

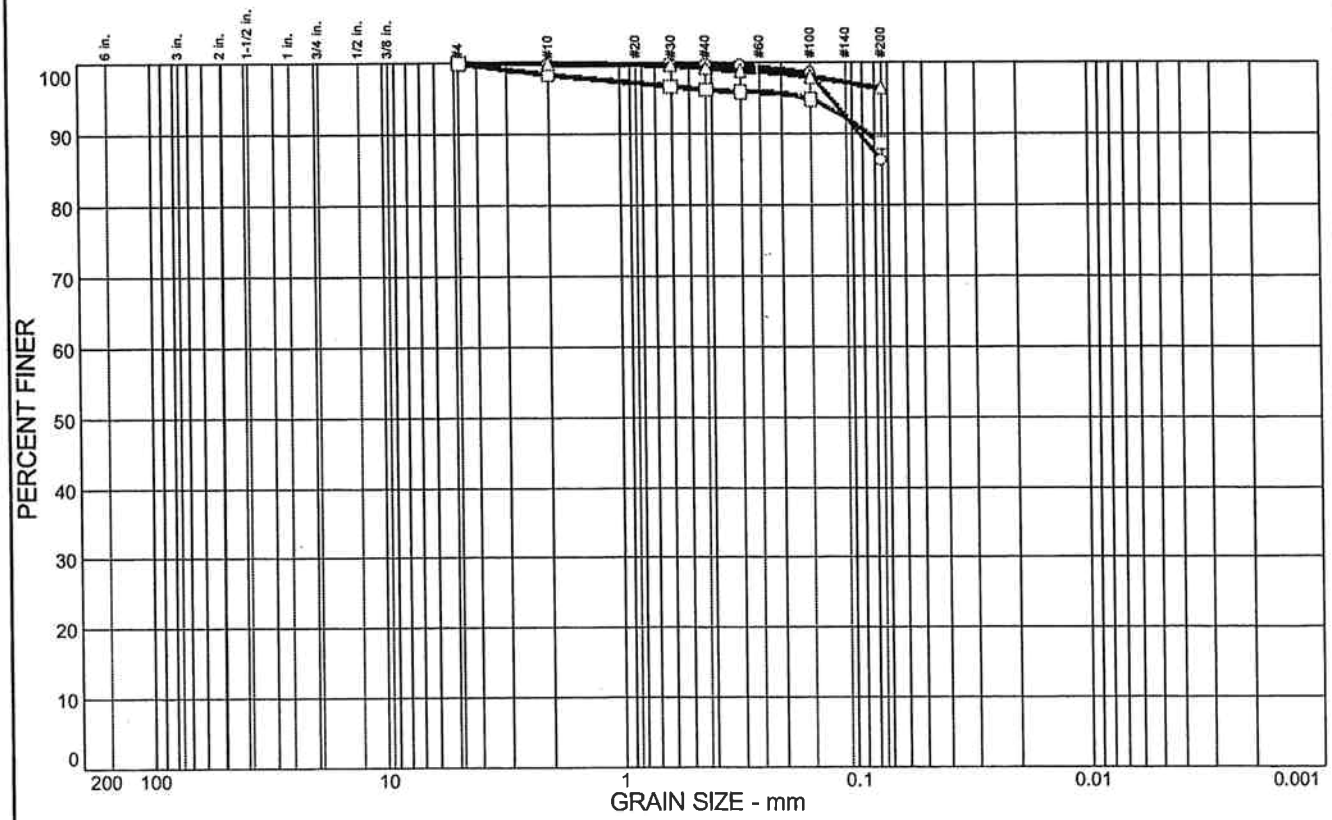
Remarks

Sample No.: 12Va/1 **Source of Sample:** RB-12Va, Sta. 125+00 **Date:** 9/26/05
Location: **Elev./Depth:** 29-31.5'

COOPER TESTING LABORATORY

Client: GeoLogic Associates
Project: Newby Island Landfill; Phase II Borings - 2004-049
Project No: 516-011 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○			13.8	86.2		CL-ML		21	25
□			11.3	88.7		ML		23	24
△			3.6	96.4					

SIEVE inches size	PERCENT FINER ○	□	△
GRAIN SIZE			
D_{60}			
D_{30}			
D_{10}			
COEFFICIENTS			
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	□	△
#4	100.0	100.0	
#10	99.9	98.4	100.0
#30	99.7	96.7	99.6
#40	99.6	96.2	99.2
#50	99.5	95.9	98.9
#100	98.5	94.8	98.0
#200	86.2	88.7	96.4

SOIL DESCRIPTION

○ Brown SILTY CLAY

□ Brown SILT

△ Gray CLAY

REMARKS:

○

□

△

○ Source: RB-12V, Sta. 125+00 Sample No.: 12V/1 Elev./Depth: 70-72.5'

□ Source: RB-12V, Sta. 125+00 Sample No.: 12V/2 Elev./Depth: 88-90.5'

△ Source: RB-12Va, Sta. 125+00 Sample No.: 12Va/2 Elev./Depth: 31.5-34'

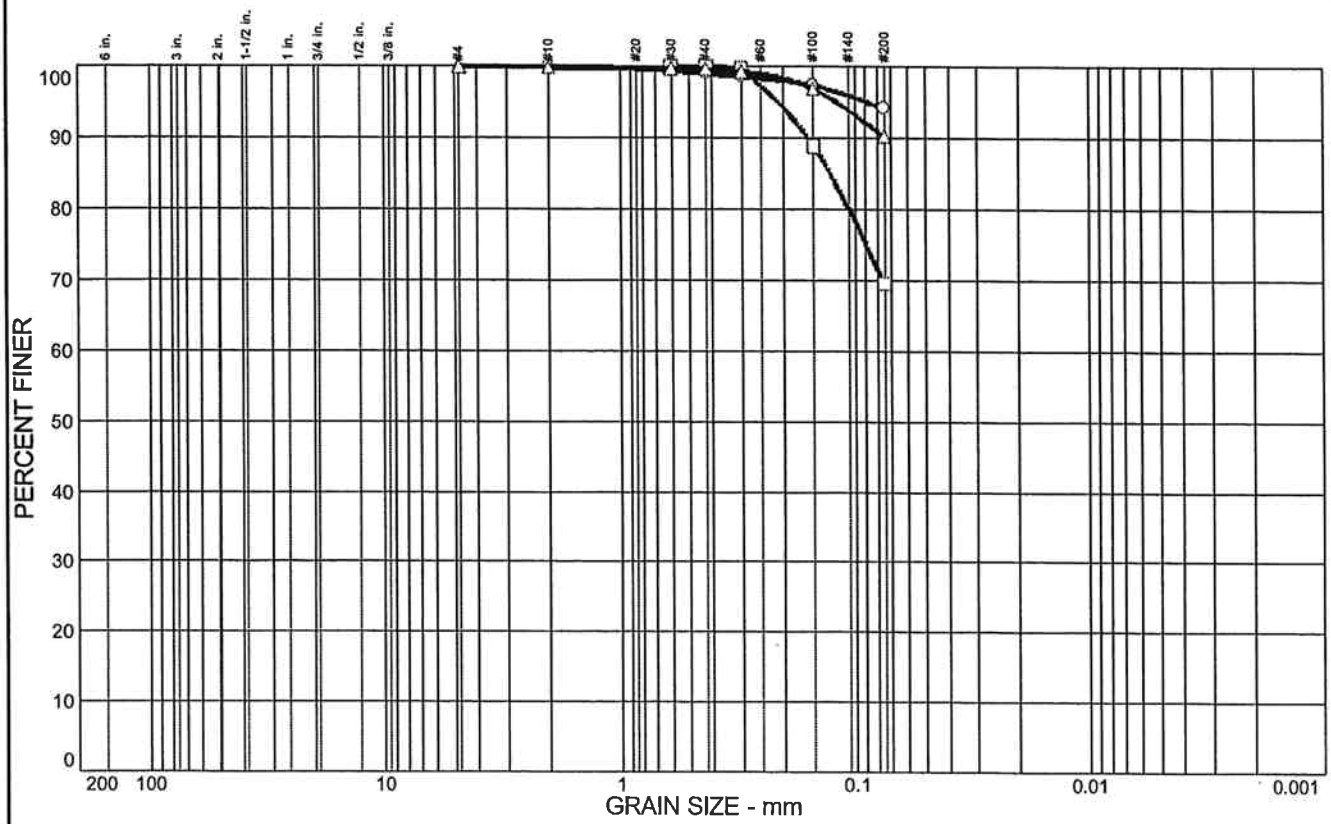
COOPER TESTING LABORATORY

Client: GeoLogic Associates

Project: Newby Island Landfill; Phase II Borings - 2004-049

Project No.: 516-011 Figure

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○			5.8	94.2					
□			30.4	69.6		CL		17	29
△			9.8	90.2		CL		19	42

SIEVE inches size	PERCENT FINER ○	□	△
GRAIN SIZE			
D_{60}			
D_{30}			
D_{10}			
COEFFICIENTS			
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	□	△
#4			100.0
#10	100.0		99.9
#30	99.4	100.0	99.7
#40	99.0	100.0	99.6
#50	98.6	99.7	99.3
#100	97.4	88.9	96.9
#200	94.2	69.6	90.2

SOIL DESCRIPTION

○ Gray CLAY, trace Sand

□ Brown Sandy Lean CLAY

△ Brown Lean CLAY

REMARKS:

○

□

△

○ Source: RB-12Va, Sta. 125+00 Sample No.: 12Va/3 Elev./Depth: 33-35.5'

□ Source: RB-12Va, Sta. 125+00 Sample No.: 12Va/4 Elev./Depth: 38.5-41'

△ Source: RB-12Va, Sta. 125+00 Sample No.: 12Va/5 Elev./Depth: 50-52.5'

COOPER TESTING LABORATORY

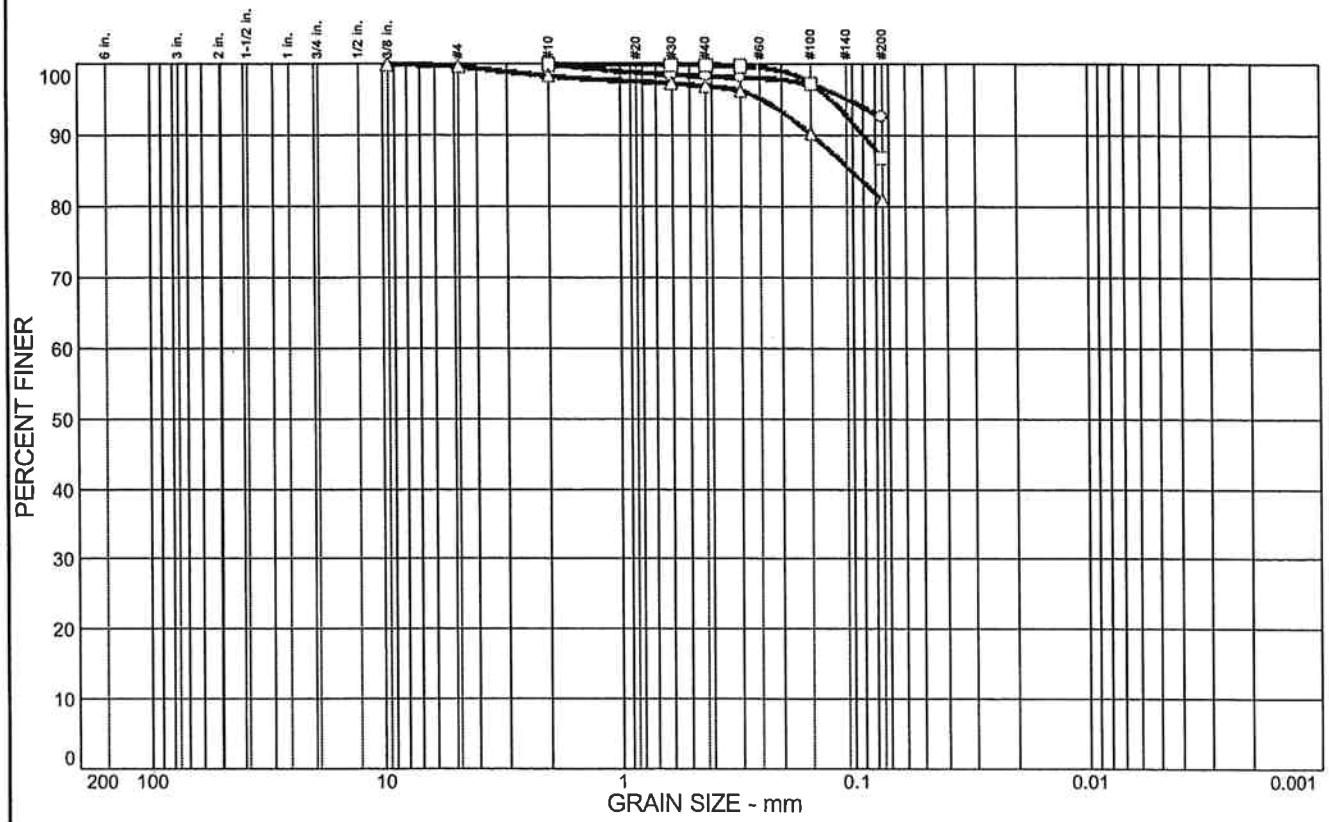
Client: GeoLogic Associates

Project: Newby Island Landfill; Phase II Borings - 2004-049

Project No.: 516-011

Figure

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○			7.4	92.6		CH		23	51
□			13.2	86.8					
△		0.4	18.7	80.9		CL		17	36

SIEVE inches size	PERCENT FINER ○	□	△
3/8			100.0
GRAIN SIZE			
D_{60}			
D_{30}			
D_{10}			
COEFFICIENTS			
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	□	△
#4			99.6
#10	100.0	100.0	98.3
#30	98.5	99.9	97.3
#40	98.3	99.9	96.9
#50	98.1	99.7	96.2
#100	97.1	97.3	90.2
#200	92.6	86.8	80.9

SOIL DESCRIPTION

○ Gray Fat CLAY

□ Brown CLAY, trace Sand

△ Brown & Gray Lean CLAY w/ Sand

REMARKS:

○

□

△

○ Source: RB-13V, Sta. 40+00 Sample No.: 13V/1 Elev./Depth: 22.5-25'

□ Source: RB-13V, Sta. 40+00 Sample No.: 13V/2 Elev./Depth: 31-33.5'

△ Source: RB-13V, Sta. 40+00 Sample No.: 13V/3 Elev./Depth: 45-47.5'

COOPER TESTING LABORATORY

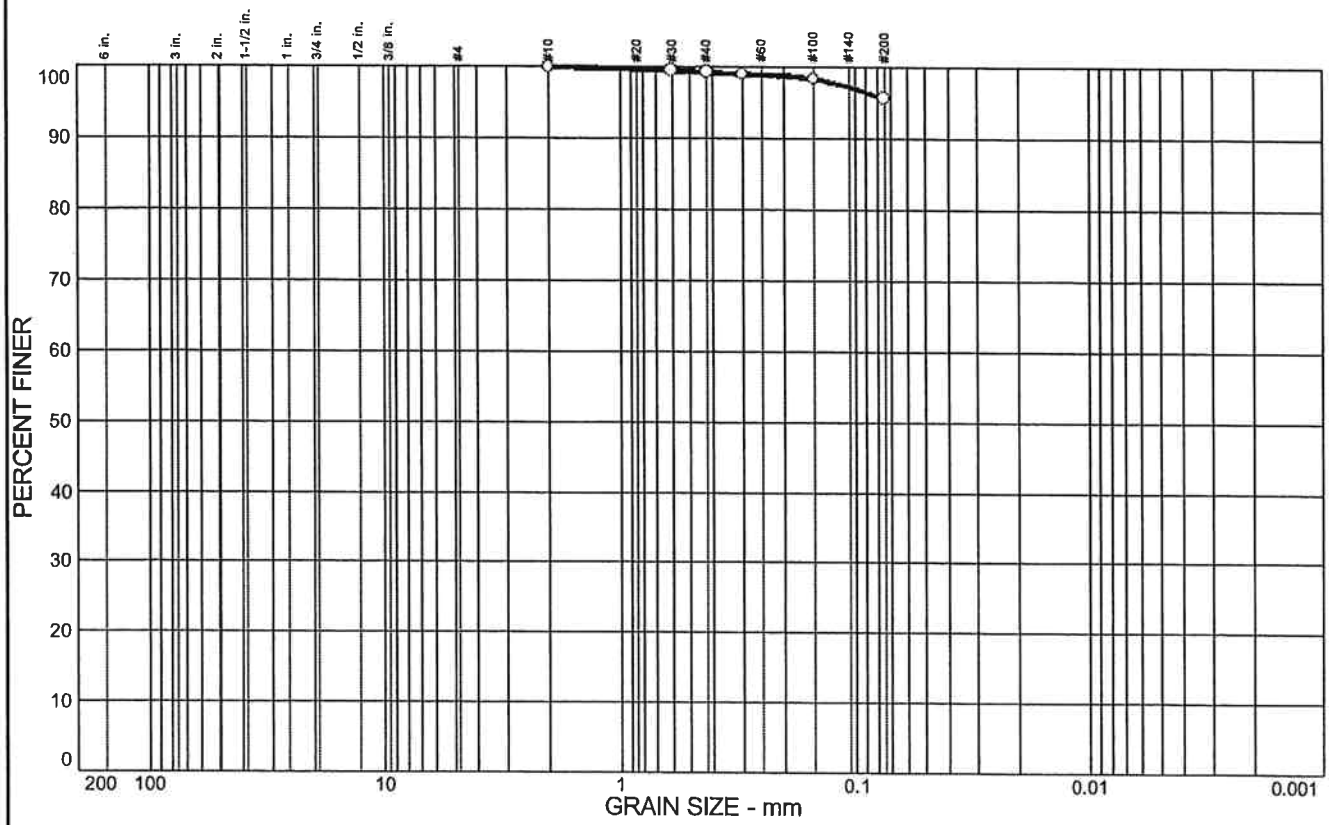
Client: GeoLogic Associates

Project: Newby Island Landfill; Phase II Borings - 2004-049

Project No.: 516-011

Figure

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○			4.3	95.7		CH		20	53

SIEVE Inches size	PERCENT FINER ○		
	GRAIN SIZE		
D_{60}			
D_{30}			
D_{10}			
	COEFFICIENTS		
C_C			
C_U			

SIEVE number size	PERCENT FINER ○		
#10	100.0		
#30	99.5		
#40	99.3		
#50	99.0		
#100	98.4		
#200	95.7		

SOIL DESCRIPTION

○ Brown Fat CLAY

REMARKS:

○

○ Source: LPZ-1, Sta. 106+50 Sample No.: LPZ-1/1 Elev./Depth: 94.5-97'

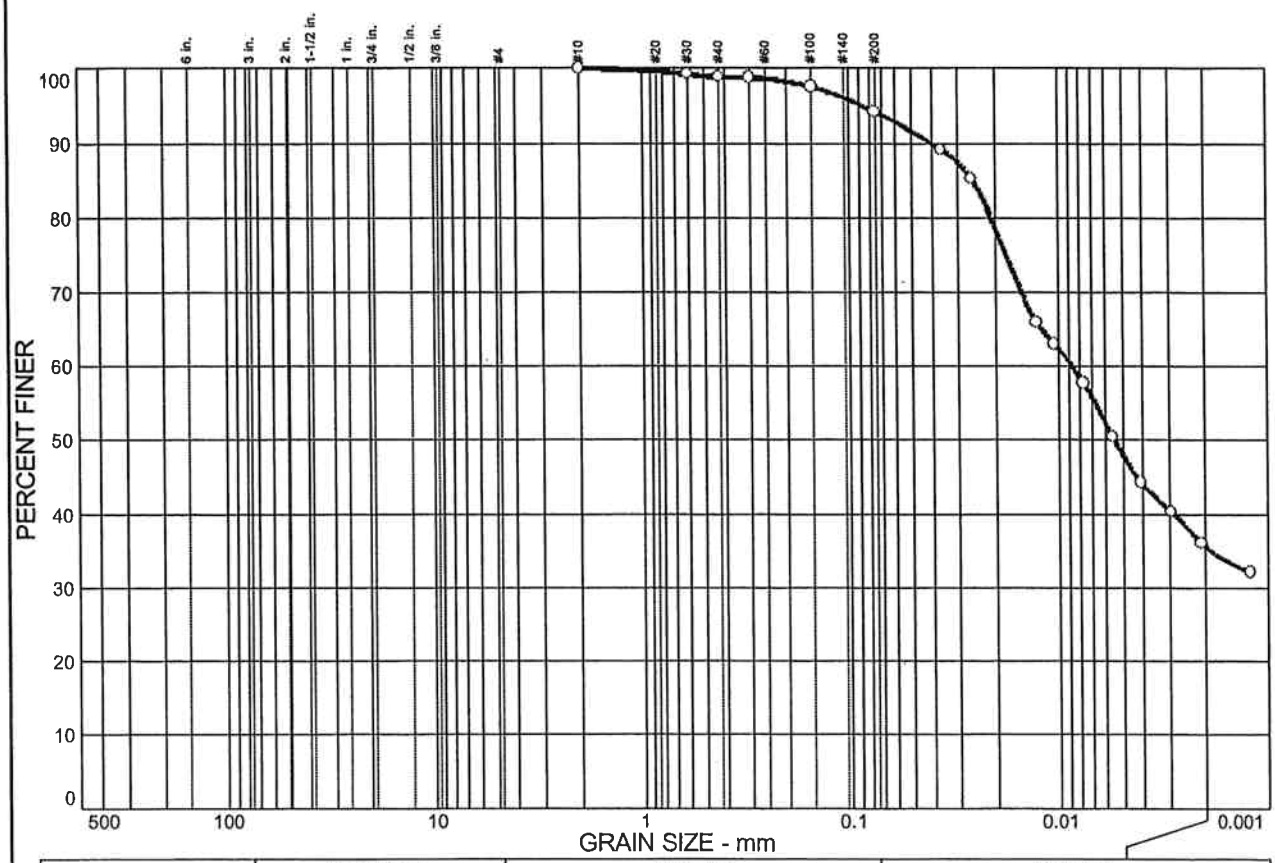
COOPER TESTING LABORATORY

Client: GeoLogic Associates

Project: Newby Island Landfill; Phase II Borings - 2004-049

Project No.: 516-011 Figure

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	1.2	4.6	58.7	35.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#30	99.2		
#40	98.8		
#50	98.7		
#100	97.5		
#200	94.2		
0.0361 mm.	89.1		
0.0260 mm.	85.2		
0.0127 mm.	65.9		
0.0105 mm.	63.0		
0.0077 mm.	57.7		
0.0056 mm.	50.5		
0.0041 mm.	44.3		
0.0029 mm.	40.4		
0.0021 mm.	36.1		
0.0012 mm.	32.1		

* (no specification provided)

Soil Description

Brown Lean CLAY

Atterberg Limits

PL= 21 LL= 43 PI= 22

Coefficients

D_{85}= 0.0258 D_{60}= 0.0087 D_{50}= 0.0055
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

Remarks

Sample No.: LPZ-2/1 **Source of Sample:** LPZ-2, Sta. 129+30 **Date:** 9/19/05
Location: **Elev./Depth:** 120-122.5'

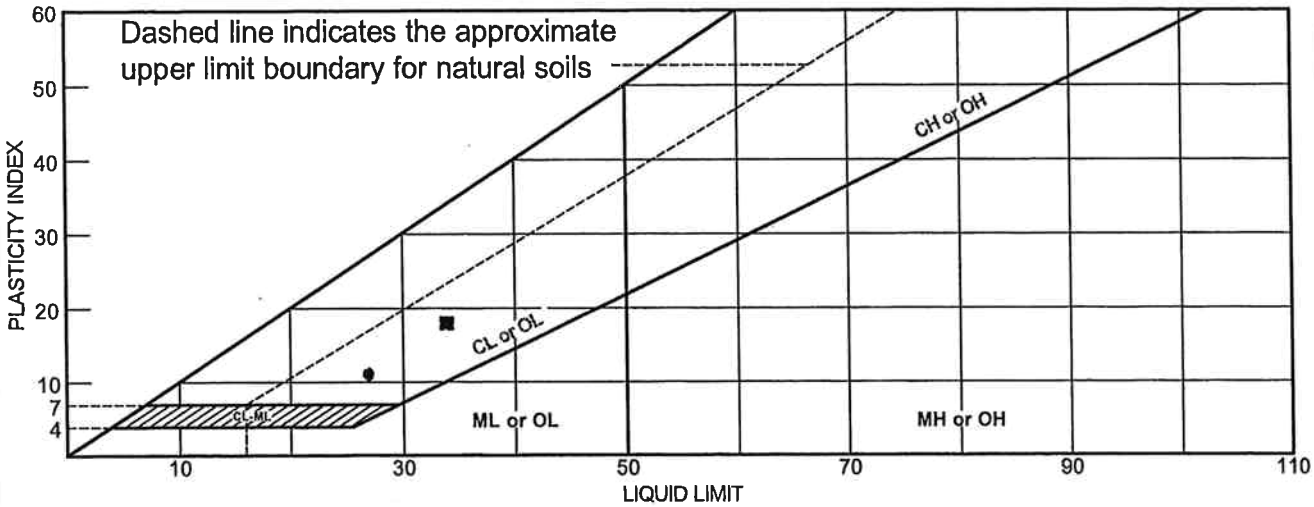
COOPER TESTING LABORATORY

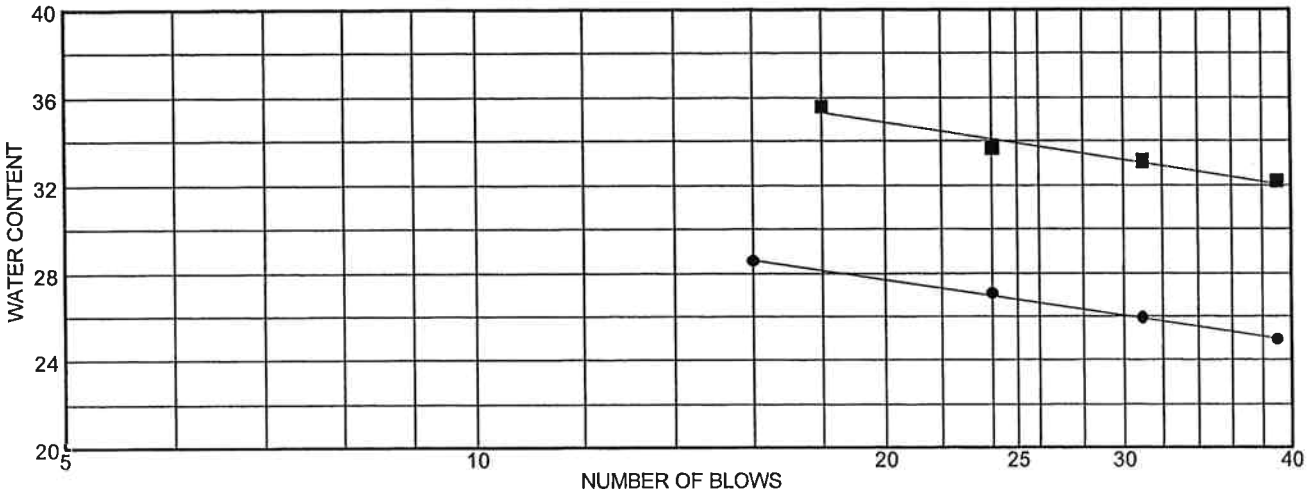
Client: GeoLogic Associates
Project: Newby Island Landfill; Phase II Borings - 2004-049
Project No: 516-011 **Figure**

LABORATORY DATA

- **Liquid and Plastic Limits Test**

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Brown Sandy Lean CLAY, trace nodules	27	16	11			
■	Brown Sandy Lean CLAY	34	16	18			

Project No. 516-008 **Client:** Geologic Associates

Project: Newby Island - 2004-049

● **Source:** RB-1 **Sample No.:** 10 **Elev./Depth:** 33

■ **Source:** RB-2 **Sample No.:** 9 **Elev./Depth:** 45

Remarks:

●

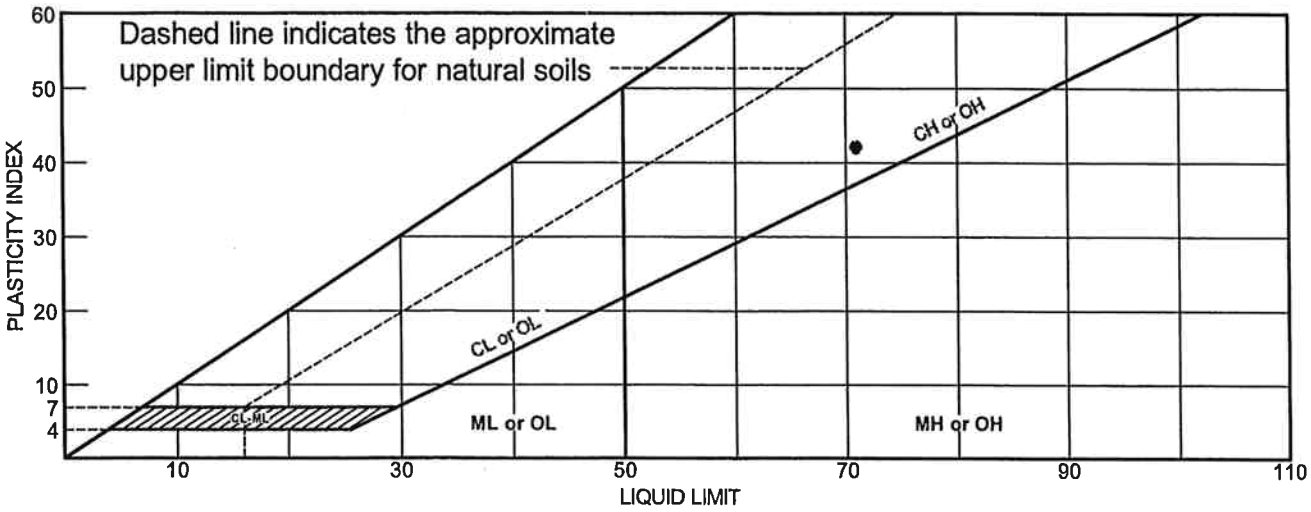
■

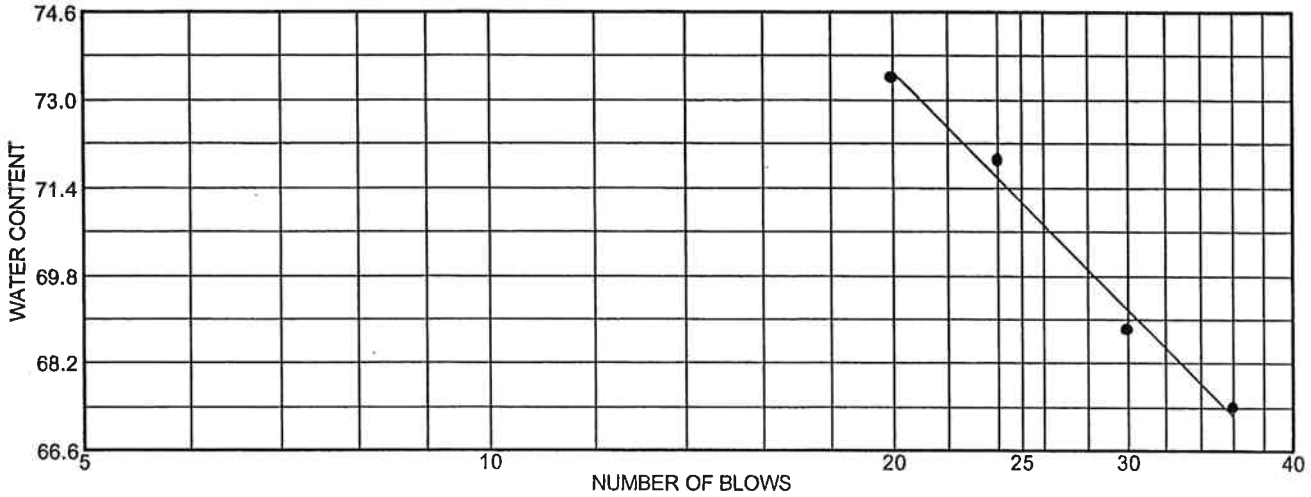
LIQUID AND PLASTIC LIMITS TEST REPORT

COOPER TESTING LABORATORY

Plate

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Gray Fat CLAY	71	29	42	99.8	96.5	CH

Project No. 516-011 **Client:** GeoLogic Associates

Project: Newby Island Landfill; Phase II Borings - 2004-049

● **Source:** RB-12Va, Sta. **Sample No.:** 12Va/1 **Elev./Depth:** 29-31.5'

Remarks:

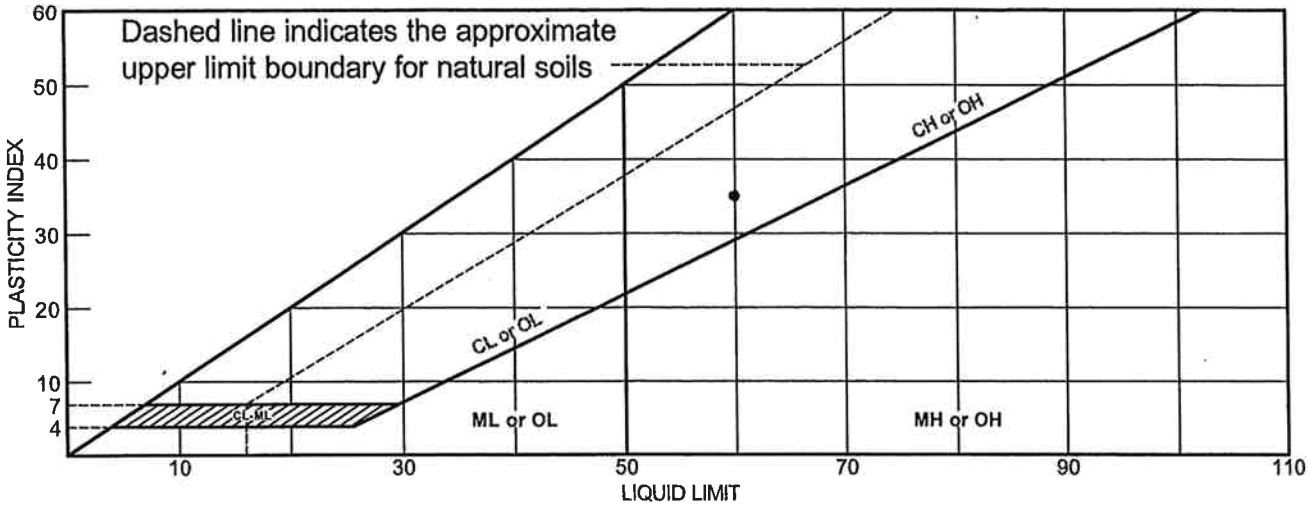
●

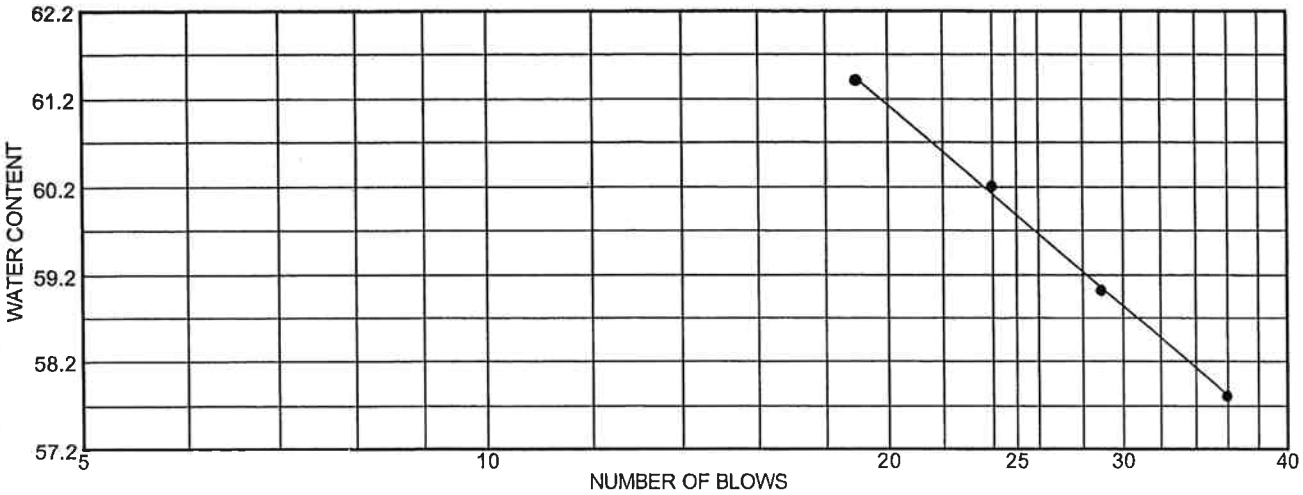
LIQUID AND PLASTIC LIMITS TEST REPORT

COOPER TESTING LABORATORY

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Gray Fat CLAY w/ Glass & Debris	60	25	35	99.2	96.4	CH

Project No. 516-012 **Client:** GeoLogic Associates

Project: Newby Island - 2004-049

● **Source:** RB-12Va, Sta. 25+00 **Sample No.:** 12Va/2 **Elev./Depth:** 31.5-34.0'

Remarks:

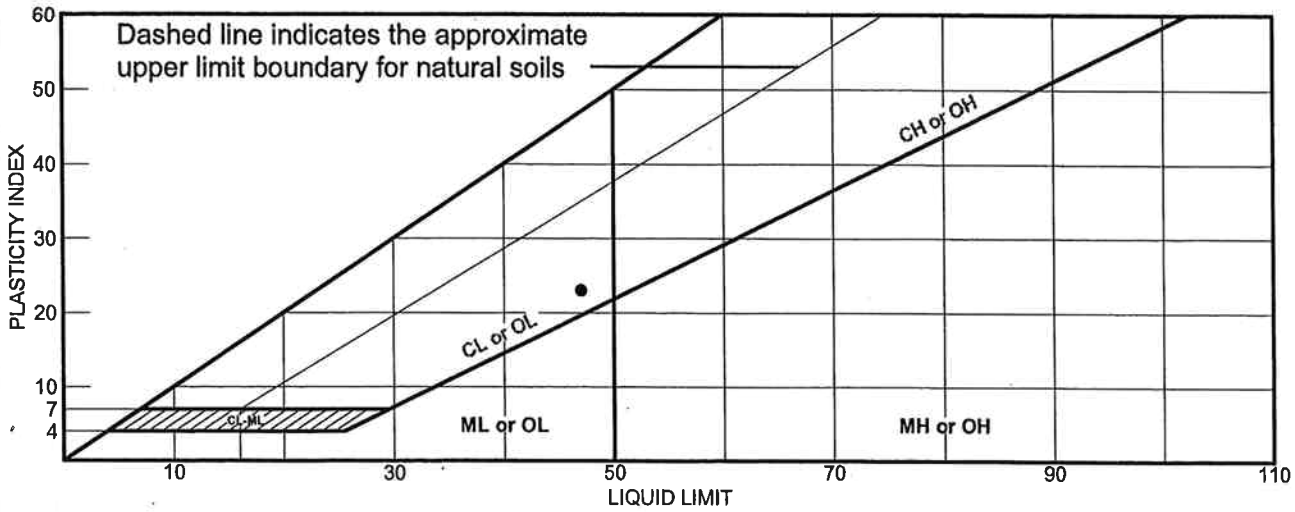
●

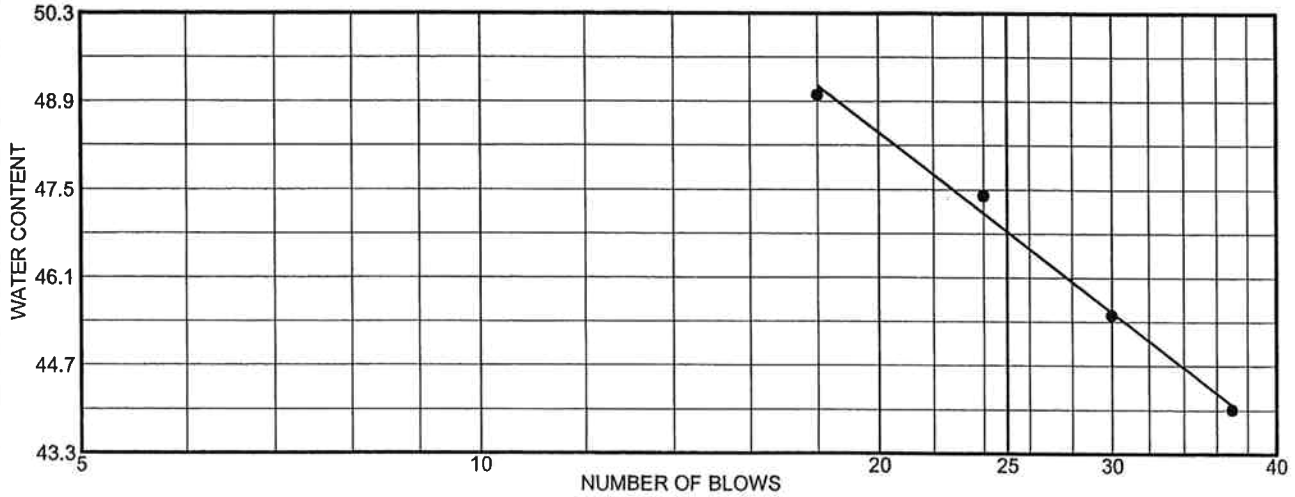
LIQUID AND PLASTIC LIMITS TEST REPORT

COOPER TESTING LABORATORY

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Dark Gray Lean CLAY	47	24	23	100.0	95.8	CL

Project No. 516-002 **Client:** GeoLogic Associates

Project: Newby Island - 2004-049

● **Source:** RB-8 **Sample No.:** 2 **Elev./Depth:** 10'

Remarks:

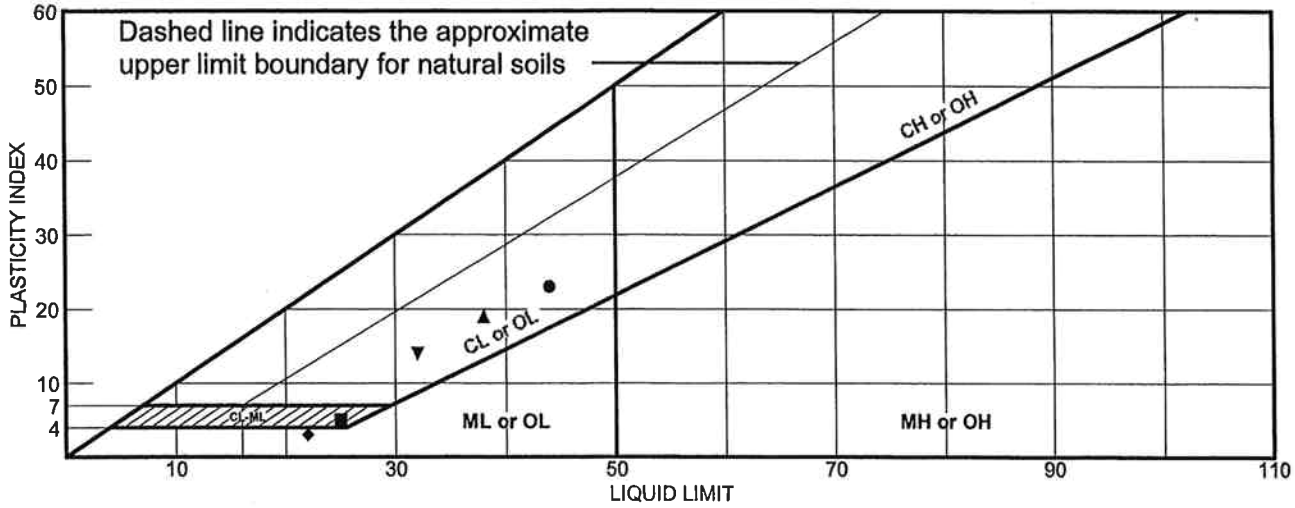
●

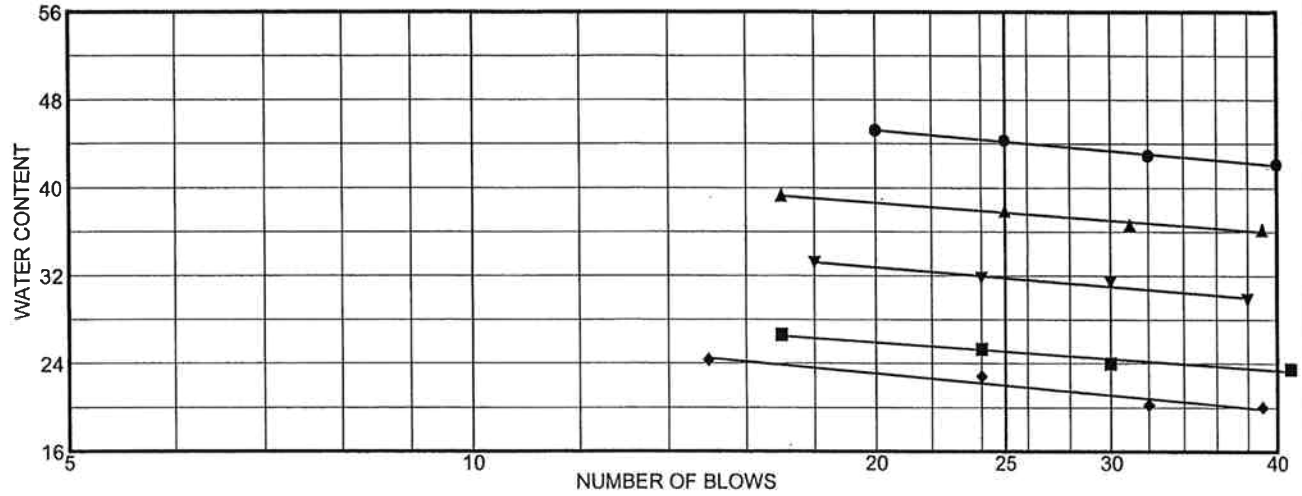
LIQUID AND PLASTIC LIMITS TEST REPORT

COOPER TESTING LABORATORY

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Brown Lean CLAY	44	21	23	99.6	96.1	CL
■	Brown Sandy CLAY (silty) grading to Silty CLAY with Sand	25	20	5	93.3	69.1	CL-ML
▲	Brown Lean CLAY	38	19	19	98.6	86.7	CL
◆	Brown Sandy SILT	22	19	3	99.8	55.5	ML
▼	Olive Gray Lean CLAY	32	18	14	97.4	89.3	CL

Project No. 516-003 **Client:** GeoLogic Associates

Project: Newby Island - 2004-049

●	**Source:** RB-1	**Sample No.:** 14	**Elev./Depth:** 44.5'
■	**Source:** RB-1	**Sample No.:** 15	**Elev./Depth:** 57.5'
▲	**Source:** RB-2	**Sample No.:** 2	**Elev./Depth:** 6.5'
◆	**Source:** RB-2	**Sample No.:** 11	**Elev./Depth:** 59'
▼	**Source:** RB-2	**Sample No.:** 15	**Elev./Depth:** 88'

Remarks:

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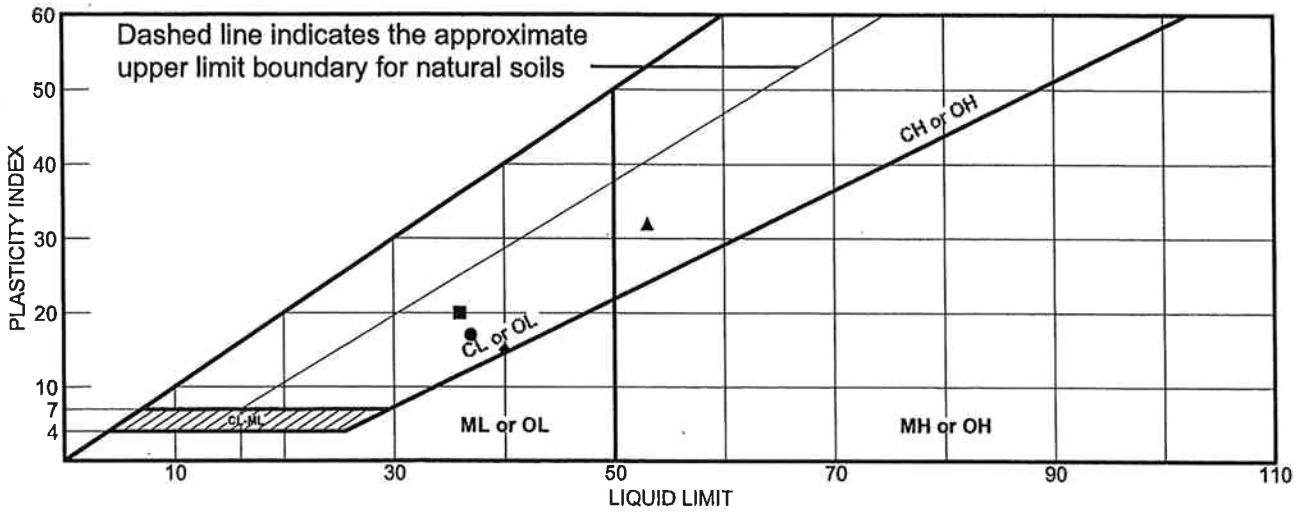
LIQUID AND PLASTIC LIMITS TEST REPORT

COOPER TESTING LABORATORY

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Gray Lean CLAY	37	20	17	98.0	86.7	CL
■	Brown Lean CLAY with Sand	36	16	20	99.1	79.8	CL
▲	Brown Fat CLAY	53	21	32	99.0	91.6	CH
◆	Olive Gray Lean CLAY	40	25	15	100.0	99.6	CL

Project No. 516-004 **Client:** GeoLogic Associates

Project: Newby Island - 2004-049

● **Source:** RB-6 **Sample No.:** 1 **Elev./Depth:** 31-32.5'

■ **Source:** RB-6 **Sample No.:** 4 **Elev./Depth:** 43.5'

▲ **Source:** RB-7 **Sample No.:** 3 **Elev./Depth:** 24.5'

◆ **Source:** RB-7 **Sample No.:** 9 **Elev./Depth:** 61.5'

Remarks:

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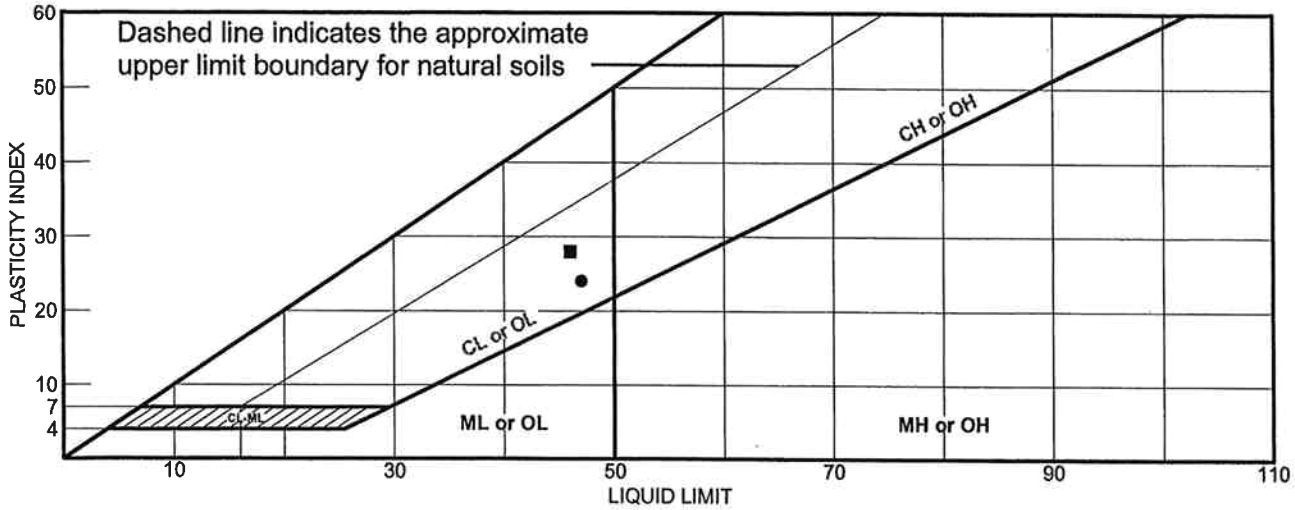
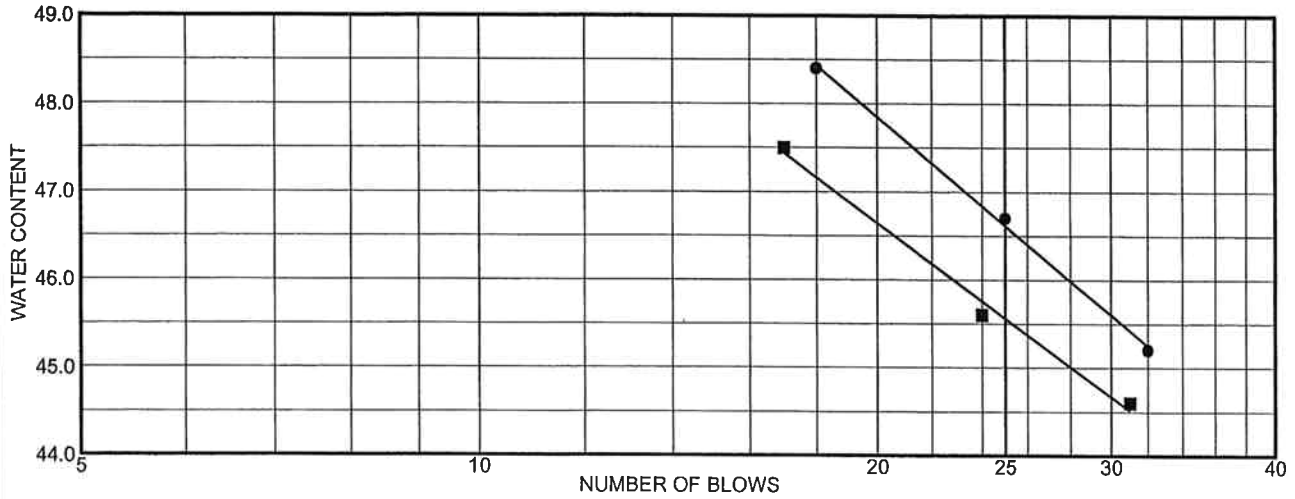
LIQUID AND PLASTIC LIMITS TEST REPORT

COOPER TESTING LABORATORY

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Brown Lean CLAY	47	23	24	98.3	92.5	CL
■	Brown Lean CLAY	46	18	28	99.6	94.6	CL

Project No. 516-004 **Client:** GeoLogic Associates

Project: Newby Island - 2004-049

● **Source:** RB-8 **Sample No.:** 1 **Elev./Depth:** 6.5'

■ **Source:** RB-8 **Sample No.:** 8 **Elev./Depth:** 35.5

Remarks:

●

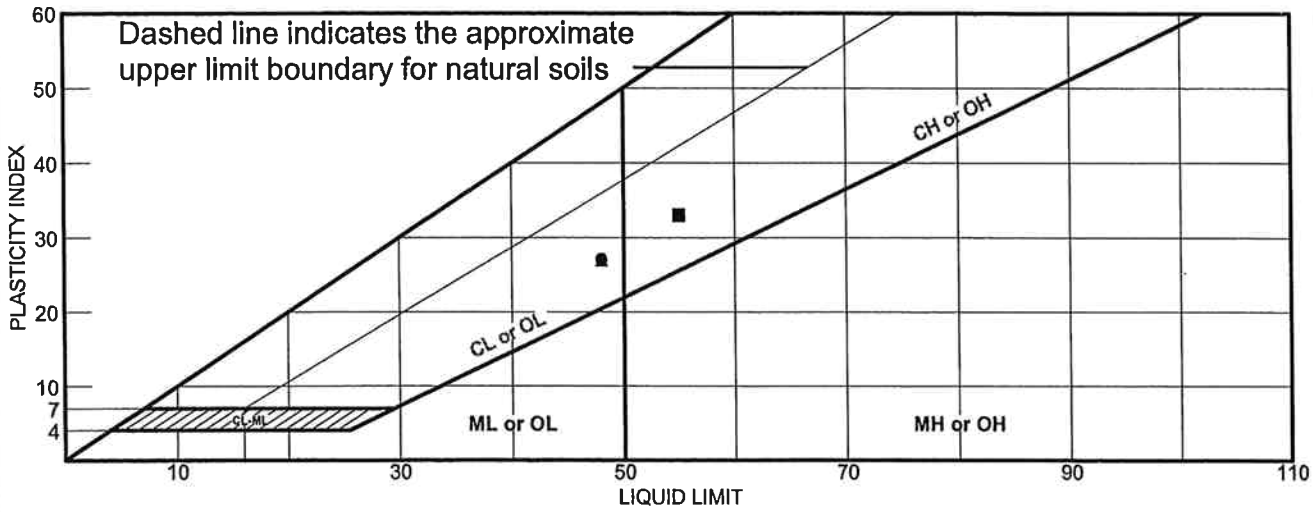
■

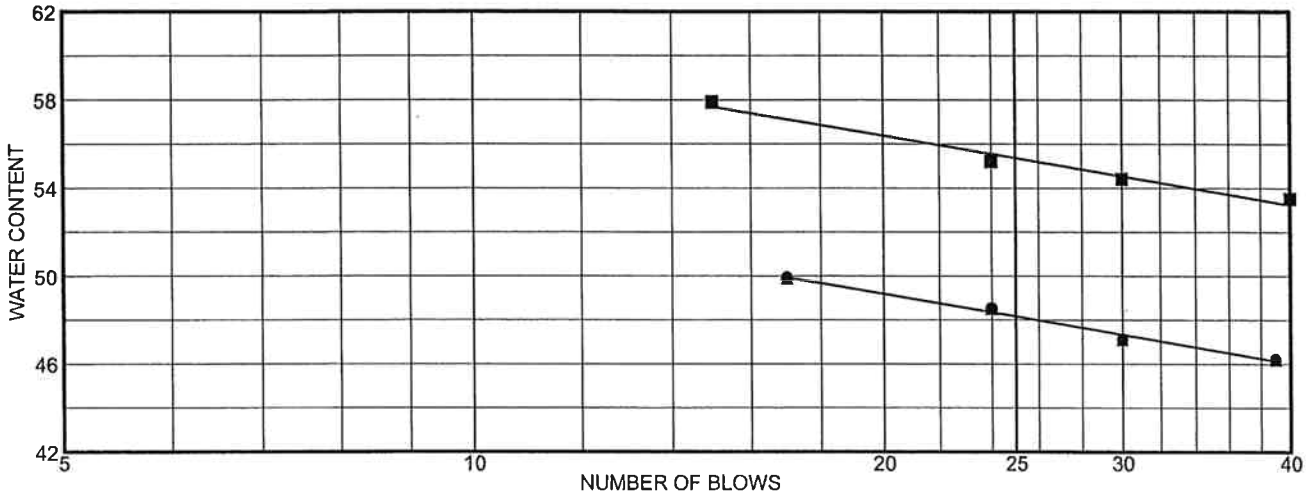
LIQUID AND PLASTIC LIMITS TEST REPORT

COOPER TESTING LABORATORY

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Brown Lean CLAY	48	21	27	99.4	95.0	CL
■	Gray Fat clay	55	22	33	98.4	97.5	CH
▲	Brown Lean CLAY	48	21	27	99.4	95.0	CL

Project No. 516-006 **Client:** GeoLogic Associates

Project: Newby Island - 2004-049

● **Source:** RB-4 **Sample No.:** 5 **Elev./Depth:** 48'

■ **Source:** RB-5 **Sample No.:** 1 **Elev./Depth:** 24'

▲ **Source:** RB-4 **Sample No.:** 5 **Elev./Depth:** 48'

Remarks:

●

■

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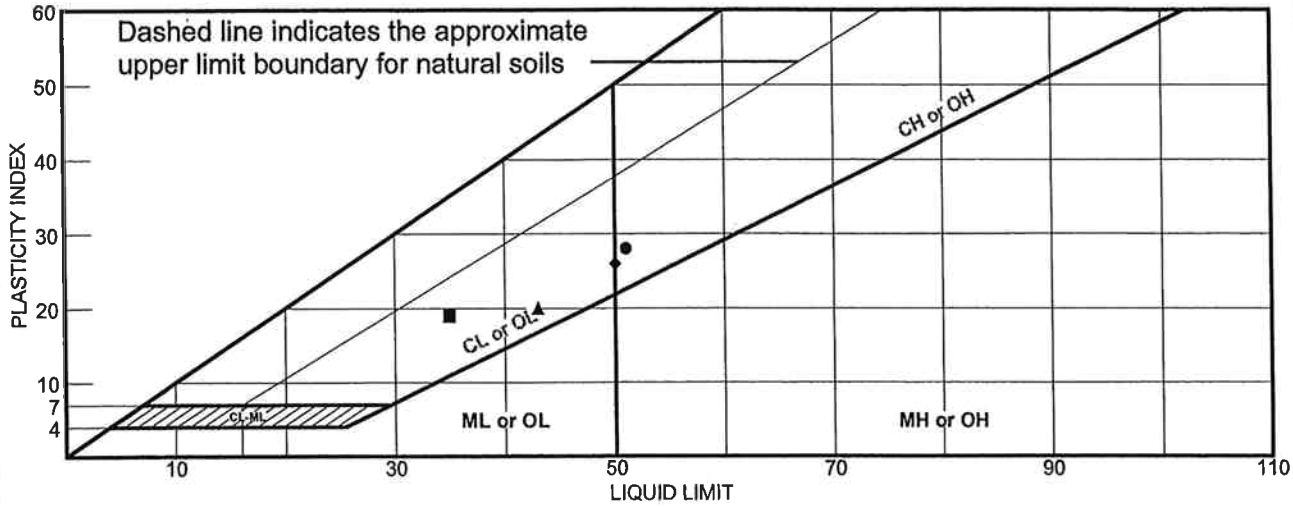
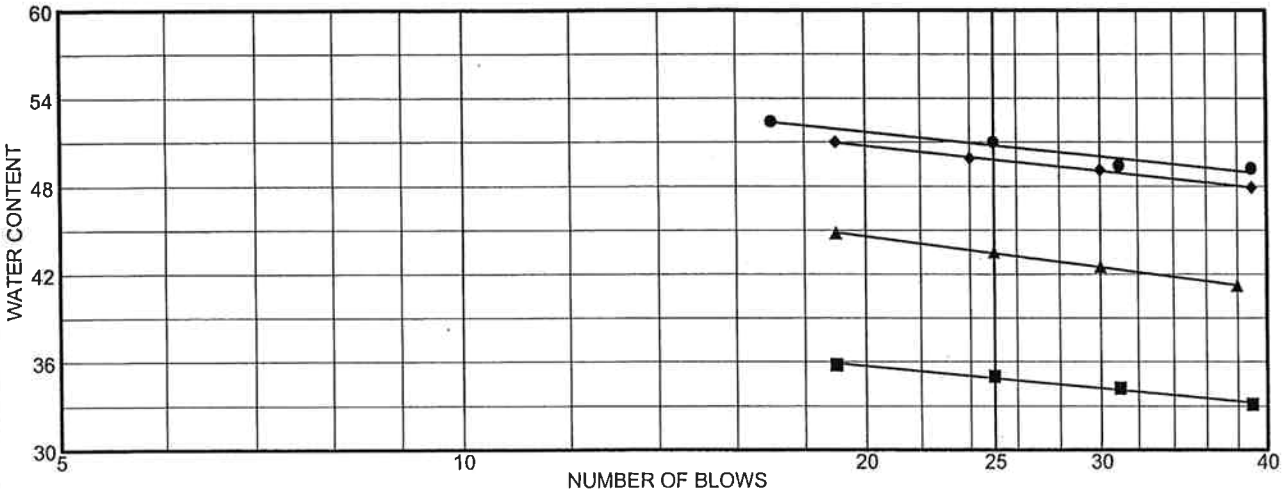
LIQUID AND PLASTIC LIMITS TEST REPORT

COOPER TESTING LABORATORY

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Gray Fat CLAY (bay mud)	51	23	28	100.0	93.3	CH
■	Brown Lean CLAY with Sand	35	16	19	99.8	74.5	CL
▲	Olive Brown Lean CLAY	43	23	20	99.8	96.9	CL
◆	Dark Gray Fat CLAY	50	24	26	99.8	88.1	CH

Project No. 516-002 **Client:** GeoLogic Associates

Project: Newby Island - 2004-049

● **Source:** RB-2A **Sample No.:** 1 **Elev./Depth:** 23'

■ **Source:** RB-2 **Sample No.:** 8 **Elev./Depth:** 35'

▲ **Source:** RB-2 **Sample No.:** 13 **Elev./Depth:** 75'

◆ **Source:** RB-8 **Sample No.:** 4 **Elev./Depth:** 22.5'

Remarks:

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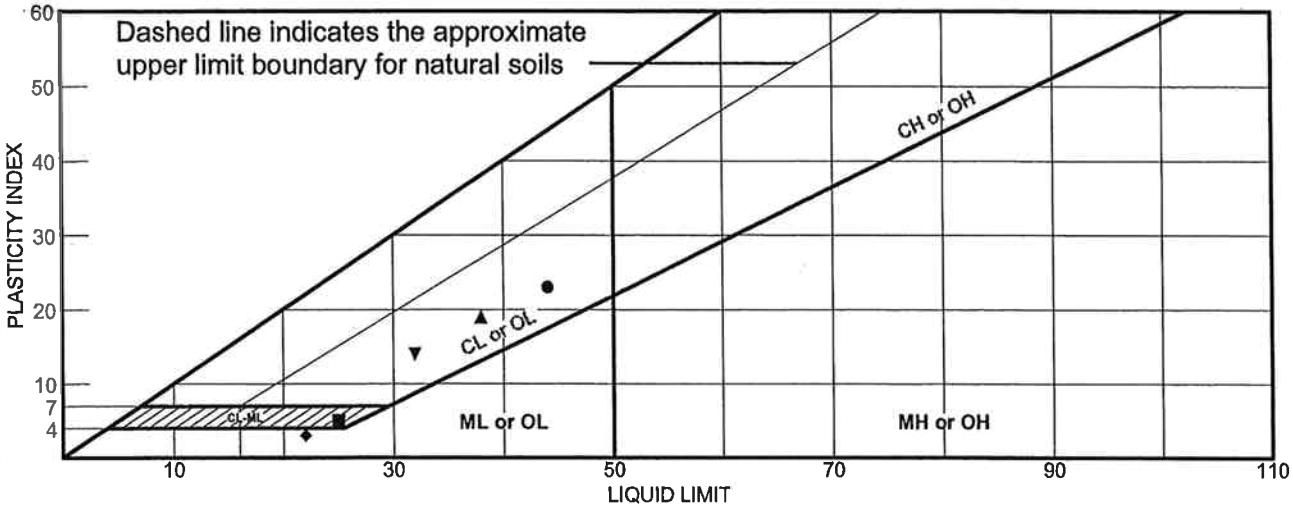
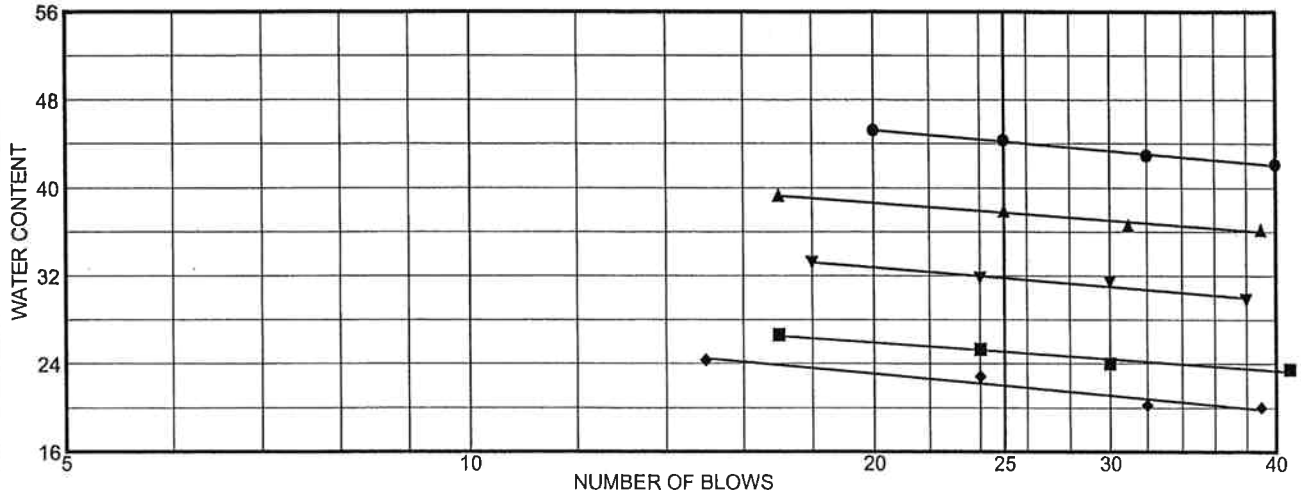
LIQUID AND PLASTIC LIMITS TEST REPORT

COOPER TESTING LABORATORY

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Brown Lean CLAY	44	21	23	99.6	96.1	CL
■	Brown Sandy Silty CLAY	25	20	5	93.3	69.1	CL-ML
▲	Brown Lean CLAY	38	19	19	98.6	86.7	CL
◆	Brown Sandy SILT	22	19	3	99.8	55.5	ML
▼	Olive Gray Lean CLAY	32	18	14	97.4	89.3	CL

Project No. 516-003 **Client:** GeoLogic Associates

Project: Newby Island - 2004-049

● **Source:** RB-1 **Sample No.:** 14 **Elev./Depth:** 44.5'

■ **Source:** RB-1 **Sample No.:** 15 **Elev./Depth:** 57.5'

▲ **Source:** RB-2 **Sample No.:** 2 **Elev./Depth:** 6.5'

◆ **Source:** RB-2 **Sample No.:** 11 **Elev./Depth:** 59'

▼ **Source:** RB-2 **Sample No.:** 15 **Elev./Depth:** 88'

Remarks:

●

■

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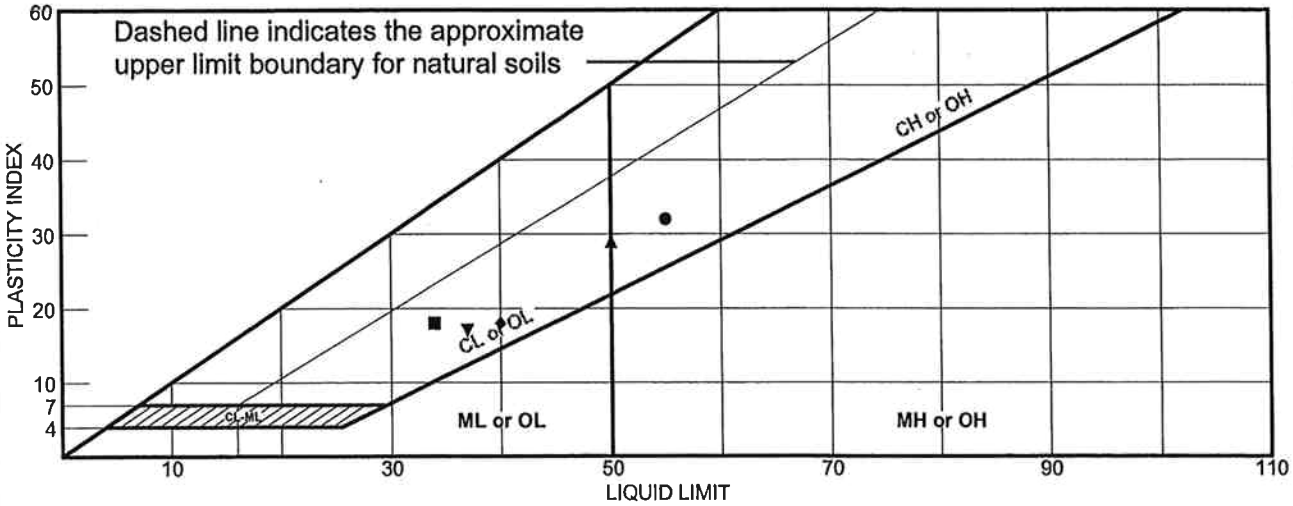
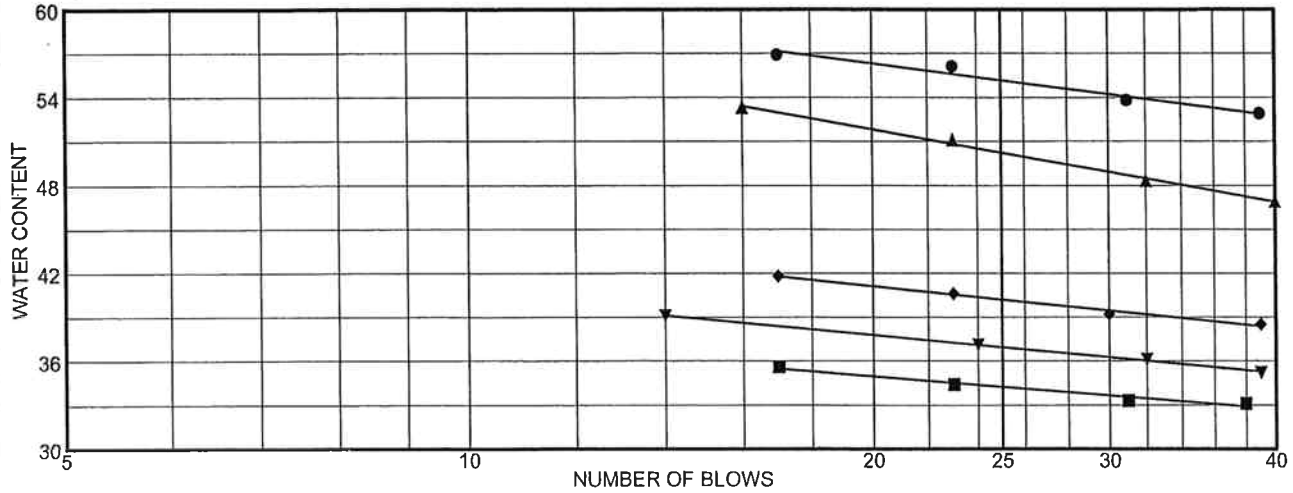
LIQUID AND PLASTIC LIMITS TEST REPORT

COOPER TESTING LABORATORY

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Brown Fat CLAY	55	23	32	99.3	97.8	CH
■	Brown Lean CLAY with Sand	34	16	18	99.8	82.4	CL
▲	Brown CLAY (silty)	50	21	29	99.6	94.8	
◆	Brown Lean CLAY	40	22	18	99.8	98.0	CL
▼	Brown Lean CLAY	37	20	17	99.4	93.4	CL

Project No. 516-003 **Client:** GeoLogic Associates

Project: Newby Island - 2004-049

●	**Source:** RB-4	**Sample No.:** 1	**Elev./Depth:** 30'
■	**Source:** RB-4	**Sample No.:** 3b	**Elev./Depth:** 40'
▲	**Source:** RB-4	**Sample No.:** 11	**Elev./Depth:** 62.5'
◆	**Source:** RB-4	**Sample No.:** 15	**Elev./Depth:** 85'
▼	**Source:** RB-5	**Sample No.:** 3	**Elev./Depth:** 35.5'

Remarks:

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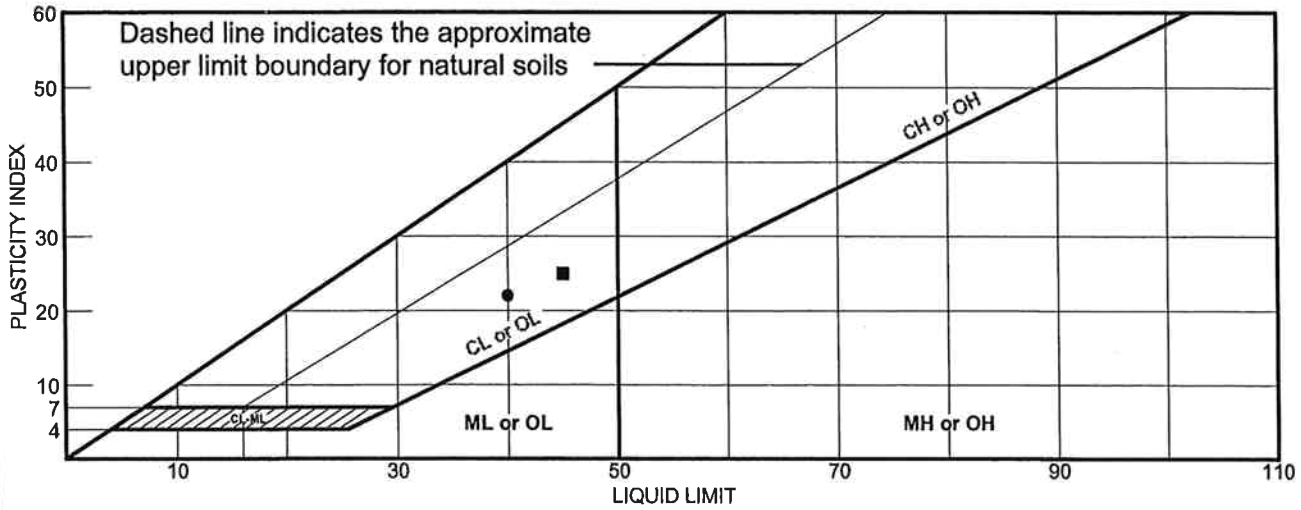
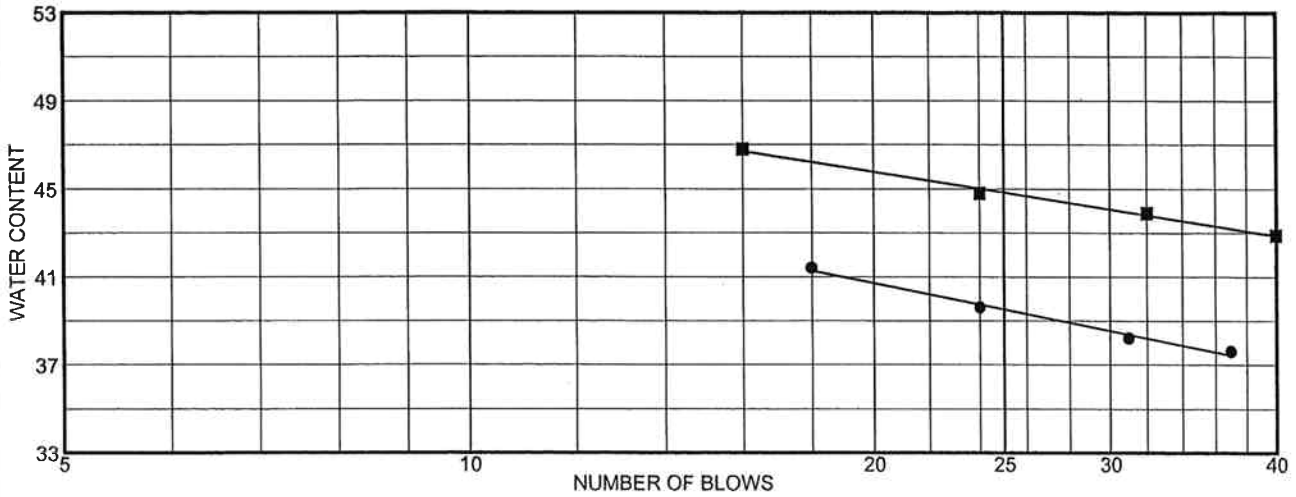
LIQUID AND PLASTIC LIMITS TEST REPORT

COOPER TESTING LABORATORY

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Brown Lean CLAY	40	18	22	99.6	90.3	CL
■	Olive Gray Lean CLAY	45	20	25	99.4	96.5	CL

Project No. 516-003 **Client:** GeoLogic Associates

Project: Newby Island - 2004-049

● **Source:** RB-5 **Sample No.:** 7 **Elev./Depth:** 55.5'

■ **Source:** RB-5 **Sample No.:** 18 **Elev./Depth:** 90.5'

Remarks:

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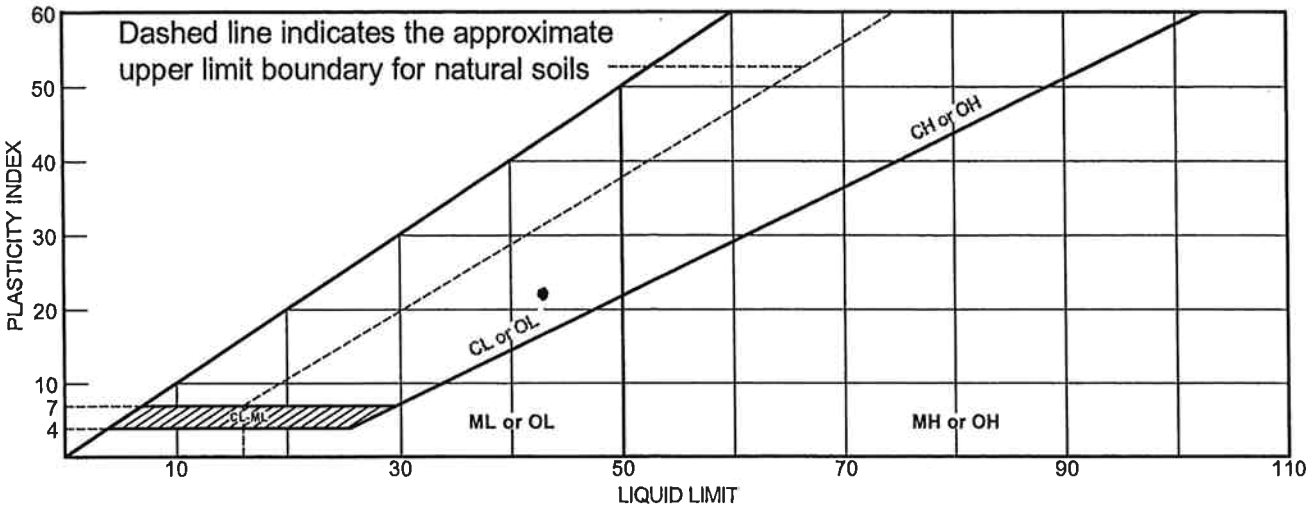
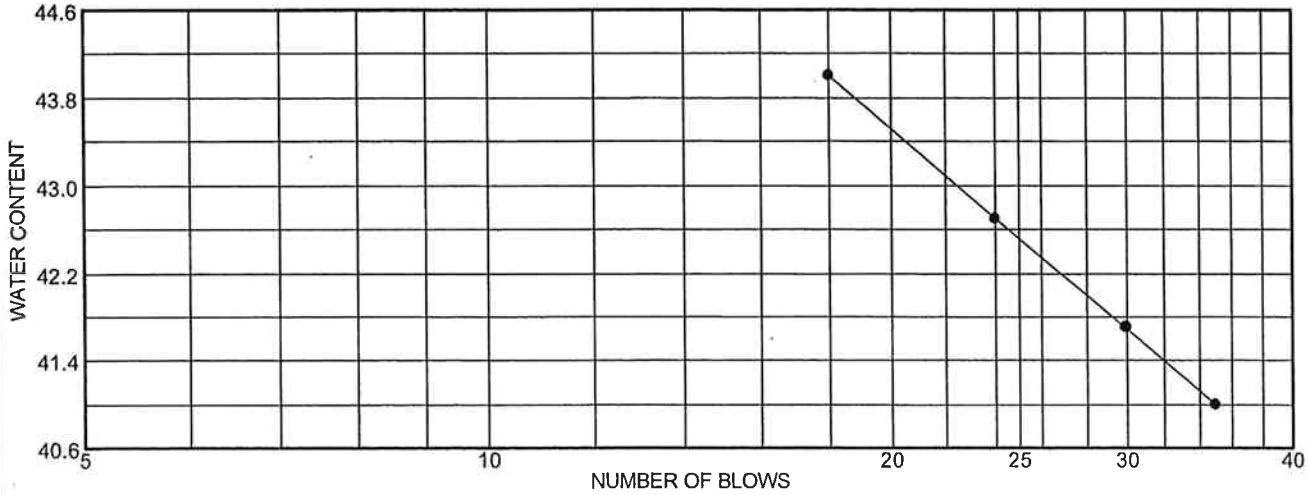
LIQUID AND PLASTIC LIMITS TEST REPORT

COOPER TESTING LABORATORY

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Brown Lean CLAY	43	21	22	98.8	94.2	CL

Project No. 516-011 **Client:** GeoLogic Associates

Project: Newby Island Landfill; Phase II Borings - 2004-049

● **Source:** LPZ-2, Sta. 129+30 **Sample No.:** LPZ-2/1 **Elev./Depth:** 120-122.5'

Remarks:

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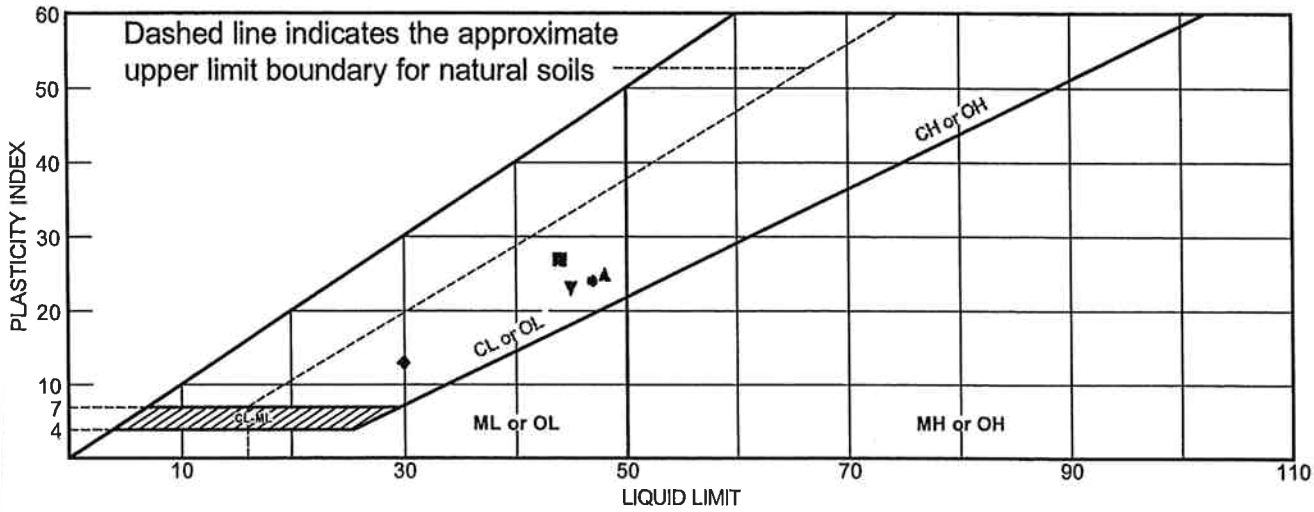
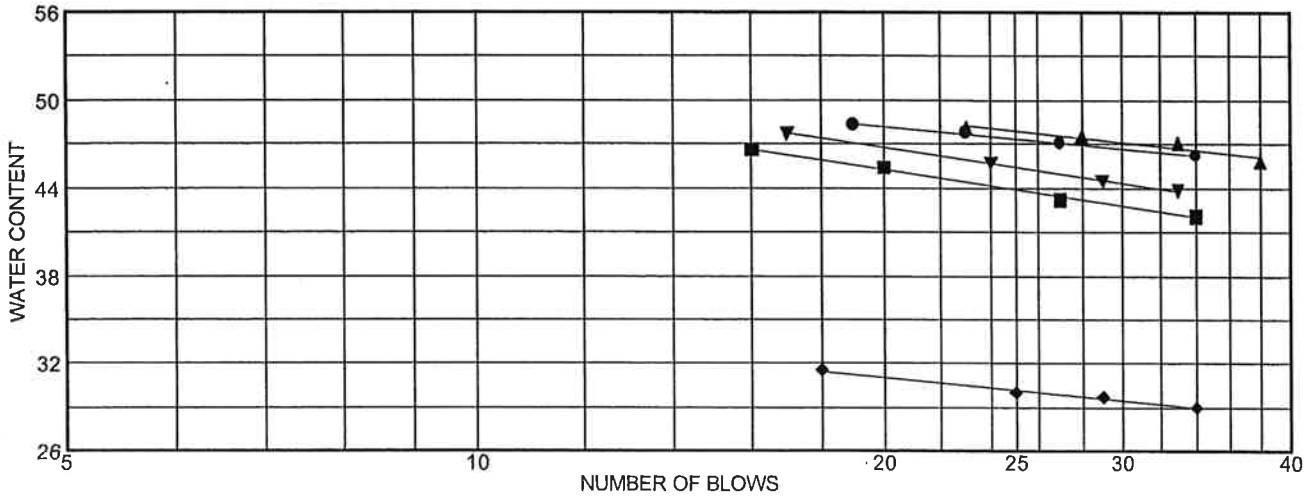
LIQUID AND PLASTIC LIMITS TEST REPORT

COOPER TESTING LABORATORY

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Brown Lean CLAY	47	23	24	99.8	98.0	CL
■	Brown Lean CLAY	44	17	27	98.8	85.2	CL
▲	Brown Lean CLAY	48	23	25	99.5	97.2	CL
◆	Brown Lean CLAY w/ Sand	30	17	13	99.8	83.1	CL
▼	Greenish Gray Lean CLAY	45	22	23	99.9	98.1	CL

Project No. 516-011 **Client:** GeoLogic Associates

Project: Newby Island Landfill; Phase II Borings - 2004-049

● **Source:** RB-10, Sta. 30+00 **Sample No.:** 10/3 **Elev./Depth:** 33-35.5'
■ **Source:** RB-10, Sta. 30+00 **Sample No.:** 10/4 **Elev./Depth:** 44-46.5'
▲ **Source:** RB-10, Sta. 30+00 **Sample No.:** 10/5 **Elev./Depth:** 53-55.5'
◆ **Source:** RB-10Va, Sta. 30+00 **Sample No.:** 10Va/1 **Elev./Depth:** 61-63.5'
▼ **Source:** RB-10Va, Sta. 30+00 **Sample No.:** 10Va/2 **Elev./Depth:** 95-97.5'

Remarks:
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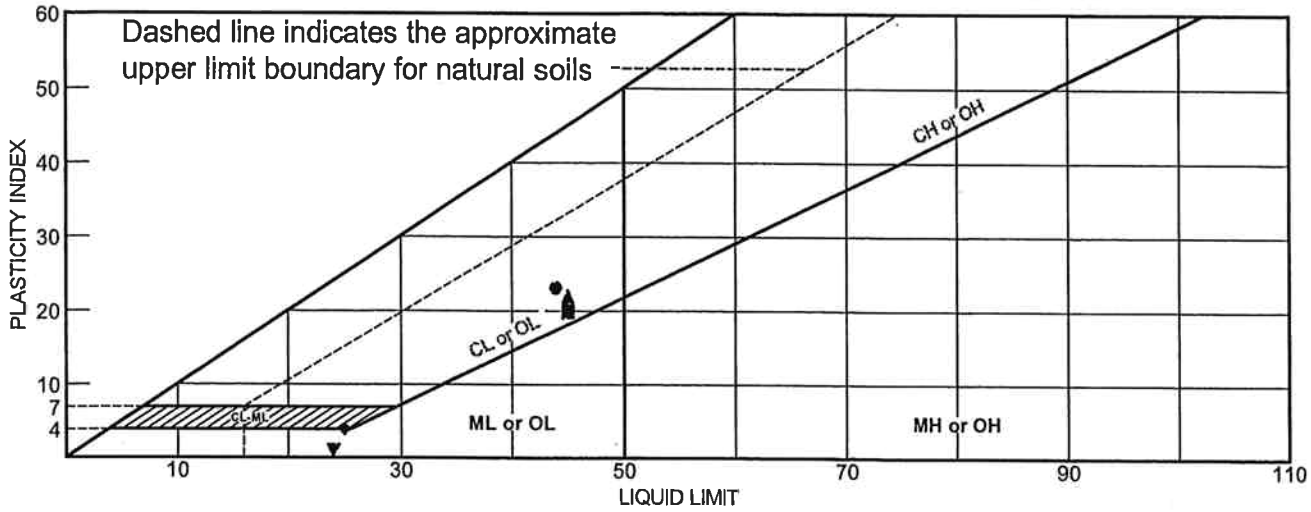
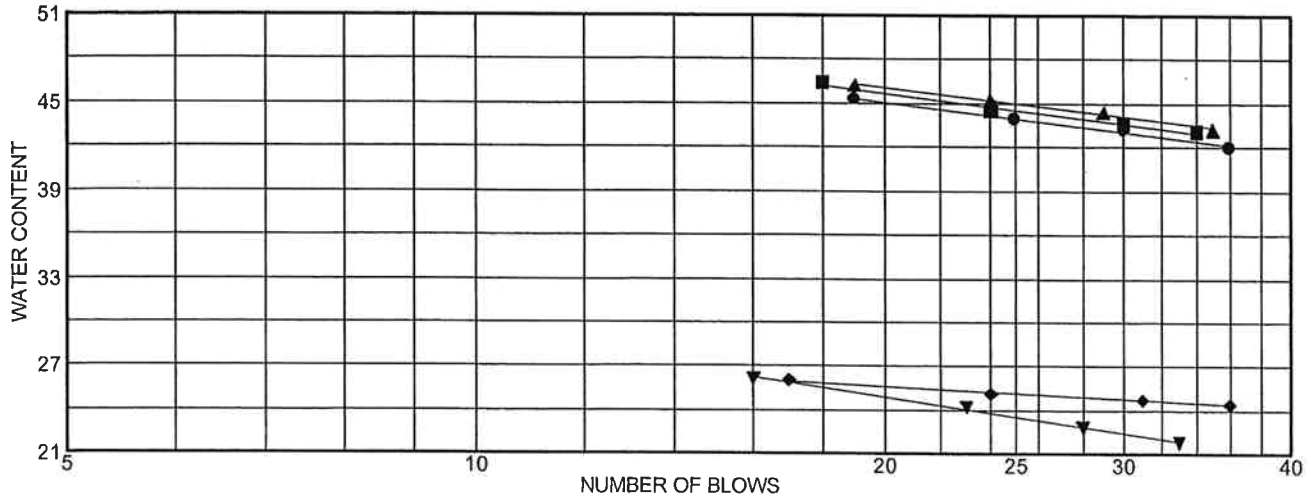
LIQUID AND PLASTIC LIMITS TEST REPORT

COOPER TESTING LABORATORY

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Brown Lean CLAY (with Claystone)	44	21	23	90.3	87.2	CL
■	Brown Lean CLAY	45	25	20	99.6	99.3	CL
▲	Gray Lean CLAY	45	23	22	98.4	95.0	CL
◆	Brown SILTY CLAY	25	21	4	99.6	86.2	CL-ML
▼	Brown SILT	24	23	1	96.2	88.7	ML

Project No. 516-011 **Client:** GeoLogic Associates

Project: Newby Island Landfill; Phase II Borings - 2004-049

● **Source:** RB-11V, Sta. 60+00 **Sample No.:** 11V/1 **Elev./Depth:** 45-47.5'
■ **Source:** RB-11V, Sta. 60+00 **Sample No.:** 11V/2 **Elev./Depth:** 71.5-74'
▲ **Source:** RB-11V, Sta. 60+00 **Sample No.:** 11V/3 **Elev./Depth:** 85-87.5'
◆ **Source:** RB-12V, Sta. 125+00 **Sample No.:** 12V/1 **Elev./Depth:** 70-72.5'
▼ **Source:** RB-12V, Sta. 125+00 **Sample No.:** 12V/2 **Elev./Depth:** 88-90.5'

Remarks:
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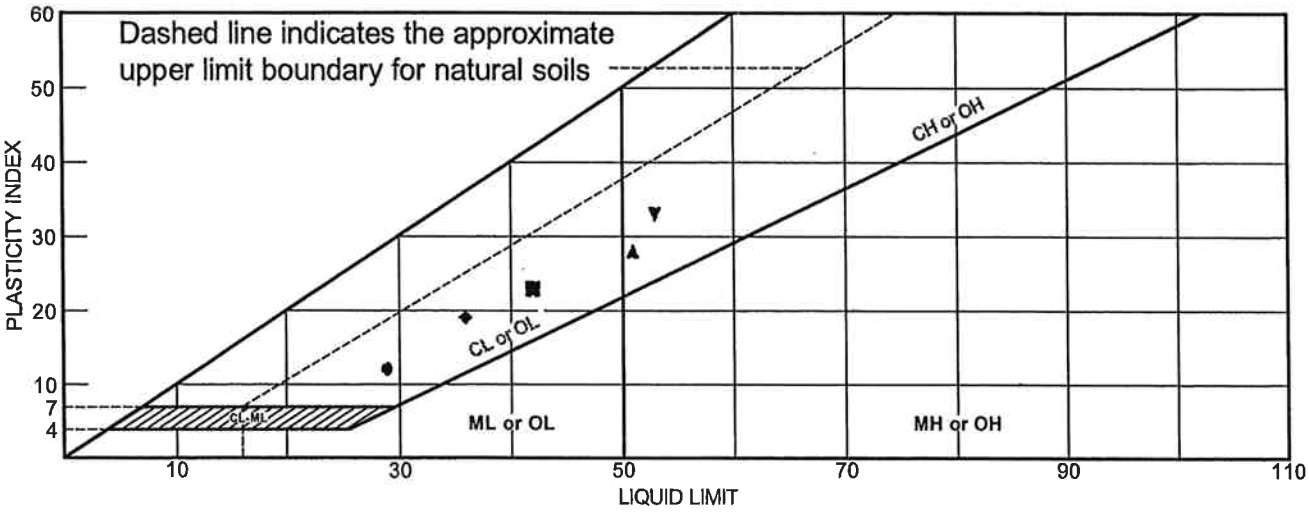
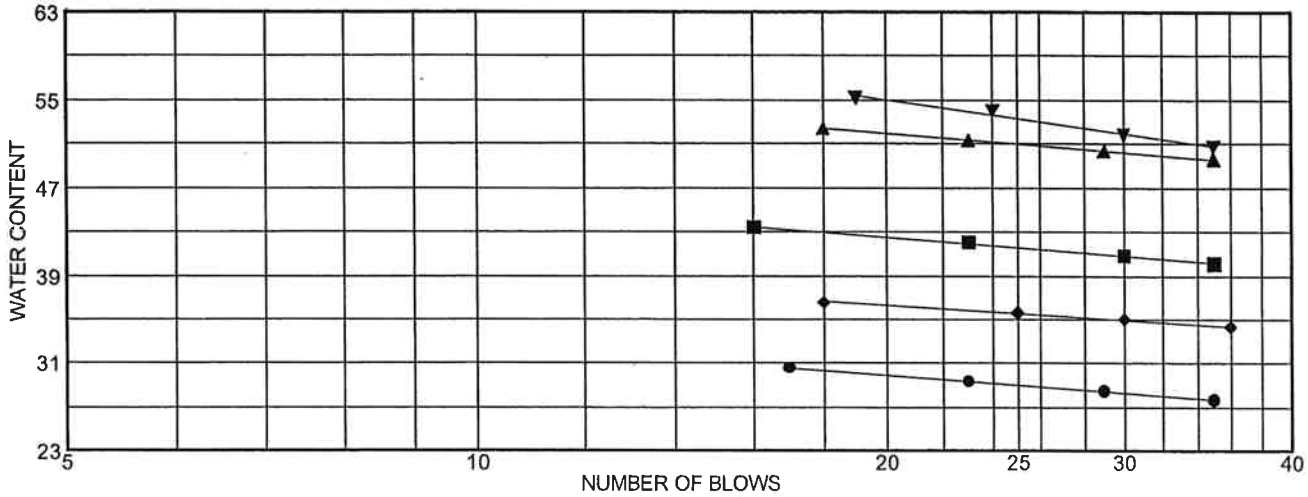
LIQUID AND PLASTIC LIMITS TEST REPORT

COOPER TESTING LABORATORY

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Brown Sandy Lean CLAY	29	17	12	100.0	69.6	CL
■	Brown Lean CLAY	42	19	23	99.6	90.2	CL
▲	Gray Fat CLAY	51	23	28	98.3	92.6	CH
◆	Brown & Gray Lean CLAY w/ Sand	36	17	19	96.9	80.9	CL
▼	Brown Fat CLAY	53	20	33	99.3	95.7	CH

Project No. 516-011 **Client:** GeoLogic Associates

Project: Newby Island Landfill; Phase II Borings - 2004-049

● **Source:** RB-12Va, Sta. **Sample No.:** 12Va/4 **Elev./Depth:** 38.5-41'

■ **Source:** RB-12Va, Sta. **Sample No.:** 12Va/5 **Elev./Depth:** 50-52.5'

▲ **Source:** RB-13V, Sta. 40+00 **Sample No.:** 13V/1 **Elev./Depth:** 22.5-25'

◆ **Source:** RB-13V, Sta. 40+00 **Sample No.:** 13V/3 **Elev./Depth:** 45-47.5'

▼ **Source:** LPZ-1, Sta. 106+50 **Sample No.:** LPZ-1/1 **Elev./Depth:** 94.5-97'

Remarks:

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LIQUID AND PLASTIC LIMITS TEST REPORT

COOPER TESTING LABORATORY

Figure

LABORATORY DATA

- **Specific Gravity Test**

COOPER TESTING LABORATORY

Specific Gravity by Pycnometer

ASTM D 854m

CTL Job#:	516-002		Project Name:	Newby Island			Date:	11/09/04
Client:	GeoLogic Associates		Project No.:	2004-049			Run By:	MD
							Checked	DC
Boring:	RB-2A	RB-2	RB-2	RB-8				
Sample:	1	8	13	4				
Depth, ft.:	23	35	75	22.5				
Pan No.:	419	C31	SE6	SE11				
Soil Description (visual)	Gray Fat CLAY (bay mud)	Brown Lean CLAY with Sand	Olive Brown Lean CLAY	Dark Gray Fat CLAY				
Dish No.	A-82	A-81	A-12	A-21				
Air-Dry Weight, gm	29.48	27.56	22.57	18.34				
Oven-Dry Weight., gm	29.35	27.45	22.46	18.27				
Dish Weight, gm	11.55	11.58	11.71	11.36				
Hydroscopic MC, %	0.7	0.7	1.0	1.0				
Pycnometer No.:	6	7	15	16				
Wt Pycn., Soil & H2O (Wb), g	710	716.9	712.6	719.8				
Test Temp. (T), °C	17	17	17	17				
Wt Pycn. & H2O @ T (Wa), g	663.2	671.87	672.23	681.37				
Wt of Air-Dried Soil (Wm), g	74.17	71.5	64.34	60.93				
Wt of Oven-Dried Soil (Wo), g	73.63	71.01	63.69	60.32				
Temp. Corr. Factor (K)	1.0008	1.0008	1.0008	1.0008				
Specific Gravity (20°C) $Gs = \frac{K\ Wo}{Wo+Wa-Wb}$	**2.75**	**2.74**	**2.74**	**2.76**				

COOPER TESTING LABORATORY

Specific Gravity by Pycnometer

ASTM D 854m

CTL Job#:	516-011			Project Name:	Jewby Island Landfill; Phase II Boring		Date:	09/19/05
Client:	GeoLogic Associates			Project No.:	2004-049		Run By:	MD
							Checked	DC
Boring:	RB11, 60+00	RB-12Va, 125+00	RB-13V, 40+00	LPZ-2, 129+30				
Sample:	11/V2	12Va/1	13V/1	LPZ-2/1				
Depth, ft.:	71.5-74	29-31.5	22.5-25	120-122.5				
Pan No.:	S29	SE15	403	C-12				
Soil Description (visual)	Brown Lean CLAY	Gray Fat CLAY	Gray Fat CLAY	Brown Lean CLAY				
Dish No.	A-1	A-19	A-19	A-26				
Air-Dry Weight, gm	30.19	34.82	28.10	27.50				
Oven-Dry Weight., gm	29.94	34.60	27.89	27.20				
Dish Weight, gm	11.54	11.43	11.43	11.74				
Hydroscopic MC, %	1.4	0.9	1.3	1.9				
Pycnometer No.:	1	16	6	7				
Wt Pycn., Soil & H2O (Wb), g	342.6	726.7	704.8	718.8				
Test Temp. (T), °C	23.2	20.4	21.5	21.4				
Wt Pycn. & H2O @ T (Wa), g	316.1	681.0	662.7	671.4				
Wt of Air-Dried Soil (Wm), g	42.43	72.31	66.97	75.15				
Wt of Oven-Dried Soil (Wo), g	41.86	71.63	66.13	73.72				
Temp. Corr. Factor (K)	0.9993	1.0006	0.9998	0.9998				
Specific Gravity (20°C) $Gs = \frac{K\ Wo}{Wo+Wa-Wb}$	**2.74**	**2.77**	**2.75**	**2.80**				

LABORATORY DATA

- **Organic Content Test**

COOPER TESTING LABORATORY

Organic Content Test

ASTM D 2974-00 (Method C - 440 °C)

CTL JOB NO.: 516-011 | PROJECT: Newby Island Landfill; Phase II Boring | DATE: 9/19/2005

CLIENT : GeoLogic Associates | PROJECT NO.: 2004-049 | BY: MJ

Boring :	RB-10, 30+00	RB-11V, 60+00	RB-12Va,125+00	RB-13V, 40+00	LPZ-2, 129+30			
Sample :	10/3	11V/2	12Va/1	13V/1	LPZ-2/1			
Depth (ft.):	33-35.5	71.5-74	29-31.5	22.5-25	120-122.5			
Visual Description:	Brown Lean CLAY	Brown Lean CLAY	Gray Fat CLAY	Gray Fat CLAY	Brown Lean CLAY			
Dish No.	OR-7	OR-17	OR-18	OR-6	OR-8			
Dish wt., gm	80.91	81.57	81.88	83.26	81.76			
Soil, Org, Dish & H_2O, gm	141.78	140.11	181.43	160.90	152.25			
Oven Dry wt (105°C), gm	128.80	125.48	144.74	136.24	139.09			
Furnace Dry wt. (440°C), gm	127.52	124.40	142.41	134.89	137.91			
Moisture Content, % of Oven Dry Mass	27.1	33.3	58.4	46.5	23.0			
Organic Matter, %	2.7	2.5	3.7	2.5	2.1			

Note: When describing soils where we know the % organic matter, we use the following guidelines: 0-5% - The organics are either not mentioned or mentioned as being "trace"; 5-15% - The soil is considered as inorganic and is classified, as per ASTM 2487, with "with organics" included in the description; 15-50% - The soil is considered as organic and is described, per ASTM 2487; >50% - The soil is described as "Peat".

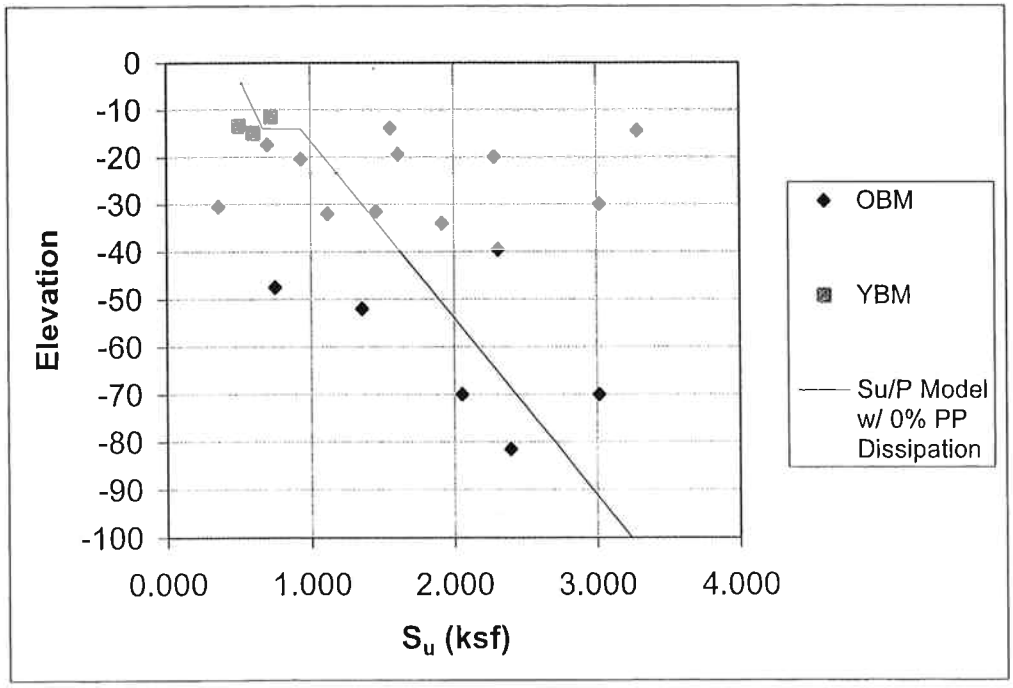
LABORATORY DATA

- **Unconsolidated-Undrained Triaxial Shear Strength Test**

2004-049 Newby Island Landfill
10/5/2005 RMW

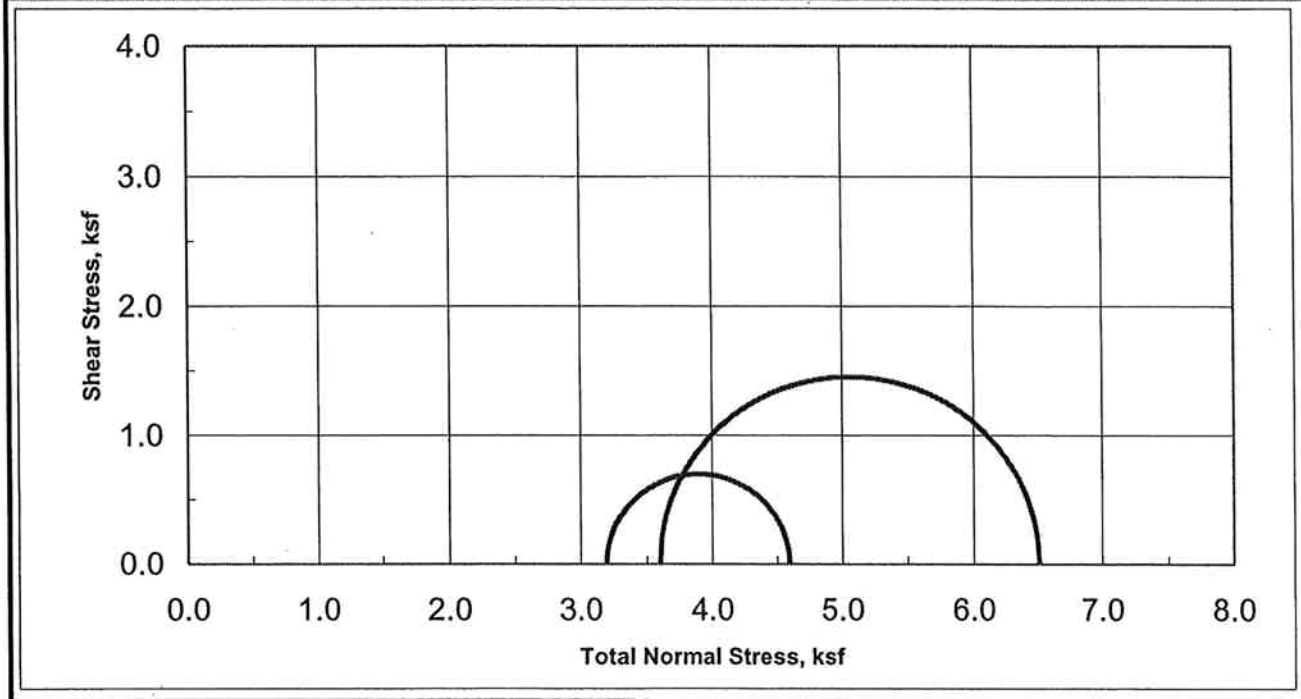
Unconsolidated-Undrained Triaxial Test Summary

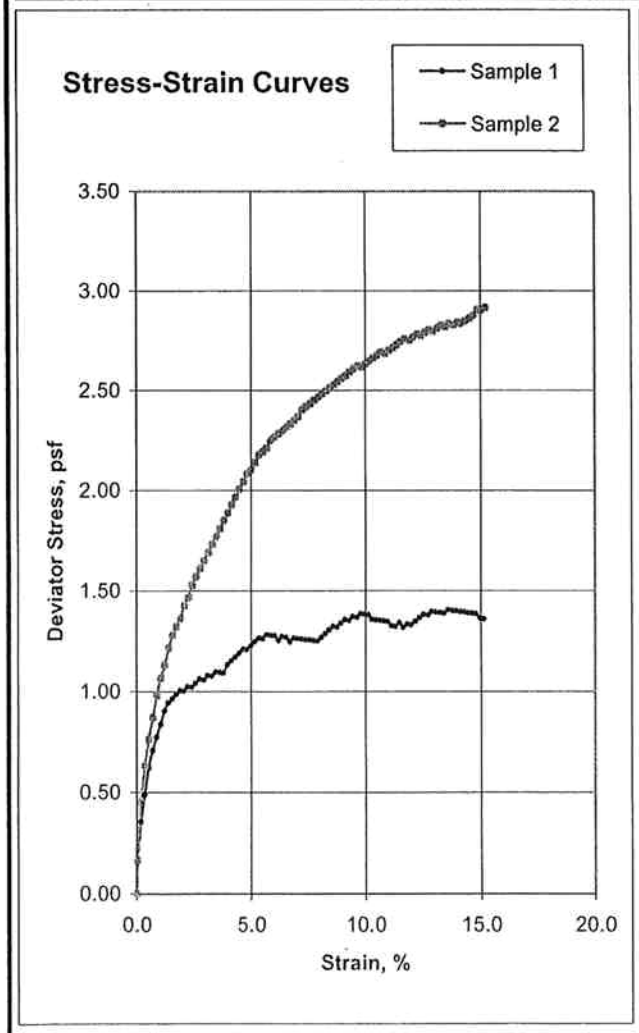
Boring	Sample	Station Location	Sample Depth (ft)	Boring Elevation (ft)	Sample Elevation (ft)	Material	Undrained Shear Strength, Su (ksf)	Failure Strain (%)
RB-13V	1	40+00	22.5	11	-11.5	*YBM*	0.729	11.1%
RB-12Va	2	125+00	31.5	18	-13.5	*YBM*	0.505	8.1%
LPZ-2	1	129+30	120	106	-14	OBM	1.558	15.0%
LPZ-1	1	106+50	94.5	80	-14.5	OBM	3.288	11.5%
RB-12Va	3	125+00	33	18	-15	*YBM*	0.605	8.4%
RB-1	10	50+00	33	15.5	-17.5	OBM	0.702	12.9%
RB-10	3	30+00	33	13.5	-19.5	OBM	1.614	15.0%
RB-13V	2	40+00	31	11	-20	OBM	2.285	15.1%
RB-12Va	4	125+00	38.5	18	-20.5	OBM	0.933	14.9%
RB-11V	1	60+00	45	15	-30	OBM	3.020	15.1%
RB-10	4	30+00	44	13.5	-30.5	OBM	0.360	14.5%
RB-2	9	30+00	45	13.5	-31.5	OBM	1.457	14.9%
RB-12Va	5	125+00	50	18	-32	OBM	1.116	14.9%
RB-13V	3	40+00	45	11	-34	OBM	1.918	15.1%
RB-10	5	30+00	53	13.5	-39.5	OBM	2.310	15.2%
RB-10Va	1	30+00	61	13.5	-47.5	OBM	0.751	15.3%
RB-12V	1	125+00	70	18	-52	OBM	1.355	15.3%
RB-11V	3	60+00	85	15	-70	OBM	2.056	14.9%
RB-12V	2	125+00	88	18	-70	OBM	3.016	15.1%
RB-10Va	2	30+00	95	13.5	-81.5	OBM	2.396	15.1%



Unconsolidated-Undrained Triaxial Test

ASTM D-2850





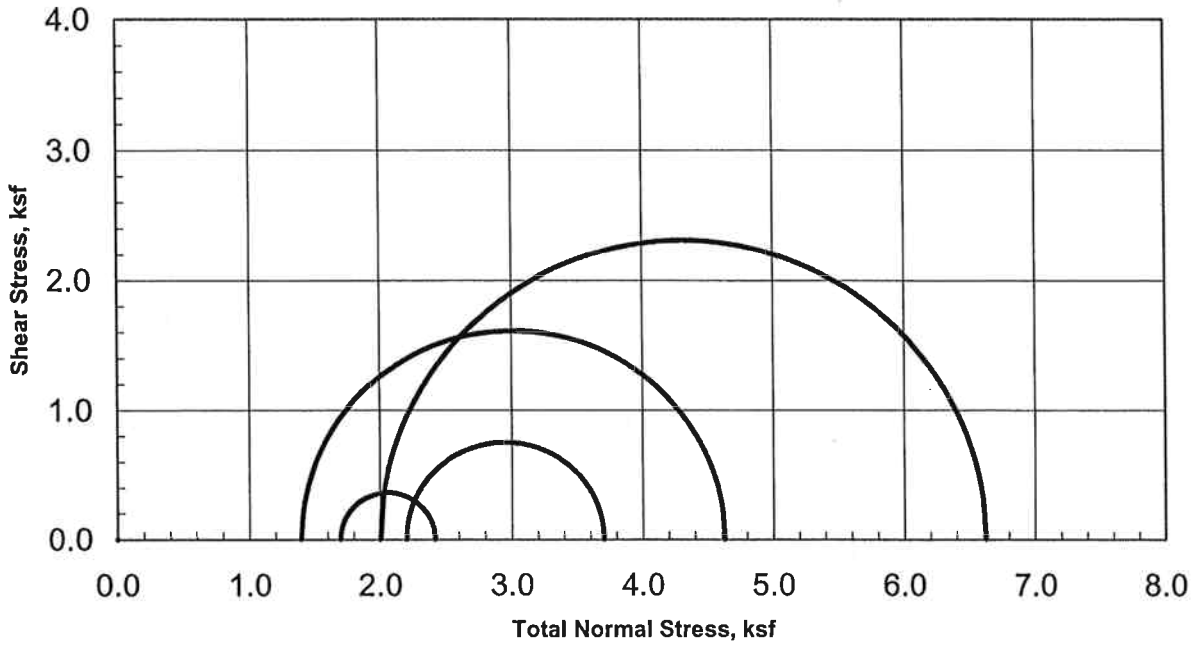
Sample Data	1	2	3	4
Moisture %	24.6	23.3		
Density pcf	101.3	104.0		
Void Ratio	0.694	0.651		
Saturation %	97.3	98.2		
Height in	6.00	6.00		
Diameter in	2.87	2.87		
Cell psi	22.2	25.0		
Strain %	12.90	14.90		
Deviator, ksf	1.404	2.914		
Rate %/min	1.00	1.00		
in/min	0.060	0.060		
Job No.:	516-008			
Client:	GeoLogic Associates			
Project:	Newby Island - 2004-049			
Boring:	RB-1	RB-2		
Sample:	10	9		
Depth ft:	33	45		

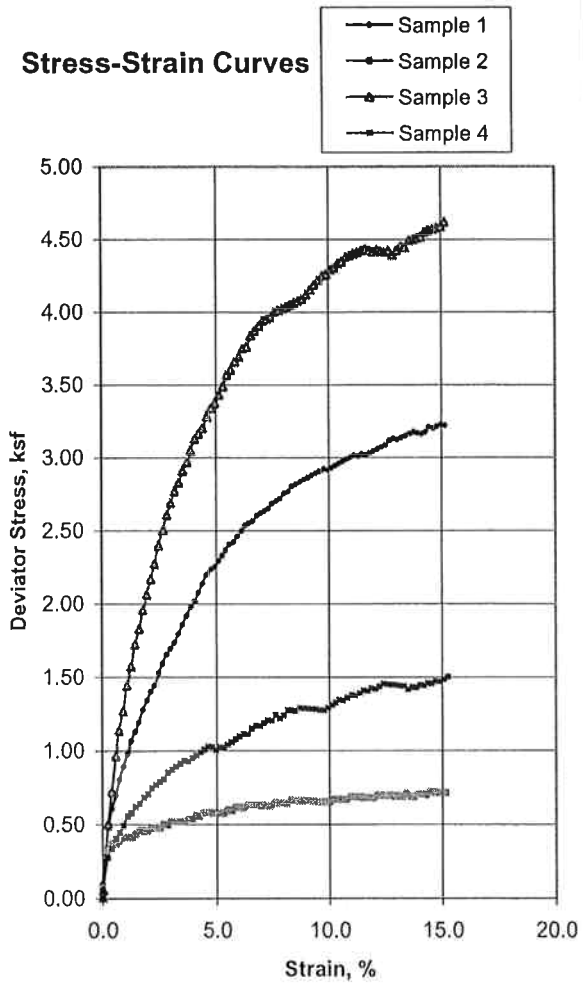
Visual Soil Description	
Sample #	
1	Brown Sandy Lean CLAY, trace nodules
2	Brown Sandy Lean CLAY
3	
4	

Remarks:

Unconsolidated-Undrained Triaxial Test

ASTM D-2850





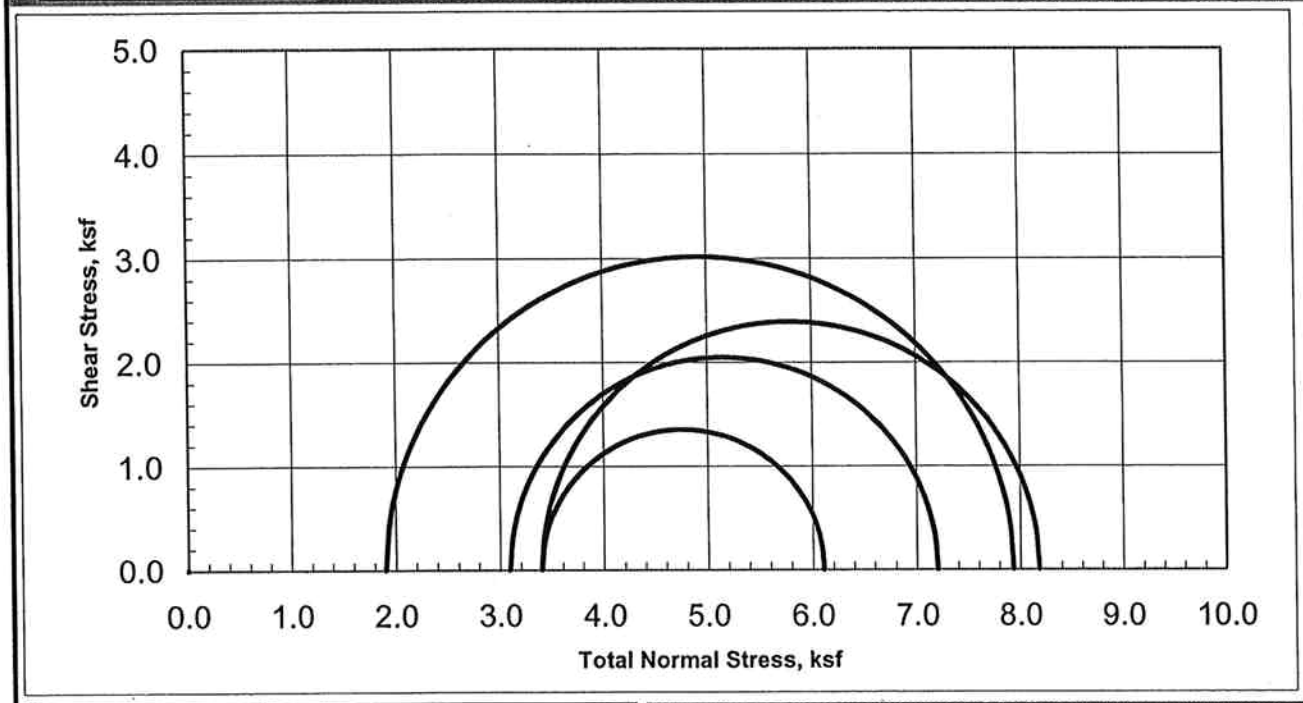
Sample Data	1	2	3	4
Moisture %	26.3	33.8	23.6	22.2
Dry Den,pcf	99.4	84.4	101.5	106.6
Void Ratio	0.759	0.997	0.660	0.611
Saturation %	97.0	91.4	96.3	99.8
Height in	5.96	5.99	5.98	5.96
Diameter in	2.87	2.80	2.87	2.87
Cell psi	9.7	11.8	13.9	15.3
Strain %	15.00	14.50	15.20	15.30
Deviator, ksf	3.227	0.720	4.619	1.501
Rate %/min	1.01	1.00	1.00	1.01
in/min	0.060	0.060	0.060	0.060
Job No.:	516-011a			
Client:	GeoLogic Associates			
Project:	Newby Island Landfill; Phase II Borings 2004-049			
Boring:	RB-10	RB-10	RB-10	RB-10Va
Sample:	10/3	10/4	10/5	10Va/1
Depth ft:	33-33.5	44-46.5	53-55.5	61-63.5

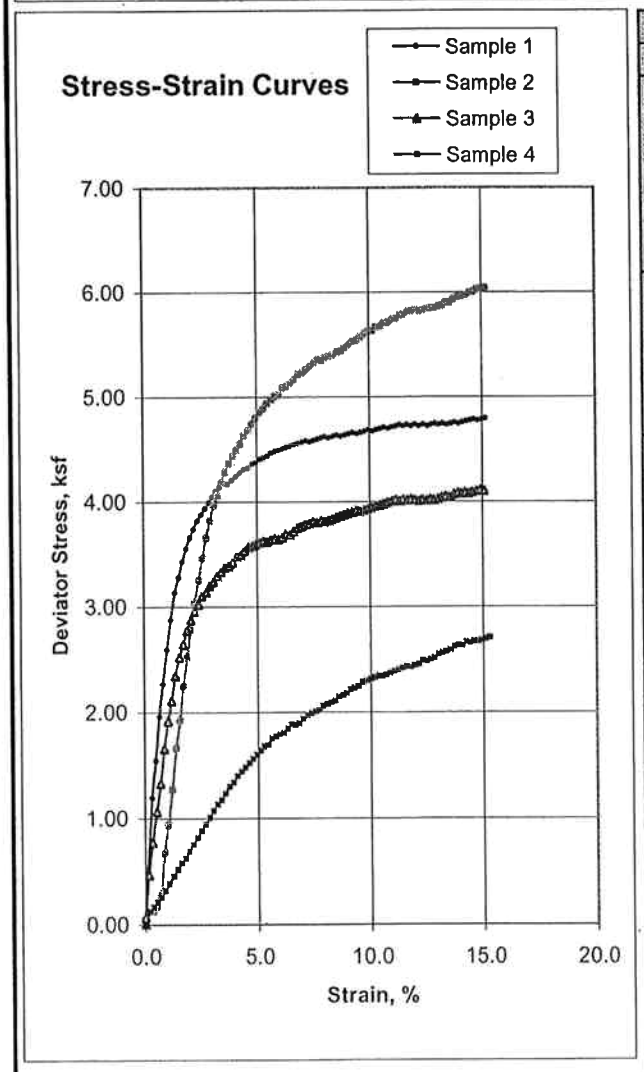
Visual Soil Description	
Sample #	
1	Brown grading to Gray-Brown Lean CLAY
2	Brown Lean CLAY
3	Brown Lean CLAY changing to Silty CLAY
4	Brown Lean CLAY w/ Sand

Remarks: RB-10, 10/4: Void running down length of sample - possibly disturbed.
RB-10Va, 10Va/1: Voids on side of sample - possibly disturbed.

Unconsolidated-Undrained Triaxial Test

ASTM D-2850





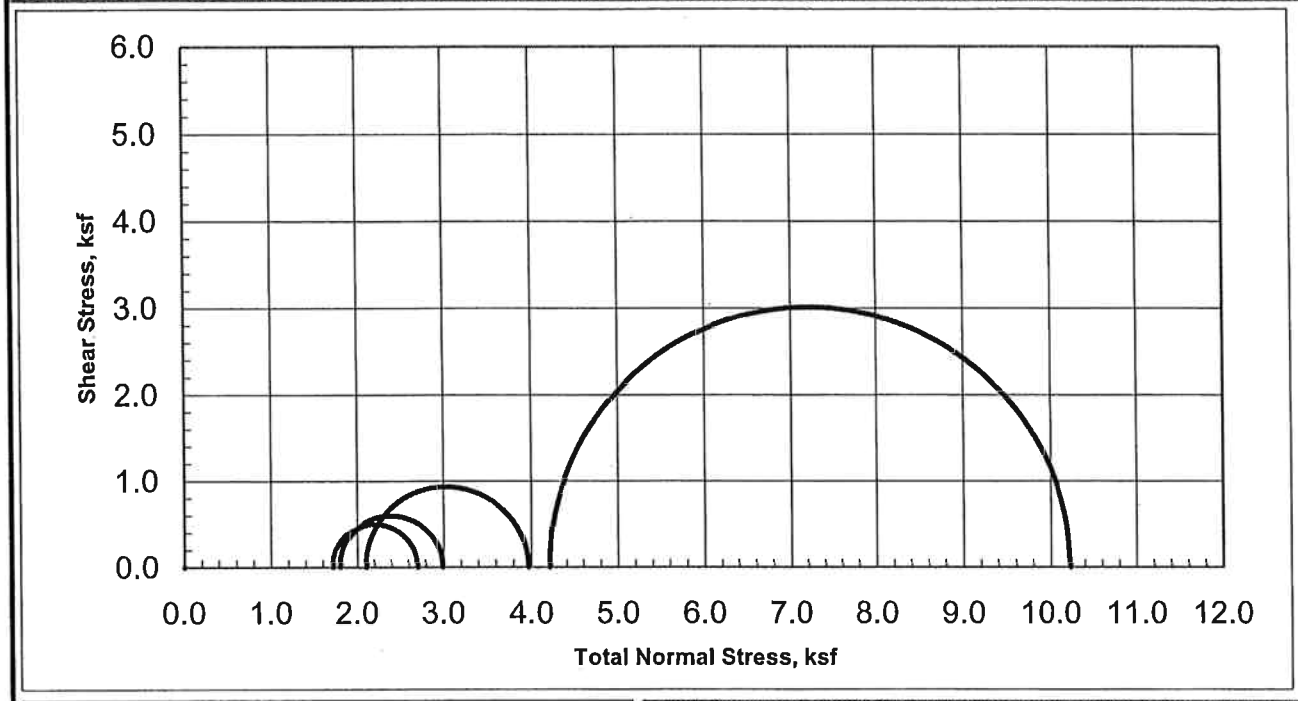
Sample Data	1	2	3	4
Moisture %	23.5	20.9	28.9	24.4
Dry Den,pcf	103.9	107.3	94.8	103.7
Void Ratio	0.652	0.571	0.810	0.685
Saturation %	99.3	98.7	98.2	99.6
Height in	5.98	5.99	5.99	5.95
Diameter in	2.87	2.87	2.87	2.87
Cell psi	23.6	13.2	21.5	23.6
Strain %	15.10	15.10	14.90	15.30
Deviator, ksf	4.792	6.040	4.112	2.710
Rate %/min	1.00	1.00	1.00	1.01
in/min	0.060	0.060	0.060	0.060
Job No.:	516-011b			
Client:	GeoLogic Associates			
Project:	Newby Island Landfill; Phase II Borings 2004-049			
Boring:	RB-10Va	RB-11V	RB-11V	RB-12V
Sample:	10Va/2	11V/1	11V/3	12V/1
Depth ft:	95-97.5	45-47.5	85-87.5	70-72.5

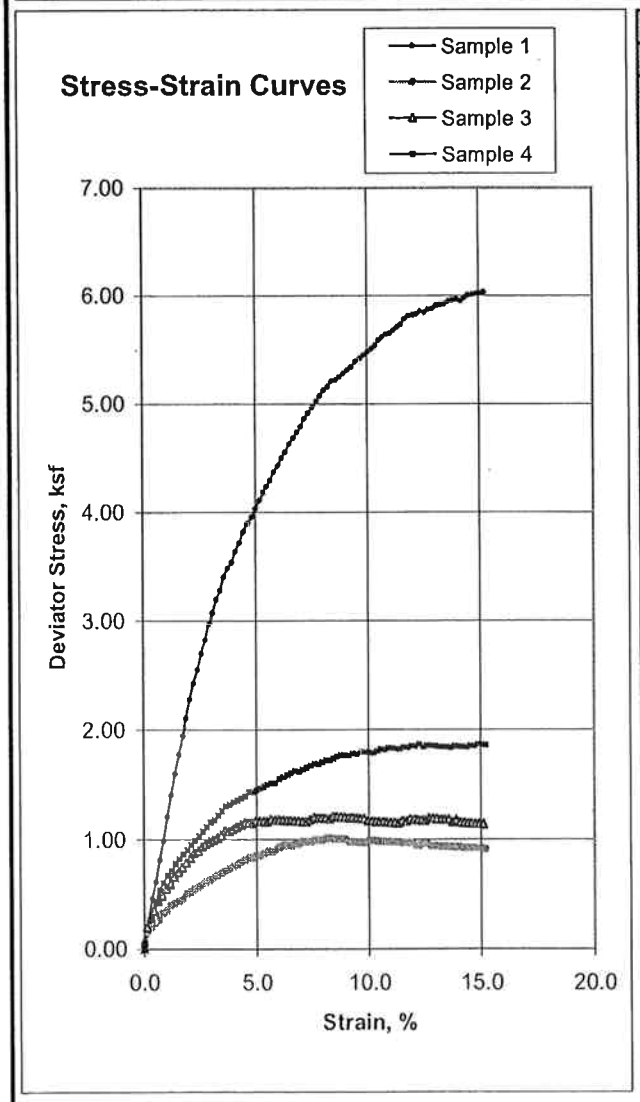
Visual Soil Description	
Sample #	
1	Greenish Gray Lean CLAY
2	Brown Lean CLAY (w/ Claystone)
3	Greenish Gray Lean CLAY
4	Brown SILTY CLAY grading to Sandy SILT

Remarks:

Unconsolidated-Undrained Triaxial Test

ASTM D-2850





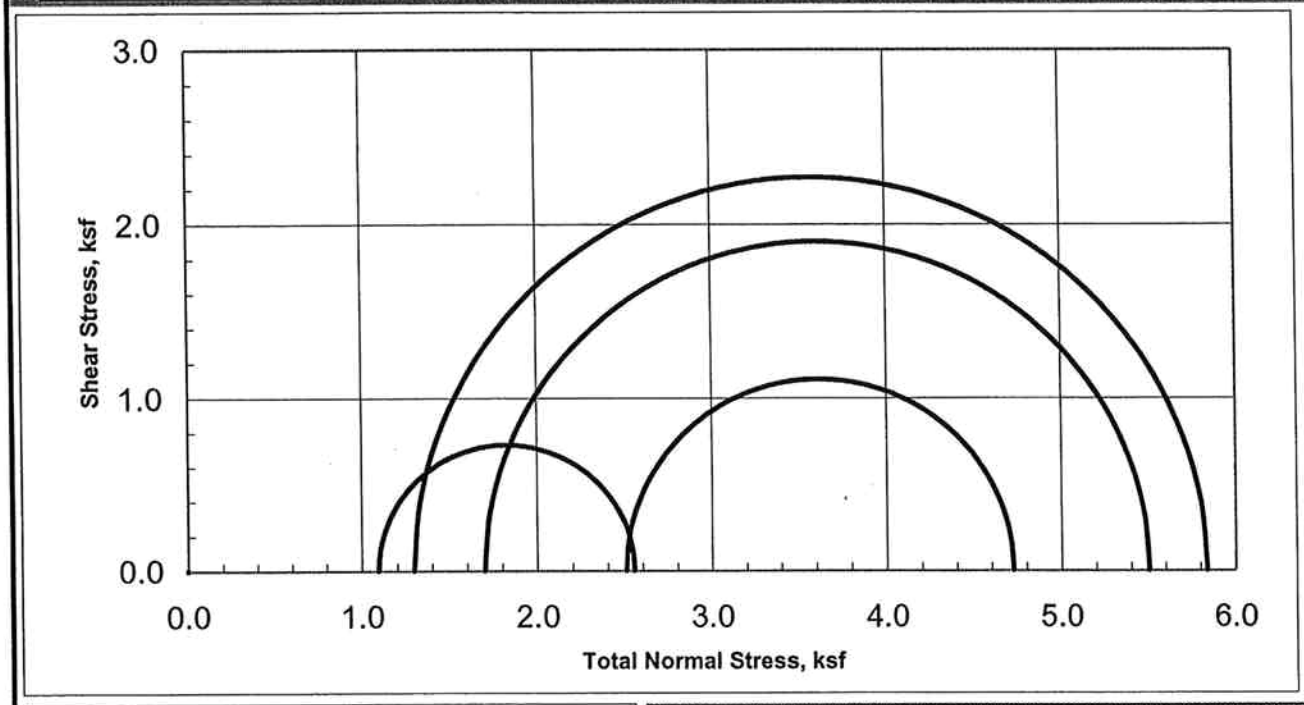
Sample Data	1	2	3	4
Moisture %	23.8	55.9	54.2	22.8
Dry Den,pcf	102.6	66.1	67.8	103.6
Void Ratio	0.642	1.550	1.488	0.627
Saturation %	100.0	97.4	98.4	98.1
Height in	5.97	5.98	5.98	5.97
Diameter in	2.87	2.86	2.86	2.87
Cell psi	29.2	11.9	12.5	14.6
Strain %	15.10	8.10	8.40	14.90
Deviator, ksf	6.032	1.009	1.209	1.866
Rate %/min	1.01	1.00	1.00	1.01
in/min	0.060	0.060	0.060	0.060
Job No.:	516-011c			
Client:	GeoLogic Associates			
Project:	Newby Island Landfill; Phase II Borings 2004-049			
Boring:	RB-12V	RB-12Va	RB-12Va	RB-12Va
Sample:	12V/2	12Va/2	12Va/3	12Va/4
Depth ft:	88-90.5	31.5-34	33-35.5	38.5-41

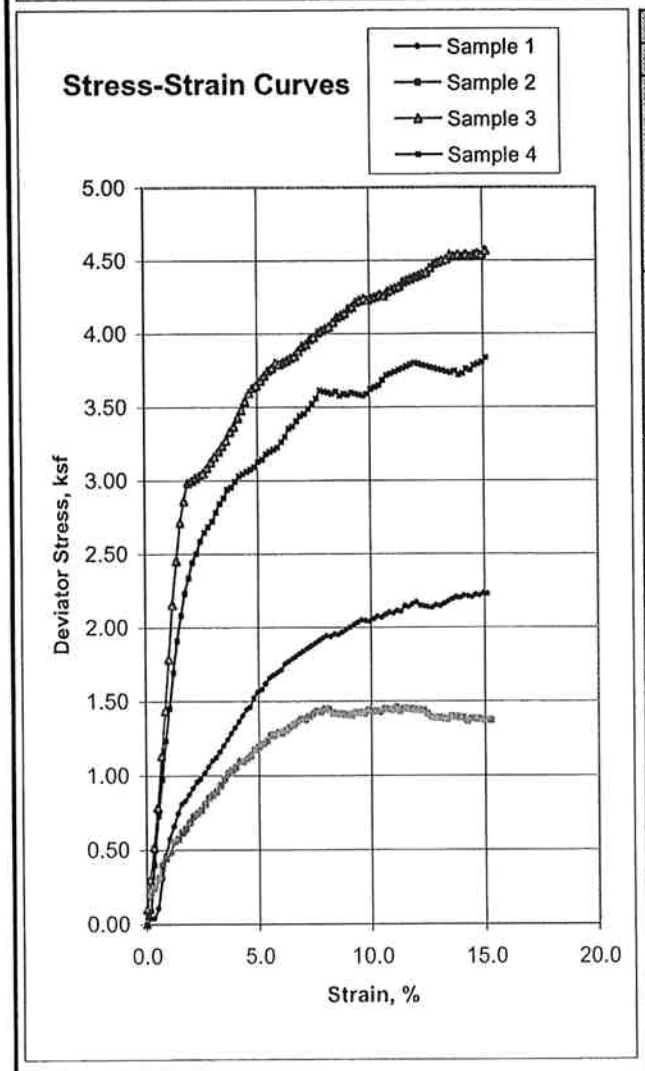
Visual Soil Description	
Sample #	
1	Brown SILT grading to Brown SILT w/ Sand
2	Gray grading to Dark Gray CLAY
3	Gray CLAY, trace Sand
4	Brown Sandy Lean CLAY

Remarks:

Unconsolidated-Undrained Triaxial Test

ASTM D-2850





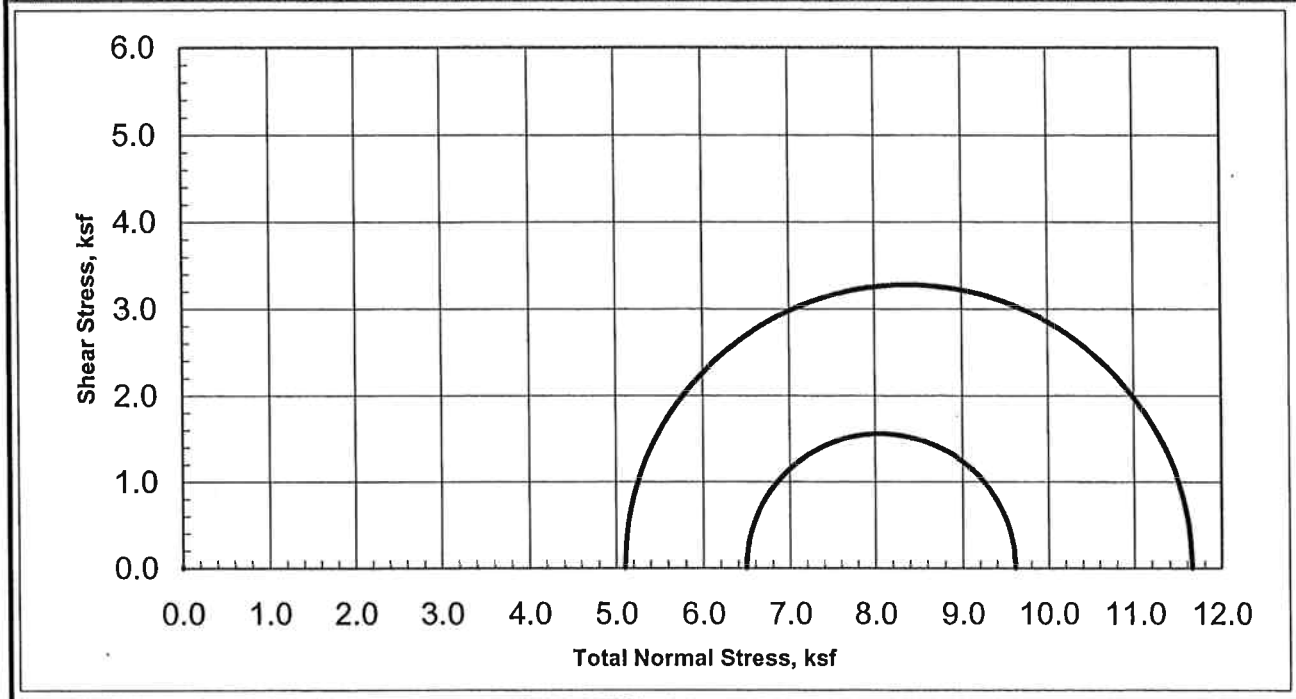
Sample Data	1	2	3	4
Moisture %	24.4	45.7	18.4	21.7
Dry Den,pcf	100.8	75.9	112.3	105.6
Void Ratio	0.672	1.263	0.500	0.596
Saturation %	98.1	99.5	99.4	98.4
Height in	5.99	5.96	5.99	5.99
Diameter in	2.87	2.86	2.88	2.87
Cell psi	17.4	7.6	9.0	11.8
Strain %	14.90	11.10	15.10	15.10
Deviator, ksf	2.232	1.458	4.570	3.836
Rate %/min	1.00	1.01	1.00	1.00
in/min	0.060	0.060	0.060	0.060
Job No.:	516-011d			
Client:	GeoLogic Associates			
Project:	Newby Island Landfill; Phase II Borings 2004-049			
Boring:	RB-12Va	RB-13V	RB-13V	RB-13V
Sample:	12Va/5	13V/1	13V/2	13V/3
Depth ft:	50-52.5	22.5-25	31-33.5	45-47.5

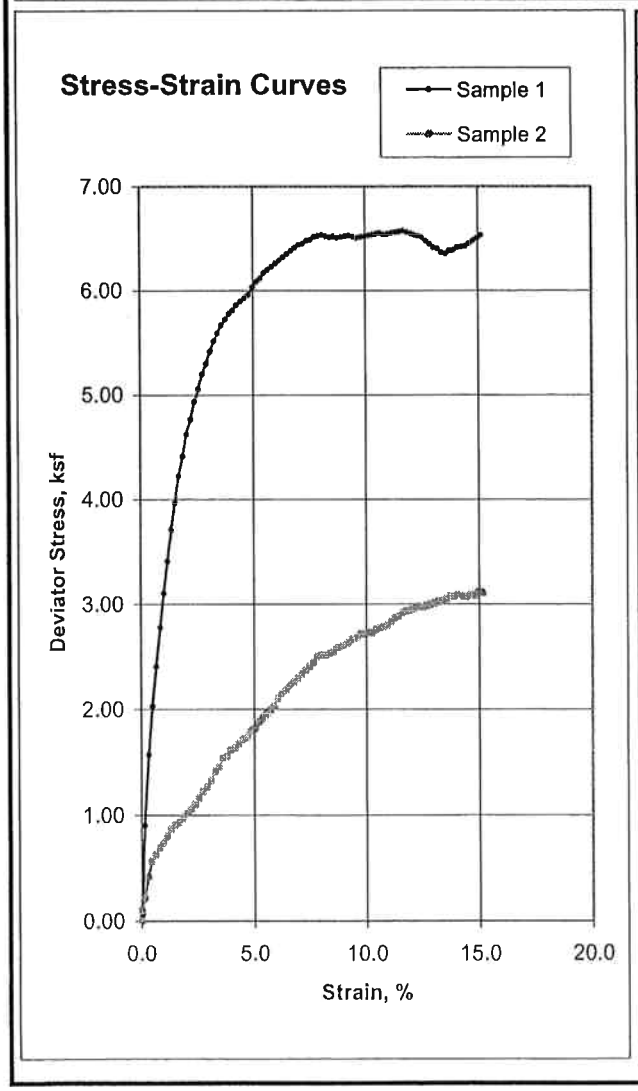
Visual Soil Description	
Sample #	
1	Brown Lean CLAY
2	Gray Fat CLAY
3	Brown CLAY, trace Sand
4	Brown & Gray Lean CLAY w/ Sand

Remarks:

Unconsolidated-Undrained Triaxial Test

ASTM D-2850





Sample Data	1	2	3	4
Moisture %	22.9	22.3		
Dry Den,pcf	104.2	106.4		
Void Ratio	0.618	0.643		
Saturation %	99.9	96.9		
Height in	5.99	5.99		
Diameter in	2.87	2.86		
Cell psi	35.4	45.1		
Strain %	11.50	15.00		
Deviator, ksf	6.575	3.116		
Rate %/min	1.00	1.00		
in/min	0.060	0.060		
Job No.:	516-011e			
Client:	GeoLogic Associates			
Project:	Newby Island Landfill; Phase II Borings 2004-049			
Boring:	LPZ-1	LPZ-2		
Sample:	LPZ-1/1	LPZ-2/1		
Depth ft:	94.5-97	120-122.5		

Visual Soil Description	
Sample #	
1	Brown Fat CLAY
2	Brown Lean CLAY
3	
4	

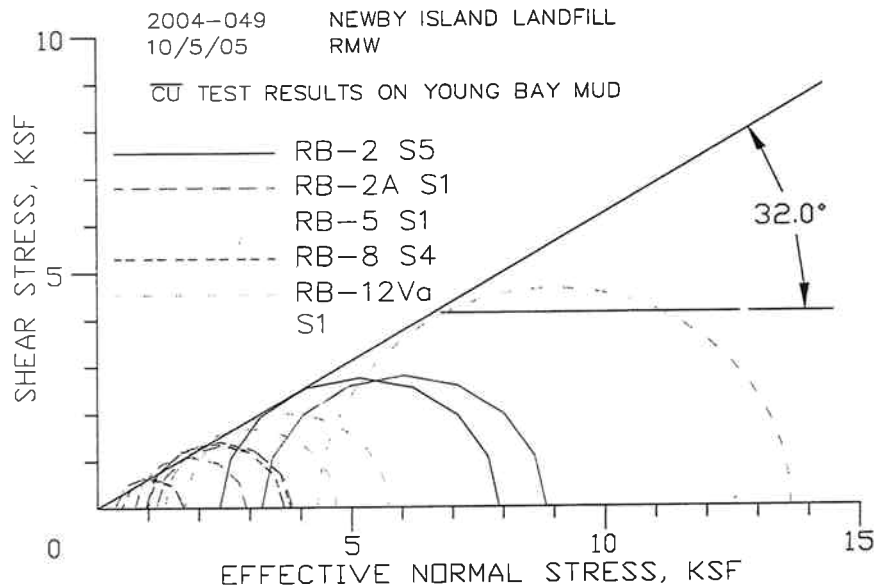
Remarks:

LABORATORY DATA

- **Consolidated-Undrained Triaxial Shear Strength Test**

2004-049 Newby Island Landfill
12/22/2005 RMW

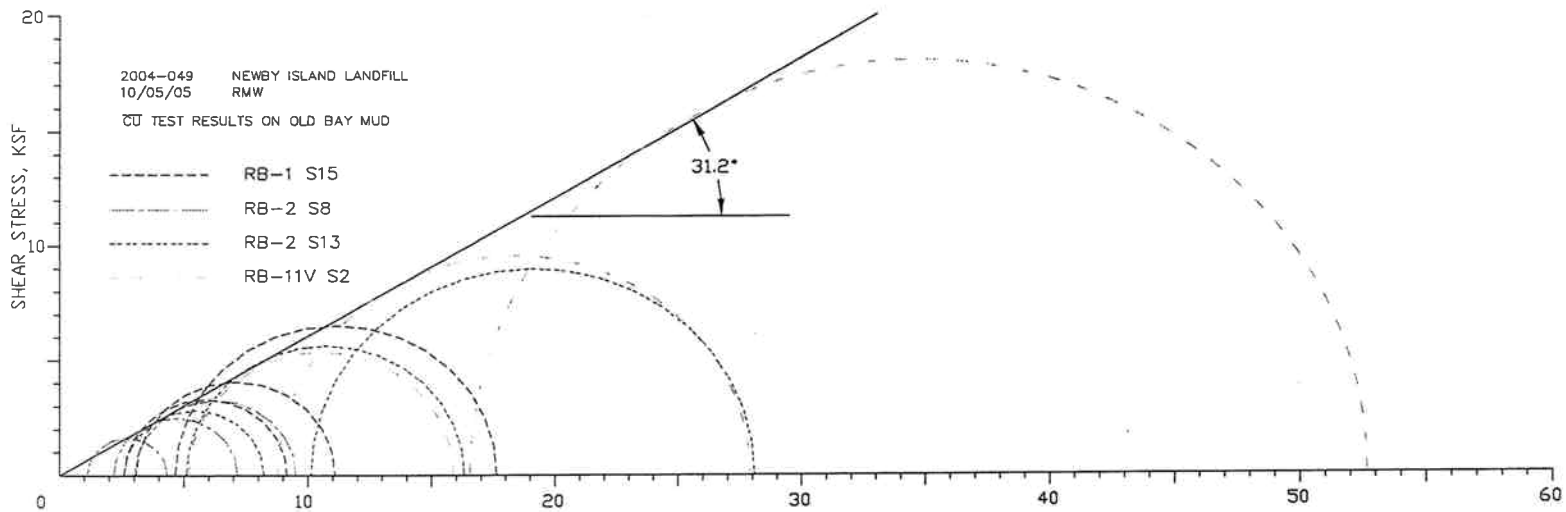
Clay Strength Summary
Young Bay Mud



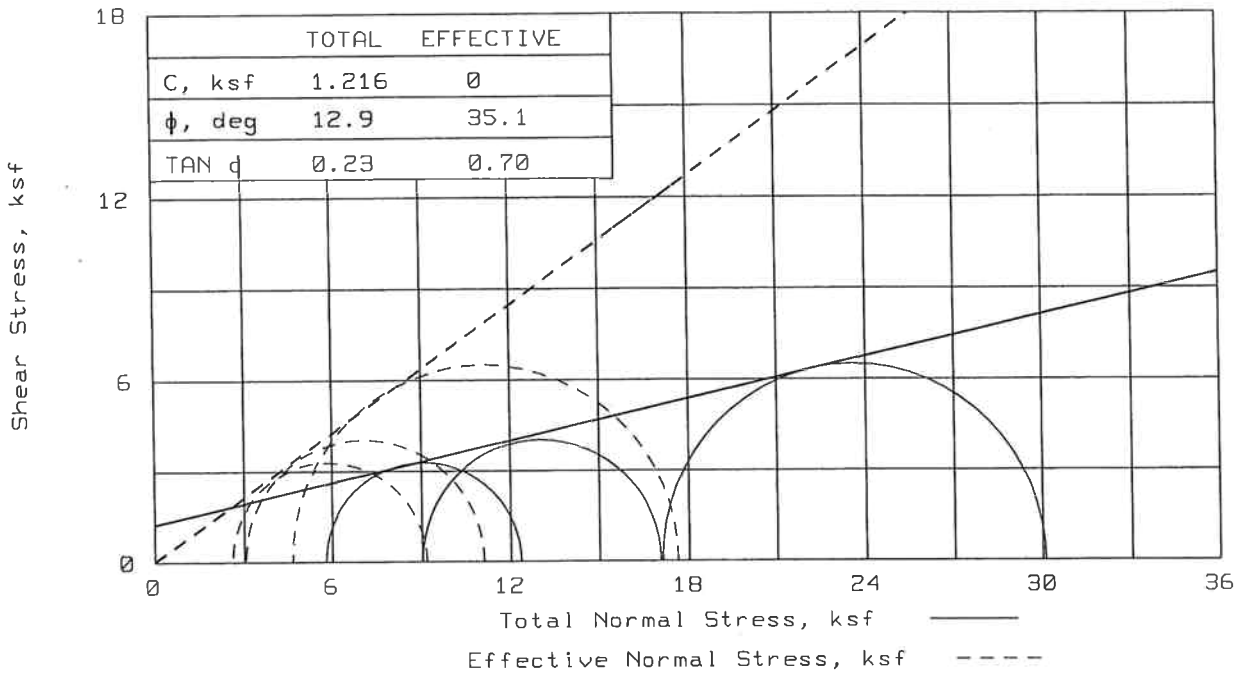
Boring	Sample	Depth	P = σ'_{3c} (ksf)	$\sigma'_{1,f}$	$\sigma'_{3,f}$	Failure Strain @ Peak $\sigma'1/\sigma'3$ or $\sigma'1 \cdot \sigma'3$ (whichever first)	S_{u1} = $(\sigma'_{1f} - \sigma'_{3f})/2$	S_{u1}/P	"true" S_{u2} = $((\sigma'_{1f} - \sigma'_{3f})/2) \times \cos(\phi')$	S_{u2}/P	p'	q'	tan ψ	d'	c' (ksf)	φ' (deg.)
RB-2A	1a	23	0.994	1.693	0.346	4.9%	0.6735	0.68	0.5713	0.57	1.0195	0.6735	0.455	0.2258	**0.254**	**27.1**
	1b		2.088	2.924	0.734	9.3%	1.095	0.52	0.9289	0.44	1.829	1.095				
	1c		**3.110**	3.833	1.152	8.3%	1.3405	0.43	1.1372	0.37	2.4925	1.3405				
RB-8	4a	22.5	1.094	1.706	0.475	15.4%	0.6155	0.56	0.5221	0.48	1.0905	0.6155	0.587	0	**0.000**	**35.9**
	4b		2.160	3.672	0.950	8.7%	1.361	0.63	1.1546	0.53	2.311	1.361				
	4c		**3.096**	3.796	0.979	12.3%	1.4085	0.45	1.1949	0.39	2.3875	1.4085				
RB-2	5	26.5	**7.963**	7.910	2.405	12.2%	2.7525	0.35	2.3350	0.29	5.1575	2.7525	0.534	0	**0.000**	**32.3**
RB-5	1	24	6.178	8.832	3.226	10.8%	2.803	0.45	2.3779	0.38	6.029	2.803	0.465	0	**0.000**	**27.7**
RB-12Va	1-1	29	**4.05**	4.700	1.333	11.1%	1.6835	0.42	1.4282	0.35	3.0165	1.6835	0.501	0.1587	**0.183**	**30.0**
	1-2		**8.050**	5.731	1.719	12.8%	2.006	0.25	1.7017	0.21	3.725	2.006				
	1-3		**15.85**	13.645	4.328	11.8%	4.6585	0.29	3.9519	0.25	8.9865	4.6585				

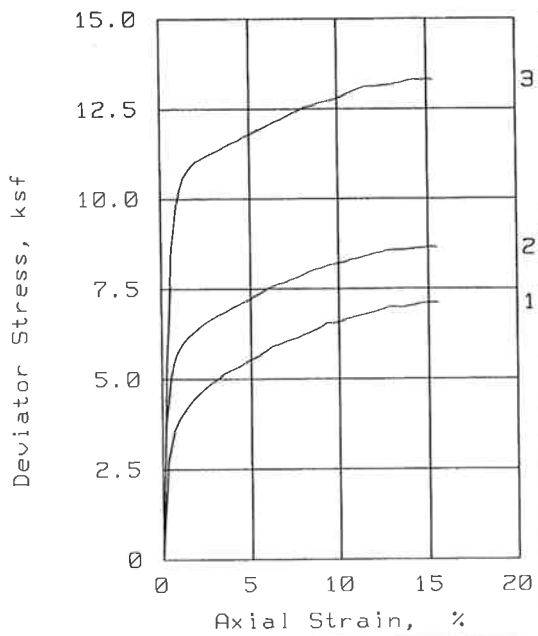
2004-049 Newby Island Landfill
12/22/2005 RMW

Clay Strength Summary
Older Bay Alluvium



Boring	Sample	Depth	P = σ'_{3c} (ksf)	$\sigma'_{1,f}$	$\sigma'_{3,f}$	Failure Strain @ Peak σ'1/σ'3 or σ'1-σ'3 (whichever first)	S_{u1} = $(\sigma'_{1f} - \sigma'_{3f})/2$	S_{u1}/P	"true" S_{u2} = $((\sigma'_{1f} - \sigma'_{3f})/2)$ x cos(φ')	S_{u2}/P	p'	q'	tan ψ	d'	c' (ksf)	φ' (deg.)
CU Tests																
RB-1	15a	57.5	5.79	9.150	2.590	9.4%	3.28	0.57	2.8069	0.48	5.87	3.28	0.575	0	**0.000**	**35.1**
	15b		**9.01**	11.090	3.050	8.7%	4.02	0.45	3.4401	0.38	7.07	4.02				
	15c		**17.110**	17.640	4.650	10.9%	6.495	0.38	5.5581	0.32	11.145	6.495				
RB-2	8a	35	2.822	4.337	1.109	4.4%	1.614	0.57	1.3812	0.49	2.723	1.614	0.46	0.3576	**0.403**	**27.4**
	8b		5.486	7.165	2.174	8.5%	2.4955	0.45	2.1355	0.39	4.6695	2.4955				
	8c		**8.107**	9.516	3.024	6.8%	3.246	0.40	2.7778	0.34	6.27	3.246				
RB-2	13a	75	5.05	8.230	2.590	5.3%	2.82	0.56	2.4132	0.48	5.41	2.82	0.446	0.5718	**0.639**	**26.5**
	13b		**15.090**	16.330	5.100	7.3%	5.615	0.37	4.8051	0.32	10.715	5.615				
	13c		**24.97**	28.090	10.120	9.0%	8.985	0.36	7.6890	0.31	19.105	8.985				
RB-11V	2-1	71.5	**14.9**	15.890	5.199	8.8%	5.3455	0.36	4.5744	0.31	10.545	5.3455	0.521	0	**0.000**	**31.4**
	2-2		**29.800**	27.920	8.785	7.9%	9.5675	0.32	8.1875	0.27	18.353	9.5675				
	2-3		**59.8**	52.658	16.551	10.5%	18.0535	0.30	15.4494	0.26	34.605	18.054				





SAMPLE NO.:		1	2	3
INITIAL	WATER CONTENT, %	24.1	25.2	25.3
	DRY DENSITY, pcf	101.5	99.9	100.2
	SATURATION, %	98.6	99.2	100.0
	VOID RATIO	0.660	0.687	0.682
	DIAMETER, in	2.870	2.870	2.875
	HEIGHT, in	5.870	6.000	6.000
AT TEST	WATER CONTENT, %	21.9	22.1	20.3
	DRY DENSITY, pcf	105.9	105.6	108.9
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	0.591	0.596	0.548
	DIAMETER, in	2.839	2.823	2.797
	HEIGHT, in	5.750	5.870	5.833
Strain rate, %/min		0.03	0.33	0.03
EFF CELL PRESSURE, ksf		5.79	9.01	17.11
DEVIATOR STRESS, ksf		6.55	8.03	12.98
EXCESS PORE PR., ksf		3.20	5.96	12.46
STRAIN, %		9.4	8.7	10.9
ULT. STRESS, ksf				
EXCESS PORE PR., ksf				
STRAIN, %				
$\bar{\sigma}_1$ FAILURE, ksf		9.15	11.09	17.64
$\bar{\sigma}_3$ FAILURE, ksf		2.59	3.05	4.65

TYPE OF TEST:
CU with Pore Pressures
SAMPLE TYPE: Undisturbed
DESCRIPTION: See "Remarks"

ASSUMED SPECIFIC GRAVITY= 2.7
REMARKS: Brn. Sandy CLAY(silty) grading to Silty CLAY with Sand. Strengths picked at peak stress ratios.
Fig. No.: _____

CLIENT: Geologic Associates

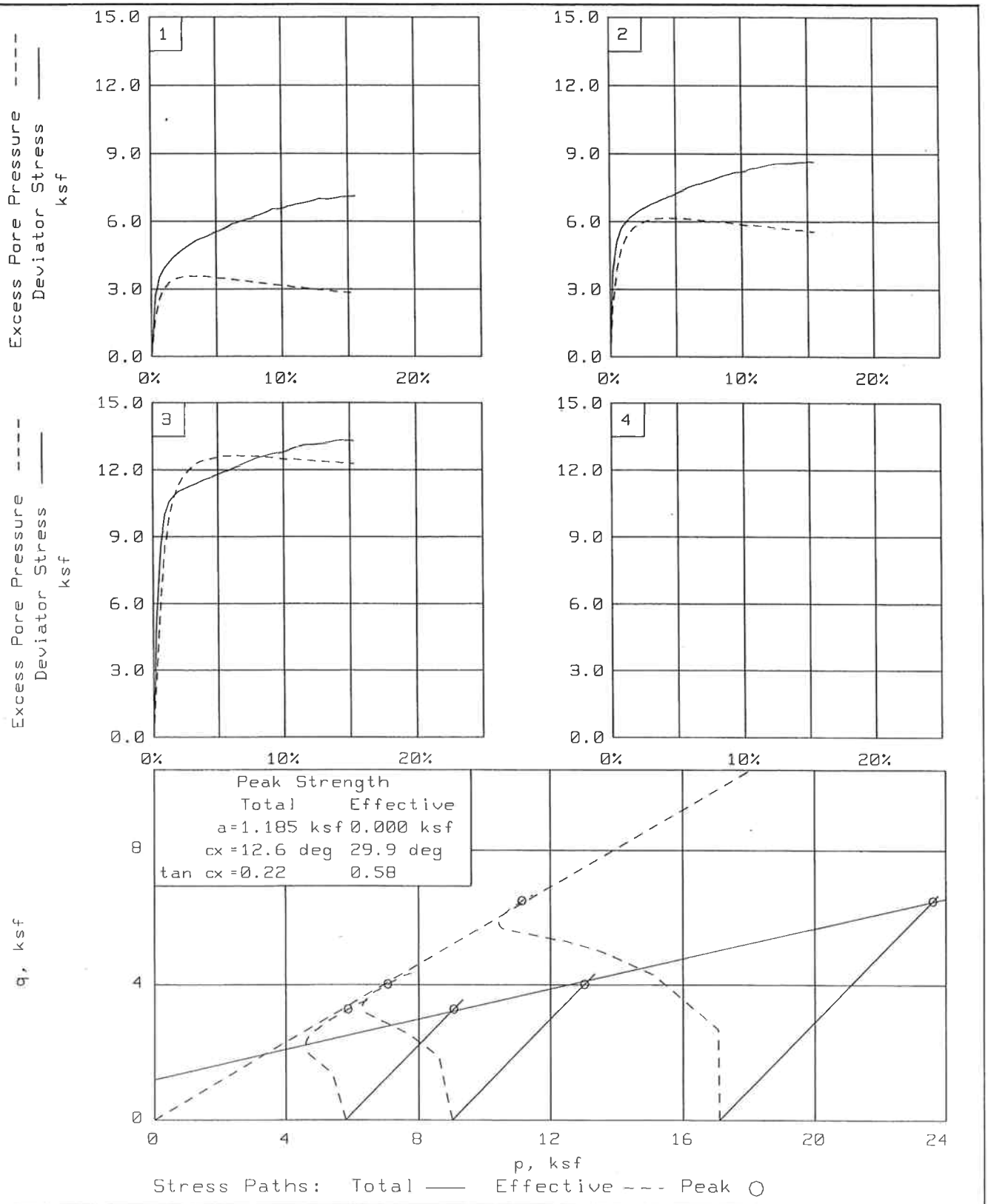
PROJECT: Newby Island - 2004-049

SAMPLE LOCATION: 1,2&3) RB-1, 15 @ 57.5'

PROJ. NO.: 516-003 DATE: 11/29/04

TRIAXIAL SHEAR TEST REPORT

COOPER TESTING LABORATORY

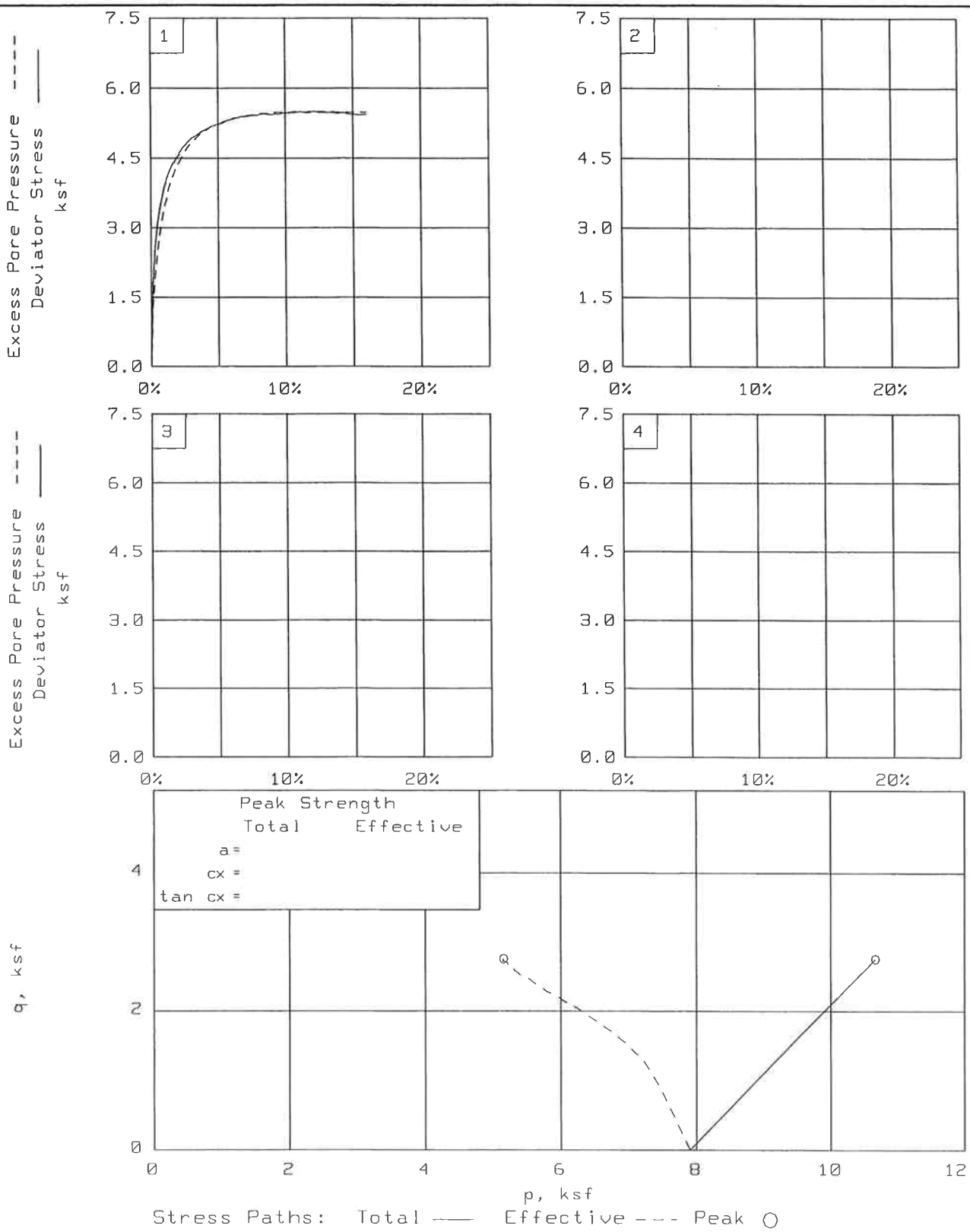


Client: Geologic Associates

Project: Newby Island - 2004-049

Location: 1,2&3) RB-1, 15 @ 57.5'

File: 516-003 Project No.: 516-003 Fig. No.: ____

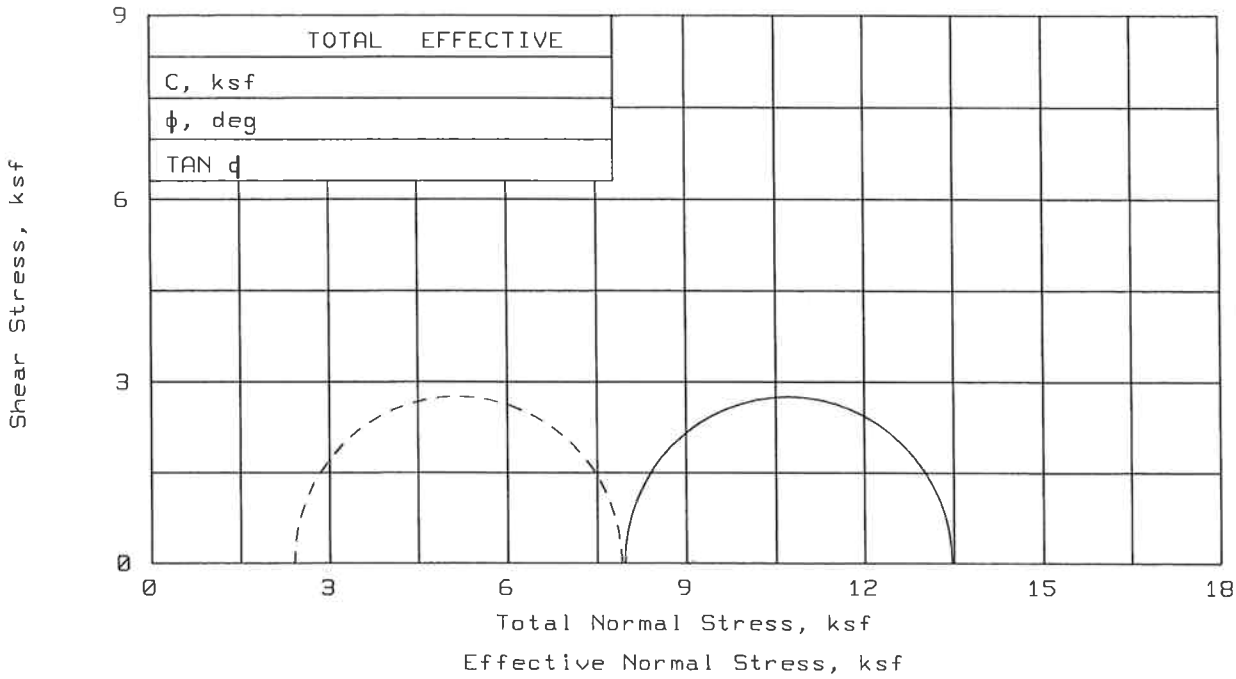


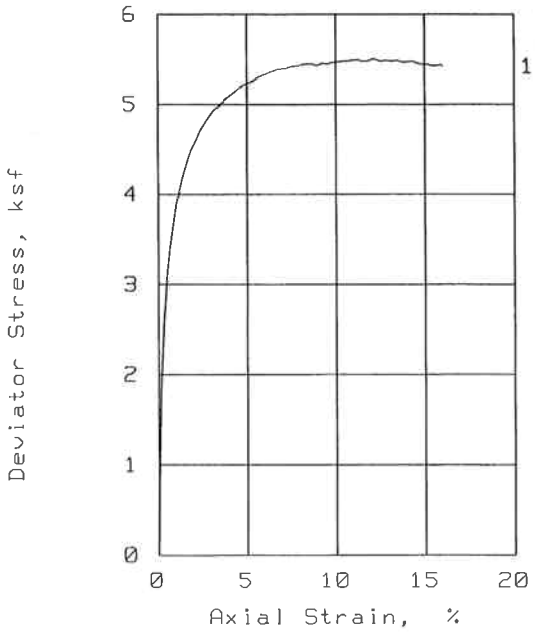
Client: GeoLogic Associates

Project: Newby Island - 2004-049

Location: RB-2, 5 @ 26.5'

File: 516-005 Project No.: 516-005 Fig. No.: ____





SAMPLE NO.:		1
INITIAL	WATER CONTENT, %	38.6
	DRY DENSITY, pcf	82.2
	SATURATION, %	97.4
	VOID RATIO	1.089
	DIAMETER, in	2.870
	HEIGHT, in	6.000
AT TEST	WATER CONTENT, %	27.3
	DRY DENSITY, pcf	98.0
	SATURATION, %	100.0
	VOID RATIO	0.752
	DIAMETER, in	2.704
	HEIGHT, in	5.670
Strain rate, %/min		0.02
EFF CELL PRESSURE, ksf		7.963
DEVIATOR STRESS, ksf		5.505
EXCESS PORE PR., ksf		5.558
STRAIN, %		12.2
ULT. STRESS, ksf		
EXCESS PORE PR., ksf		
STRAIN, %		
$\bar{\sigma}_1$ FAILURE, ksf		7.910
$\bar{\sigma}_3$ FAILURE, ksf		2.405

TYPE OF TEST:
CU with Pore Pressures
SAMPLE TYPE: Undisturbed
DESCRIPTION: Dark Gray CLAY

ASSUMED SPECIFIC GRAVITY= 2.75
REMARKS: Strengths picked at peak stress ratios.

Fig. No.: _____

CLIENT: GeoLogic Associates

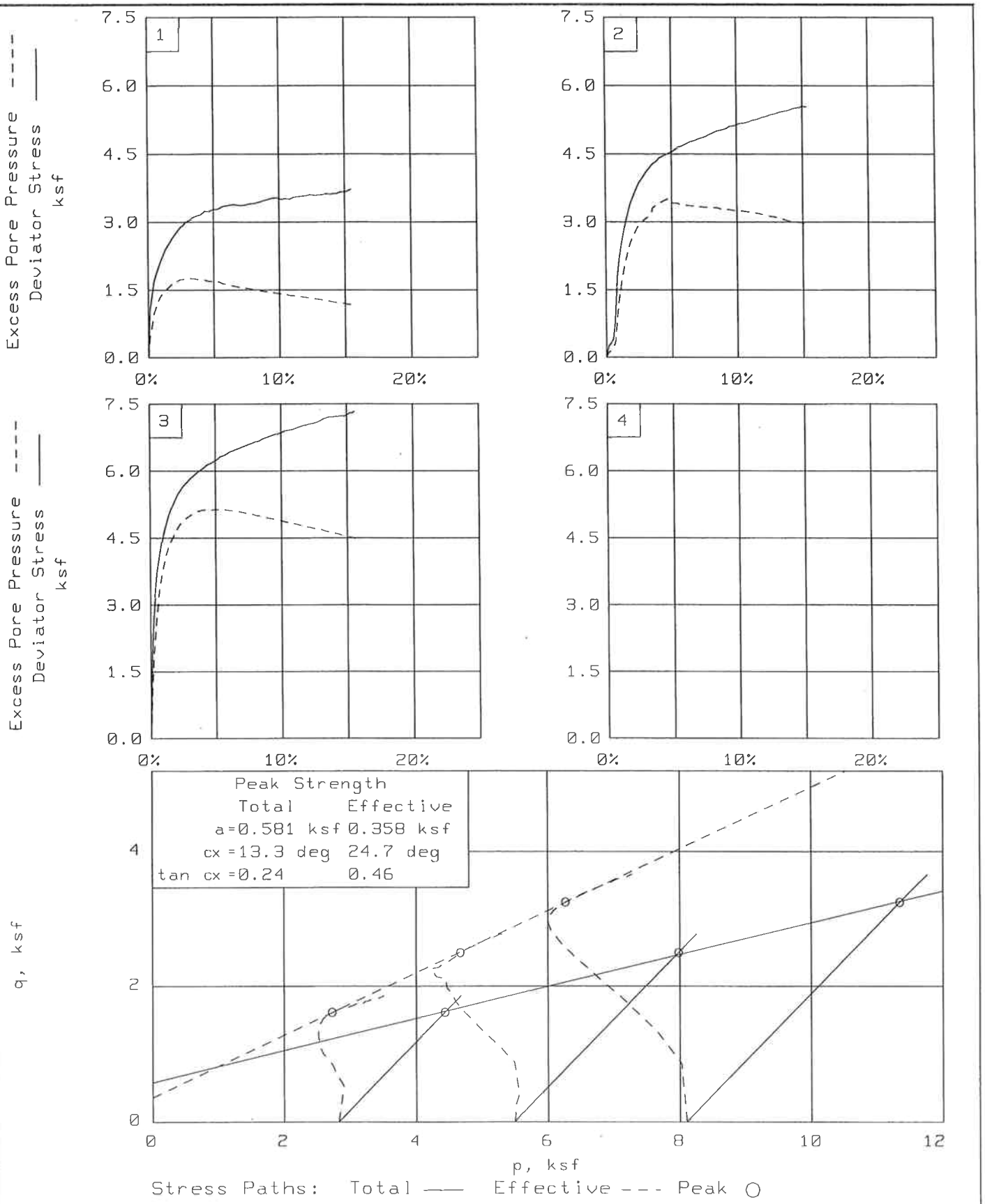
PROJECT: Newby Island - 2004-049

SAMPLE LOCATION: RB-2, 5 @ 26.5'

PROJ. NO.: 516-005 DATE: 12/10/04

TRIAXIAL SHEAR TEST REPORT

COOPER TESTING LABORATORY

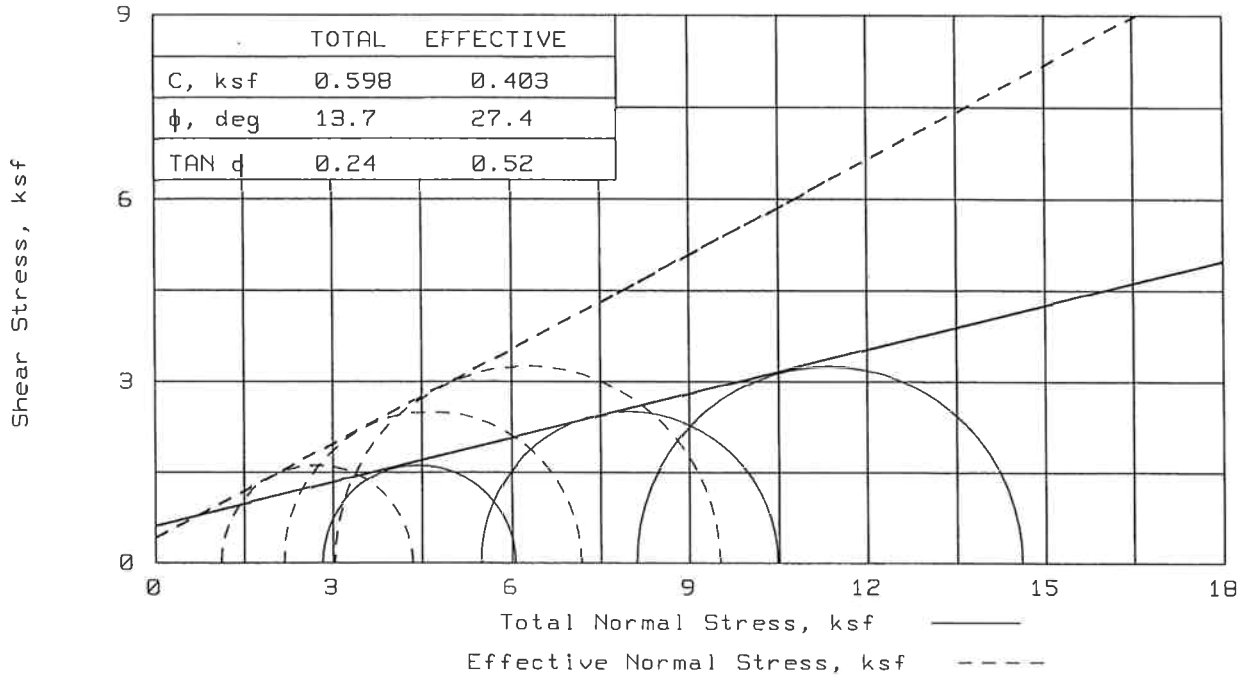


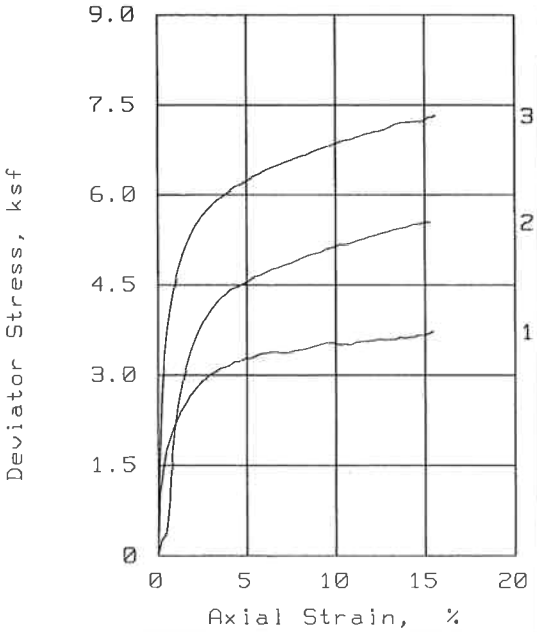
Client: GeoLogic Associates

Project: Newby Island - 2004-049

Location: RB-2, 8 @ 35'

File: 516-002D Project No.: 516-002d Fig. No.: ____





SAMPLE NO.:		1	2	3
INITIAL	WATER CONTENT, %	22.3	20.3	20.6
	DRY DENSITY, pcf	102.7	107.1	108.0
	SATURATION, %	93.8	95.6	99.1
	VOID RATIO	0.641	0.573	0.561
	DIAMETER, in	2.870	2.870	2.870
	HEIGHT, in	6.000	6.000	6.000
AT TEST	WATER CONTENT, %	20.8	17.8	17.3
	DRY DENSITY, pcf	107.9	113.9	114.8
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	0.563	0.480	0.468
	DIAMETER, in	2.834	2.813	2.833
	HEIGHT, in	5.858	5.875	5.791
Strain rate, %/min		0.02	0.02	0.02
EFF CELL PRESSURE, ksf		2.822	5.486	8.107
DEVIATOR STRESS, ksf		3.228	4.991	6.492
EXCESS PORE PR., ksf		1.714	3.312	5.083
STRAIN, %		4.4	8.5	6.8
ULT. STRESS, ksf				
EXCESS PORE PR., ksf				
STRAIN, %				
$\bar{\sigma}_1$ FAILURE, ksf		4.337	7.165	9.516
$\bar{\sigma}_3$ FAILURE, ksf		1.109	2.174	3.024

TYPE OF TEST:
CU with Pore Pressures
SAMPLE TYPE: Undisturbed
DESCRIPTION: Brown Lean CLAY with Sand

ASSUMED SPECIFIC GRAVITY= 2.7
REMARKS: Strengths picked at peak stress ratios.

Fig. No.: _____

CLIENT: GeoLogic Associates

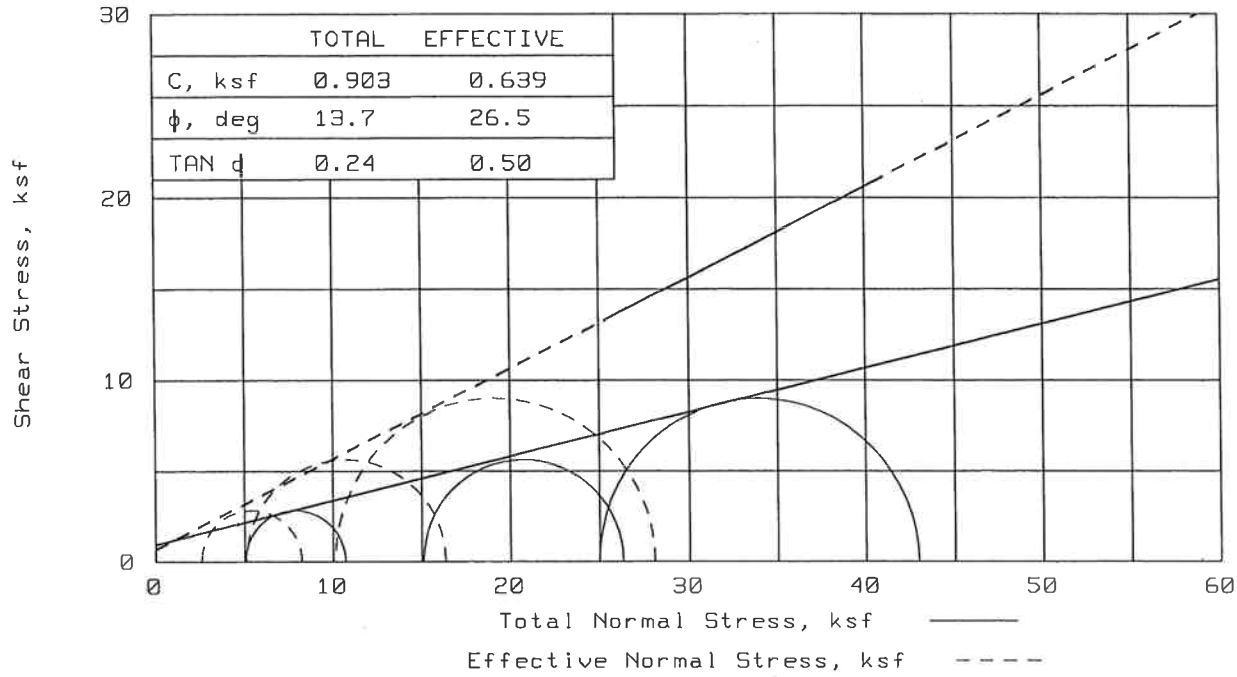
PROJECT: Newby Island - 2004-049

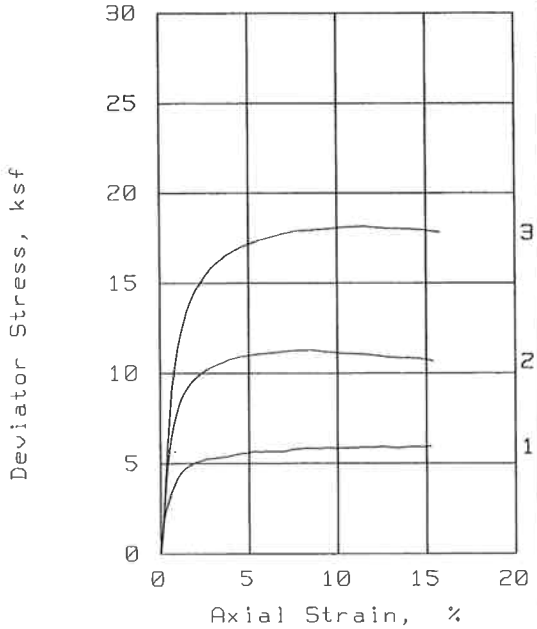
SAMPLE LOCATION: RB-2, 8 @ 35'

PROJ. NO.: 516-002d DATE: 11/30/04

TRIAXIAL SHEAR TEST REPORT

COOPER TESTING LABORATORY





SAMPLE NO.:		1	2	3
INITIAL	WATER CONTENT, %	30.5	29.2	29.0
	DRY DENSITY, pcf	92.4	92.9	94.5
	SATURATION, %	99.9	96.9	99.9
	VOID RATIO	0.825	0.815	0.783
	DIAMETER, in	2.875	2.875	2.874
	HEIGHT, in	6.000	6.000	6.000
AT TEST	WATER CONTENT, %	29.5	25.4	22.7
	DRY DENSITY, pcf	93.8	100.1	104.6
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	0.797	0.685	0.612
	DIAMETER, in	2.866	2.805	2.794
	HEIGHT, in	5.944	5.850	5.738
Strain rate, %/min		0.02	0.02	0.02
EFF CELL PRESSURE, ksf		5.05	15.09	24.97
DEVIATOR STRESS, ksf		5.64	11.23	17.97
EXCESS PORE PR., ksf		2.46	9.99	14.85
STRAIN, %		5.3	7.3	9.0
ULT. STRESS, ksf				
EXCESS PORE PR., ksf				
STRAIN, %				
$\bar{\sigma}_1$ FAILURE, ksf		8.23	16.33	28.09
$\bar{\sigma}_3$ FAILURE, ksf		2.59	5.10	10.12

TYPE OF TEST:
CU with Pore Pressures
SAMPLE TYPE: Undisturbed
DESCRIPTION: Olive Brown Lean CLAY

ASSUMED SPECIFIC GRAVITY= 2.7
REMARKS: Strengths@ peak stress ratios. Non-linear effective stress envelope. Linear best fit may overstate cohesion.
Fig. No.: _____

CLIENT: GeoLogic Associates

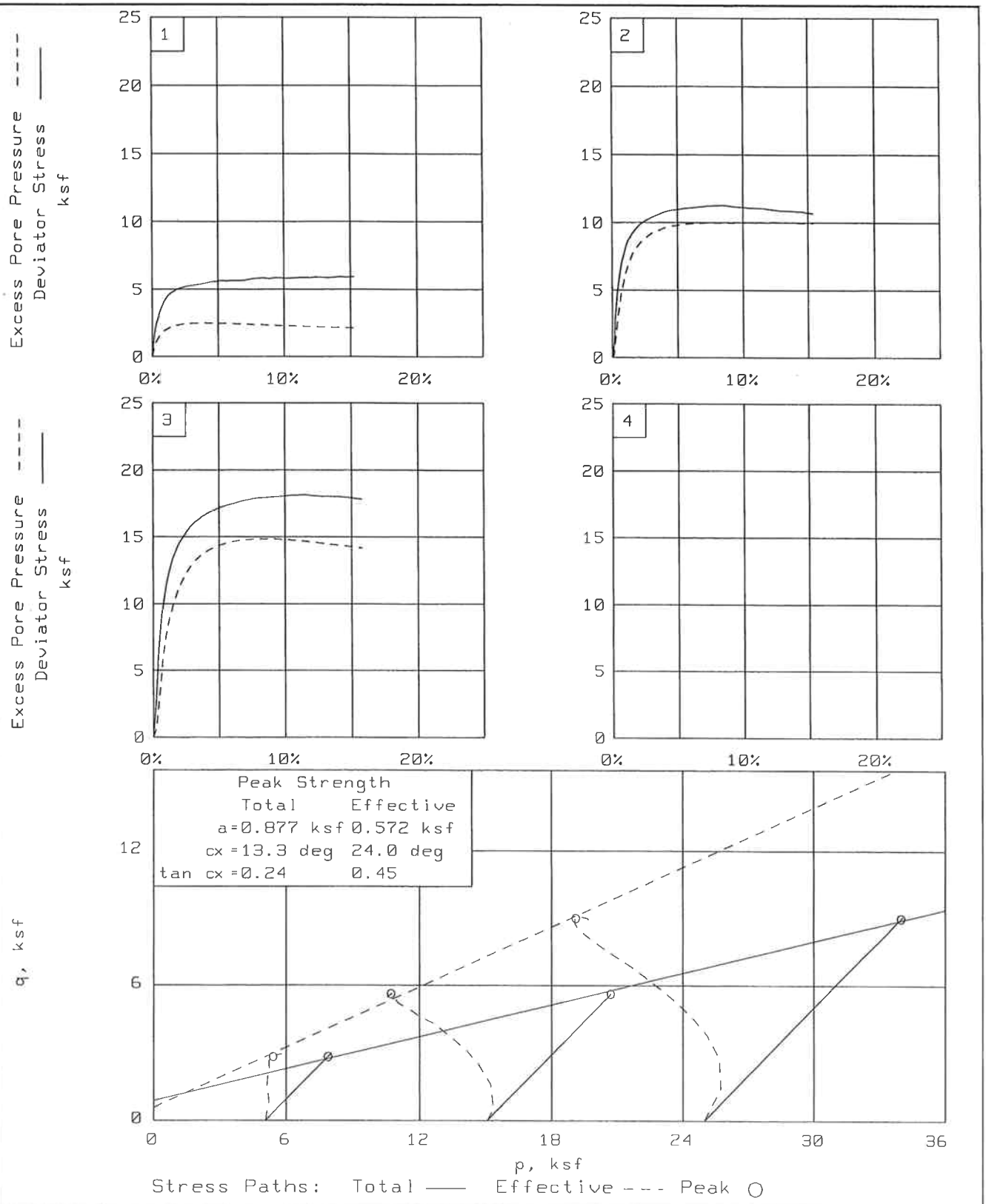
PROJECT: Newby Island - 2004-049

SAMPLE LOCATION: RB-2, 13 @ 75'

PROJ. NO.: 516-002a DATE: 11/22/04

TRIAXIAL SHEAR TEST REPORT

COOPER TESTING LABORATORY

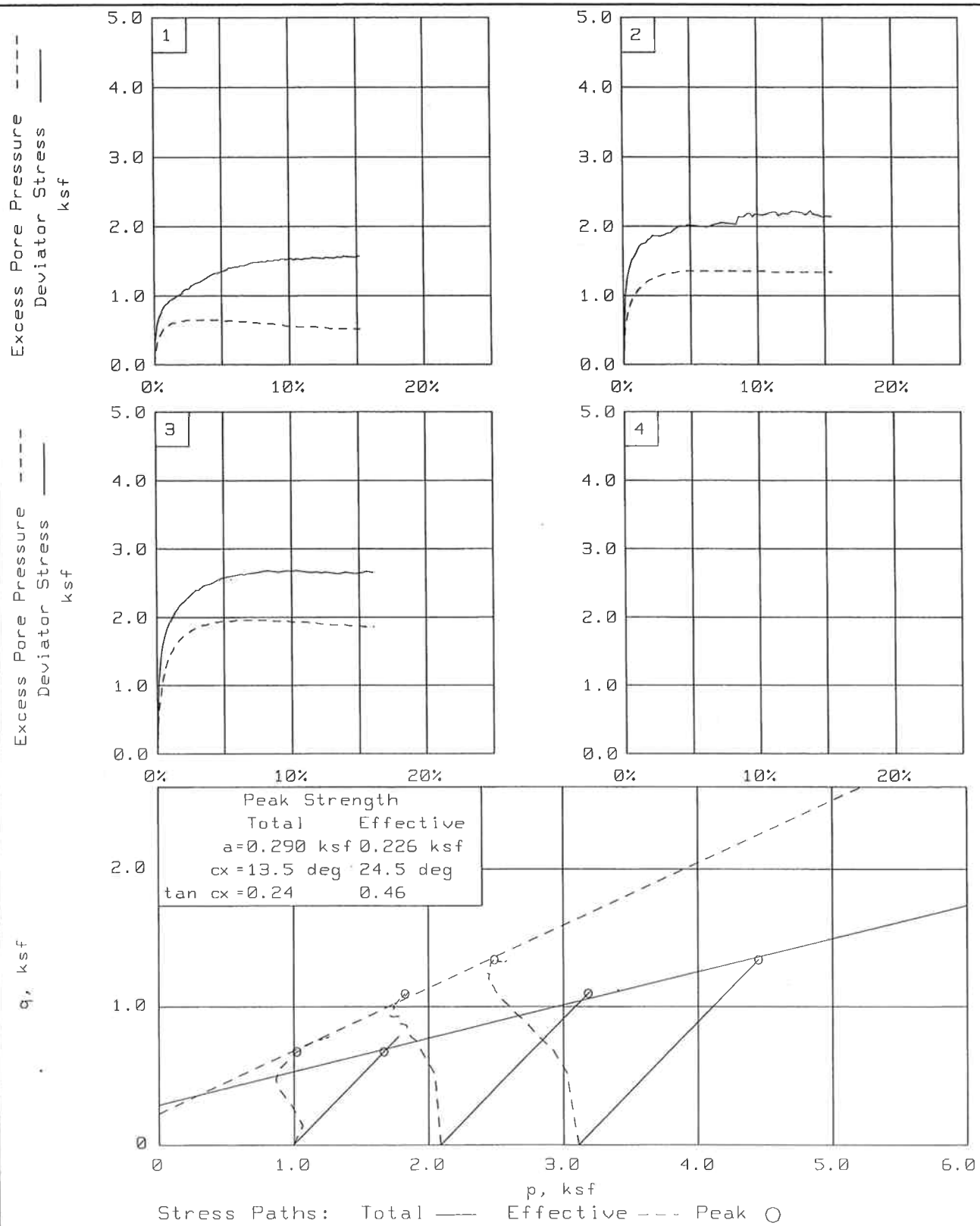


Client: GeoLogic Associates

Project: Newby Island - 2004-049

Location: RB-2, 13 @ 75'

File: 516-002A Project No.: 516-002a Fig. No.: ____

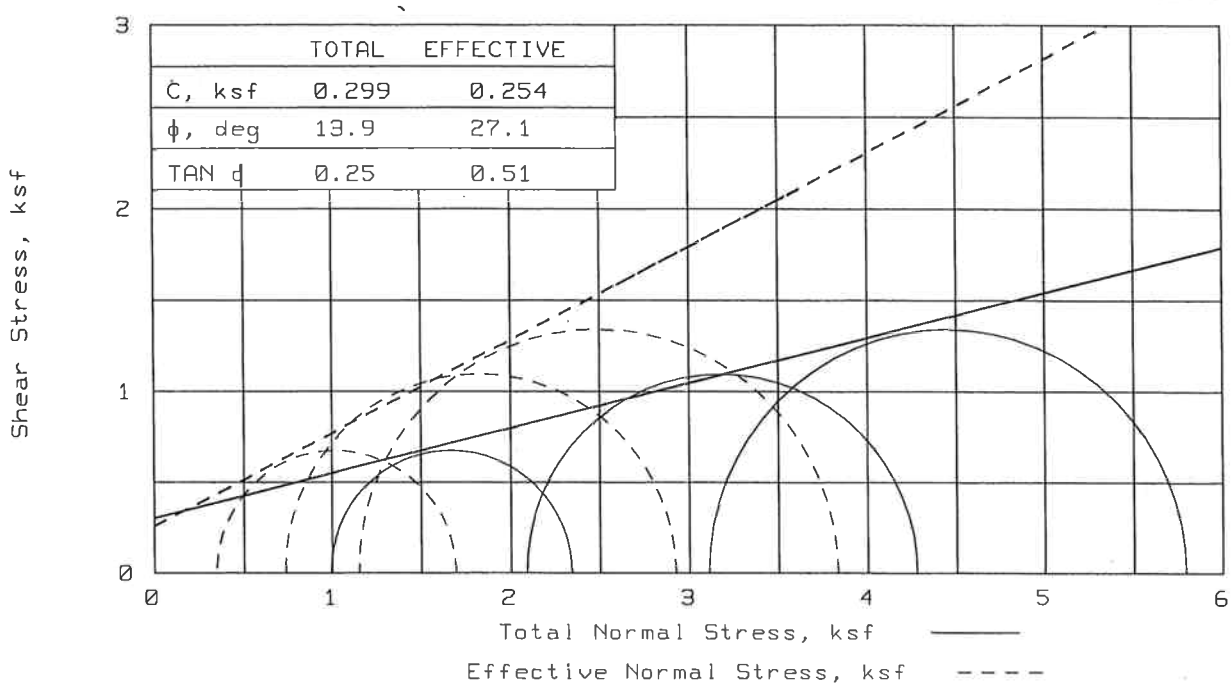


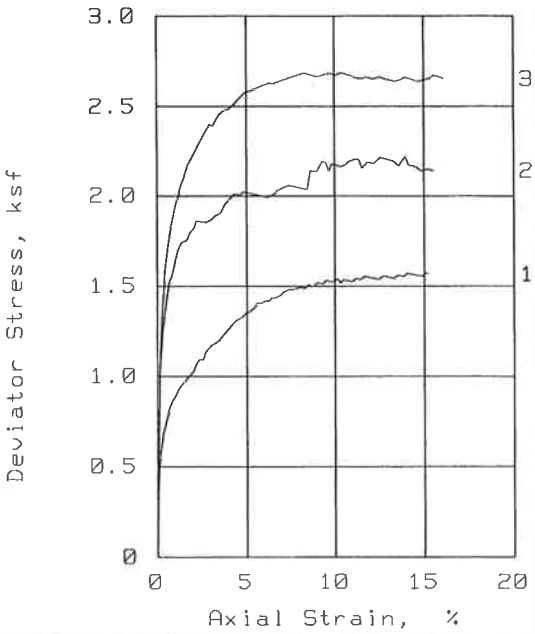
Client: GeoLogic Associates

Project: Newby Island - 2004-049

Location: RB-2A, 1 @ 23'

File: 516-002 Project No.: 516-002 Fig. No.: ____





SAMPLE NO.:		1	2	3
INITIAL	WATER CONTENT, %	33.9	35.3	37.2
	DRY DENSITY, pcf	88.7	84.3	84.3
	SATURATION, %	99.7	93.6	98.8
	VOID RATIO	0.935	1.037	1.036
	DIAMETER, in	2.870	2.870	2.870
	HEIGHT, in	6.000	5.930	5.800
AT TEST	WATER CONTENT, %	31.7	30.4	30.7
	DRY DENSITY, pcf	91.8	93.5	93.1
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	0.871	0.837	0.845
	DIAMETER, in	2.841	2.756	2.774
	HEIGHT, in	5.922	5.800	5.625
Strain rate, %/min		0.02	0.02	0.02
EFF CELL PRESSURE, ksf		0.994	2.088	3.110
DEVIATOR STRESS, ksf		1.348	2.190	2.681
EXCESS PORE PR., ksf		0.648	1.354	1.958
STRAIN, %		4.9	9.3	8.3
ULT. STRESS, ksf				
EXCESS PORE PR., ksf				
STRAIN, %				
$\bar{\sigma}_1$ FAILURE, ksf		1.693	2.924	3.833
$\bar{\sigma}_3$ FAILURE, ksf		0.346	0.734	1.152

TYPE OF TEST:
CU with Pore Pressures
SAMPLE TYPE: Undisturbed
DESCRIPTION: Gray Fat CLAY
(bay mud)

ASSUMED SPECIFIC GRAVITY= 2.75
REMARKS: Non-linear strength envelope. Linear best fit may overstate apparent cohesion. Strengths@ peak stress ratios
Fig. No.: _____

CLIENT: GeoLogic Associates

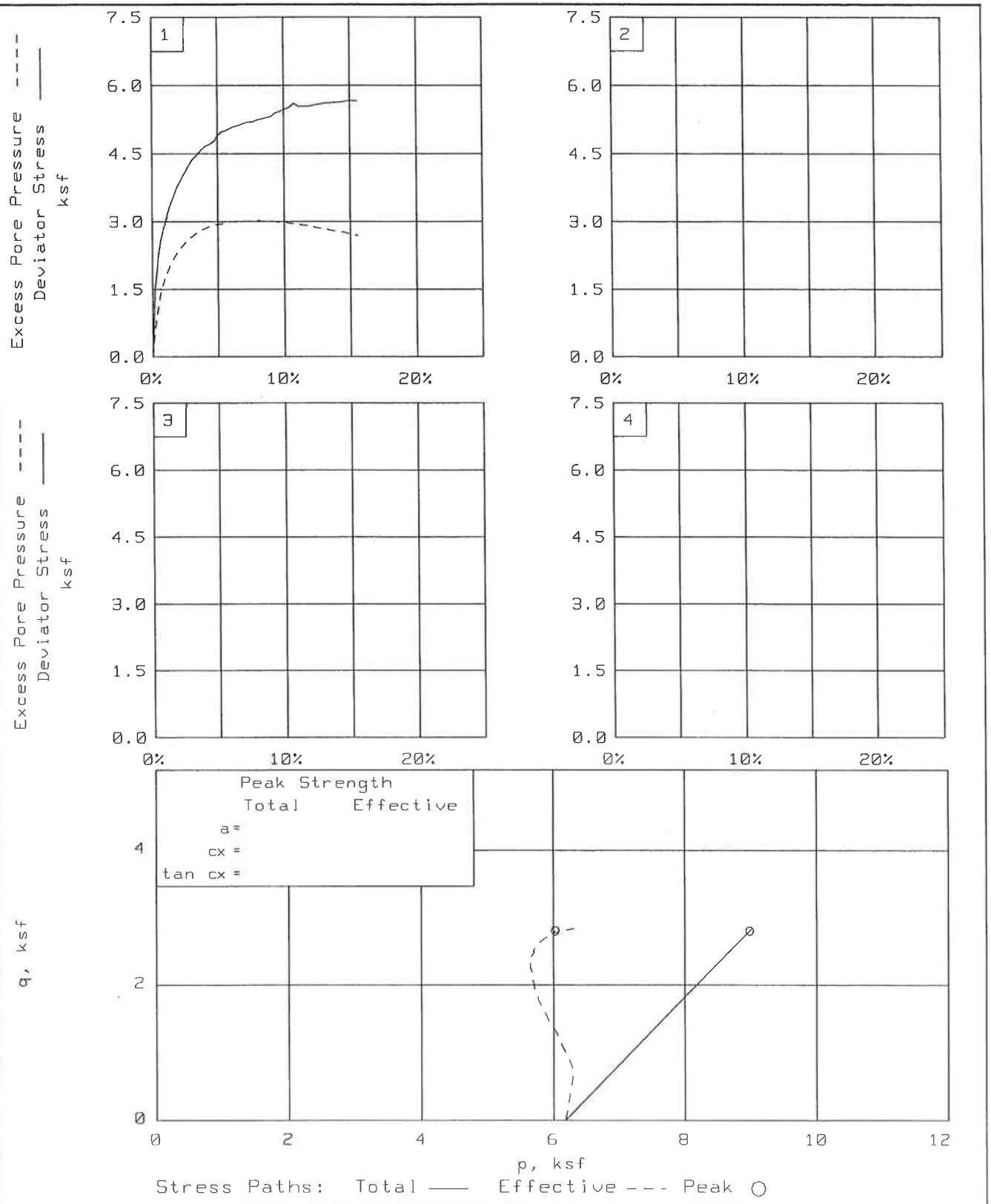
PROJECT: Newby Island - 2004-049

SAMPLE LOCATION: RB-2A, 1 @ 23'

PROJ. NO.: 516-002 DATE: 11/11/04

TRIAXIAL SHEAR TEST REPORT

COOPER TESTING LABORATORY

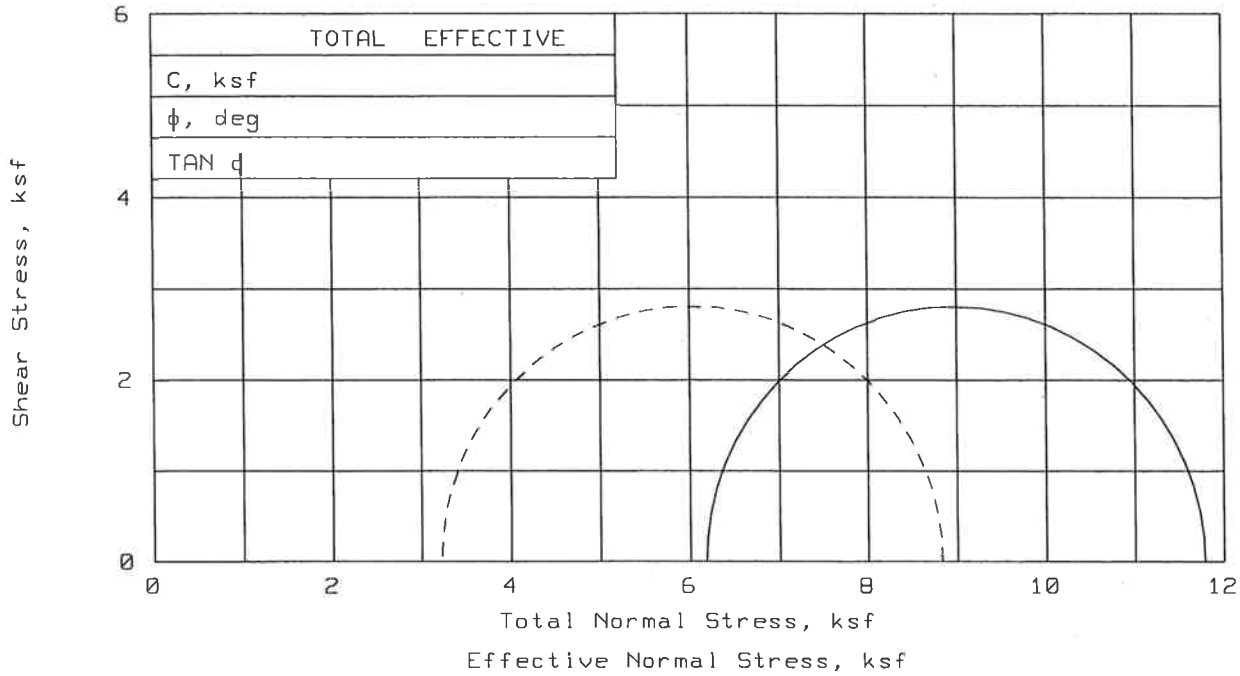


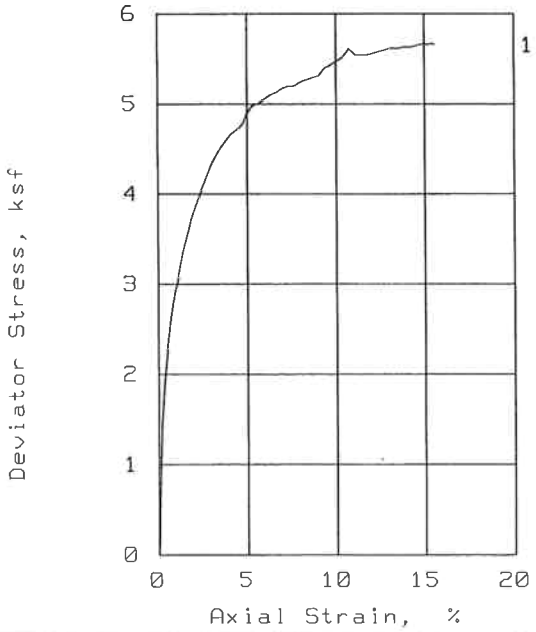
Client: GeoLogic Associates

Project: Newby Island - 2004-049

Location: RB-5, S-1 @ 24'

File: 516-006 Project No.: 516-006 Fig. No.: ____





SAMPLE NO.:		1
INITIAL	WATER CONTENT, %	29.8
	DRY DENSITY, pcf	93.3
	SATURATION, %	99.6
	VOID RATIO	0.807
	DIAMETER, in	2.860
	HEIGHT, in	6.000
AT TEST	WATER CONTENT, %	25.7
	DRY DENSITY, pcf	99.6
	SATURATION, %	100.0
	VOID RATIO	0.693
	DIAMETER, in	2.805
	HEIGHT, in	5.845
Strain rate, %/min		0.02
EFF CELL PRESSURE, ksf		6.178
DEVIATOR STRESS, ksf		5.606
EXCESS PORE PR., ksf		2.952
STRAIN, %		10.8
ULT. STRESS, ksf		
EXCESS PORE PR., ksf		
STRAIN, %		
$\bar{\sigma}_1$ FAILURE, ksf		8.832
$\bar{\sigma}_3$ FAILURE, ksf		3.226

TYPE OF TEST:
CU with Pore Pressures
SAMPLE TYPE: Undisturbed
DESCRIPTION: Gray Fat CLAY

ASSUMED SPECIFIC GRAVITY= 2.7
REMARKS: Strength picked at peak stress ratio.

Fig. No.: _____

CLIENT: GeoLogic Associates

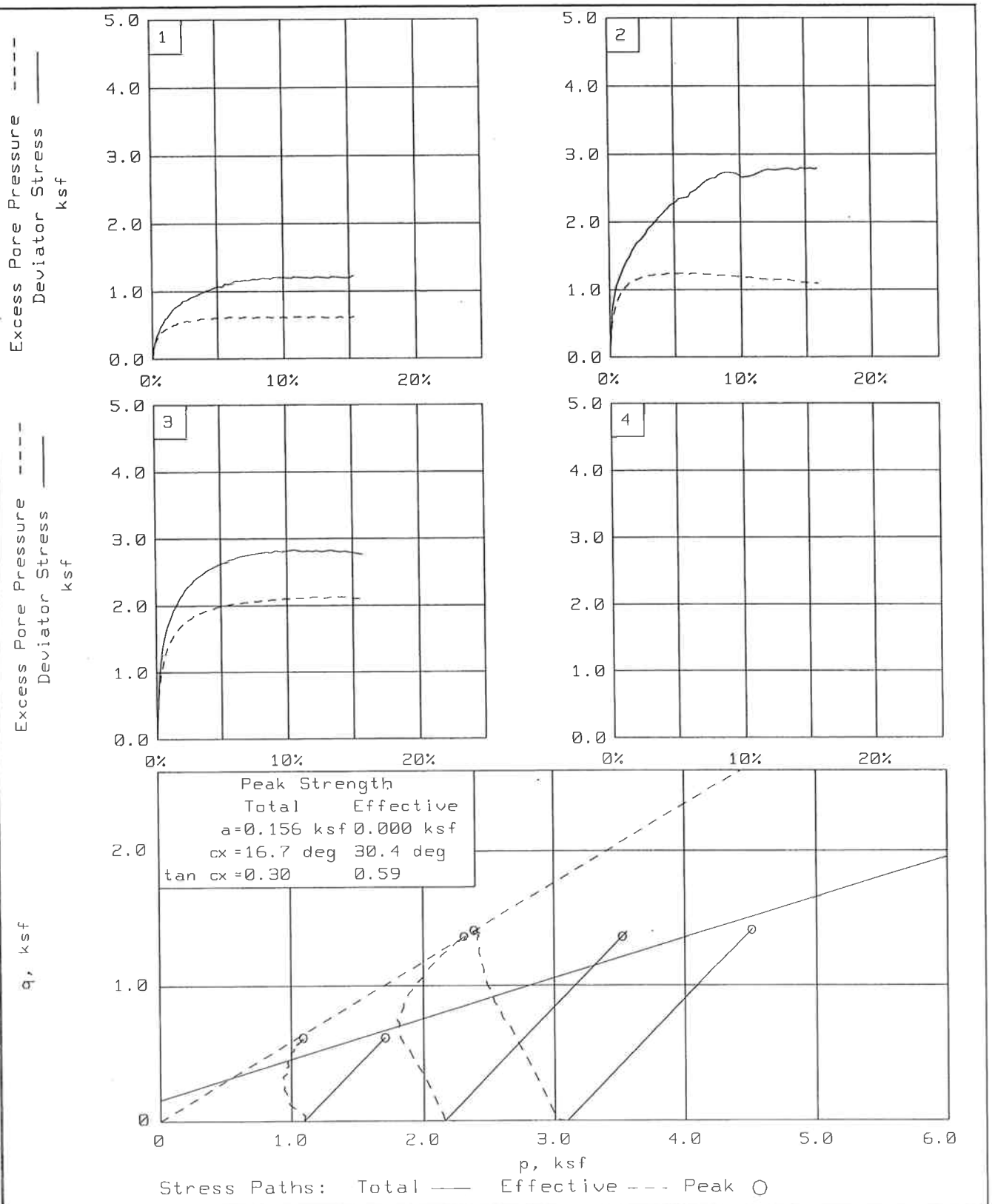
PROJECT: Newby Island - 2004-049

SAMPLE LOCATION: RB-5, S-1 @ 24'

PROJ. NO.: 516-006 DATE: 12/23/04

TRIAXIAL SHEAR TEST REPORT

COOPER TESTING LABORATORY

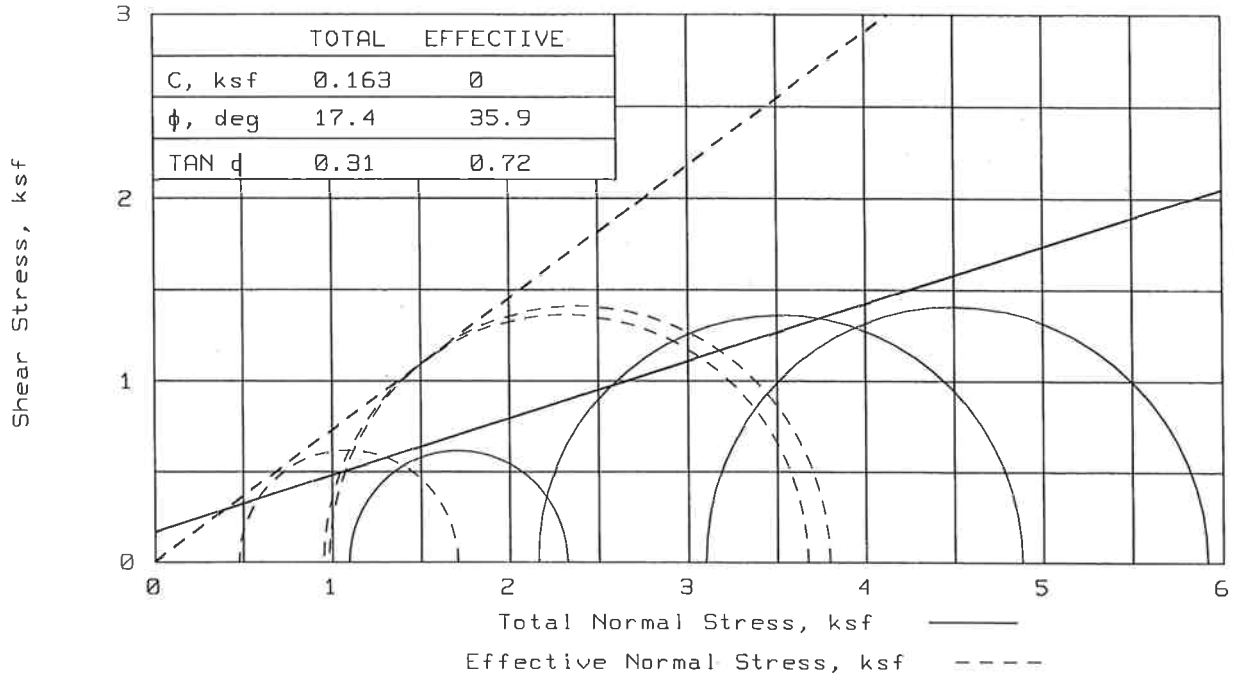


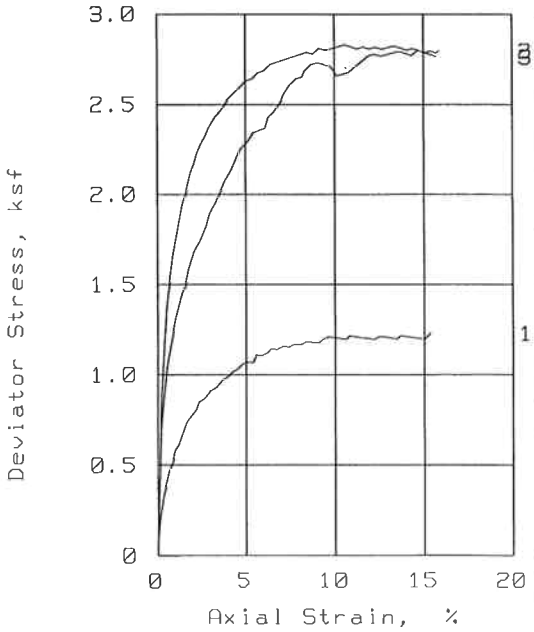
Client: GeoLogic Associates

Project: Newby Island - 2004-049

Location: RB-8, 4 @ 22.5'

File: 516-002C Project No.: 516-002c Fig. No.: ____





SAMPLE NO.:		1	2	3
INITIAL	WATER CONTENT, %	54.5	37.6	43.8
	DRY DENSITY, pcf	68.0	83.1	76.7
	SATURATION, %	99.4	98.7	98.9
	VOID RATIO	1.480	1.028	1.197
	DIAMETER, in	2.870	2.870	2.870
	HEIGHT, in	6.000	5.845	5.958
AT TEST	WATER CONTENT, %	49.6	34.3	38.2
	DRY DENSITY, pcf	72.1	87.5	83.0
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.339	0.926	1.032
	DIAMETER, in	2.805	2.827	2.804
	HEIGHT, in	5.924	5.720	5.773
Strain rate, %/min		0.02	0.02	0.02
EFF CELL PRESSURE, ksf		1.094	2.160	3.096
DEVIATOR STRESS, ksf		1.231	2.721	2.817
EXCESS PORE PR., ksf		0.619	1.210	2.117
STRAIN, %		15.4	8.7	12.3
ULT. STRESS, ksf				
EXCESS PORE PR., ksf				
STRAIN, %				
$\bar{\sigma}_1$ FAILURE, ksf		1.706	3.672	3.796
$\bar{\sigma}_3$ FAILURE, ksf		0.475	0.950	0.979

TYPE OF TEST:
CU with Pore Pressures
SAMPLE TYPE: Undisturbed
DESCRIPTION: Dark Gray Fat CLAY

ASSUMED SPECIFIC GRAVITY= 2.7
REMARKS: Strengths@ peak stress ratios. Non-linear effective stress envelope. Linear best fit may overstate cohesion.
Fig. No.: _____

CLIENT: GeoLogic Associates

PROJECT: Newby Island - 2004-049

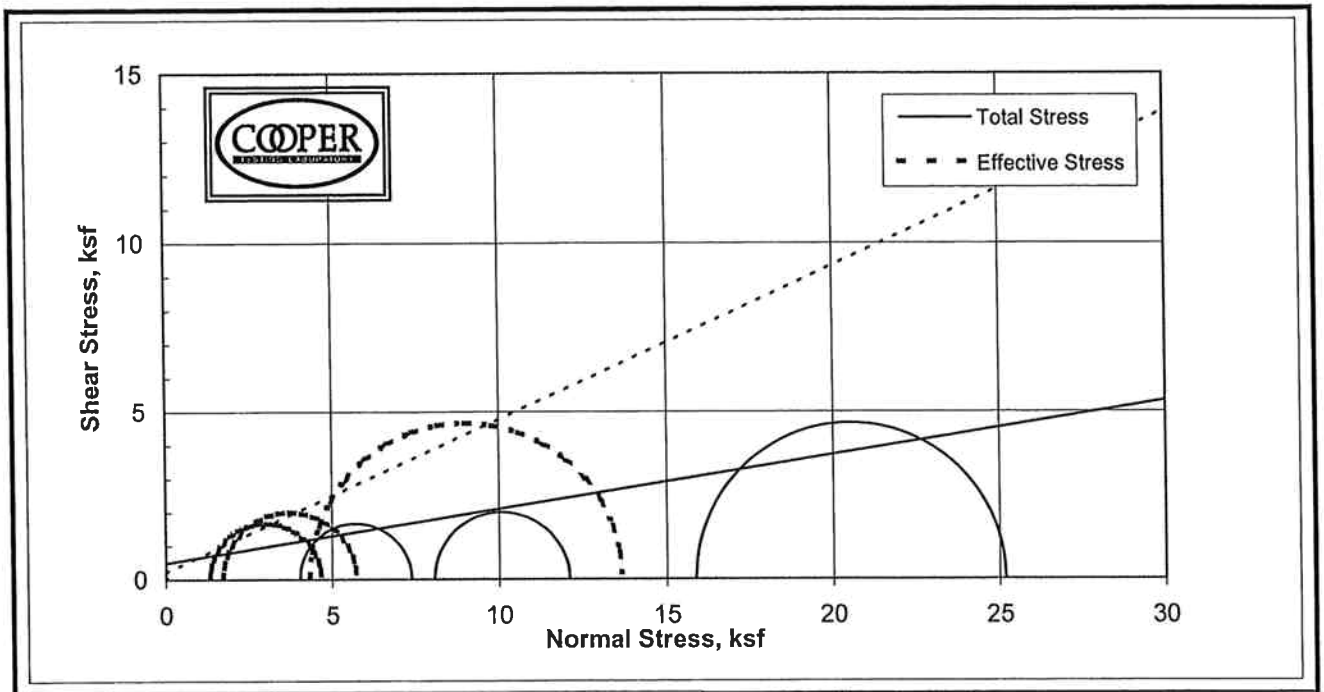
SAMPLE LOCATION: RB-8, 4 @ 22.5'

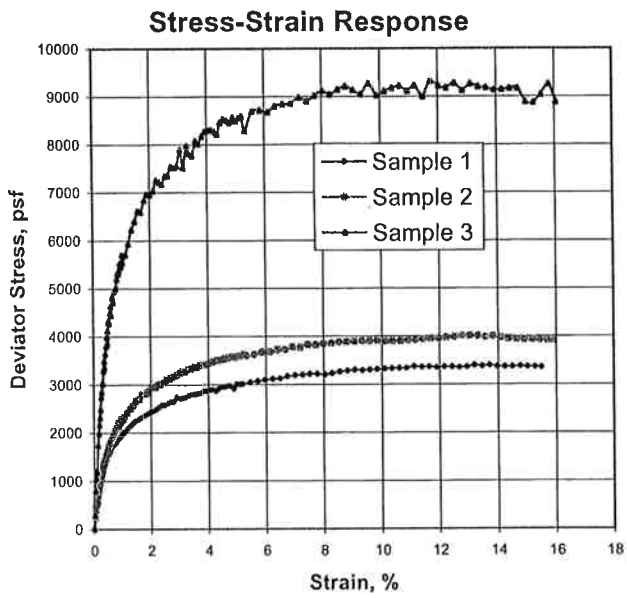
PROJ. NO.: 516-002c DATE: 11/22/04

TRIAXIAL SHEAR TEST REPORT

COOPER TESTING LABORATORY

Triaxial Consolidated Undrained with Pore Pressure
ASTM D4767





Sample:	1	2	3	4
MC, %	54.2	52.9	60.4	
DD, pcf	66.2	67.5	62.2	
Sat. %	94.8	95.5	95.6	
Void Ratio	1.544	1.497	1.708	
Diameter in	2.87	2.87	2.87	
Height, in	6.00	5.96	5.94	
	Final			
MC, %	40.0	38.5	33.3	
DD, pcf	81.0	82.6	88.7	
Sat. %	100.0	100.0	100.0	
Void Ratio	1.080	1.040	0.899	
Diameter, in	2.64	2.67	2.49	
Height, in	5.82	5.64	5.52	
Cell, psi	77.8	105.3	161.2	
BP, psi	49.7	49.4	51.1	
	Effective Stresses At:			
Strain, %	11.1	12.8	11.8	
Deviator ksf	3.337	4.011	9.318	
Excess PP	2.699	6.338	11.533	
Sigma 1	4.672	5.731	13.645	
Sigma 3	1.335	1.719	4.328	
P, ksf	3.004	3.725	8.987	
Q, ksf	1.669	2.006	4.659	
Stress Ratio	3.500	3.333	3.153	
Rate in/min	0.002	0.001	0.002	

Job No.: 516-011b **Date:** 9/26/2005

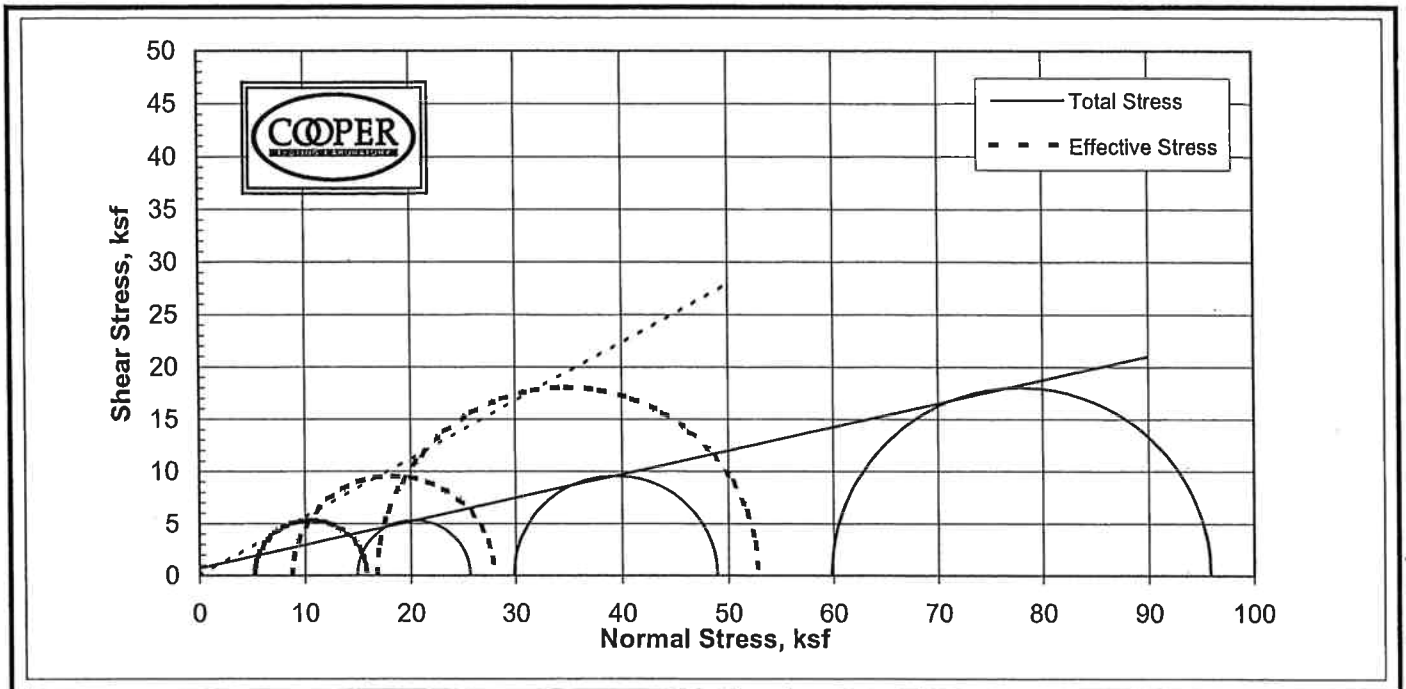
Client: GeoLogic Associates BY:DC

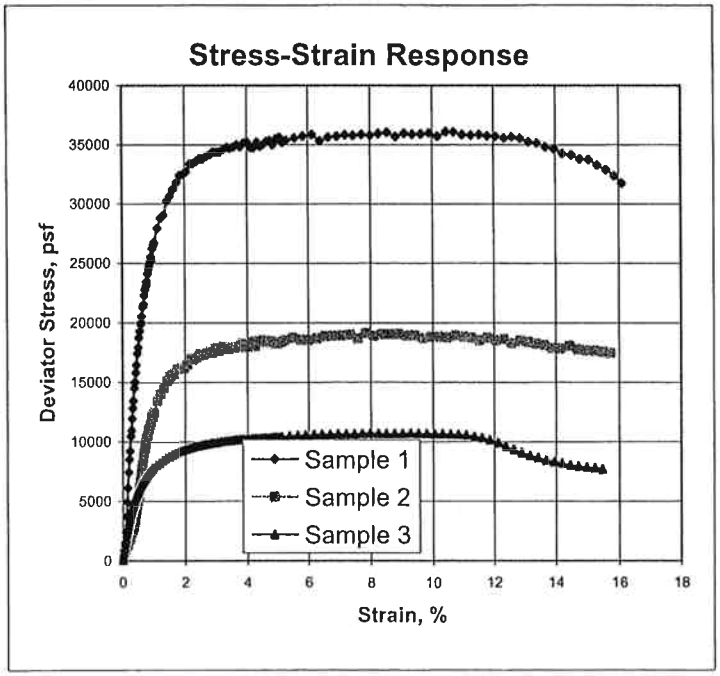
Project: Newby Island Landfill; Phase II Borings 2004-049

Sample 1)	RB12VA, 12VA/1@29-31.5'	Gray Fat CLAY
Sample 2)	RB12VA, 12VA/1@29-31.5'	Gray Fat CLAY
Sample 3)	RB12VA, 12VA/1@29-31.5'	Gray Fat CLAY

Total Phi	9.2	C, ksf	0.5
Eff. Phi	24.5	C, ksf	0.2

Triaxial Consolidated Undrained w/Pore Pressure
ASTM D4767





Sample:	1	2	3	4
MC, %	29.6	29.4	30.2	
DD, pcf	94.9	94.4	93.6	
Sat. %	98.6	96.8	97.4	
Void Ratio	0.842	0.852	0.867	
Diameter in	2.87	2.87	2.87	
Height, in	5.96	5.99	6.00	
	Final			
MC, %	19.8	22.1	26.4	
DD, pcf	112.4	108.0	100.5	
Sat. %	100.0	100.0	100.0	
Void Ratio	0.555	0.618	0.738	
Diameter, in	2.75	2.75	2.81	
Height, in	5.50	5.69	5.82	
Cell, psi	466.4	258.0	154.1	
BP, psi	51.1	51.0	50.3	
	Effective Stresses At:			
Strain, %	8.8	7.9	10.5	
Deviator ksf	36.046	19.134	10.655	
Excess PP	43.005	21.023	9.757	
Sigma 1	52.850	27.920	15.847	
Sigma 3	16.804	8.785	5.192	
P, ksf	34.827	18.352	10.519	
Q, ksf	18.023	9.567	5.328	
Stress Ratio	3.145	3.178	3.052	
Rate in/min	0.002	0.002	0.002	

Job No.: 516-011a Date: 9/20/2005

Client: GeoLogic Associates BY:DC

Project: Newby Island Landfill; Phase II Borings - 2004-049

Sample 1) RB-11V, 11V/2 @ 71.5-74' Brown Lean CLAY

Sample 2) RB-11V, 11V/2 @ 71.5-74' Brown Lean CLAY

Sample 3) RB-11V, 11V/2 @ 71.5-74' Brown Lean CLAY

Sample 4)

Total Phi	12.7	C, ksf	0.7
Eff. Phi	29.2	C, ksf	0.0

LABORATORY DATA

- **Radiocarbon Dating Analyses**

BETA

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Beta Analytic Inc.
4985 SW 74 Court
Miami, Florida 33155 USA
Tel: 305 667 5167
Fax: 305 663 0964
beta@radiocarbon.com
www.radiocarbon.com

MR. DARDEN HOOD
Director

Mr. Ronald Hatfield
Mr. Christopher Patrick
Deputy Directors

July 31, 2007

Mr. Robbie Warner
GeoLogic Associates
250 W. First St.
Suite 228
Claremont, CA 91711

RE: Radiocarbon Dating Results For Samples 04-049 NB5 18.5-19.0, 04-049 NB5 23.5-24.0, 04-049 NB5 26.5-27.0, 04-049 NB5 32.5-33.0, 04-049 NB5 34.5-35.0, 04-049 NB5 40.5-41.0, 04-049 NB5 56.5-57.0, 04-049 NB5 59.5-60.0, 04-049 NB5 68.0-68.5, 04-049 NB5 18.5-19.0 WF, NB5 26-26.5

Dear Mr. Warner:

Enclosed are the radiocarbon dating results for 11 samples recently sent to us. They each provided plenty of carbon for accurate measurements and all the analyses proceeded normally. The report sheet contains the dating result, method used, material type, applied pretreatment and two-sigma calendar calibration result (where applicable) for each sample.

This report has been both mailed and sent electronically, along with a separate publication quality calendar calibration page. This is useful for incorporating directly into your reports. It is also digitally available in Windows metafile (.wmf) format upon request. Calibrations are calculated using the newest (1998) calibration database. References are quoted on the bottom of each calibration page. Multiple probability ranges may appear in some cases, due to short-term variations in the atmospheric 14C contents at certain time periods. Examining the calibration graphs will help you understand this phenomenon. Calibrations may not be included with all analyses. The upper limit is about 20,000 years, the lower limit is about 250 years and some material types are not suitable for calibration (e.g. water).

We analyzed these samples on a sole priority basis. No students or intern researchers who would necessarily be distracted with other obligations and priorities were used in the analyses. We analyzed them with the combined attention of our entire professional staff.

Information pages are enclosed with the mailed copy of this report. They should answer most of questions you may have. If they do not, or if you have specific questions about the analyses, please do not hesitate to contact us. Someone is always available to answer your questions.

The cost of the analysis was charged to the American Express card provided. A receipt is enclosed. Thank you. As always, if you have any questions or would like to discuss the results, don't hesitate to contact me.

Sincerely,

Darden Hood

BETA

BETA ANALYTIC INC.

DR. M.A. TAMERS and MR. D.G. HOOD

UNIVERSITY BRANCH
4985 S.W. 74 COURT
MIAMI, FLORIDA, USA 33155
PH: 305/667-5167 FAX: 305/663-0964
E-MAIL: beta@radiocarbon.com

REPORT OF RADIOCARBON DATING ANALYSES

Report Date: 7/31/2007

Mr. Robbie Warner

Material Received: 6/5/2007

GeoLogic Associates

Sample Data	Measured Radiocarbon Age	13C/12C Ratio	Conventional Radiocarbon Age(*)
Beta - 231255	2970 +/- 40 BP	-24.8 o/oo	2970 +/- 40 BP

SAMPLE : 04-049 NB5 18.5-19.0
ANALYSIS : AMS-Standard delivery
MATERIAL/PRETREATMENT : (organic sediment): acid washes
2 SIGMA CALIBRATION : Cal BC 1360 to 1350 (Cal BP 3310 to 3300) AND Cal BC 1310 to 1050 (Cal BP 3260 to 3000)

Beta - 231256	10860 +/- 60 BP	-24.6 o/oo	10870 +/- 60 BP

SAMPLE : 04-049 NB5 23.5-24.0
ANALYSIS : AMS-Standard delivery
MATERIAL/PRETREATMENT : (organic sediment): acid washes
2 SIGMA CALIBRATION : Cal BC 10980 to 10850 (Cal BP 12930 to 12800)

Beta - 231257	3570 +/- 40 BP	-24.2 o/oo	3580 +/- 40 BP

SAMPLE : 04-049 NB5 26.5-27.0
ANALYSIS : AMS-Standard delivery
MATERIAL/PRETREATMENT : (organic sediment): acid washes
2 SIGMA CALIBRATION : Cal BC 2030 to 1870 (Cal BP 3980 to 3820) AND Cal BC 1840 to 1820 (Cal BP 3790 to 3770)
Cal BC 1790 to 1780 (Cal BP 3740 to 3730)

Beta - 231258	16300 +/- 80 BP	-23.9 o/oo	16320 +/- 80 BP

SAMPLE : 04-049 NB5 32.5-33.0
ANALYSIS : AMS-Standard delivery
MATERIAL/PRETREATMENT : (organic sediment): acid washes
2 SIGMA CALIBRATION : Cal BC 17820 to 17740 (Cal BP 19780 to 19690) AND Cal BC 17630 to 17330 (Cal BP 19580 to 19280)

Beta - 231259	13180 +/- 60 BP	-23.6 o/oo	13200 +/- 60 BP

SAMPLE : 04-049 NB5 34.5-35.0
ANALYSIS : AMS-Standard delivery
MATERIAL/PRETREATMENT : (organic sediment): acid washes
2 SIGMA CALIBRATION : Cal BC 14020 to 13360 (Cal BP 15960 to 15310)

Dates are reported as RCYBP (radiocarbon years before present, "present" = 1950A.D.). By international convention, the modern reference standard was 95% of the C14 content of the National Bureau of Standards' Oxalic Acid & calculated using the Libby C14 half life (5568 years). Quoted errors represent 1 standard deviation statistics (68% probability) & are based on combined measurements of the sample, background, and modern reference standards.

Measured C13/C12 ratios were calculated relative to the PDB-1 international standard and the RCYBP ages were normalized to -25 per mil. If the ratio and age are accompanied by an (*), then the C13/C12 value was estimated, based on values typical of the material type. The quoted results are NOT calibrated to calendar years. Calibration to calendar years should be calculated using the Conventional C14 age.

BETA

BETA ANALYTIC INC.

DR. M.A. TAMERS and MR. D.G. HOOD

UNIVERSITY BRANCH
4985 S.W. 74 COURT
MIAMI, FLORIDA, USA 33155
PH: 305/667-5167 FAX: 305/663-0964
E-MAIL: beta@radiocarbon.com

REPORT OF RADIOCARBON DATING ANALYSES

Mr. Robbie Warner

Report Date: 7/31/2007

Sample Data	Measured Radiocarbon Age	13C/12C Ratio	Conventional Radiocarbon Age(*)
Beta - 231260 SAMPLE : 04-049 NB5 40.5-41.0 ANALYSIS : AMS-Standard delivery MATERIAL/PRETREATMENT : (organic sediment): acid washes 2 SIGMA CALIBRATION : Cal BC 20510 to 20130 (Cal BP 22460 to 22080)	18680 +/- 90 BP	-23.8 o/oo	18700 +/- 90 BP
Beta - 231261 SAMPLE : 04-049 NB5 56.5-57.0 ANALYSIS : AMS-Standard delivery MATERIAL/PRETREATMENT : (organic sediment): acid washes	20510 +/- 100 BP	-23.7 o/oo	20530 +/- 100 BP
Beta - 231262 SAMPLE : 04-049 NB5 59.5-60.0 ANALYSIS : AMS-Standard delivery MATERIAL/PRETREATMENT : (organic sediment): acid washes	21940 +/- 110 BP	-23.4 o/oo	21970 +/- 110 BP
Beta - 231263 SAMPLE : 04-049 NB5 68.0-68.5 ANALYSIS : AMS-Standard delivery MATERIAL/PRETREATMENT : (organic sediment): acid washes	23710 +/- 120 BP	-23.6 o/oo	23730 +/- 120 BP
Beta - 232526 SAMPLE : 04-049 NB5 18.5-19.0 WF ANALYSIS : AMS-Standard delivery MATERIAL/PRETREATMENT : (wood): acid/alkali/acid 2 SIGMA CALIBRATION : Cal AD 1470 to 1660 (Cal BP 480 to 290)	340 +/- 40 BP	-27.2 o/oo	300 +/- 40 BP

Dates are reported as RCYBP (radiocarbon years before present, "present" = 1950A.D.). By International convention, the modern reference standard was 95% of the C14 content of the National Bureau of Standards' Oxalic Acid & calculated using the Libby C14 half life (5568 years). Quoted errors represent 1 standard deviation statistics (68% probability) & are based on combined measurements of the sample, background, and modern reference standards.

Measured C13/C12 ratios were calculated relative to the PDB-1 international standard and the RCYBP ages were normalized to -25 per mil. If the ratio and age are accompanied by an (*), then the C13/C12 value was estimated, based on values typical of the material type. The quoted results are NOT calibrated to calendar years. Calibration to calendar years should be calculated using the Conventional C14 age.

BETA

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UNIVERSITY BRANCH
4985 S.W. 74 COURT
MIAMI, FLORIDA, USA 33155
PH: 305/667-5167 FAX: 305/663-0964
E-MAIL: beta@radiocarbon.com

REPORT OF RADIOCARBON DATING ANALYSES

Mr. Robbie Warner

Report Date: 7/31/2007

Sample Data	Measured Radiocarbon Age	13C/12C Ratio	Conventional Radiocarbon Age(*)
Beta - 232543	3310 +/- 40 BP	-21.9 o/oo	3360 +/- 40 BP

SAMPLE : NB5 26-26.5
ANALYSIS : AMS-ADVANCE delivery
MATERIAL/PRETREATMENT : (organic sediment): acid washes
2 SIGMA CALIBRATION : Cal BC 1740 to 1530 (Cal BP 3690 to 3480)

Dates are reported as RCYBP (radiocarbon years before present, "present" = 1950A.D.). By International convention, the modern reference standard was 95% of the C14 content of the National Bureau of Standards' Oxalic Acid & calculated using the Libby C14 half life (5568 years). Quoted errors represent 1 standard deviation statistics (68% probability) & are based on combined measurements of the sample, background, and modern reference standards.

Measured C13/C12 ratios were calculated relative to the PDB-1 international standard and the RCYBP ages were normalized to -25 per mil. If the ratio and age are accompanied by an (*), then the C13/C12 value was estimated, based on values typical of the material type. The quoted results are NOT calibrated to calendar years. Calibration to calendar years should be calculated using the Conventional C14 age.

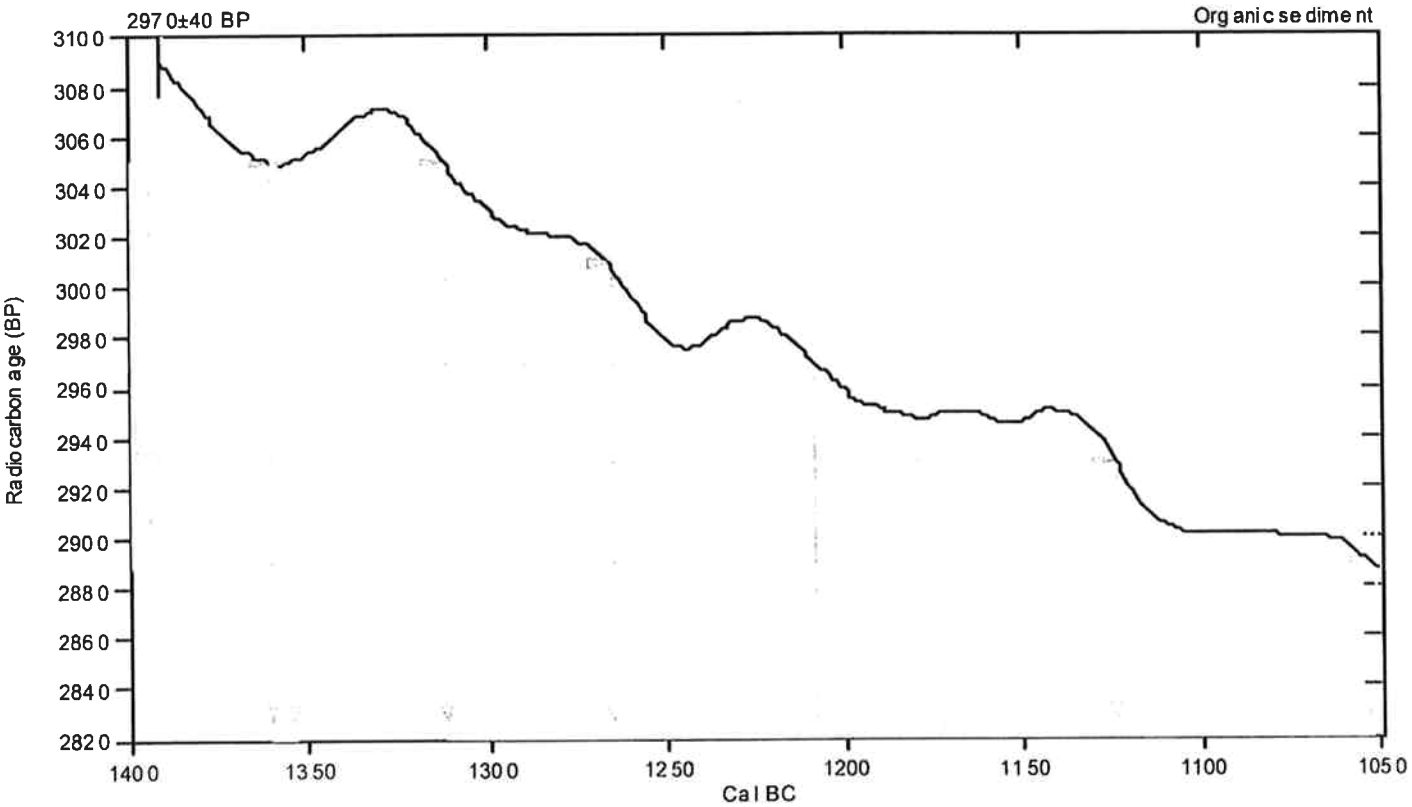
CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-24.8:lab. mult=1)

Laboratory number:	**Beta-231255**
Conventional radiocarbon age:	**2970±40 BP**
2 Sigma calibrated results: (95% probability)	**Cal BC 1360 to 1350 (Cal BP 3310 to 3300) and Cal BC 1310 to 1050 (Cal BP 3260 to 3000)**

Intercept data

Intercept of radiocarbon age with calibration curve:	Cal BC 1210 (Cal BP 3160)
1 Sigma calibrated result: (68% probability)	Cal BC 1270 to 1120 (Cal BP 3220 to 3070)



References:

Database used

INTCAL04

Calibration Database

INTCAL04 Radiocarbon Age Calibration

IntCal04: Calibration Issue of Radiocarbon (Volume 46, nr 3, 2004).

Mathematics

A Simplified Approach to Calibrating C14 Dates

Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

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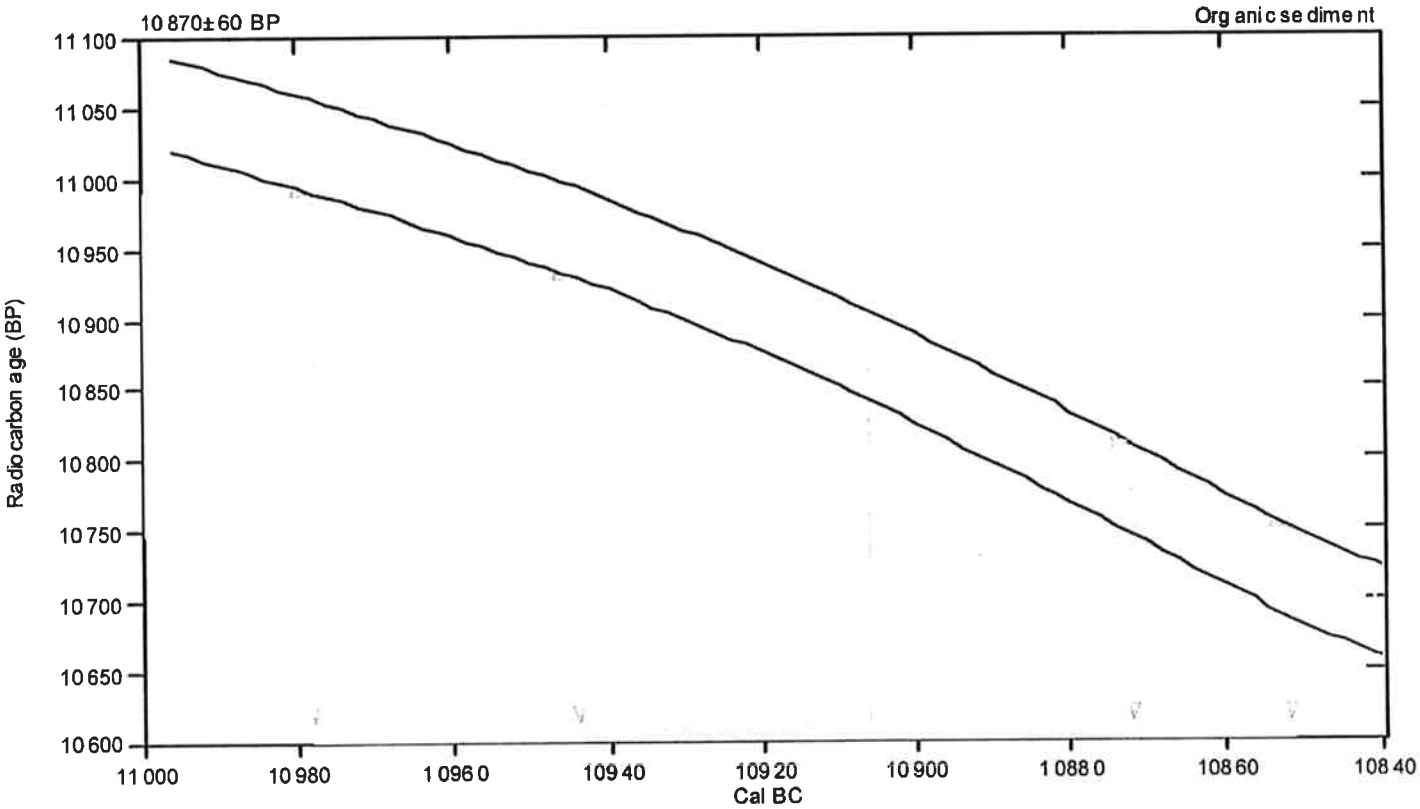
CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-24.6:lab. mult=1)

Laboratory number:	**Beta-231256**
Conventional radiocarbon age:	**10870±60 BP**
2 Sigma calibrated result: (95% probability)	**Cal BC 10980 to 10850 (Cal BP 12930 to 12800)**

Intercept data

Intercept of radiocarbon age with calibration curve:	Cal BC 10910 (Cal BP 12860)
1 Sigma calibrated result: (68% probability)	Cal BC 10940 to 10870 (Cal BP 12890 to 12820)



References:

Database used

INTCAL04

Calibration Database

INTCAL04 Radiocarbon Age Calibration

IntCal04: Calibration Issue of Radiocarbon (Volume 46, nr 3, 2004)

Mathematics

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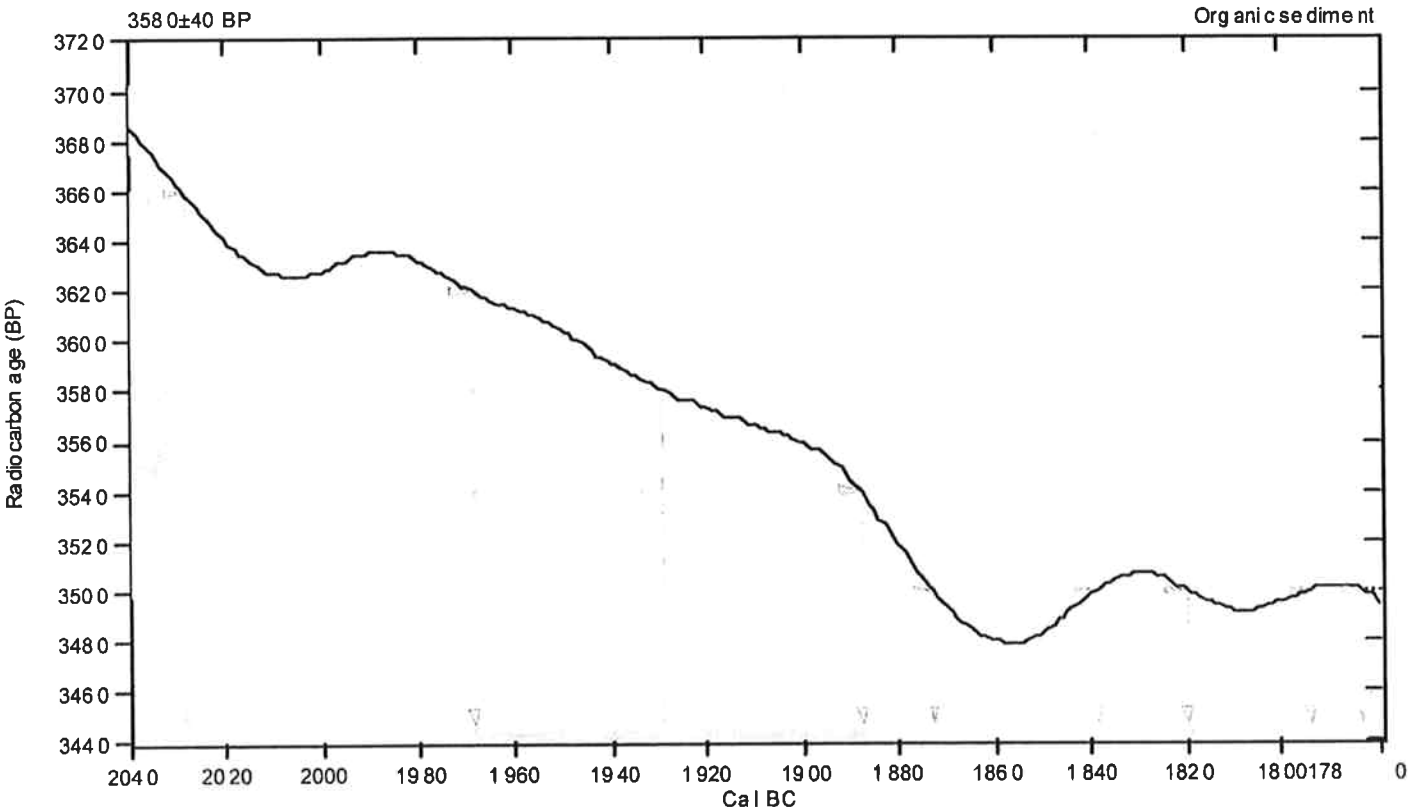
CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-24.2:lab. mult=1)

Laboratory number:	**Beta-231257**
Conventional radiocarbon age:	**3580±40 BP**
2 Sigma calibrated results: (95% probability)	**Cal BC 2030 to 1870 (Cal BP 3980 to 3820) and Cal BC 1840 to 1820 (Cal BP 3790 to 3770) and Cal BC 1790 to 1780 (Cal BP 3740 to 3730)**

Intercept data

Intercept of radiocarbon age with calibration curve:	Cal BC 1930 (Cal BP 3880)
1 Sigma calibrated result: (68% probability)	Cal BC 1970 to 1890 (Cal BP 3920 to 3840)



References:

Database used

INTCAL04

Calibration Database

INTCAL04 Radiocarbon Age Calibration

IntCal04: Calibration Issue of Radiocarbon (Volume 46, nr 3, 2004).

Mathematics

A Simplified Approach to Calibrating C14 Dates

Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

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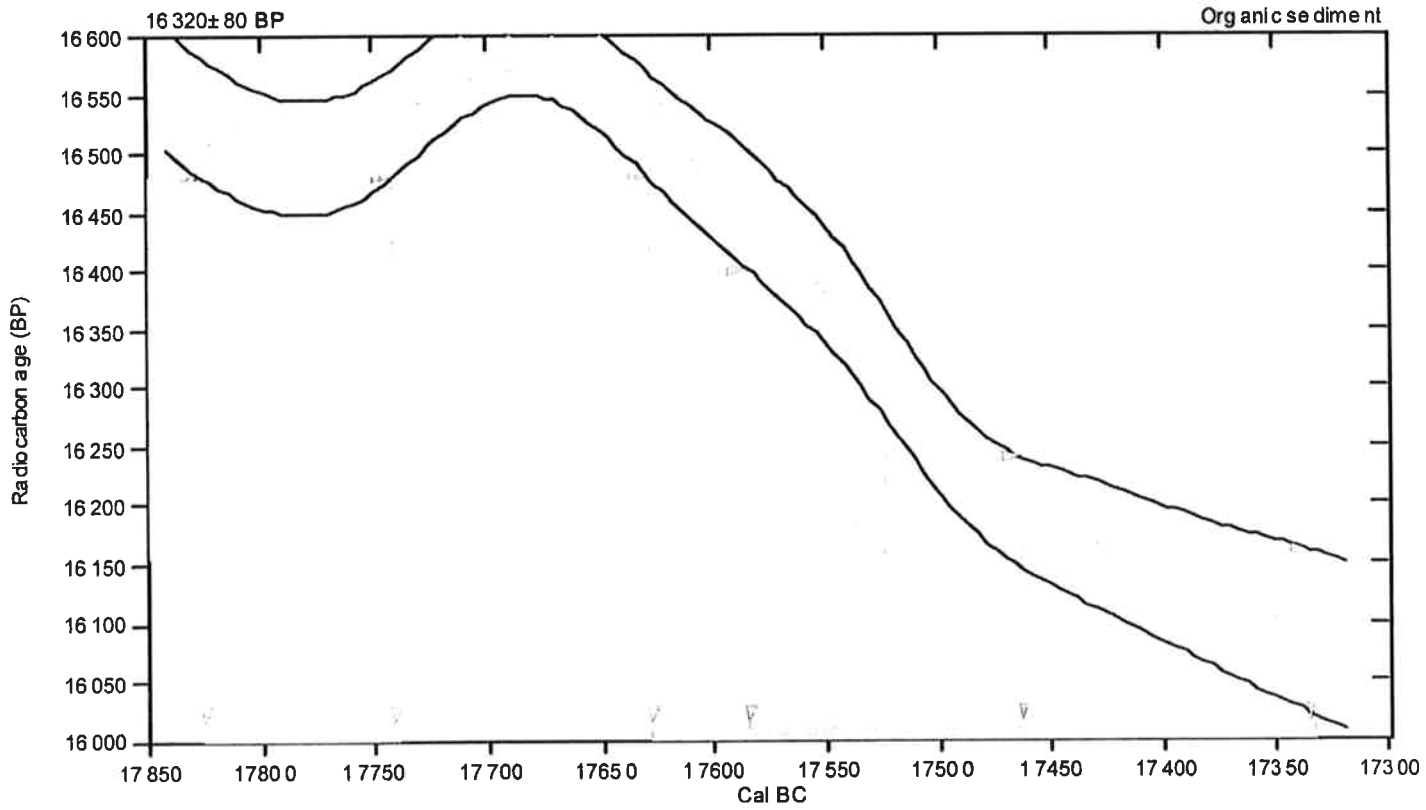
CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-23.9:lab. mult=1)

Laboratory number:	**Beta-231258**
Conventional radiocarbon age:	**16320±80 BP**
2 Sigma calibrated results: (95% probability)	**Cal BC 17820 to 17740 (Cal BP 19780 to 19690) and Cal BC 17630 to 17330 (Cal BP 19580 to 19280)**

Intercept data

Intercept of radiocarbon age with calibration curve:	Cal BC 17520 (Cal BP 19470)
1 Sigma calibrated result: (68% probability)	Cal BC 17580 to 17460 (Cal BP 19530 to 19410)



References:

Database used

INTCAL04

Calibration Database

INTCAL04 Radiocarbon Age Calibration

IntCal04: Calibration Issue of Radiocarbon (Volume 46, nr 3, 2004).

Mathematics

A Simplified Approach to Calibrating C14 Dates

Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

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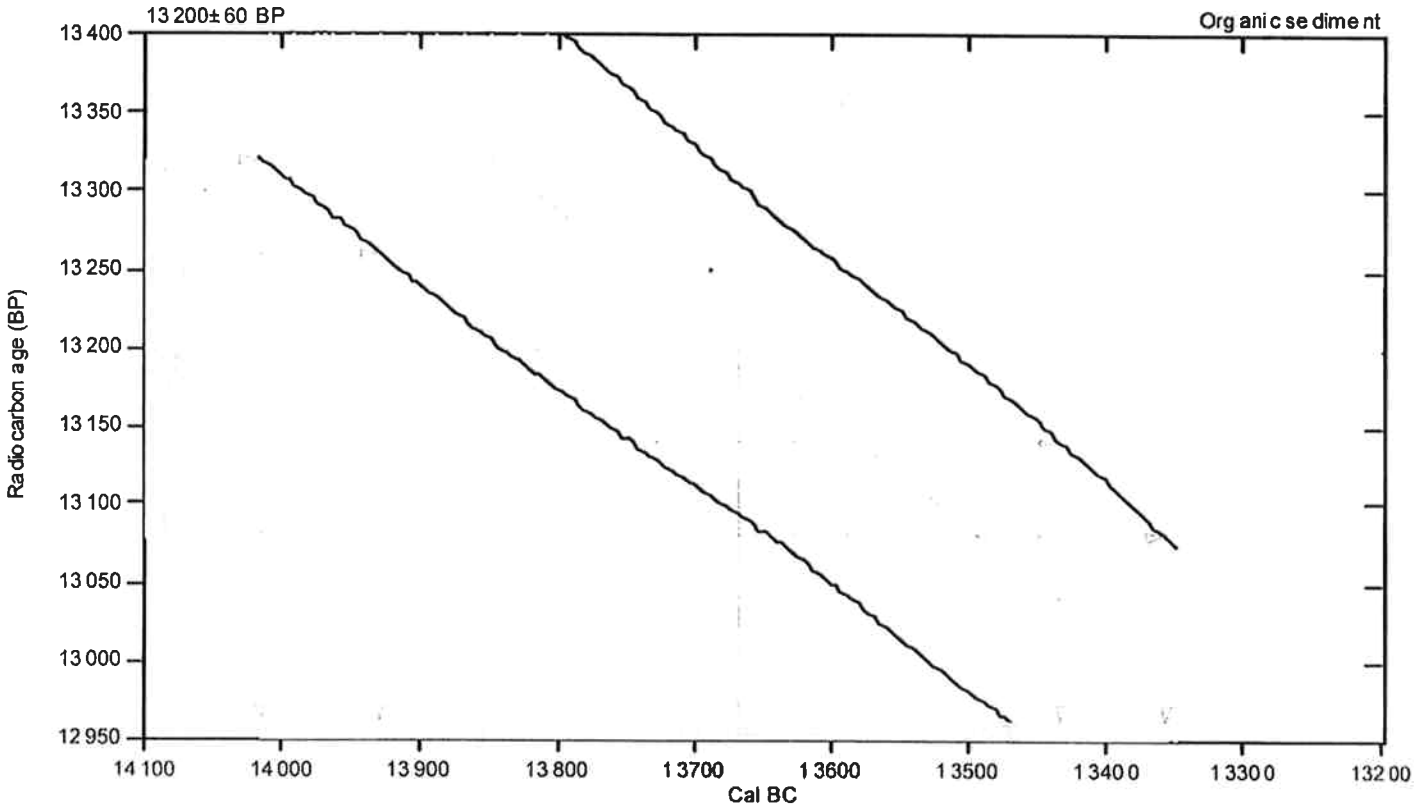
CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-23.6:lab. mult=1)

Laboratory number:	**Beta-231259**
Conventional radiocarbon age:	**13200±60 BP**
2 Sigma calibrated result: (95% probability)	**Cal BC 14020 to 13360 (Cal BP 15960 to 15310)**

Intercept data

Intercept of radiocarbon age with calibration curve:	Cal BC 13670 (Cal BP 15620)
1 Sigma calibrated result: (68% probability)	Cal BC 13930 to 13430 (Cal BP 15880 to 15380)



References:

Database used

INTCAL04

Calibration Database

INTCAL04 Radiocarbon Age Calibration

IntCal04: Calibration Issue of Radiocarbon (Volume 46, nr 3, 2004).

Mathematics

A Simplified Approach to Calibrating C14 Dates

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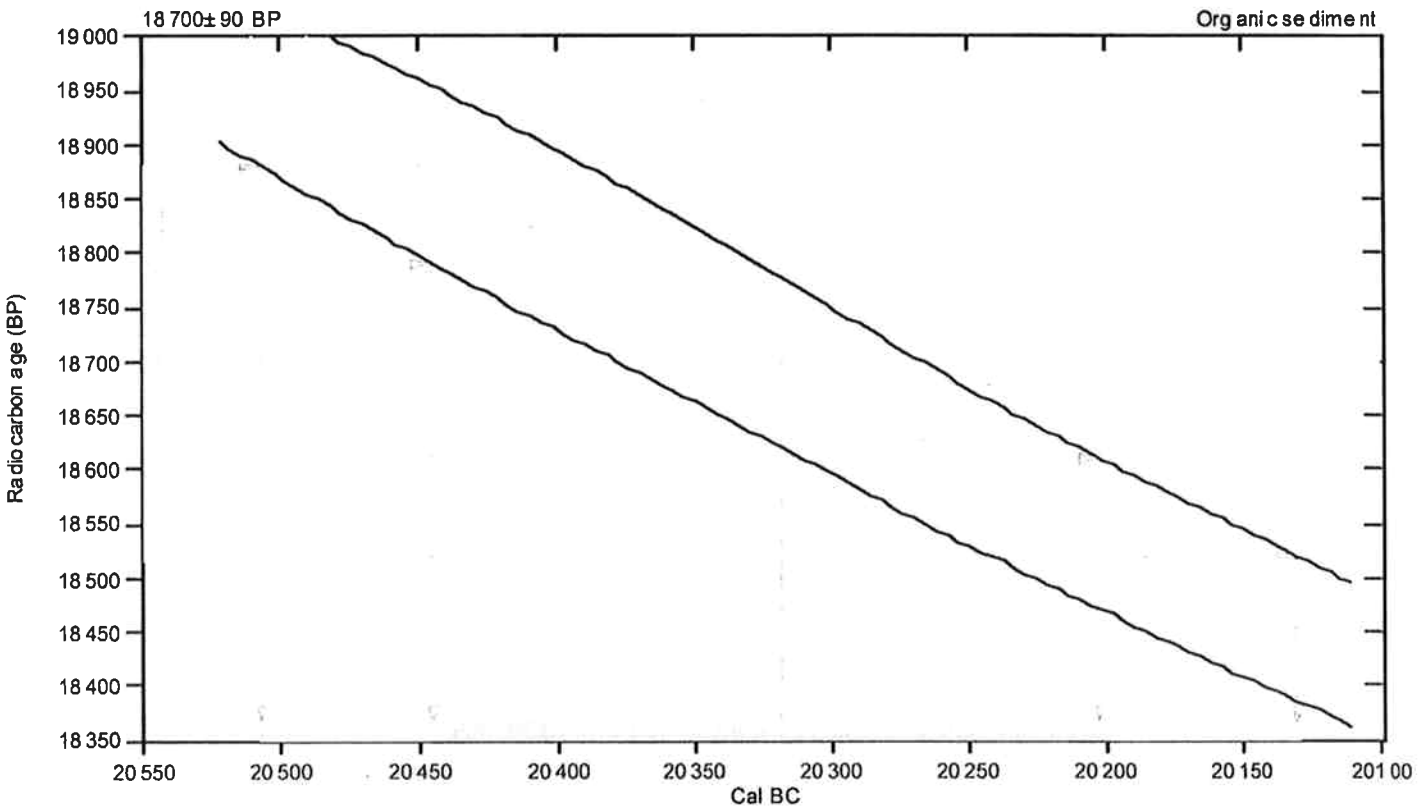
CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-23.8:lab. mult=1)

Laboratory number:	**Beta-231260**
Conventional radiocarbon age:	**18700±90 BP**
2 Sigma calibrated result: (95% probability)	**Cal BC 20510 to 20130 (Cal BP 22460 to 22080)**

Intercept data

Intercept of radiocarbon age with calibration curve:	Cal BC 20320 (Cal BP 22270)
1 Sigma calibrated result: (68% probability)	Cal BC 20440 to 20200 (Cal BP 22400 to 22150)



References:

Database used

INTCAL04

Calibration Database

INTCAL04 Radiocarbon Age Calibration

IntCal04: Calibration Issue of Radiocarbon (Volume 46, nr 3, 2004)

Mathematics

A Simplified Approach to Calibrating C14 Dates

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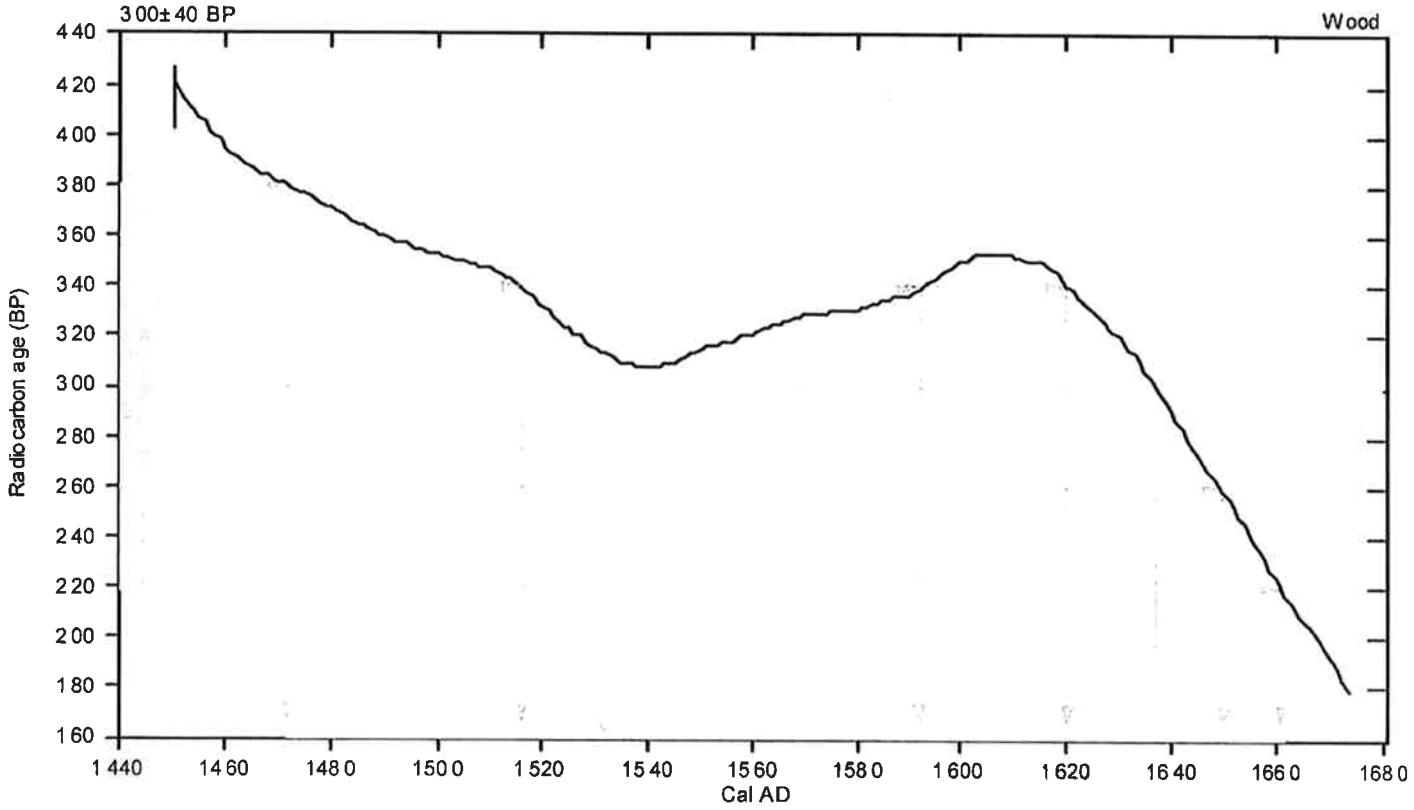
CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-27.2:lab. mult=1)

Laboratory number:	**Beta-232526**
Conventional radiocarbon age:	**300±40 BP**
2 Sigma calibrated result: (95% probability)	**Cal AD 1470 to 1660 (Cal BP 480 to 290)**

Intercept data

Intercept of radiocarbon age with calibration curve:	Cal AD 1640 (Cal BP 310)
1 Sigma calibrated results: (68% probability)	Cal AD 1520 to 1590 (Cal BP 430 to 360) and Cal AD 1620 to 1650 (Cal BP 330 to 300)



References:

Database used

INTCAL04

Calibration Database

INTCAL04 Radiocarbon Age Calibration

IntCal04: Calibration Issue of Radiocarbon (Volume 46, nr 3, 2004).

Mathematics

A Simplified Approach to Calibrating C14 Dates

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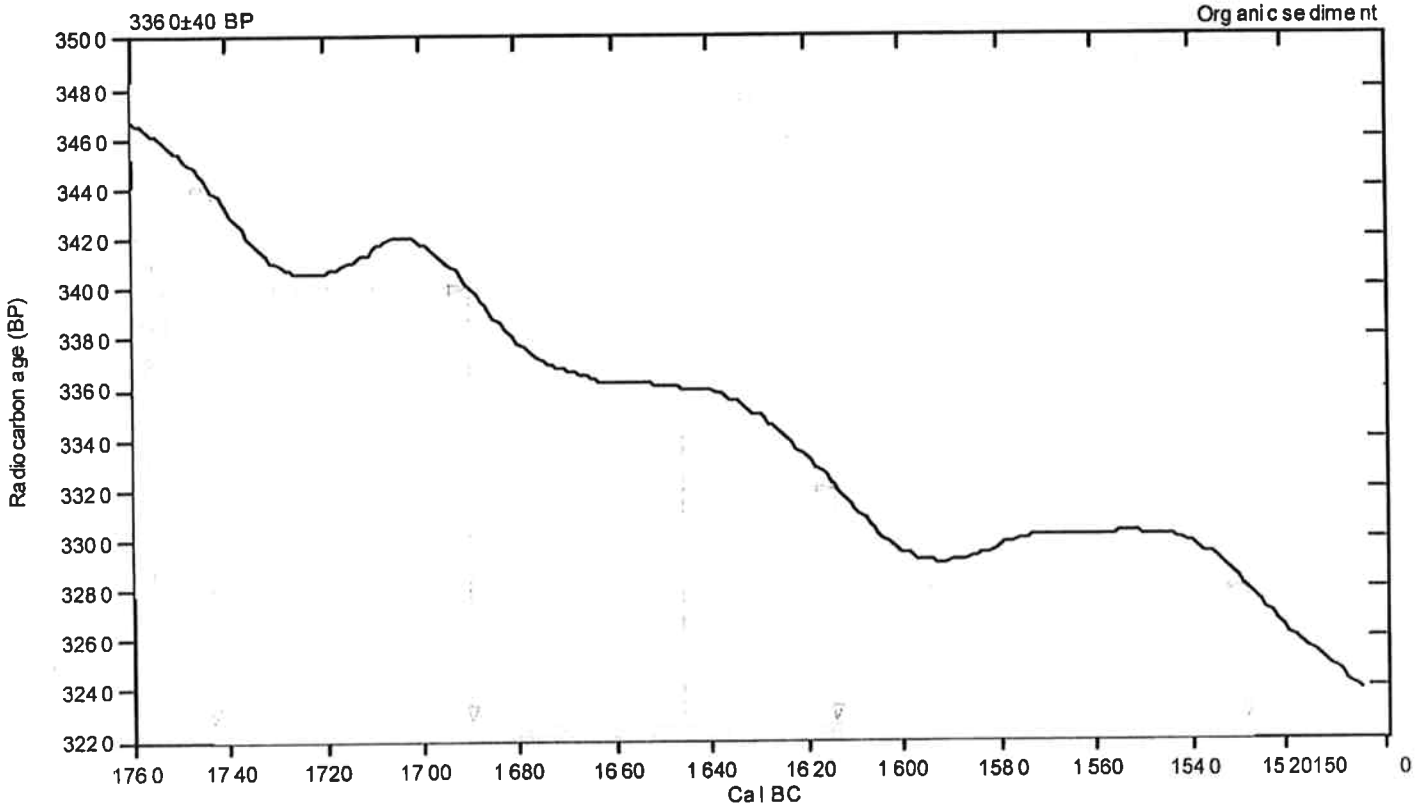
CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-21.9:lab. mult=1)

Laboratory number:	**Beta-232543**
Conventional radiocarbon age:	**3360±40 BP**
2 Sigma calibrated result: (95% probability)	**Cal BC 1740 to 1530 (Cal BP 3690 to 3480)**

Intercept data

Intercept of radiocarbon age with calibration curve:	Cal BC 1650 (Cal BP 3600)
1 Sigma calibrated result: (68% probability)	Cal BC 1690 to 1610 (Cal BP 3640 to 3560)



References:

Database used

INTCAL04

Calibration Database

INTCAL04 Radiocarbon Age Calibration

IntCal04: Calibration Issue of Radiocarbon (Volume 46, nr 3, 2004).

Mathematics

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PRETREATMENT GLOSSARY
Standard Pretreatment Protocols at Beta Analytic

Unless otherwise requested by a submitter or discussed in a final date report, the following procedures apply to pretreatment of samples submitted for analysis. This glossary defines the pretreatment methods applied to each result listed on the date report form (e.g. you will see the designation "acid/alkali/acid" listed along with the result for a charcoal sample receiving such pretreatment).

Pretreatment of submitted materials is required to eliminate secondary carbon components. These components, if not eliminated, could result in a radiocarbon date, which is too young or too old. Pretreatment does not ensure that the radiocarbon date will represent the time event of interest. This is determined by the sample integrity. Effects such as the old wood effect, burned intrusive roots, bioturbation, secondary deposition, secondary biogenic activity incorporating recent carbon (bacteria) and the analysis of multiple components of differing age are just some examples of potential problems. The pretreatment philosophy is to reduce the sample to a single component, where possible, to minimize the added subjectivity associated with these types of problems. If you suspect your sample requires special pretreatment considerations be sure to tell the laboratory prior to analysis.

"acid/alkali/acid"

The sample was first gently crushed/dispersed in deionized water. It was then given hot HCI acid washes to eliminate carbonates and alkali washes (NaOH) to remove secondary organic acids. The alkali washes were followed by a final acid rinse to neutralize the solution prior to drying. Chemical concentrations, temperatures, exposure times, and number of repetitions, were applied accordingly with the uniqueness of the sample. Each chemical solution was neutralized prior to application of the next. During these serial rinses, mechanical contaminants such as associated sediments and rootlets were eliminated. This type of pretreatment is considered a "full pretreatment". On occasion the report will list the pretreatment as "acid/alkali/acid - insolubles" to specify which fraction of the sample was analyzed. This is done on occasion with sediments (See "acid/alkali/acid - solubles"

Typically applied to: charcoal, wood, some peats, some sediments, and textiles "acid/alkali/acid - solubles"

On occasion the alkali soluble fraction will be analyzed. This is a special case where soil conditions imply
That the soluble fraction will provide a more accurate date. It is also used on some occasions to verify the present/absence or degree of contamination present from secondary organic acids. The sample was first pretreated with acid to remove any carbonates and to weaken organic bonds. After the alkali washes (as discussed above) are used, the solution containing the alkali soluble fraction is isolated/filtered and combined with acid. The soluble fraction, which precipitates, is rinsed and dried prior to combustion.

"acid/alkali/acid/cellulose extraction"

Following full acid/alkali/acid pretreatments, the sample is bathed in (sodium chlorite) $NaClO_2$ under very controlled conditions (Ph = 3, temperature = 70 degrees C). This eliminates all components except wood cellulose. It is useful for woods that are either very old or highly contaminated.

Applied to: wood

"acid washes"

Surface area was increased as much a possible. Solid chunks were crushed, fibrous materials were shredded, and sediments were dispersed. Acid (HCI) was applied repeatedly to ensure the absence of carbonates. Chemical concentrations, temperatures, exposure times, and number of repetitions, were applied accordingly with the uniqueness of each sample. The sample was not be subjected to alkali washes to ensure the absence of secondary organic acids for intentional reasons. The most common reason is that the primary carbon is soluble in the alkali. Dating results reflect the total organic content of the analyzed material. Their accuracy depends on the researcher's ability to subjectively eliminate potential contaminants based on contextual facts.

Typically applied to: organic sediments, some peats, small wood or charcoal, special cases

Beta Analytic Inc.
4985 SW 74 Court
Miami, Florida 33155 USA
Tel: 305 667 5167
Fax: 305 663 0/97
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Www.radiocarbon.com

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Director

Mr. Ronald Hatfield
Mr. Christopher Patrick
Deputy Directors

Final Report

The final report package includes the final date report, a statement outlining our analytical procedures, a glossary of pretreatment terms, calendar calibration information, billing documents (containing balance/credit information and the number of samples submitted within the yearly discount period), and peripheral items to use with future submittals. The final report includes the individual analysis method, the delivery basis, the material type and the individual pretreatments applied. The final report has been sent by mail and e-mail (where available).

Pretreatment

Pretreatment methods are reported along with each result. All necessary chemical and mechanical pretreatments of the submitted material were applied at the laboratory to isolate the carbon which may best represent the time event of interest. When interpreting the results, it is important to consider the pretreatments. Some samples cannot be fully pretreated, making their ^{14}C ages more subjective than samples which can be fully pretreated. Some materials receive no pretreatments. Please look at the pretreatment indicated for each sample and read the pretreatment glossary to understand the implications.

Analysis

Materials measured by the radiometric technique were analyzed by synthesizing sample carbon to benzene (92% C), measuring for ^{14}C content in one of 53 scintillation spectrometers, and then calculating for radiocarbon age. If the Extended Counting Service was used, the ^{14}C content was measured for a greatly extended period of time. AMS results were derived from reduction of sample carbon to graphite (100% C), along with standards and backgrounds. The graphite was then detected for ^{14}C content in one of 9 accelerator-mass-spectrometers (AMS) .

The Radiocarbon Age and Calendar Calibration

The "Conventional ^{14}C Age (*)" is the result after applying $^{13}C/^{12}C$ corrections to the measured age and is the most appropriate radiocarbon age. If an "*" is attached to this date, it means the $^{13}C/^{12}C$ was estimated rather than measured (The ratio is an option for radiometric analysis, but included on all AMS analyses.) Ages are reported with the units "BP" (Before Present). "Present" is defined as AD 1950 for the purposes of radiocarbon dating.

Results for samples containing more ^{14}C than the modern reference standard are reported as "percent modern carbon" (pMC). These results indicate the material was respiring carbon after the advent of thermo-nuclear weapons testing (and is less than ~ 50 years old).

Applicable calendar calibrations are included for materials between about 100 and 19,000 BP. If calibrations are not included with a report, those results were either too young, too old, or inappropriate for calibration. Please read the enclosed page discussing calibration.

Beta Analytic Inc.
4985 SW 74 Court
Miami, Florida 33155 USA
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Calendar Calibration at Beta Analytic

Calibrations of radiocarbon age determinations are applied to convert BP results to calendar years. The short-term difference between the two is caused by fluctuations in the heliomagnetic modulation of the galactic cosmic radiation and, recently, large scale burning of fossil fuels and nuclear devices testing. Geomagnetic variations are the probable cause of longer-term differences.

The parameters used for the corrections have been obtained through precise analyses of hundreds of samples taken from known-age tree rings of oak, sequoia, and fir up to about 10,000 BP. Calibration using tree-rings to about 12,000 BP is still being researched and provides somewhat less precise correlation. Beyond that, up to about 20,000 BP, correlation using a modeled curve determined from U/Th measurements on corals is used. This data is still highly subjective. Calibrations are provided up to about 19,000 years BP using the most recent calibration data available.

The Pretoria Calibration Procedure (Radiocarbon, Vol 35, No.1, 1993, pg 317) program has been chosen for these calendar calibrations. It uses splines through the tree-ring data as calibration curves, which eliminates a large part of the statistical scatter of the actual data points. The spline calibration allows adjustment of the average curve by a quantified closeness-of-fit parameter to the measured data points. A single spline is used for the precise correlation data available back to 9900 BP for terrestrial samples and about 6900 BP for marine samples. Beyond that, splines are taken on the error limits of the correlation curve to account for the lack of precision in the data points.

In describing our calibration curves, the solid bars represent one sigma statistics (68% probability) and the hollow bars represent two sigma statistics (95% probability). Marine carbonate samples that have been corrected for $^{13}C/^{12}C$, have also been corrected for both global and local geographic reservoir effects (as published in Radiocarbon, Volume 35, Number 1, 1993) prior to the calibration. Marine carbonates that have not been corrected for $^{13}C/^{12}C$ are adjusted by an assumed value of 0 %0 in addition to the reservoir corrections. Reservoir corrections for fresh water carbonates are usually unknown and are generally not accounted for in those calibrations. In the absence of measured $^{13}C/^{12}C$ ratios, a typical value of -5 %0 is assumed for freshwater carbonates.

(Caveat: the correlation curve for organic materials assume that the material dated was living for exactly ten years (e.g. a collection of 10 individual tree rings taken from the outer portion of a tree that was cut down to produce the sample in the feature dated). For other materials, the maximum and minimum calibrated age ranges given by the computer program are uncertain. The possibility of an "old wood effect" must also be considered, as well as the potential inclusion of younger or older material in matrix samples. Since these factors are indeterminant error in most cases, these calendar calibration results should be used only for illustrative purposes. In the case of carbonates, reservoir correction is theoretical and the local variations are real, highly variable and dependent on provenience. Since imprecision in the correlation data beyond 10,000 years is high, calibrations in this range are likely to change in the future with refinement in the correlation curve. The age ranges and especially the intercept ages generated by the program must be considered as approximations.)

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

Variables used in the calculation of age calibration → (Variables: est. C13/C12=-25:lab. mult=1)

Laboratory number: **Beta-123456**

The uncalibrated Conventional Radiocarbon Age (± 1 sigma)

Conventional radiocarbon age[1]: **2400±60 BP**

The calendar age range in both calendar years (AD or BC) and in Radiocarbon Years (BP) → **2 Sigma calibrated result: (95% probability)** **Cal BC 770 to 380 (Cal BP 2720 to 2330)**

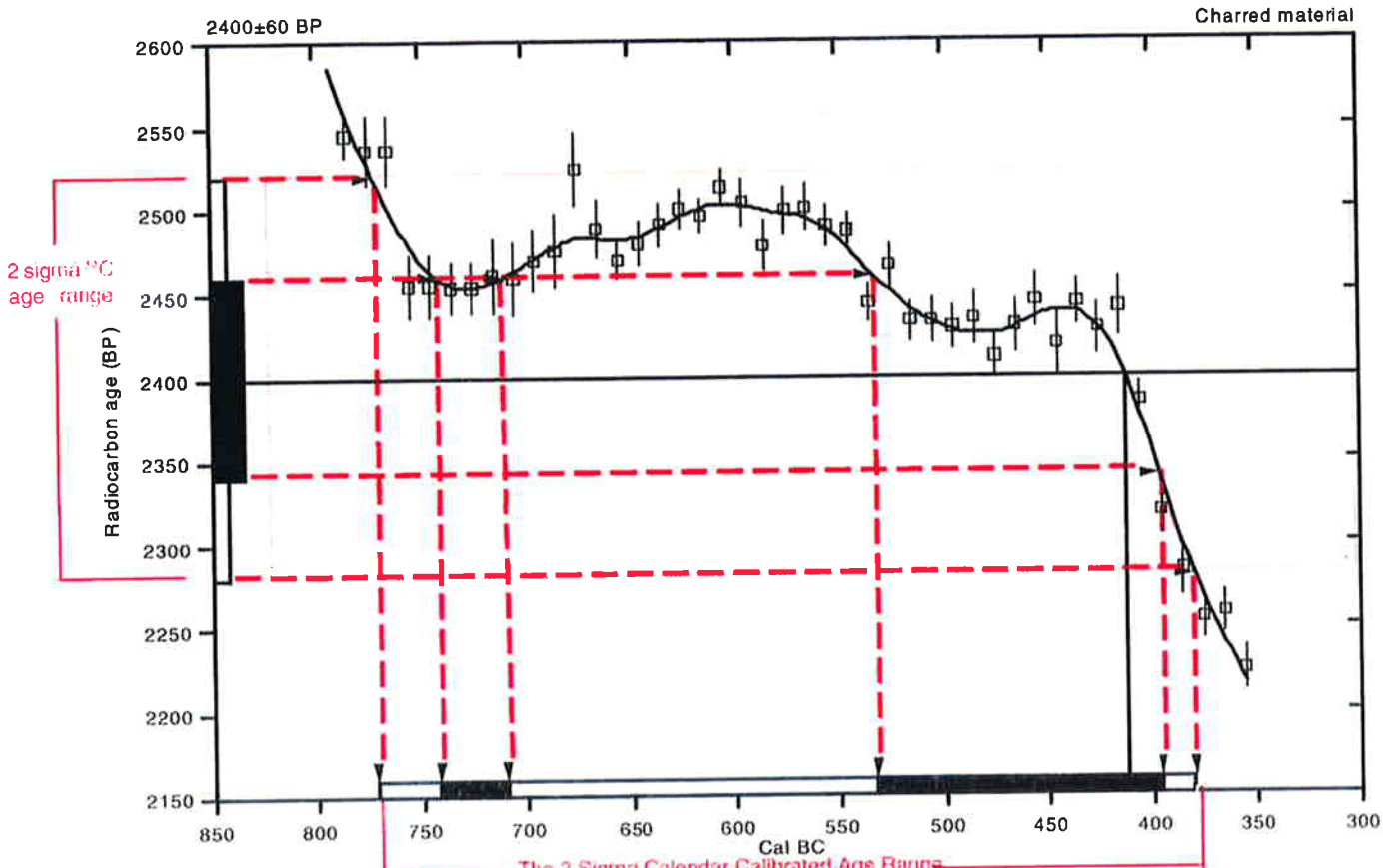
[1] *C13/C12 ratio estimated*

Intercept data

The intercept between the average radiocarbon age and the calibrated curve time scale. This value is illustrative and should not be used by itself.

Intercept of radiocarbon age with calibration curve: Cal BC 410 (Cal BP 2360)

1 Sigma calibrated result: (68% probability) Cal BC 740 to 710 (Cal BP 2690 to 2660) and Cal BC 535 to 395 (Cal BP 2485 to 2345)



The 2 Sigma Calendar Calibrated Age Range

This range is determined by the portion of the curve that is in a "box" drawn from the 2 sigma limits on the radiocarbon age. If a section of the curve goes outside of the "box", multiple ranges will occur as shown by the two 1 sigma ranges which occur from sections going outside of a similar "box" which would be drawn at the 1 sigma limits.

References:

Database used
Intcal 98
Calibration Database
Editorial Comment
Stuiver, M., van der Plicht, H., 1998, Radiocarbon 40(3), pxii-xiii
INTCAL98 Radiocarbon Age Calibration
Stuiver, M., et. al., 1998, Radiocarbon 40(3), p1041-1083
Mathematics
A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

References for the calibration data and the mathematics applied to the data. These references, as well as the Conventional Radiocarbon Age and the 13C/12C ratio used should be included in your papers.

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