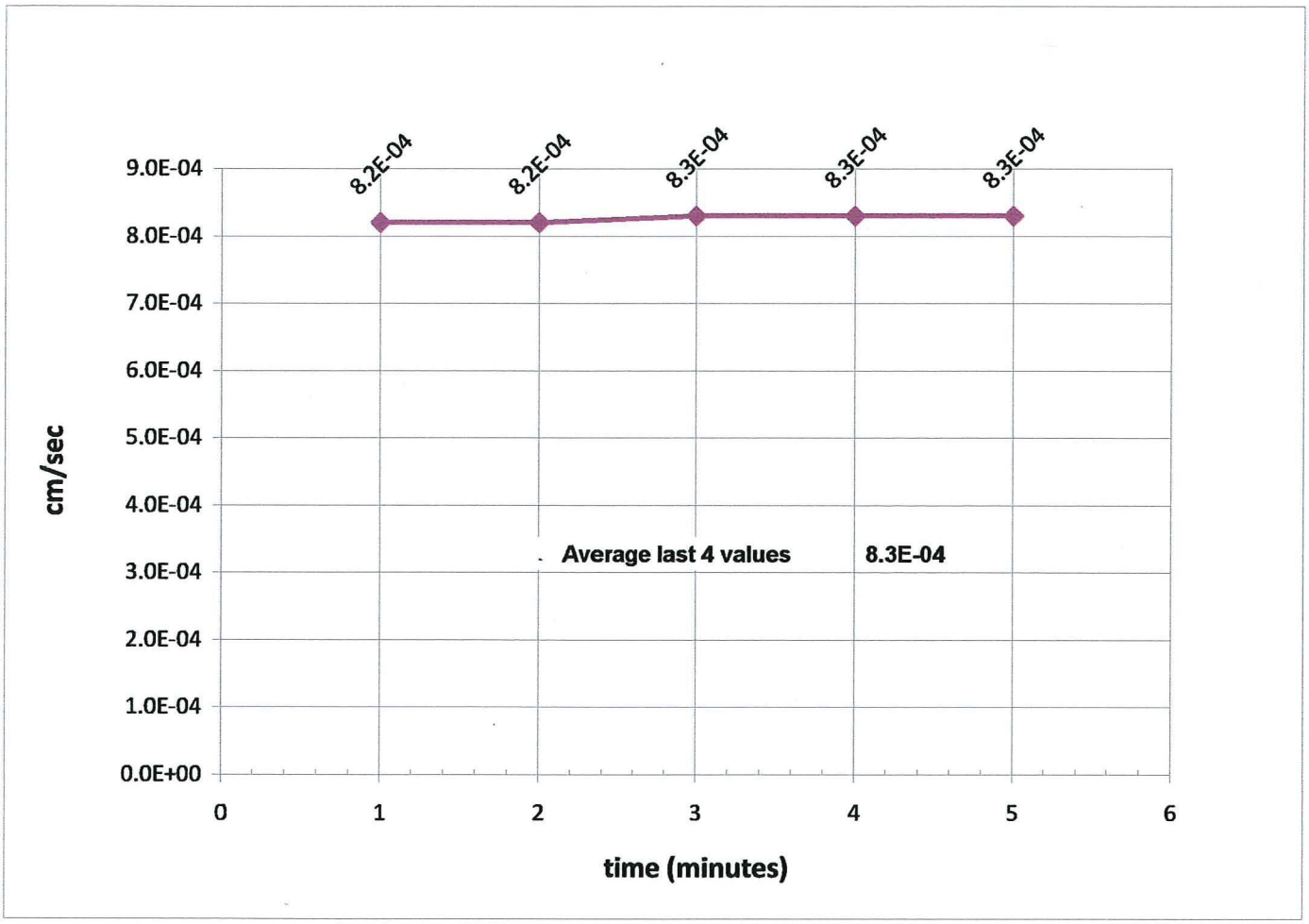
ADVANCED TERRA TESTING

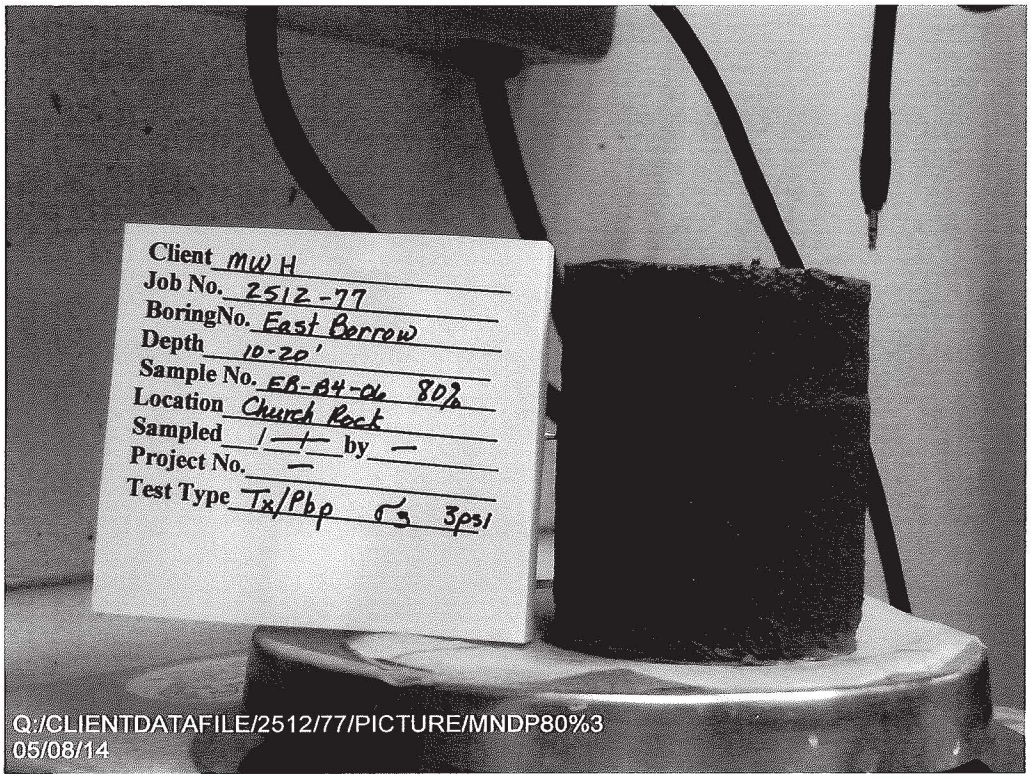
Preliminary Flow Pump Test Data
ASTM D5084

Client:	MWH	Boring Number:	East Borrow		
Job Number:	2512-77	Depth:	10-20'		
Project:	--	Sample Number:	EB-B4-06 80%		
Location:	Church Rock	Sampled Date:	--	Sampled By:	--
Project Number:	--	Test Date:	5/6/2014	Technician:	CAL



Data Entered By: CAL
Date: 5/6/2014
File Name: 2512_77_PrelimPerm_ASTMD-5084-methodD_31.xls

Checked By: DJW
Date: 05/08/14


Client MWH
Job No. 2512-77
BoringNo. East Borrow
Depth 10-20'
Sample No. EB-B4-D6 80%
Location Church Rock
Sampled 1-1- by -
Project No. -
Test Type Tx/Pbp σ3 3psi
Q:/CLIENTDATAFILE/2512/77/PICTURE/MNDP80%3
05/08/14

PERMEABILITY TEST - BACK PRESSURE SATURATED - FLOW PUMP METHOD

ASTM D 5084

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	Dilco Hill	SAMPLED	--
DEPTH	0-10'	TEST STARTED	03/20/14 CAL
SAMPLE NO.	DH-B1-03 85%	TEST FINISHED	04/07/14 DPM
LOCATION	Church Rock	CELL NUMBER	2P
PROJECT NO.	--	SATURATED TEST	Yes
SOIL DESCR.	Remolded -#4	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	432

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	376.8	448.0
Wt. Wet Soil & Pan (g)	390.6	461.7
Wt. Dry Soil & Pan (g)	371.6	371.6
Wt. Lost Moisture (g)	19.0	90.2
Wt. of Pan Only (g)	13.7	13.7
Wt. of Dry Soil (g)	357.8	357.8
Moisture Content %	5.3	25.2
Wet Density PCF	104.7	129.9
Dry Density PCF	99.4	103.8

Init. Diameter (in)	2.407	(cm)	6.114
Init. Area (sq in)	4.550	(sq cm)	29.359
Init. Height (in)	3.013	(cm)	7.653
Vol. Bef. Consol. (cu ft)	0.00793		
Vol. After Consol. (cu ft)	0.00760		
Porosity %	41.87		

FLOW PUMP CALCULATIONS

Pump Setting (gear number)	3
Percentage of Pump setting	100
Q (cc/s)	2.33E-02
Height	2.995
Diameter	2.363
Pressure (psi)	0.126
Area after consol. (cm*cm)	28.302
Gradient	1.165
Permeability k (cm/s)	7.1E-04
Permeability k (m/s)	7.1E-06
Back Pressure (psi)	118.0
Cell Pressure (psi)	121.0
Ave. Effective Stress (psi)	2.937
Average temperature degree C:	22.2

Data entry by: DAW Date: 04/08/2014
Checked by: DPM Date: 4/18/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_13.xls

ATT
ADVANCED TERRA TESTING

TRIAXAL TEST DATA
ASTM D 5084

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	Dilco Hill	SAMPLED	--
DEPTH	0-10'	TEST STARTED	03/20/14 CAL
SAMPLE NO.	DH-B1-03 85%	TEST FINISHED	04/07/14 DPM
LOCATION	Church Rock	SETUP NO.	2P
PROJECT NO.	--	SATURATED TEST	Yes
SOIL DESCR.	Remolded -#4	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	432

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	1.5	13.1				
50.0	48.0	17.8	19.4	37.0	43.1	6.1	0.61
60.0	58.0	19.4	20.7	47.9	54.3	6.4	0.64
70.0	68.0	20.8	21.9	58.0	65.1	7.1	0.71
80.0	78.0	22.2	23.4	68.5	76.2	7.7	0.77
90.0	88.0	23.6	24.6	77.7	86.0	8.3	0.83
100.0	98.0	25.6	26.7	88.2	96.8	8.6	0.86
110.0	108.0	27.0	27.9	98.4	107.3	8.9	0.89
120.0	118.0	28.3	29.3	108.4	117.6	9.2	0.92
130.0		29.7	29.9	118.4	127.9	9.5	0.95

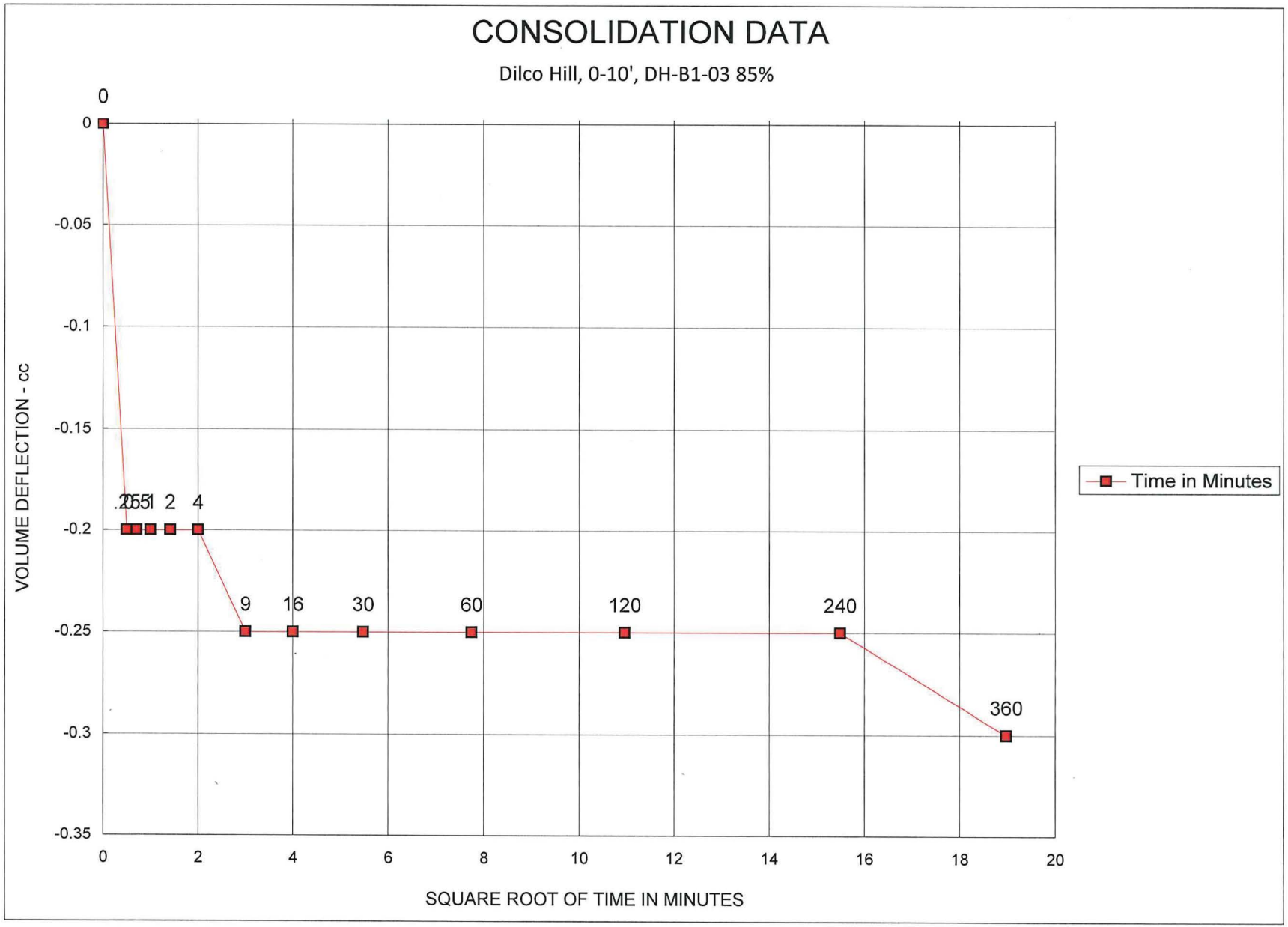
CONSOLIDATION DATA

Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	29.90	0.00
0.25	0.50	30.10	-0.20
0.5	0.71	30.10	-0.20
1	1.00	30.10	-0.20
2	1.41	30.10	-0.20
4	2.00	30.10	-0.20
9	3.00	30.15	-0.25
16	4.00	30.15	-0.25
30	5.48	30.15	-0.25
60	7.75	30.15	-0.25
120	10.95	30.15	-0.25
240	15.49	30.15	-0.25
360	18.97	30.20	-0.30

Initial Height (in)	3.013	Init. Vol. (CC)	224.709
Height Change (in)	0.018	Vol. Change (CC)	29.300
Ht. After Cons. (in)	2.995	Cell Exp. (CC)	19.929
Initial Area (sq in)	4.550	Net Change (CC)	9.372
Area After Cons. (sq in)	4.387	Cons. Vol. (CC)	215.337

Data entry by: DAW Date: 04/08/2014
Checked by: DPM Date: 4/8/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_13.xls

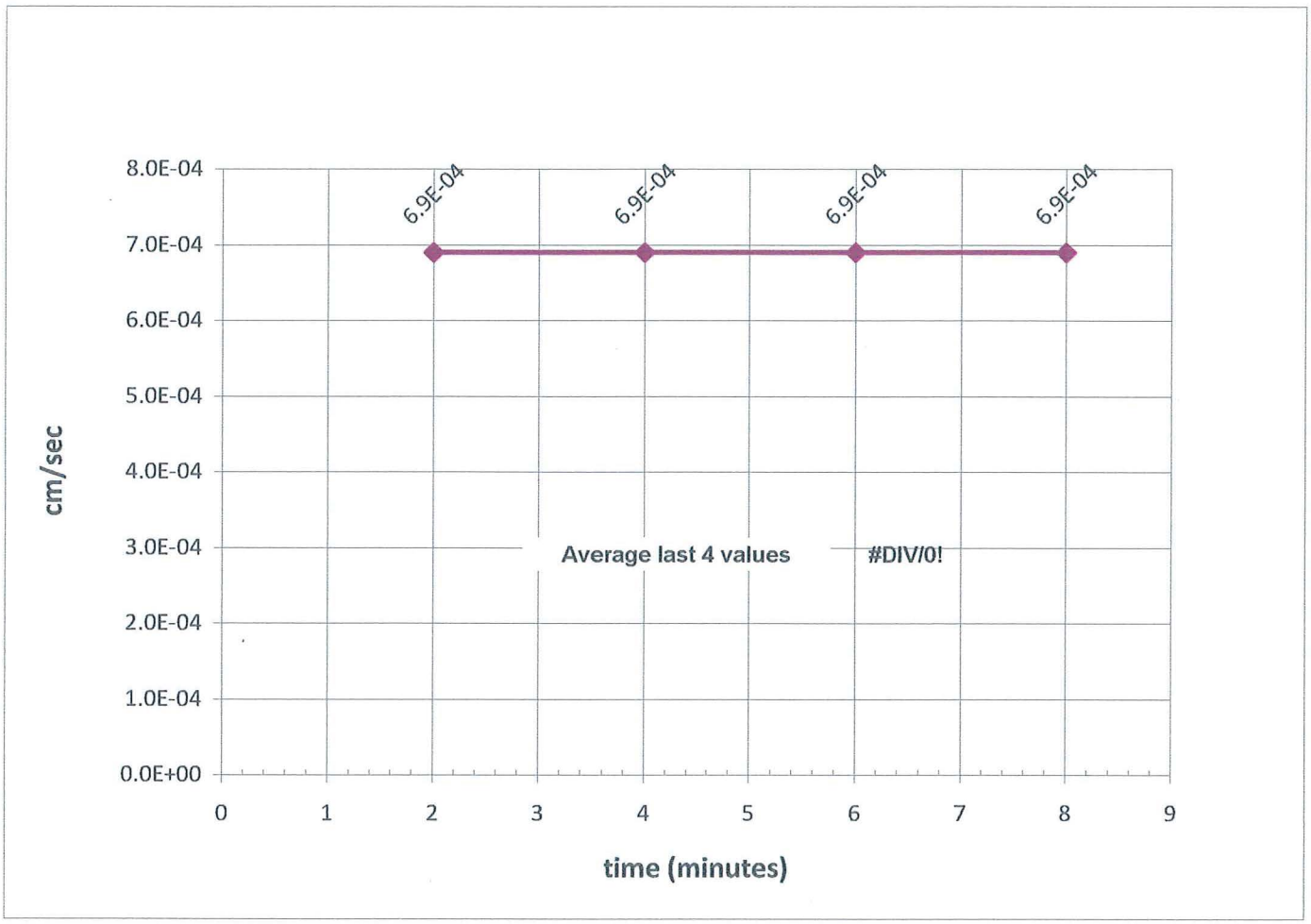
ATT
ADVANCED TERRA TESTING


CONSOLIDATION DATA
Dilco Hill, 0-10', DH-B1-03 85%
VOLUME DEFLECTION - cc
0
-0.05
-0.1
-0.15
-0.2
-0.25
-0.3
-0.35
0
2
4
6
8
10
12
14
16
18
20
SQUARE ROOT OF TIME IN MINUTES
0
.25
.5
1
2
4
9
16
30
60
120
240
360
Time in Minutes

ADVANCED TERRA TESTING

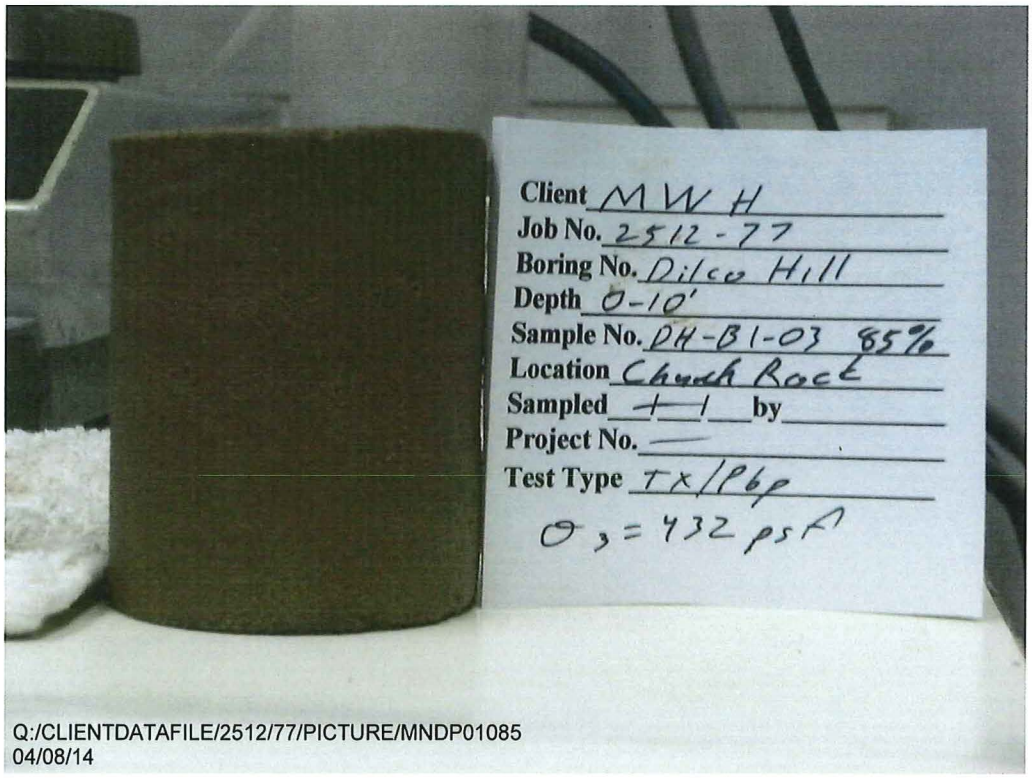
Preliminary Flow Pump Test Data
ASTM D5084

Client:	MWH	Boring Number:	Dilco Hill		
Job Number:	2512-77	Depth:	0-10'		
Project:	--	Sample Number:	DH-B1-03 85%		
Location:	Church Rock	Sampled Date:	--	Sampled By:	--
Project Number:	--	Test Date:	4/7/2014	Technician:	DPM



Data Entered By: DPM
Date: 4/7/2014
File Name: 2512_77_PrelimPerm_ASTMD-5084-methodD_16.xls

Checked By: DMW
Date: 04/08/14



Q:/CLIENTDATAFILE/2512/77/PICTURE/MNDP01085
04/08/14

PERMEABILITY TEST - BACK PRESSURE SATURATED - FLOW PUMP METHOD

ASTM D 5084

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	East Borrow	SAMPLED	--
DEPTH	0-10'	TEST STARTED	03/20/14 CAL
SAMPLE NO.	EB-B6-03 85%	TEST FINISHED	04/07/14 DPM
LOCATION	Church Rock	CELL NUMBER	5P
PROJECT NO.	--	SATURATED TEST	Yes
SOIL DESCR.	Remolded -#4	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	432

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	382.7	438.0
Wt. Wet Soil & Pan (g)	396.5	451.7
Wt. Dry Soil & Pan (g)	363.3	363.3
Wt. Lost Moisture (g)	33.2	88.5
Wt. of Pan Only (g)	13.8	13.8
Wt. of Dry Soil (g)	349.5	349.5
Moisture Content %	9.5	25.3
Wet Density PCF	106.8	132.9
Dry Density PCF	97.5	106.1

Init. Diameter (in)	2.405	(cm)	6.109
Init. Area (sq in)	4.543	(sq cm)	29.310
Init. Height (in)	3.005	(cm)	7.633
Vol. Bef. Consol. (cu ft)	0.00790		
Vol. After Consol. (cu ft)	0.00726		
Porosity %	43.01		

FLOW PUMP CALCULATIONS

Pump Setting (gear number)	6
Percentage of Pump setting	100
Q (cc/s)	2.31E-03
Height	2.992
Diameter	2.311
Pressure (psi)	0.254
Area after consol. (cm*cm)	27.064
Gradient	2.350
Permeability k (cm/s)	3.6E-05
Permeability k (m/s)	3.6E-07
Back Pressure (psi)	98.0
Cell Pressure (psi)	101.0
Ave. Effective Stress (psi)	2.873
Average temperature degree C:	21.8

Data entry by: DAW Date: 04/08/2014
Checked by: DPM Date: 4/8/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_14.xls

ATT
ADVANCED TERRA TESTING

TRIAXAL TEST DATA
ASTM D 5084

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	East Borrow	SAMPLED	--
DEPTH	0-10'	TEST STARTED	03/20/14 CAL
SAMPLE NO.	EB-B6-03 85%	TEST FINISHED	04/07/14 DPM
LOCATION	Church Rock	SETUP NO.	5P
PROJECT NO.	--	SATURATED TEST	Yes
SOIL DESCR.	Remolded -#4	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	432

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	2.0	23.2				
50.0	48.0	25.8	27.8	37.3	45.6	8.3	0.83
60.0	58.0	27.9	29.1	47.6	55.8	8.2	0.82
70.0	68.0	29.1	30.2	57.9	66.4	8.5	0.85
80.0	78.0	30.2	31.2	68.4	77.2	8.8	0.88
90.0	88.0	31.5	33.0	77.7	86.9	9.2	0.92
100.0	98.0	33.0	33.7	88.3	97.7	9.4	0.94
110.0		33.9	34.0	98.5	108.1	9.6	0.96

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	0.20	0.00
0.25	0.50	0.60	-0.40
0.5	0.71	0.70	-0.50
1	1.00	0.70	-0.50
2	1.41	0.75	-0.55
4	2.00	0.80	-0.60
9	3.00	0.80	-0.60
16	4.00	0.80	-0.60
30	5.48	0.85	-0.65
60	7.75	0.85	-0.65
120	10.95	0.90	-0.70
240	15.49	0.90	-0.70
360	18.97	0.90	-0.70

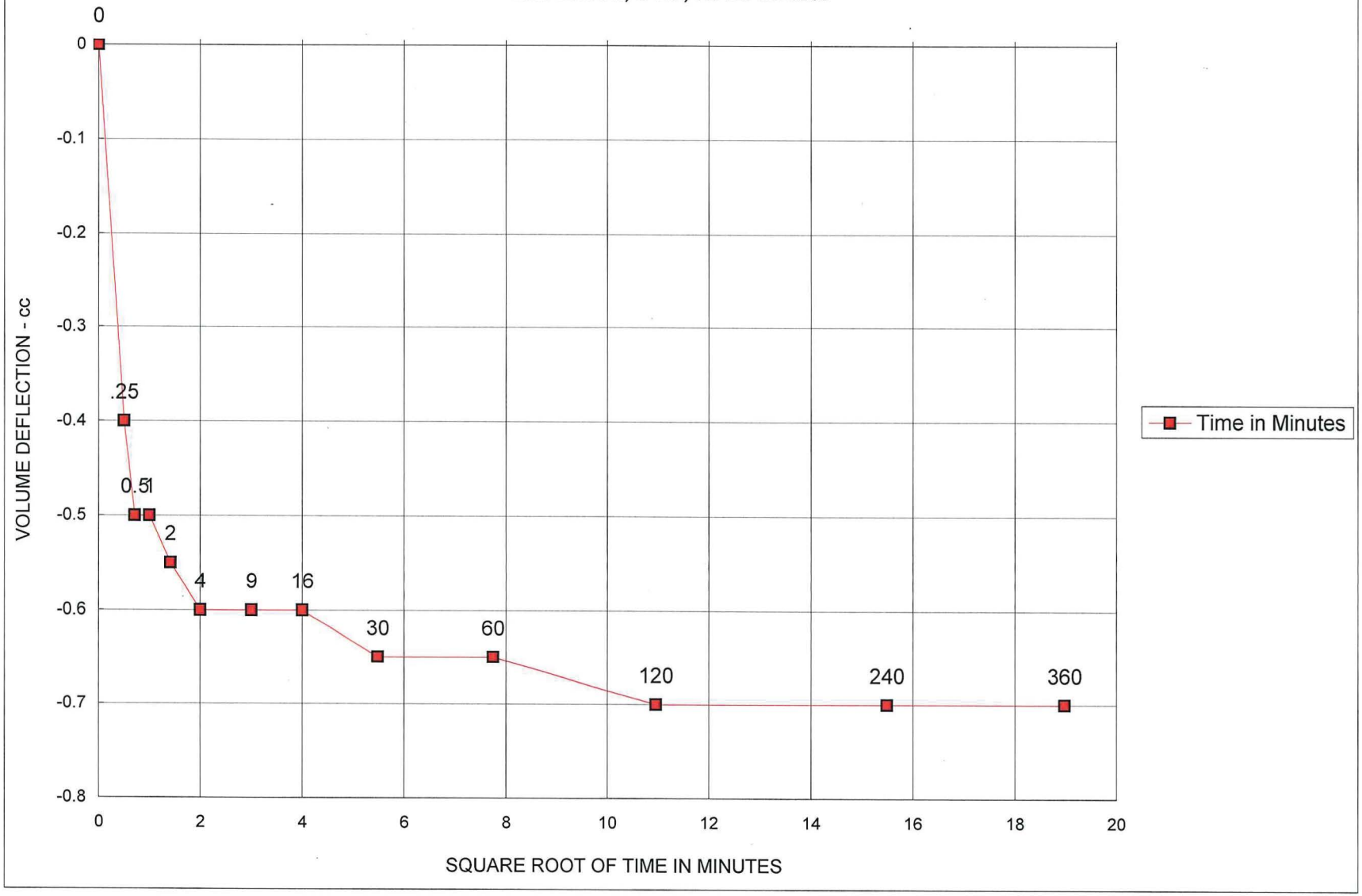
Initial Height (in)	3.005	Init. Vol. (CC)	223.740
Height Change (in)	0.013	Vol. Change (CC)	33.900
Ht. After Cons. (in)	2.992	Cell Exp. (CC)	15.877
Initial Area (sq in)	4.543	Net Change (CC)	18.023
Area After Cons. (sq in)	4.195	Cons. Vol. (CC)	205.717

Data entry by: DAW Date: 04/08/2014
Checked by: DPM Date: 4/8/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_14.xls

ATT
ADVANCED TERRA TESTING

CONSOLIDATION DATA

East Borrow, 0-10', EB-B6-03 85%

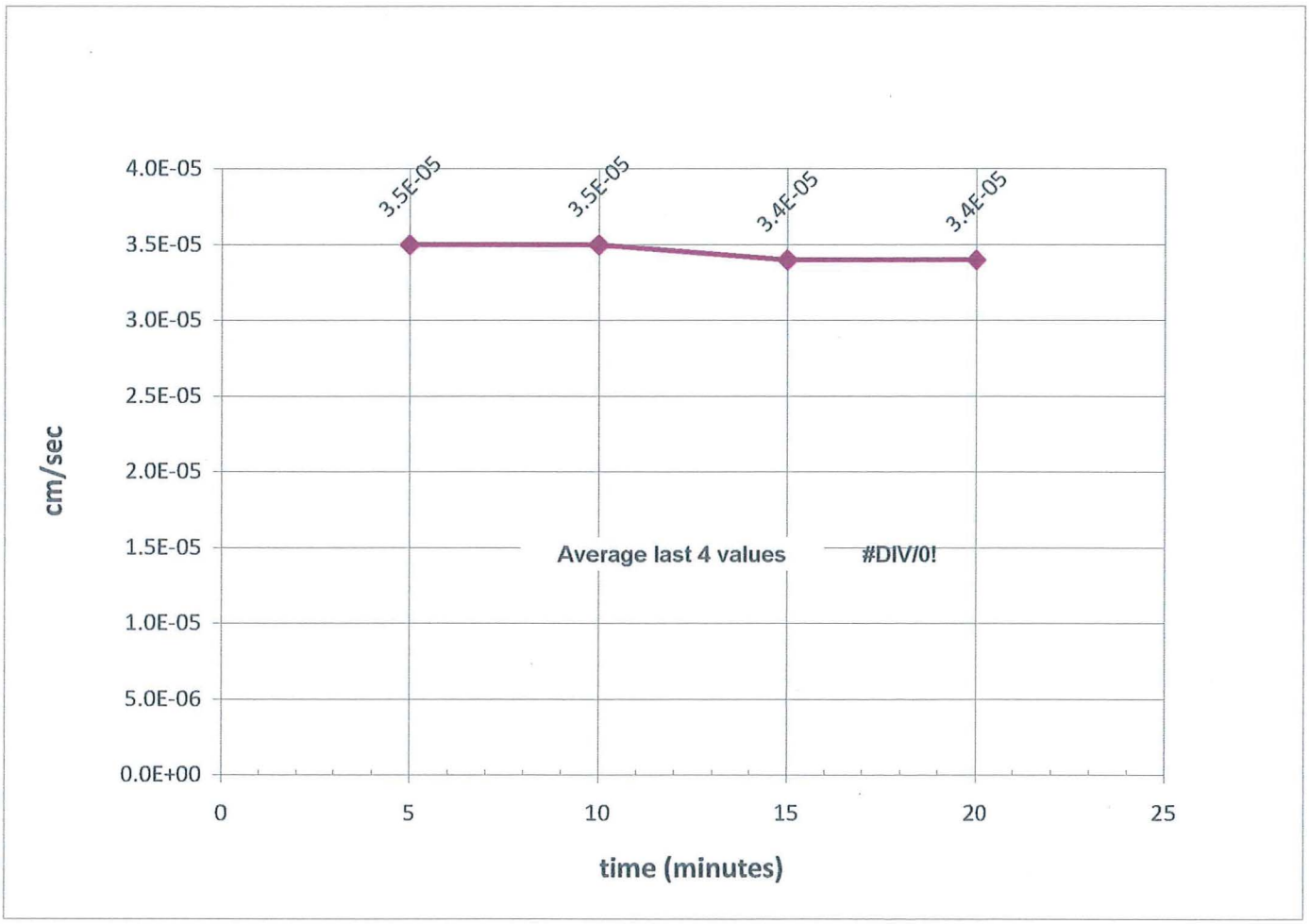


ATT
ADVANCED TERRA TESTING

ADVANCED TERRA TESTING

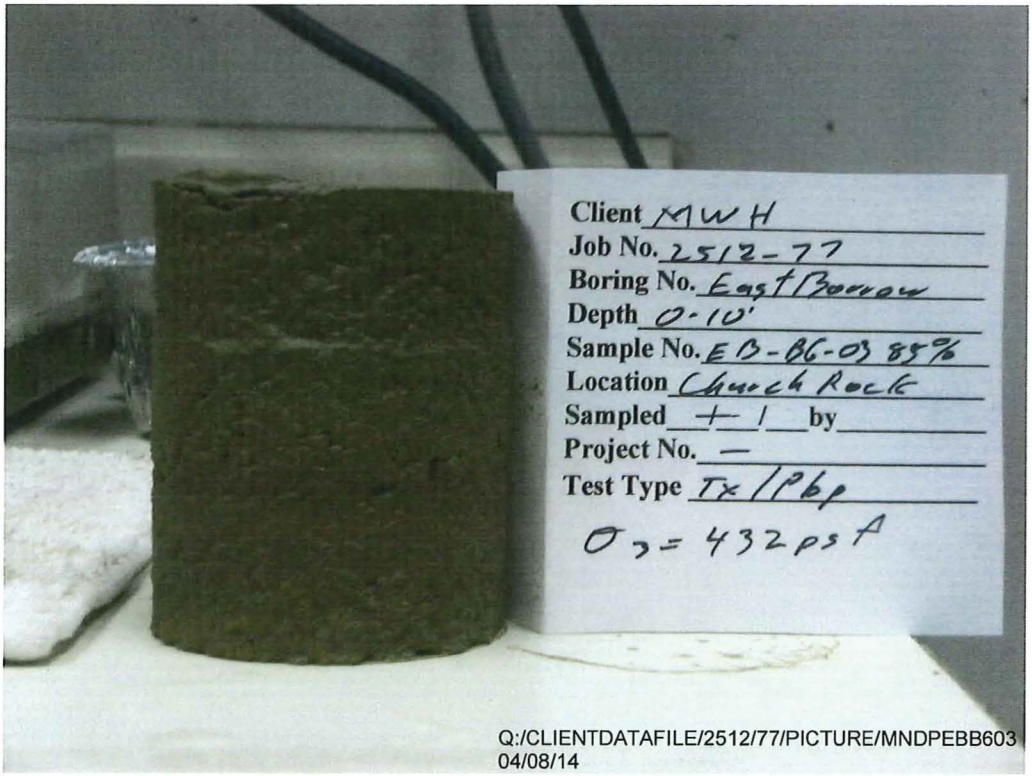
Preliminary Flow Pump Test Data
ASTM D5084

Client:	MWH	Boring Number:	East Borrow		
Job Number:	2512-77	Depth:	0-10'		
Project:	--	Sample Number:	EB-B6-03 85%		
Location:	Church Rock	Sampled Date:	--	Sampled By:	--
Project Number:	--	Test Date:	4/7/2014	Technician:	DPM



Data Entered By: DPM
Date: 4/7/2014
File Name: 2512_77_PrelimPerm_ASTMD-5084-methodD_15.xls

Checked By: DAW
Date: 04/08/14



Q:/CLIENTDATAFILE/2512/77/PICTURE/MNDPEBB603
04/08/14

PERMEABILITY TEST - BACK PRESSURE SATURATED - FLOW PUMP METHOD

ASTM D 5084

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	South Borrow	SAMPLED	--
DEPTH	0-15'	TEST STARTED	03/19/14 CAL
SAMPLE NO.	SB-B4-01 85%	TEST FINISHED	04/09/14 CAL
LOCATION	Church Rock	CELL NUMBER	17S
PROJECT NO.	--	SATURATED TEST	Yes
SOIL DESCR.	Remolded -#4	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	432

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	389.3	442.1
Wt. Wet Soil & Pan (g)	396.0	448.7
Wt. Dry Soil & Pan (g)	353.7	353.7
Wt. Lost Moisture (g)	42.3	95.0
Wt. of Pan Only (g)	6.7	6.7
Wt. of Dry Soil (g)	347.0	347.0
Moisture Content %	12.2	27.4
Wet Density PCF	108.5	127.2
Dry Density PCF	96.8	99.9

Init. Diameter (in)	2.406	(cm)	6.111
Init. Area (sq in)	4.547	(sq cm)	29.334
Init. Height (in)	3.005	(cm)	7.633
Vol. Bef. Consol. (cu ft)	0.00791		
Vol. After Consol. (cu ft)	0.00766		
Porosity %	43.81		

FLOW PUMP CALCULATIONS

Pump Setting (gear number)	5
Percentage of Pump setting	100
Q (cc/s)	5.81E-03
Height	2.993
Diameter	2.373
Pressure (psi)	0.110
Area after consol. (cm*cm)	28.530
Gradient	1.017
Permeability k (cm/s)	2.0E-04
Permeability k (m/s)	2.0E-06
Back Pressure (psi)	98.0
Cell Pressure (psi)	101.0
Ave. Effective Stress (psi)	2.945
Average temperature degree C:	23.0

Data entry by: DAW Date: 04/10/2014
Checked by: DAW Date: 4/11/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_19.xls

ATT
ADVANCED TERRA TESTING

TRIAXAL TEST DATA
ASTM D 5084

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	South Borrow	SAMPLED	--
DEPTH	0-15'	TEST STARTED	03/19/14 CAL
SAMPLE NO.	SB-B4-01 85%	TEST FINISHED	04/09/14 CAL
LOCATION	Church Rock	SETUP NO.	17S
PROJECT NO.	--	SATURATED TEST	Yes
SOIL DESCR.	Remolded -#4	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	432

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	2.1	15.9				
50.0	48.0	15.9	17.4	38.0	45.3	7.3	0.73
60.0	58.0	16.8	17.9	47.8	55.8	8.0	0.80
70.0	68.0	17.8	18.6	58.2	66.4	8.2	0.82
80.0	78.0	18.6	19.4	68.1	76.9	8.8	0.88
90.0	88.0	19.5	20.2	78.2	87.1	8.9	0.89
100.0	98.0	20.3	21.0	88.3	97.6	9.3	0.93
110.0		21.3	21.3	98.0	107.5	9.5	0.95

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	21.30	0.00
0.25	0.50	21.65	-0.35
0.5	0.71	21.65	-0.35
1	1.00	21.65	-0.35
2	1.41	21.65	-0.35
4	2.00	21.65	-0.35
9	3.00	21.65	-0.35
16	4.00	21.65	-0.35
30	5.48	21.65	-0.35
60	7.75	21.70	-0.40
120	10.95	21.70	-0.40
240	15.49	21.70	-0.40
360	18.97	21.70	-0.40

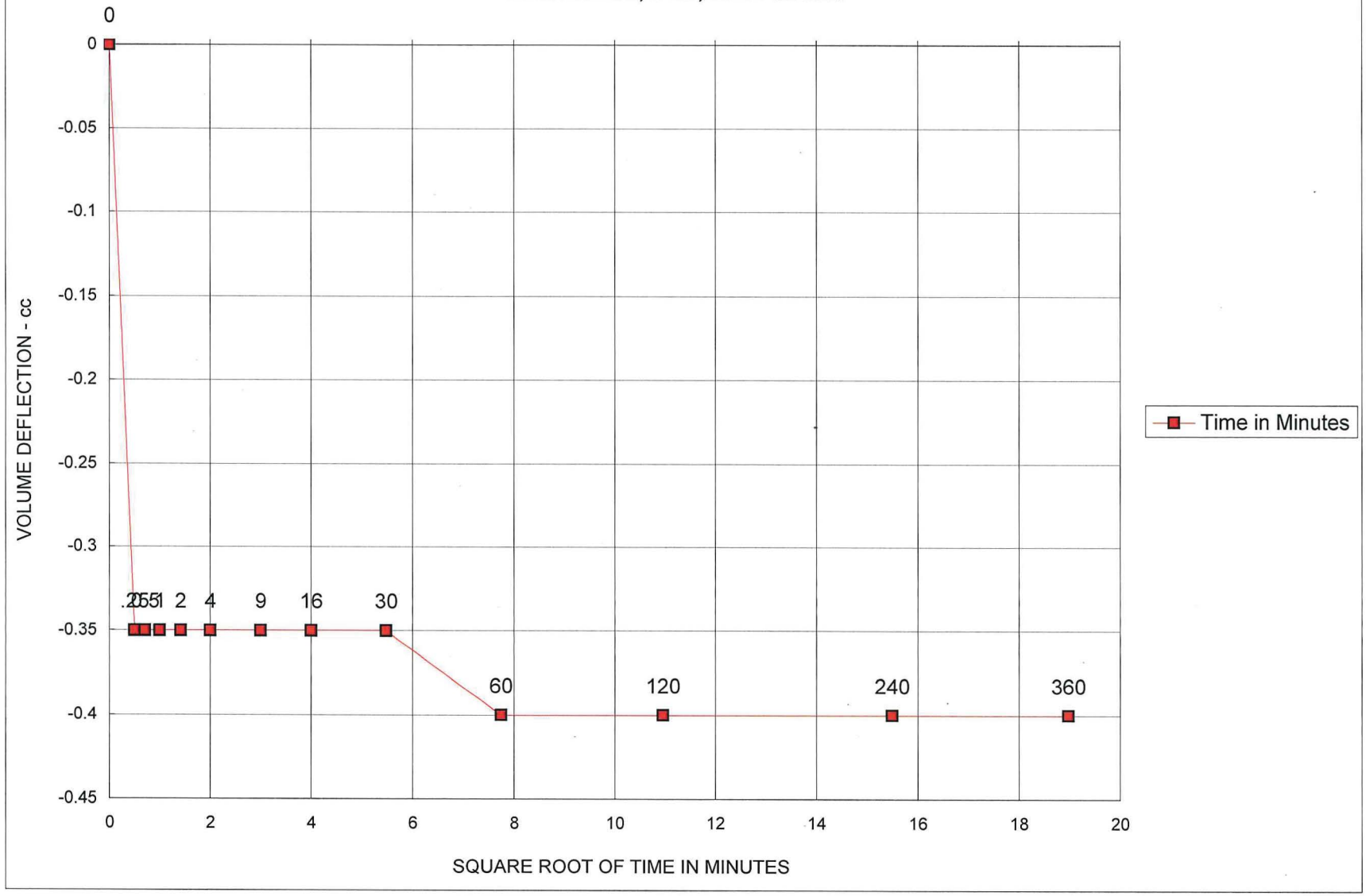
Initial Height (in)	3.005	Init. Vol. (CC)	223.926
Height Change (in)	0.012	Vol. Change (CC)	20.200
Ht. After Cons. (in)	2.993	Cell Exp. (CC)	13.204
Initial Area (sq in)	4.547	Net Change (CC)	6.996
Area After Cons. (sq in)	4.422	Cons. Vol. (CC)	216.930

Data entry by: DAW Date: 04/10/2014
Checked by: dsh Date: 4/11/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_19.xls

ATT
ADVANCED TERRA TESTING

CONSOLIDATION DATA

South Borrow, 0-15', SB-B4-01 85%

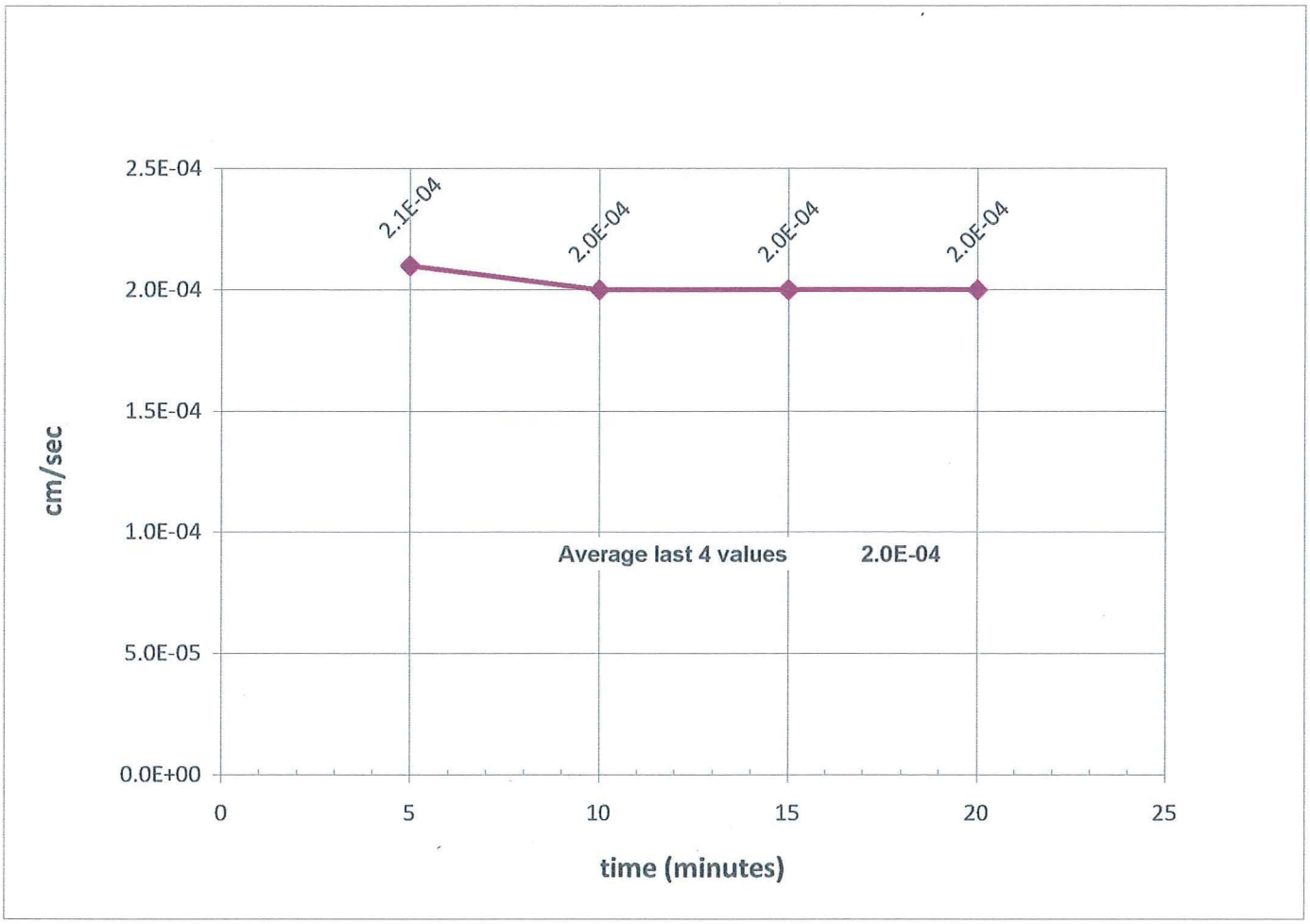


ATT
ADVANCED TERRA TESTING

ADVANCED TERRA TESTING

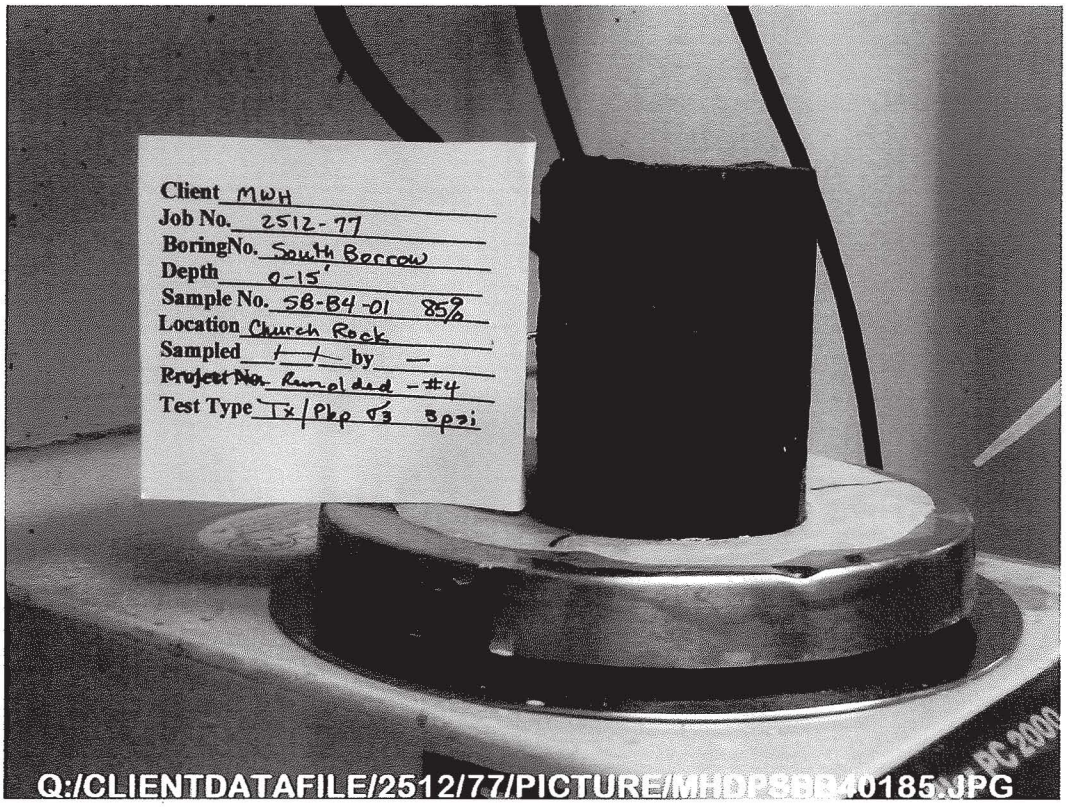
Preliminary Flow Pump Test Data
ASTM D5084

Client:	MWH	Boring Number:	South Borrow		
Job Number:	2512-77	Depth:	0-15'		
Project:	--	Sample Number:	SB-B4-01 85%		
Location:	Church Rock	Sampled Date:	--	Sampled By:	--
Project Number:	--	Test Date:	4/9/2014	Technician:	CAL



Data Entered By: CAL
Date: 4/9/2014
File Name: 2512_77_PrelimPerm_ASTMD-5084-methodD_20.xls

Checked By: DAW
Date: 04/10/14


Client MWH
Job No. 2512-77
BoringNo. South Borrow
Depth 0-15'
Sample No. SB-B4-01 85%
Location Church Rock
Sampled 1 1 by —
Project No. Remolded -#4
Test Type Tx/Pkp σ3 5psi
Q:/CLIENTDATAFILE/2512/77/PICTURE/MHDPSBB40185.JPG

PERMEABILITY TEST - BACK PRESSURE SATURATED - FLOW PUMP METHOD

ASTM D 5084

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	South Borrow	SAMPLED	--
DEPTH	0-25'	TEST STARTED	03/18/14 CAL
SAMPLE NO.	SB-B1-04 (85%)	TEST FINISHED	04/09/14 CAL
LOCATION	Church Rock	CELL NUMBER	9P
PROJECT NO.	--	SATURATED TEST	Yes
SOIL DESCR.	Remolded -#4	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	432

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	381.5	443.8
Wt. Wet Soil & Pan (g)	389.8	452.2
Wt. Dry Soil & Pan (g)	360.0	360.0
Wt. Lost Moisture (g)	29.8	92.2
Wt. of Pan Only (g)	8.4	8.4
Wt. of Dry Soil (g)	351.7	351.7
Moisture Content %	8.5	26.2
Wet Density PCF	106.3	134.0
Dry Density PCF	98.0	106.2

Init. Diameter (in)	2.403	(cm)	6.104
Init. Area (sq in)	4.535	(sq cm)	29.261
Init. Height (in)	3.015	(cm)	7.658
Vol. Bef. Consol. (cu ft)	0.00791		
Vol. After Consol. (cu ft)	0.00730		
Porosity %	44.58		

FLOW PUMP CALCULATIONS

Pump Setting (gear number)	6
Percentage of Pump setting	100
Q (cc/s)	2.31E-03
Height	3.006
Diameter	2.312
Pressure (psi)	0.163
Area after consol. (cm*cm)	27.075
Gradient	1.501
Permeability k (cm/s)	5.7E-05
Permeability k (m/s)	5.7E-07
Back Pressure (psi)	98.0
Cell Pressure (psi)	101.0
Ave. Effective Stress (psi)	2.919
Average temperature degree C:	22.8

Data entry by: DAW Date: 04/10/2014
Checked by: cmc Date: 4/11/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_17.xls

ATT
ADVANCED TERRA TESTING

TRIAXAL TEST DATA
ASTM D 5084

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	South Borrow	SAMPLED	--
DEPTH	0-25'	TEST STARTED	03/18/14 CAL
SAMPLE NO.	SB-B1-04 (85%)	TEST FINISHED	04/09/14 CAL
LOCATION	Church Rock	SETUP NO.	9P
PROJECT NO.	--	SATURATED TEST	Yes
SOIL DESCR.	Remolded -#4	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	432

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	2.2	17.2				
50.0	48.0	19.6	21.6	38.6	46.5	7.9	0.79
60.0	58.0	24.3	25.3	47.9	56.3	8.4	0.84
70.0	68.0	25.8	26.7	58.7	67.4	8.7	0.87
80.0	78.0	27.1	28.0	68.7	77.6	8.9	0.89
90.0	88.0	28.3	29.1	78.6	87.8	9.2	0.92
100.0	98.0	29.4	30.3	88.6	97.9	9.3	0.93
110.0		32.1	32.3	98.5	108.1	9.6	0.96

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	32.30	0.00
0.25	0.50	32.65	-0.35
0.5	0.71	32.70	-0.40
1	1.00	32.70	-0.40
2	1.41	32.70	-0.40
4	2.00	32.70	-0.40
9	3.00	32.70	-0.40
16	4.00	32.70	-0.40
30	5.48	32.70	-0.40
60	7.75	32.75	-0.45
120	10.95	32.75	-0.45
240	15.49	32.75	-0.45
360	18.97	32.75	-0.45

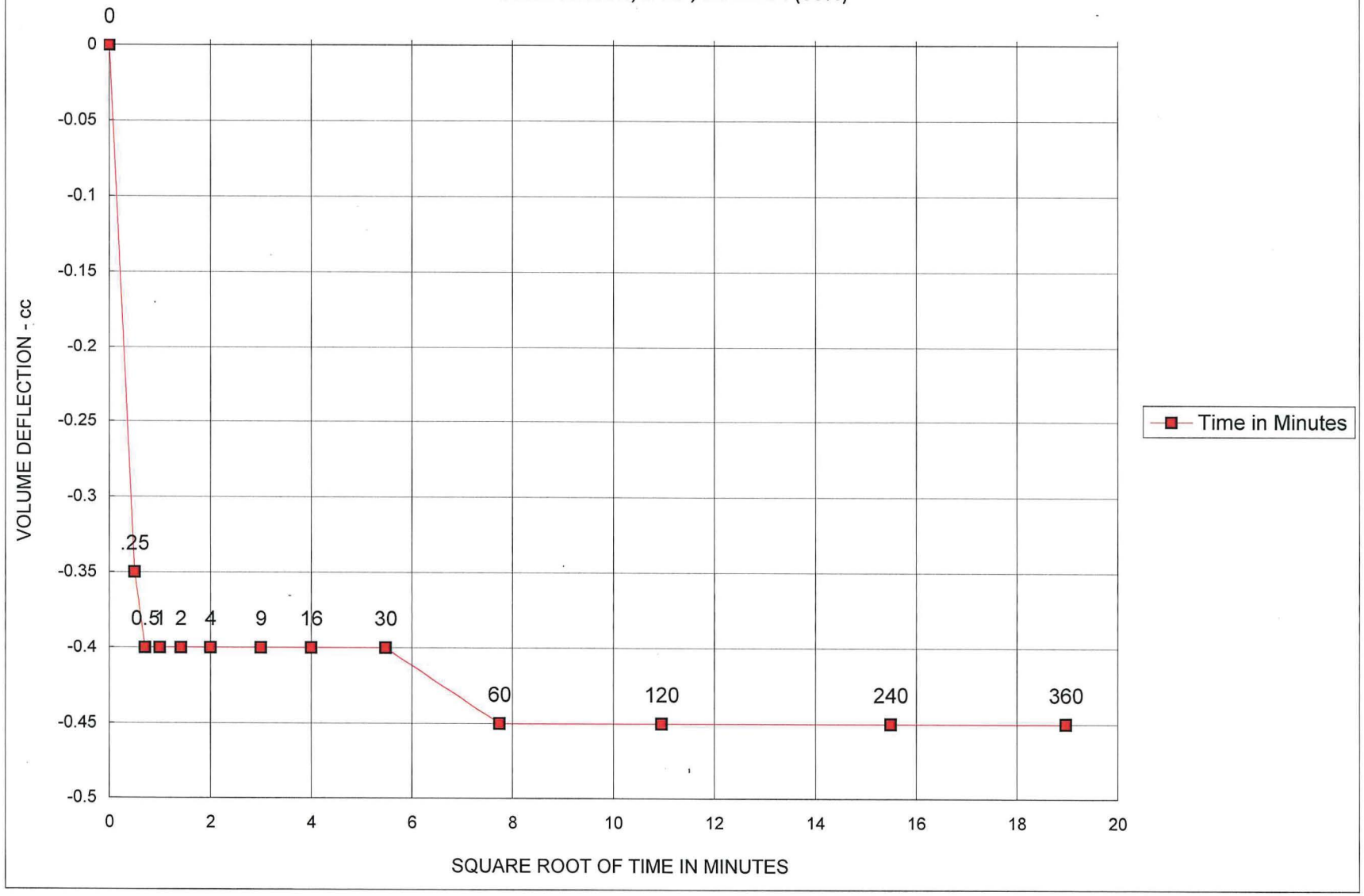
Initial Height (in)	3.015	Init. Vol. (CC)	224.111
Height Change (in)	0.009	Vol. Change (CC)	33.200
Ht. After Cons. (in)	3.006	Cell Exp. (CC)	15.850
Initial Area (sq in)	4.535	Net Change (CC)	17.350
Area After Cons. (sq in)	4.197	Cons. Vol. (CC)	206.761

Data entry by: DAW Date: 04/10/2014
Checked by: CMC Date: 4/11/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_17.xls

ATT
ADVANCED TERRA TESTING

CONSOLIDATION DATA

South Borrow, 0-25', SB-B1-04 (85%)

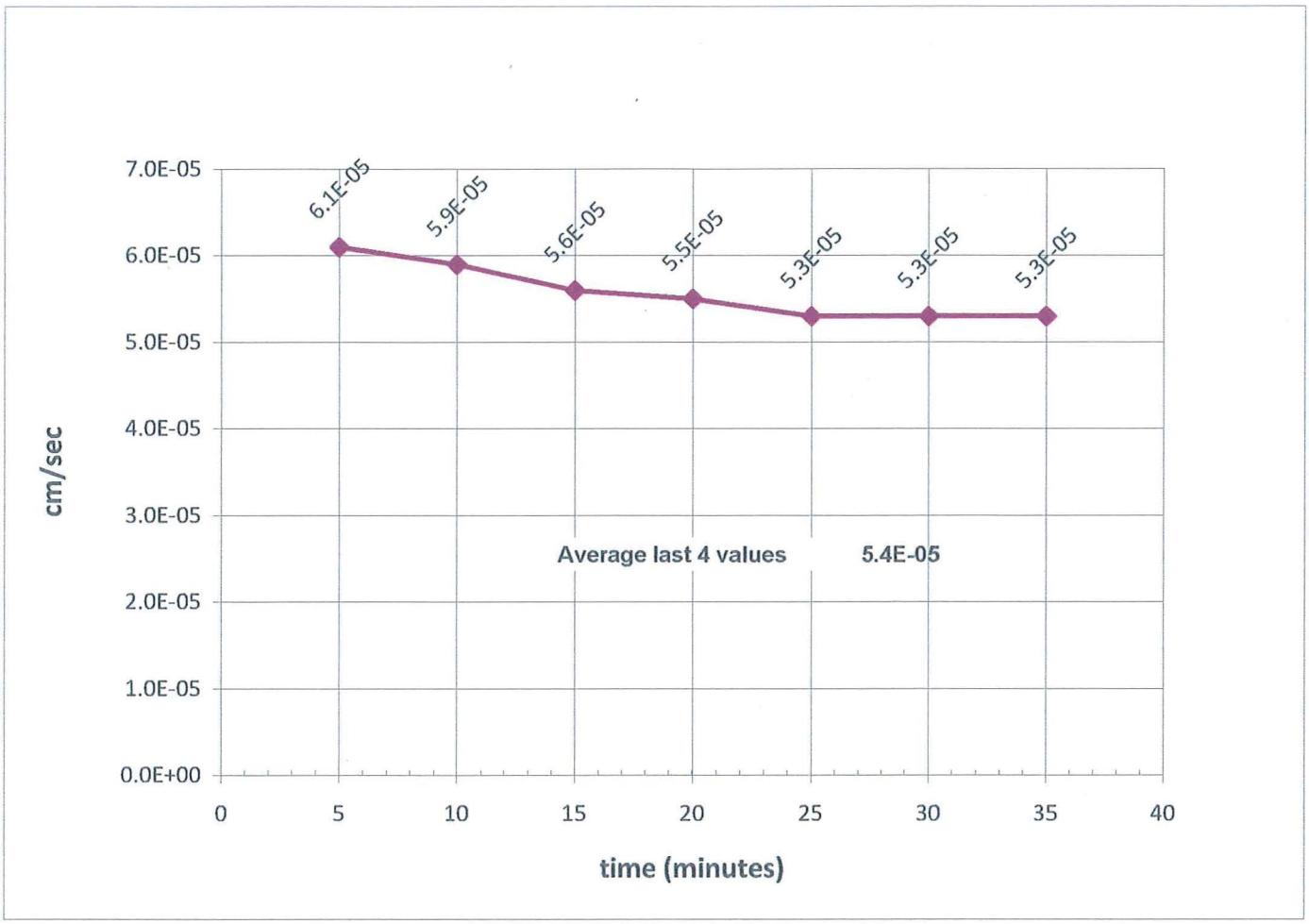


ATT
ADVANCED TERRA TESTING

ADVANCED TERRA TESTING

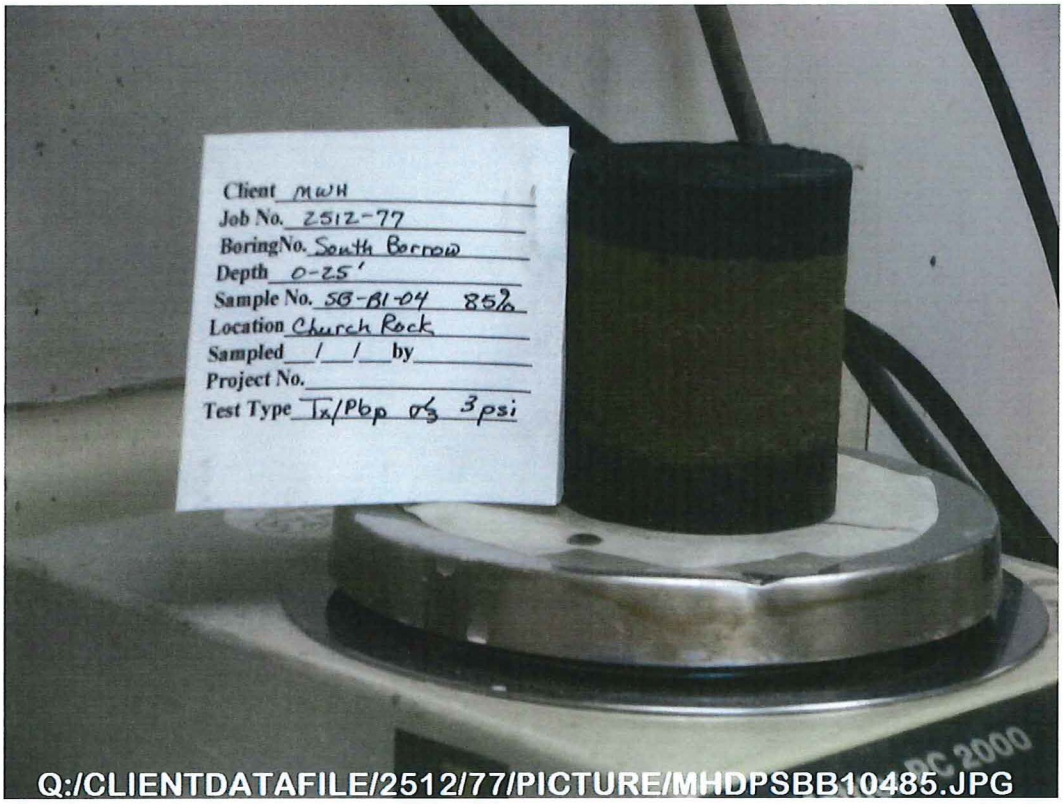
Preliminary Flow Pump Test Data
ASTM D5084

Client:	MWH	Boring Number:	South Borrow		
Job Number:	2512-77	Depth:	0-25'		
Project:	--	Sample Number:	SB-B1-04 85%		
Location:	Church Rock	Sampled Date:	--	Sampled By:	--
Project Number:	--	Test Date:	4/9/2014	Technician:	CAL



Data Entered By: CAL
Date: 4/9/2014
File Name: 2512_77_PrelimPerm_ASTMD-5084-methodD_18.xls

Checked By: DAV
Date: 04/10/14


Client MWH
Job No. 2512-77
BoringNo. South Borrow
Depth 0-25'
Sample No. SB-B1-04 85%
Location Church Rock
Sampled / / by
Project No.
Test Type Tx/Pbp @ 3psi
Q:/CLIENTDATAFILE/2512/77/PICTURE/MHDPSBB10485.JPG

PERMEABILITY TEST - BACK PRESSURE SATURATED - FLOW PUMP METHOD

ASTM D 5084

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	West Borrow	SAMPLED	--
DEPTH	10-20'	TEST STARTED	03/18/14 CAL
SAMPLE NO.	WB-B2-05 85%	TEST FINISHED	04/09/14 CAL
LOCATION	Church Rock	CELL NUMBER	11P
PROJECT NO.	--	SATURATED TEST	Yes
SOIL DESCR.	Remolded -#4	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	432

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	367.8	427.6
Wt. Wet Soil & Pan (g)	374.8	434.6
Wt. Dry Soil & Pan (g)	349.5	349.5
Wt. Lost Moisture (g)	25.3	85.1
Wt. of Pan Only (g)	7.0	7.0
Wt. of Dry Soil (g)	342.5	342.5
Moisture Content %	7.4	24.8
Wet Density PCF	103.3	130.4
Dry Density PCF	96.2	104.5

Init. Diameter (in)	2.402	(cm)	6.101
Init. Area (sq in)	4.531	(sq cm)	29.237
Init. Height (in)	2.994	(cm)	7.605
Vol. Bef. Consol. (cu ft)	0.00785		
Vol. After Consol. (cu ft)	0.00723		
Porosity %	41.56		

FLOW PUMP CALCULATIONS

Pump Setting (gear number)	5
Percentage of Pump setting	100
Q (cc/s)	5.81E-03
Height	2.962
Diameter	2.317
Pressure (psi)	0.195
Area after consol. (cm*cm)	27.205
Gradient	1.822
Permeability k (cm/s)	1.2E-04
Permeability k (m/s)	1.2E-06
Back Pressure (psi)	118.0
Cell Pressure (psi)	121.0
Ave. Effective Stress (psi)	2.903
Average temperature degree C:	23.0

Data entry by: DAW Date: 04/10/2014
Checked by: CAC Date: 4/11/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-R1_18.xls

ATT
ADVANCED TERRA TESTING

TRIAXAL TEST DATA
ASTM D 5084

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	West Borrow	SAMPLED	--
DEPTH	10-20'	TEST STARTED	03/18/14 CAL
SAMPLE NO.	WB-B2-05 85%	TEST FINISHED	04/09/14 CAL
LOCATION	Church Rock	SETUP NO.	11P
PROJECT NO.	--	SATURATED TEST	Yes
SOIL DESCR.	Remolded -#4	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	432

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	2.8	22.4				
50.0	48.0	23.7	26.4	38.6	46.2	7.6	0.76
60.0	58.0	26.8	28.0	47.7	55.5	7.8	0.78
70.0	68.0	28.1	29.0	58.8	66.8	8.0	0.80
80.0	78.0	29.1	29.8	68.7	77.2	8.5	0.85
90.0	88.0	30.1	30.8	78.5	87.2	8.7	0.87
100.0	98.0	31.0	31.7	88.5	97.5	9.0	0.90
110.0	108.0	32.3	33.0	98.3	107.5	9.2	0.92
120.0	118.0	33.2	33.9	108.4	117.8	9.4	0.94
130.0		35.3	35.3	118.5	128.4	9.9	0.99

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	0.50	0.00
0.25	0.50	1.10	-0.60
0.5	0.71	1.20	-0.70
1	1.00	1.20	-0.70
2	1.41	1.25	-0.75
4	2.00	1.25	-0.75
9	3.00	1.30	-0.80
16	4.00	1.35	-0.85
30	5.48	1.35	-0.85
60	7.75	1.35	-0.85
120	10.95	1.35	-0.85
240	15.49	1.35	-0.85
360	18.97	1.35	-0.85

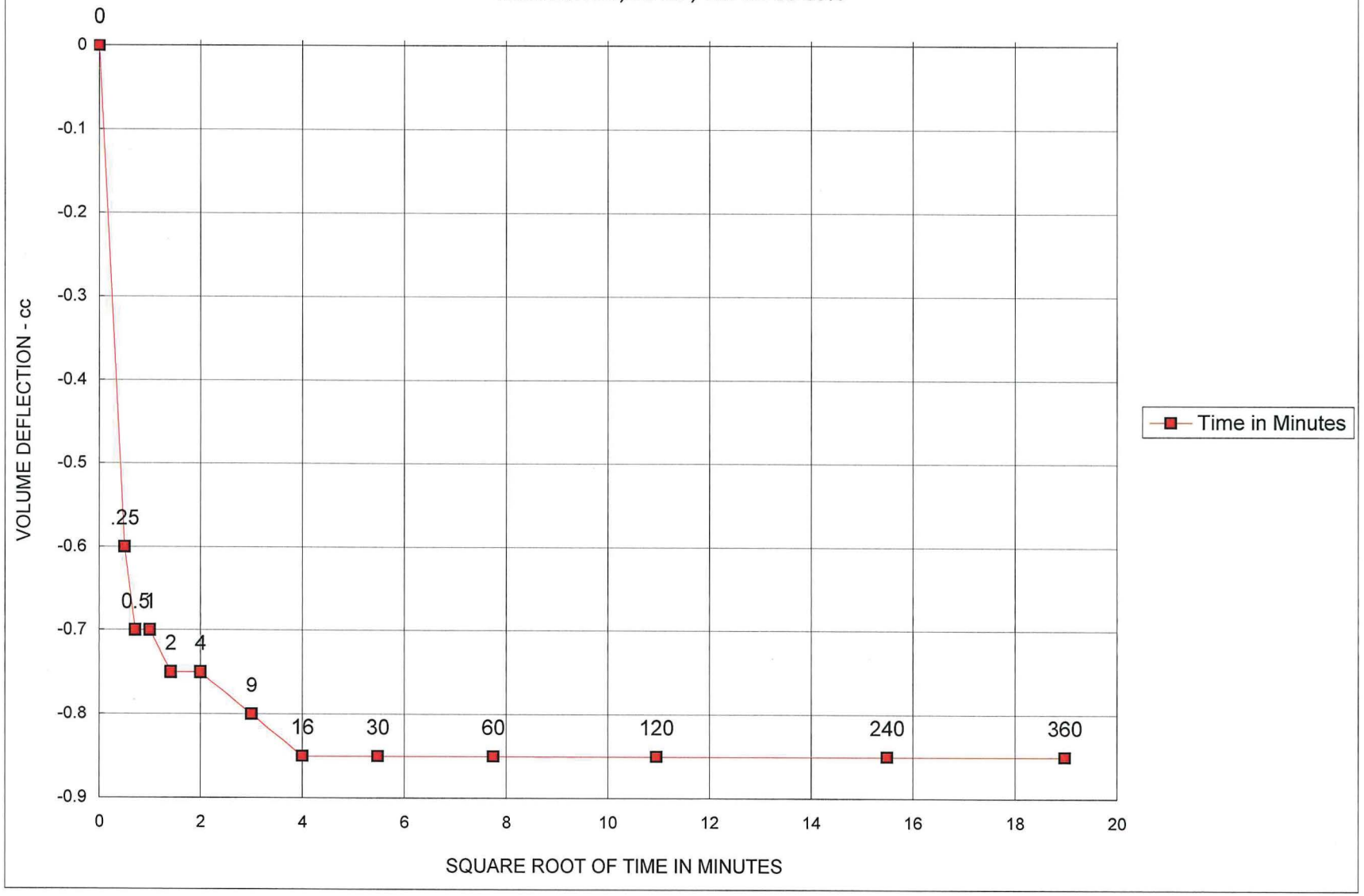
Initial Height (in)	2.994	Init. Vol. (CC)	222.365
Height Change (in)	0.032	Vol. Change (CC)	34.300
Ht. After Cons. (in)	2.962	Cell Exp. (CC)	16.651
Initial Area (sq in)	4.531	Net Change (CC)	17.650
Area After Cons. (sq in)	4.217	Cons. Vol. (CC)	204.716

Data entry by: DAW Date: 04/10/2014
Checked by: cwe Date: 4/11/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-R1_18.xls

ATT
ADVANCED TERRA TESTING

CONSOLIDATION DATA

West Borrow, 10-20', WB-B2-05 85%

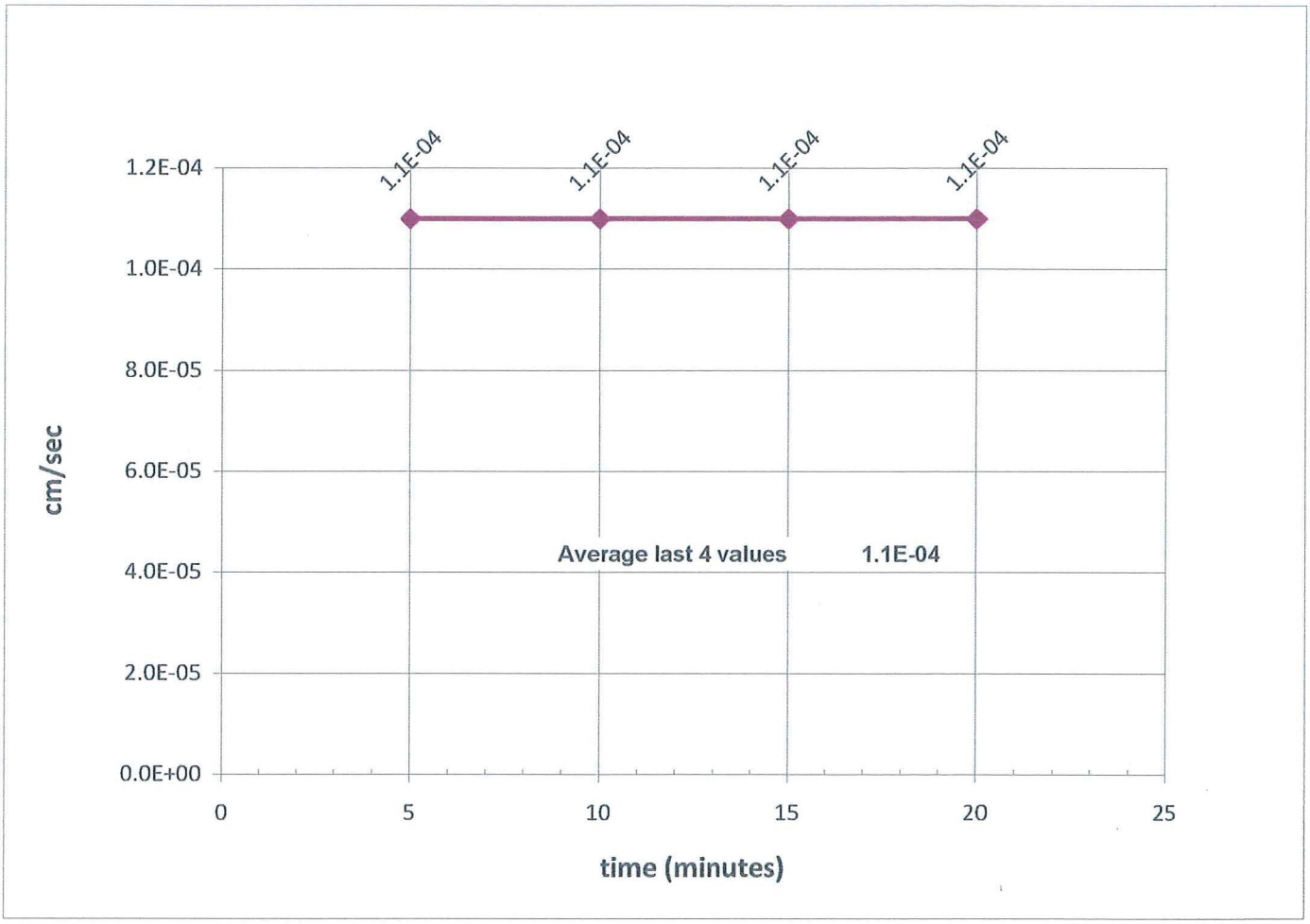


ATT
ADVANCED TERRA TESTING

ADVANCED TERRA TESTING

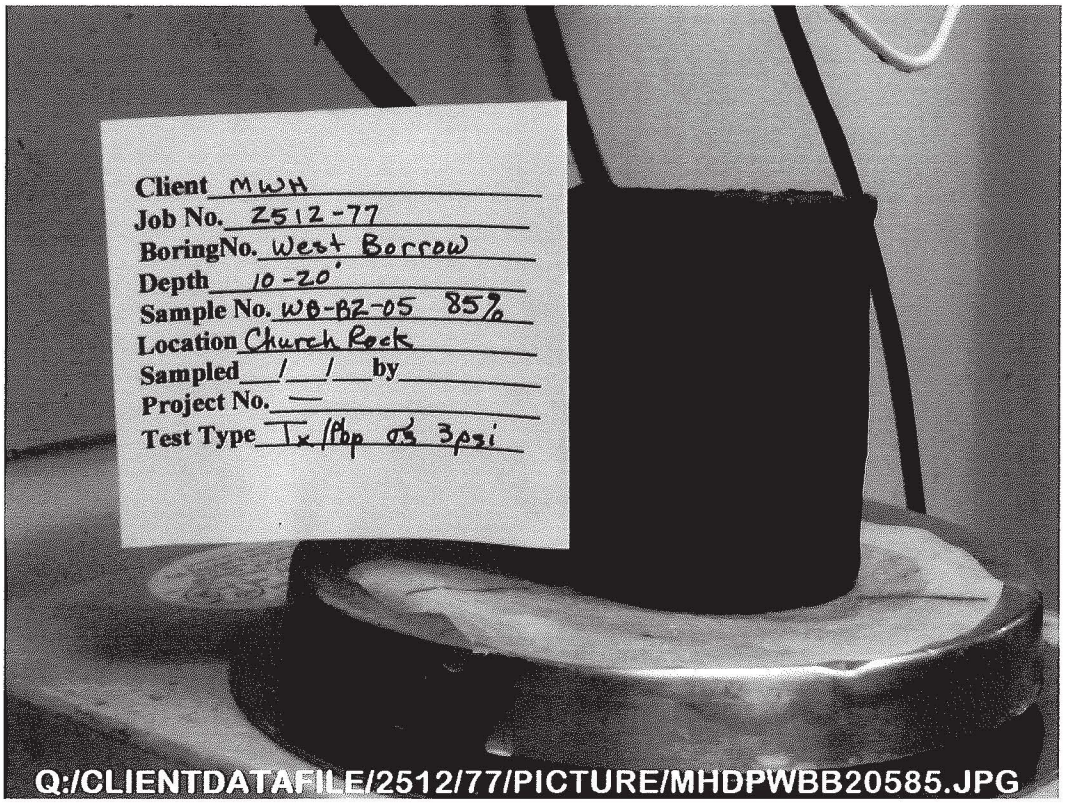
Preliminary Flow Pump Test Data
ASTM D5084

Client:	MWH	Boring Number:	West Borrow		
Job Number:	2512-77	Depth:	10-20'		
Project:	--	Sample Number:	WB-B2-05 85%		
Location:	Church Rock	Sampled Date:	--	Sampled By:	--
Project Number:	--	Test Date:	4/9/2014	Technician:	CAL



Data Entered By: CAL
Date: 4/9/2014
File Name: 2512_77_PrelimPerm_ASTMD-5084-methodD_19.xls

Checked By: DJW
Date: 5/7/14


Client MWH
Job No. 2512-77
BoringNo. West Borrow
Depth 10-20'
Sample No. WB-B2-05 85%
Location Church Rock
Sampled / / by
Project No. —
Test Type Tx/Bop @ 3psi
Q:/CLIENTDATAFILE/2512/77/PICTURE/MHDPWBB20585.JPG

PERMEABILITY TEST - BACK PRESSURE SATURATED - FLOW PUMP METHOD

ASTM D 5084

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	North Borrow	SAMPLED	-
DEPTH	0-10'	TEST STARTED	3/20/14 CAL
SAMPLE NO.	NB-B2-04 85%	TEST FINISHED	4/08/14 CAL
LOCATION	Church Rock	CELL NUMBER	1P
PROJECT NO.	-	SATURATED TEST	Yes
SOIL DESCR.	Remolded -#4	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	432

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	370.1	442.0
Wt. Wet Soil & Pan (g)	377.0	448.9
Wt. Dry Soil & Pan (g)	354.0	354.0
Wt. Lost Moisture (g)	23.0	94.9
Wt. of Pan Only (g)	6.9	6.9
Wt. of Dry Soil (g)	347.1	347.1
Moisture Content %	6.6	27.3
Wet Density PCF	102.9	130.7
Dry Density PCF	96.5	102.6

Init. Diameter (in)	2.406	(cm)	6.111
Init. Area (sq in)	4.547	(sq cm)	29.334
Init. Height (in)	3.013	(cm)	7.653
Vol. Bef. Consol. (cu ft)	0.00793		
Vol. After Consol. (cu ft)	0.00746		
Porosity %	44.94		

FLOW PUMP CALCULATIONS

Pump Setting (gear number)	4
Percentage of Pump setting	100
Q (cc/s)	1.16E-02
Height	2.985
Diameter	2.344
Pressure (psi)	0.164
Area after consol. (cm*cm)	27.848
Gradient	1.521
Permeability k (cm/s)	2.7E-04
Permeability k (m/s)	2.7E-06
Back Pressure (psi)	108.0
Cell Pressure (psi)	111.0
Ave. Effective Stress (psi)	2.918

Average temperature degree C: 22.1

Data entry by: SKL Date: 04/09/2014
Checked by: CAL Date: 4/09/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_16.xls

ATT
ADVANCED TERRA TESTING

TRIAXAL TEST DATA
ASTM D 5084

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	North Borrow	SAMPLED	-
DEPTH	0-10'	TEST STARTED	3/20/14 CAL
SAMPLE NO.	NB-B2-04 85%	TEST FINISHED	4/08/14 CAL
LOCATION	Church Rock	SETUP NO.	1P
PROJECT NO.	-	SATURATED TEST	Yes
SOIL DESCR.	Remolded -#4	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	432

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	4.1	13.1				
50.0	48.0	18.5	20.3	37.3	44.5	7.2	0.72
60.0	58.0	20.6	22.0	47.9	55.3	7.4	0.74
70.0	68.0	22.3	23.6	58.0	66.1	8.1	0.81
80.0	78.0	24.1	25.5	68.6	77.0	8.4	0.84
90.0	88.0	25.9	27.1	77.9	86.8	8.9	0.89
100.0	98.0	28.4	29.6	88.5	97.5	9.0	0.90
110.0	108.0	30.0	31.2	98.6	107.8	9.2	0.92
120.0		31.8	32.0	108.5	118.0	9.5	0.95

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	0.30	0.00
0.25	0.50	0.75	-0.45
0.5	0.71	0.75	-0.45
1	1.00	0.80	-0.50
2	1.41	0.80	-0.50
4	2.00	0.80	-0.50
9	3.00	0.85	-0.55
16	4.00	0.90	-0.60
30	5.48	0.90	-0.60
60	7.75	0.90	-0.60
120	10.95	0.95	-0.65
240	15.49	0.95	-0.65
360	18.97	1.00	-0.70

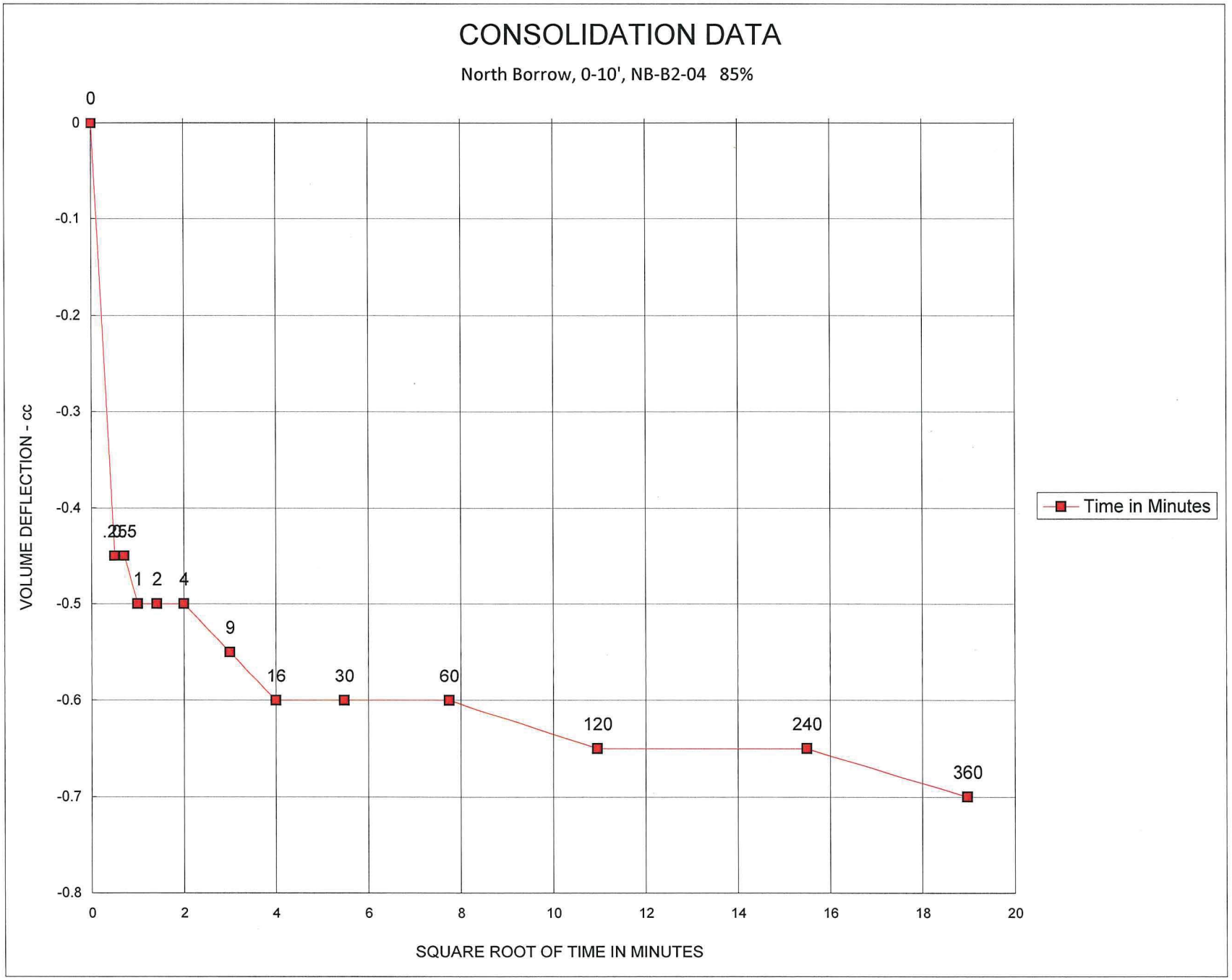
Initial Height (in)	3.013	Init. Vol. (CC)	224.522
Height Change (in)	0.028	Vol. Change (CC)	30.600
Ht. After Cons. (in)	2.985	Cell Exp. (CC)	17.256
Initial Area (sq in)	4.547	Net Change (CC)	13.345
Area After Cons. (sq in)	4.316	Cons. Vol. (CC)	211.178

Data entry by: SKL Date: 04/09/2014
Checked by: CH Date: 4/09/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_16.xls

ATT
ADVANCED TERRA TESTING

CONSOLIDATION DATA

North Borrow, 0-10', NB-B2-04 85%

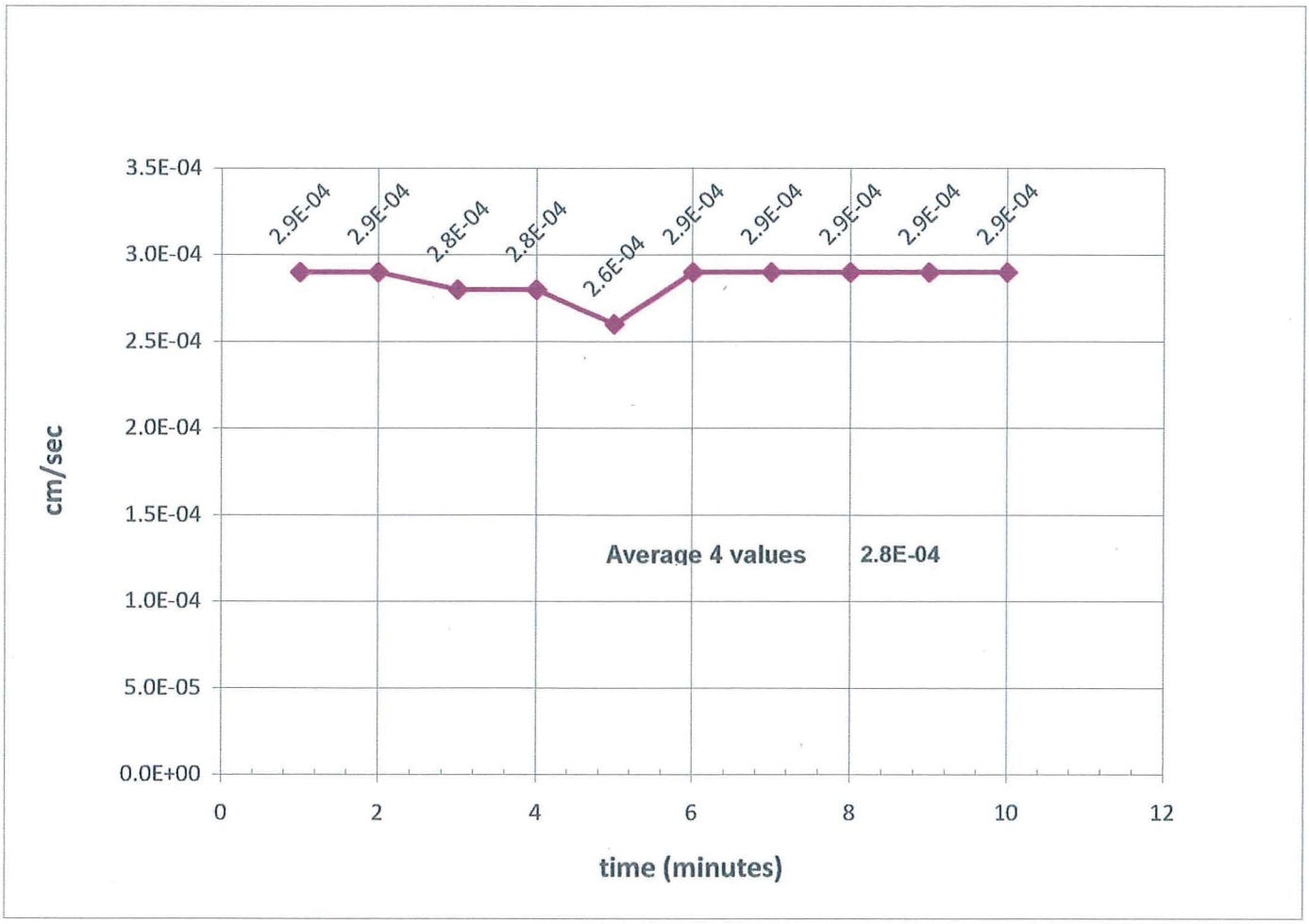


ATT
ADVANCED TERRA TESTING

ADVANCED TERRA TESTING

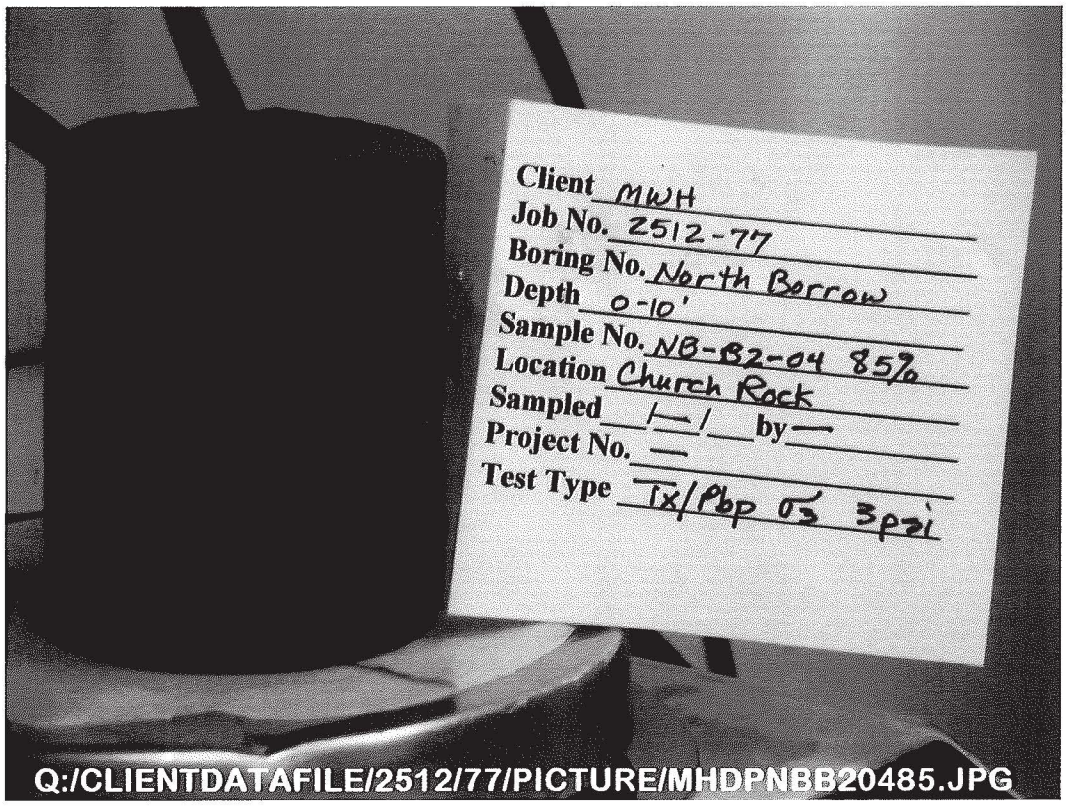
Preliminary Flow Pump Test Data
ASTM D5084

Client:	MWH	Boring Number:	North Borrow		
Job Number:	2512-77	Depth:	0-10'		
Project:	--	Sample Number:	NB-B2-04 85%		
Location:	Church Rock	Sampled Date:	--	Sampled By:	--
Project Number:	--	Test Date:	4/8/2014	Technician:	CAL



Data Entered By: CAL
Date: 4/8/2014
File Name: 2512_77_PrelimPerm_ASTMD-5084-methodD_17.xls

Checked By: SM
Date: 4/9/14


Client MWH
Job No. 2512-77
Boring No. North Borrow
Depth 0-10'
Sample No. NB-B2-04 85%
Location Church Rock
Sampled __/__/__ by__
Project No. __
Test Type Tx/Pbp 03 3psi
Q:/CLIENTDATAFILE/2512/77/PICTURE/MHDPNBB20485.JPG

PERMEABILITY TEST - BACK PRESSURE SATURATED - FLOW PUMP METHOD

ASTM D 5084

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	West Borrow	SAMPLED	--
DEPTH	5-10'	TEST STARTED	03/20/14 CAL
SAMPLE NO.	WB-B1-06 85%	TEST FINISHED	04/07/14 DPM
LOCATION	Church Rock	CELL NUMBER	12P
PROJECT NO.	--	SATURATED TEST	Yes
SOIL DESCR.	Remolded -#4	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	432

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	370.9	435.4
Wt. Wet Soil & Pan (g)	377.9	442.4
Wt. Dry Soil & Pan (g)	351.0	351.0
Wt. Lost Moisture (g)	27.0	91.4
Wt. of Pan Only (g)	7.0	7.0
Wt. of Dry Soil (g)	344.0	344.0
Moisture Content %	7.8	26.6
Wet Density PCF	103.5	128.3
Dry Density PCF	96.0	101.3

Init. Diameter (in)	2.405	(cm)	6.109
Init. Area (sq in)	4.543	(sq cm)	29.310
Init. Height (in)	3.005	(cm)	7.633
Vol. Bef. Consol. (cu ft)	0.00790		
Vol. After Consol. (cu ft)	0.00748		
Porosity %	43.15		

FLOW PUMP CALCULATIONS

Pump Setting (gear number)	3
Percentage of Pump setting	100
Q (cc/s)	2.33E-02
Height	2.990
Diameter	2.346
Pressure (psi)	0.155
Area after consol. (cm*cm)	27.897
Gradient	1.435
Permeability k (cm/s)	5.8E-04
Permeability k (m/s)	5.8E-06
Back Pressure (psi)	98.0
Cell Pressure (psi)	101.0
Ave. Effective Stress (psi)	2.923
Average temperature degree C:	22.5

Data entry by: DAW/SKL Date: 04/09/2014
Checked by: DPM rcvd Date: 4/9/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084_R1_15.xls

ATT
ADVANCED TERRA TESTING

TRIAXAL TEST DATA
ASTM D 5084

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	West Borrow	SAMPLED	--
DEPTH	5-10'	TEST STARTED	03/20/14 CAL
SAMPLE NO.	WB-B1-06 85%	TEST FINISHED	04/07/14 DPM
LOCATION	Church Rock	SETUP NO.	12P
PROJECT NO.	--	SATURATED TEST	Yes
SOIL DESCR.	Remolded -#4	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	432

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	2.2	15.5				
50.0	48.0	17.2	18.6	37.6	45.1	7.5	0.75
60.0	58.0	18.9	19.8	47.8	55.7	7.9	0.79
70.0	68.0	20.0	20.9	58.0	66.2	8.2	0.82
80.0	78.0	21.1	21.8	67.7	76.3	8.6	0.86
90.0	88.0	22.1	22.9	77.6	86.6	9.0	0.90
100.0	98.0	23.4	24.2	88.2	97.4	9.2	0.92
110.0		24.3	24.4	98.4	107.9	9.5	0.95

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	0.10	0.00
0.25	0.50	0.45	-0.35
0.5	0.71	0.45	-0.35
1	1.00	0.45	-0.35
2	1.41	0.50	-0.40
4	2.00	0.50	-0.40
9	3.00	0.50	-0.40
16	4.00	0.50	-0.40
30	5.48	0.50	-0.40
60	7.75	0.50	-0.40
120	10.95	0.50	-0.40
240	15.49	0.50	-0.40
360	18.97	0.50	-0.40

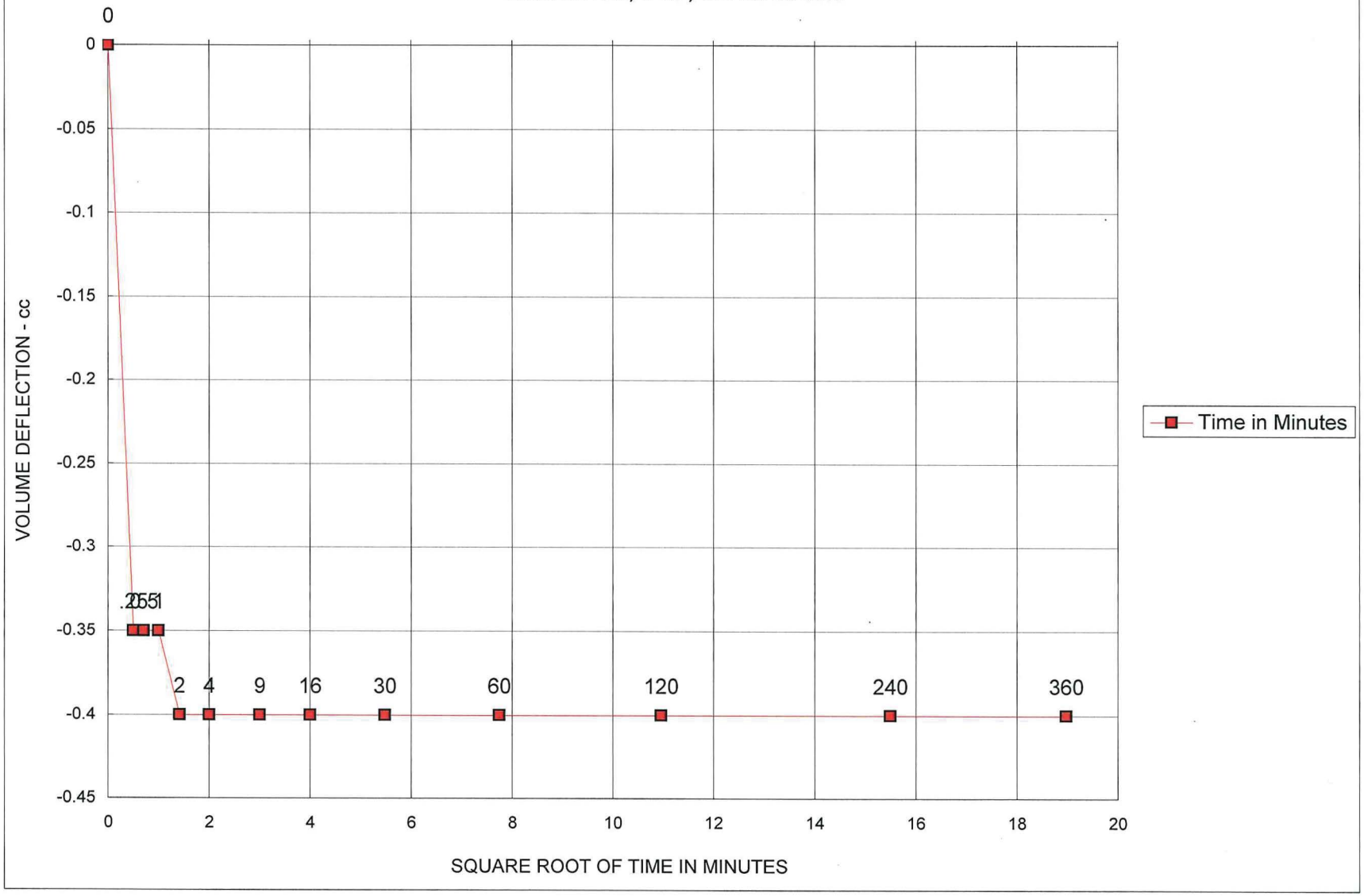
Initial Height (in)	3.005	Init. Vol. (CC)	223.740
Height Change (in)	0.015	Vol. Change (CC)	23.500
Ht. After Cons. (in)	2.990	Cell Exp. (CC)	11.668
Initial Area (sq in)	4.543	Net Change (CC)	11.833
Area After Cons. (sq in)	4.324	Cons. Vol. (CC)	211.907

Data entry by: DAW/SKL Date: 04/09/2014
Checked by: ch +DPM Date: 4/09/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084_R1_15.xls

ATT
ADVANCED TERRA TESTING

CONSOLIDATION DATA

West Borrow, 5-10', WB-B1-06 85%

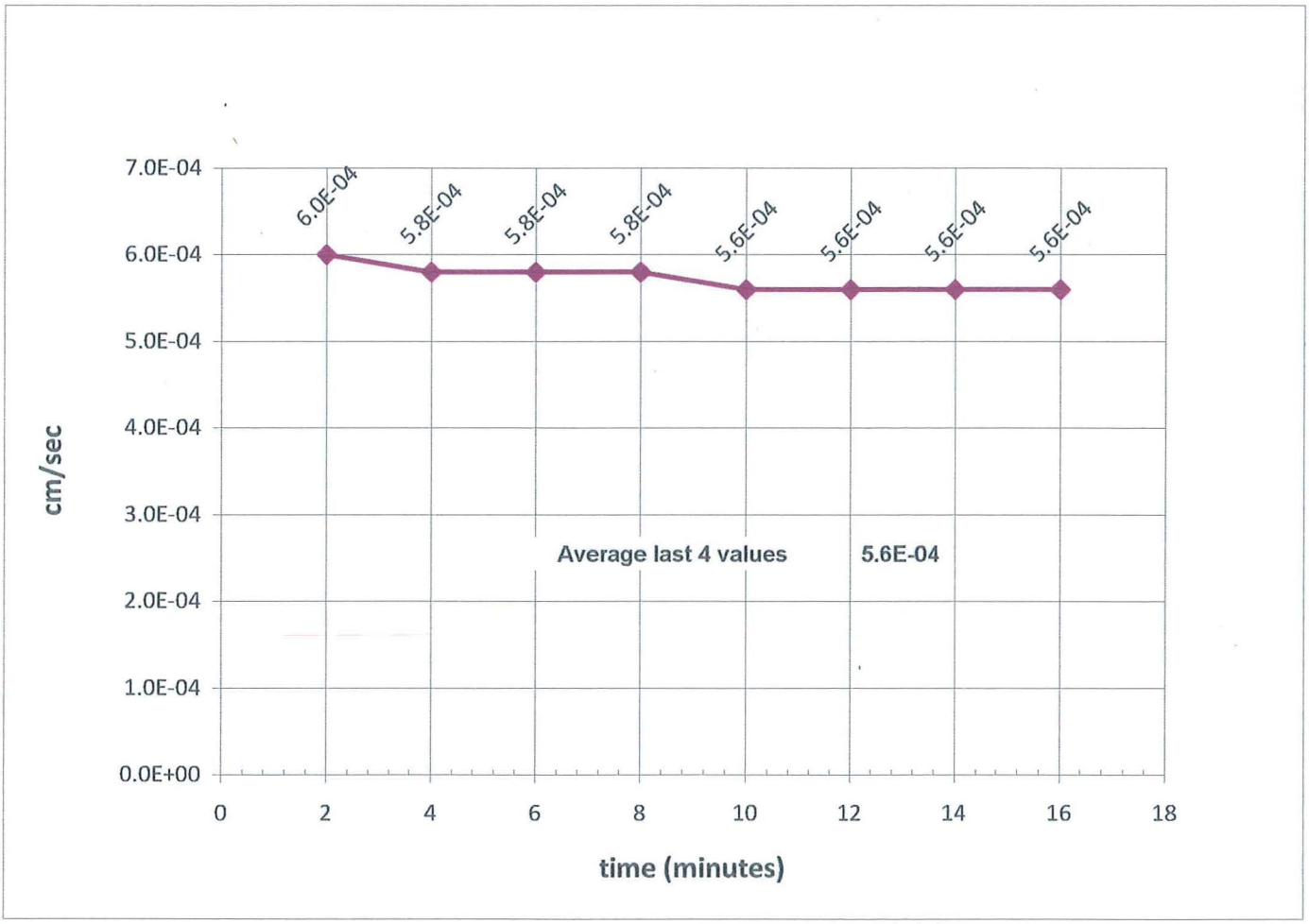


ATT
ADVANCED TERRA TESTING

ADVANCED TERRA TESTING

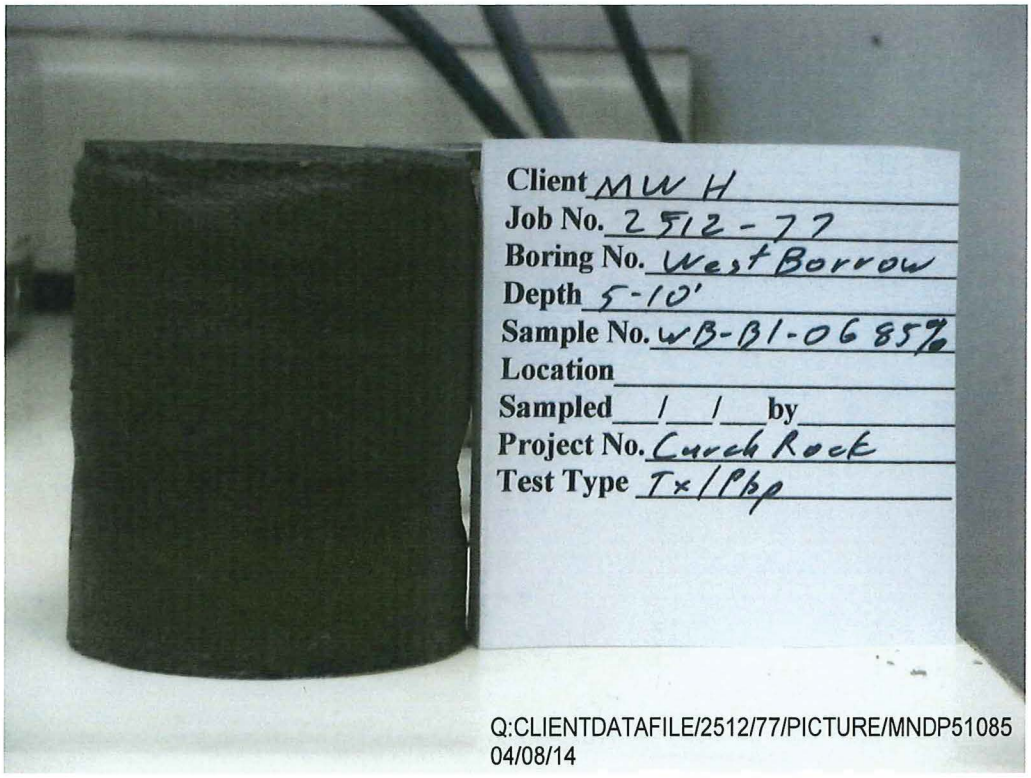
Preliminary Flow Pump Test Data
ASTM D5084

Client:	MWH	Boring Number:	West Borrow		
Job Number:	2512-77	Depth:	5-10'		
Project:	--	Sample Number:	WB-B1-06 85%		
Location:	Church Rock	Sampled Date:	--	Sampled By:	--
Project Number:	--	Test Date:	4/7/2014	Technician:	DPM



Data Entered By: DPM
Date: 4/7/2014
File Name: 2512_77_PrelimPerm_ASTMD-5084-methodD_14.xls

Checked By:
Date: 4/9/14



Q:CLIENTDATAFILE/2512/77/PICTURE/MNDP51085
04/08/14

PERMEABILITY TEST - BACK PRESSURE SATURATED - FLOW PUMP METHOD

ASTM D 5084

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	Dilco Hill	SAMPLED	--
DEPTH	35-45'	TEST STARTED	03/18/14 CAL
SAMPLE NO.	DH-B1-10 85%	TEST FINISHED	04/04/14 CAL
LOCATION	Church Rock	CELL NUMBER	8P
PROJECT NO.	--	SATURATED TEST	Yes
SOIL DESCR.	Remolded -#4	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	432

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	401.9	435.3
Wt. Wet Soil & Pan (g)	408.9	442.3
Wt. Dry Soil & Pan (g)	363.8	363.8
Wt. Lost Moisture (g)	45.1	78.5
Wt. of Pan Only (g)	7.0	7.0
Wt. of Dry Soil (g)	356.8	356.8
Moisture Content %	12.6	22.0
Wet Density PCF	112.0	121.2
Dry Density PCF	99.5	99.3

Init. Diameter (in)	2.404	(cm)	6.106
Init. Area (sq in)	4.539	(sq cm)	29.286
Init. Height (in)	3.011	(cm)	7.648
Vol. Bef. Consol. (cu ft)	0.00791		
Vol. After Consol. (cu ft)	0.00792		
Porosity %	34.99		

FLOW PUMP CALCULATIONS

Pump Setting (gear number)	7
Percentage of Pump setting	100
Q (cc/s)	1.14E-03
Height	2.983
Diameter	2.417
Pressure (psi)	0.165
Area after consol. (cm*cm)	29.606
Gradient	1.531
Permeability k (cm/s)	2.5E-05
Permeability k (m/s)	2.5E-07
Back Pressure (psi)	68.0
Cell Pressure (psi)	71.0
Ave. Effective Stress (psi)	2.918
Average temperature degree C:	22.7

Data entry by: DAW/SKL Date: 04/09/2014
Checked by: CAL Date: 4/09/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-R1_12.xls

ATT
ADVANCED TERRA TESTING

TRIAXAL TEST DATA
ASTM D 5084

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	Dilco Hill	SAMPLED	--
DEPTH	35-45'	TEST STARTED	03/18/14 CAL
SAMPLE NO.	DH-B1-10 85%	TEST FINISHED	04/04/14 CAL
LOCATION	Church Rock	SETUP NO.	8P
PROJECT NO.	--	SATURATED TEST	Yes
SOIL DESCR.	Remolded -#4	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	432

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	2.6	11.9				
50.0	48.0	12.6	13.7	38.1	45.9	7.8	0.78
60.0	58.0	13.4	14.2	48.0	57.1	9.1	0.91
70.0	68.0	14.4	15.2	59.0	68.1	9.1	0.91
80.0		15.4	15.5	68.3	78.1	9.8	0.98

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	0.20	0.00
0.25	0.50	0.80	-0.60
0.5	0.71	0.80	-0.60
1	1.00	0.80	-0.60
2	1.41	0.80	-0.60
4	2.00	0.80	-0.60
9	3.00	0.80	-0.60
16	4.00	0.80	-0.60
30	5.48	0.85	-0.65
60	7.75	0.85	-0.65
120	10.95	0.90	-0.70
240	15.49	0.90	-0.70
360	18.97	0.90	-0.70

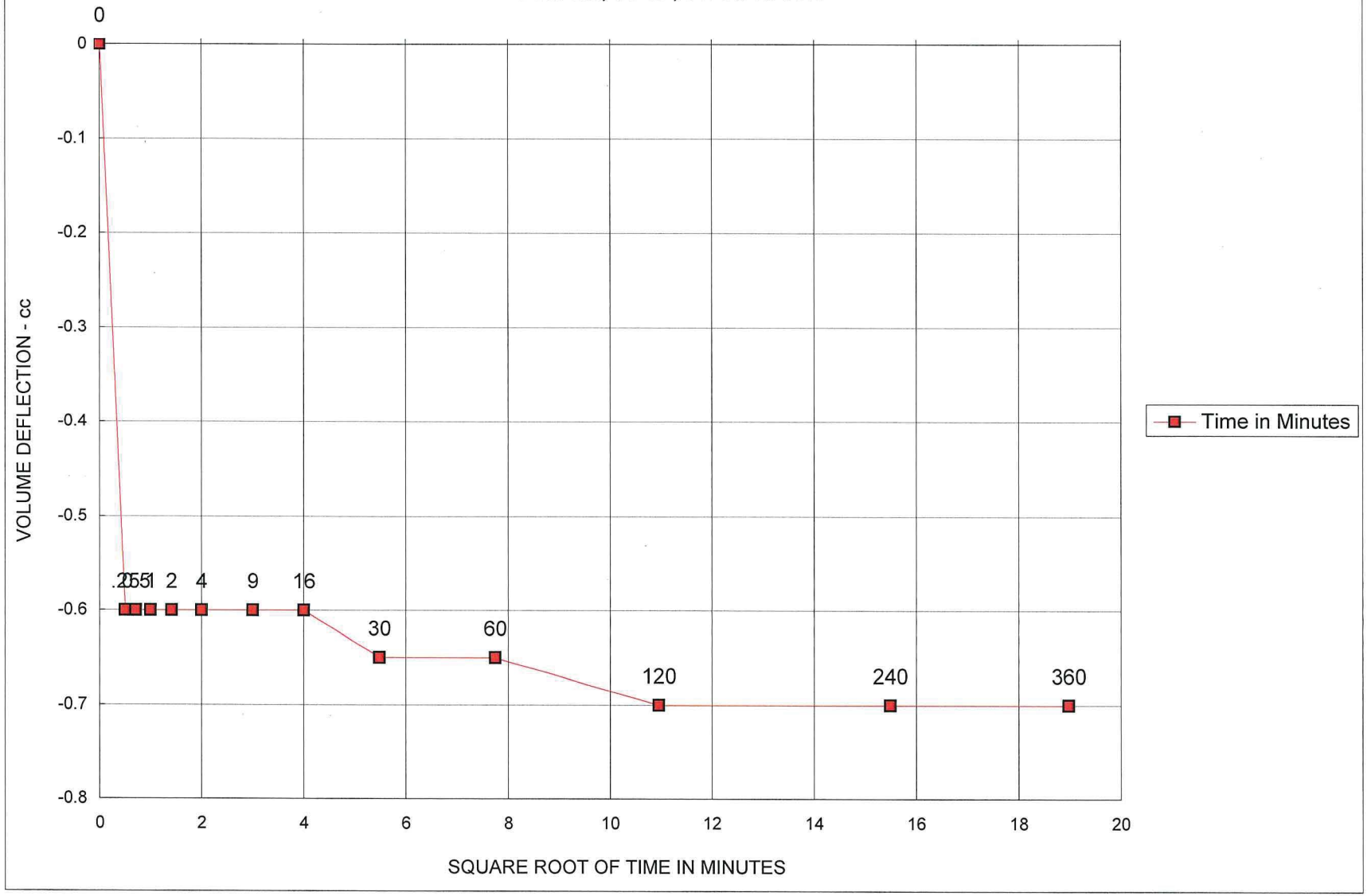
Initial Height (in)	3.011	Init. Vol. (CC)	224.000
Height Change (in)	0.028	Vol. Change (CC)	14.200
Ht. After Cons. (in)	2.983	Cell Exp. (CC)	14.560
Initial Area (sq in)	4.539	Net Change (CC)	-0.360
Area After Cons. (sq in)	4.589	Cons. Vol. (CC)	224.360

Data entry by: DAW/SKL Date: 04/09/2014
Checked by: CAL Date: 4/09/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-R1_12.xls

ATT
ADVANCED TERRA TESTING

CONSOLIDATION DATA

Dilco Hill, 35-45', DH-B1-10 85%



ATT
ADVANCED TERRA TESTING