



DATE: September 10, 2010

TO: Josh Otis
Northgate Environmental Management, Inc.
300 Frank H. Ogawa Plaza, Suite 510,
Oakland, CA 94612

JOB NO: USVC00059
LAB LOG: 3068.0

RE: Lab Report: Tronox Slurry Wall

Enclosed are results for: Samples Received - August 5, 2010

Code	Item	Quantity
18572	Hydraulic Conductivity-Flex-wall, ASTM D-5084	4
99992	Sample Tubes	4

Thank you for consulting Vector Engineering for your material testing requirements. We look forward to working with you again. If you have any questions or require any additional information, please call us at 1-530-272-2448.

Sincerely,

Prepared By: Margaret Dell-Era
Laboratory Project Manager

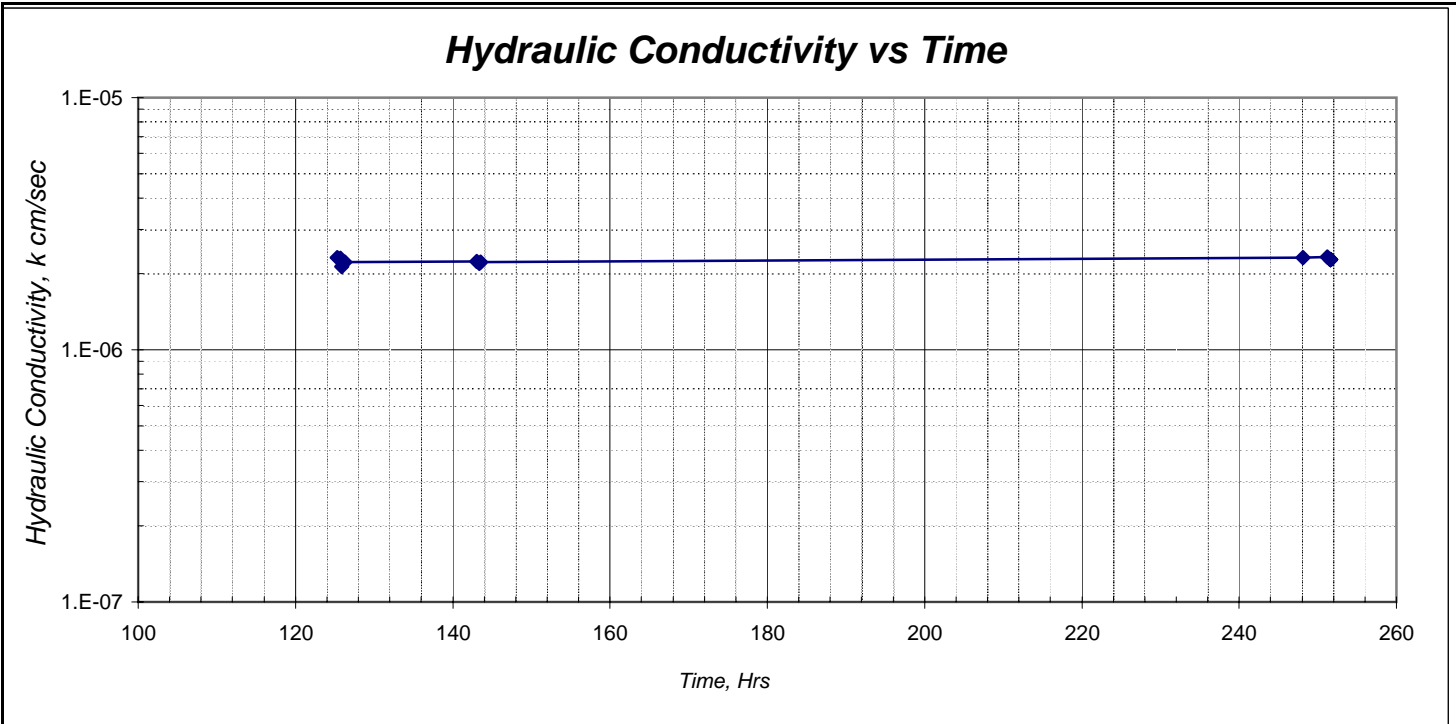
Reviewed By: Kenneth R. Criley
Technical Director

This testing is based up on accepted industry practice as well as the test method listed. These results apply only to the samples supplied and tested for the above referenced job. The data and information are proprietary and can not be released without authorization of Vector Engineering Inc. By accepting the data and results represented on this page, client agrees to limit the liability of Vector Engineering, Inc. from Client and all other parties claims arising out of the use of this data to the cost for the respective test(s) represented here, and Client agrees to indemnify and hold harmless Vector from and against all liability in excess of the aforementioned limit.

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Client / Project Name: **Northgate Environmental Management, Inc. / Tronox Slurry Wall** Project No: **USVC00059** Lab Sample Number: **3068A**

Sample ID: **BWI-LOC 2** Report Date: **September 10, 2010**



SPECIMEN DATA

TEST DATA

SAMPLE ID:	BWI-LOC 2	
DESCRIPTION:	Soil Bentonite	
	<u>INITIAL</u>	<u>FINAL</u>
HEIGHT, in.	2.4	2.4
DIAMETER, in.	2.9	2.8
WATER CONTENT, %	32.6	38.2
DRY DENSITY, pcf	79	81
SATURATION, %	77	95
<i>(Specific Gravity assumed as 2.7)</i>		
MAXIMUM DRY DENSITY, pcf		
OPTIMUM WATER CONTENT, %		
SPECIFIED COMPACTION, %		
ACHIEVED COMPACTION, %		

ASTM D-5084, Method C

EFFECTIVE STRESS:	10 psi
GRADIENT RANGE:	2 - 17
IN / OUT RATIO:	0.97
"B" PARAMETER:	0.98

		HYDRAULIC
TRIAL	TIME	CONDUCTIVITY
<u>nos.</u>	<u>hrs.</u>	<u>cm / sec</u>
4	126.3	2.2E-06
5	143.1	2.2E-06
6	143.4	2.2E-06
7	143.5	2.2E-06
8	248.2	2.3E-06
9	251.2	2.3E-06
10	251.7	2.3E-06
AVERAGE LAST 4 :		2.3E-06

COMMENTS:
Tap water used as permeant.

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Client / Project Name:

Northgate Environmental Management, Inc. / Tronox Slurry Wall

Project No:

USVC00059

Lab Sample Number:

3068B

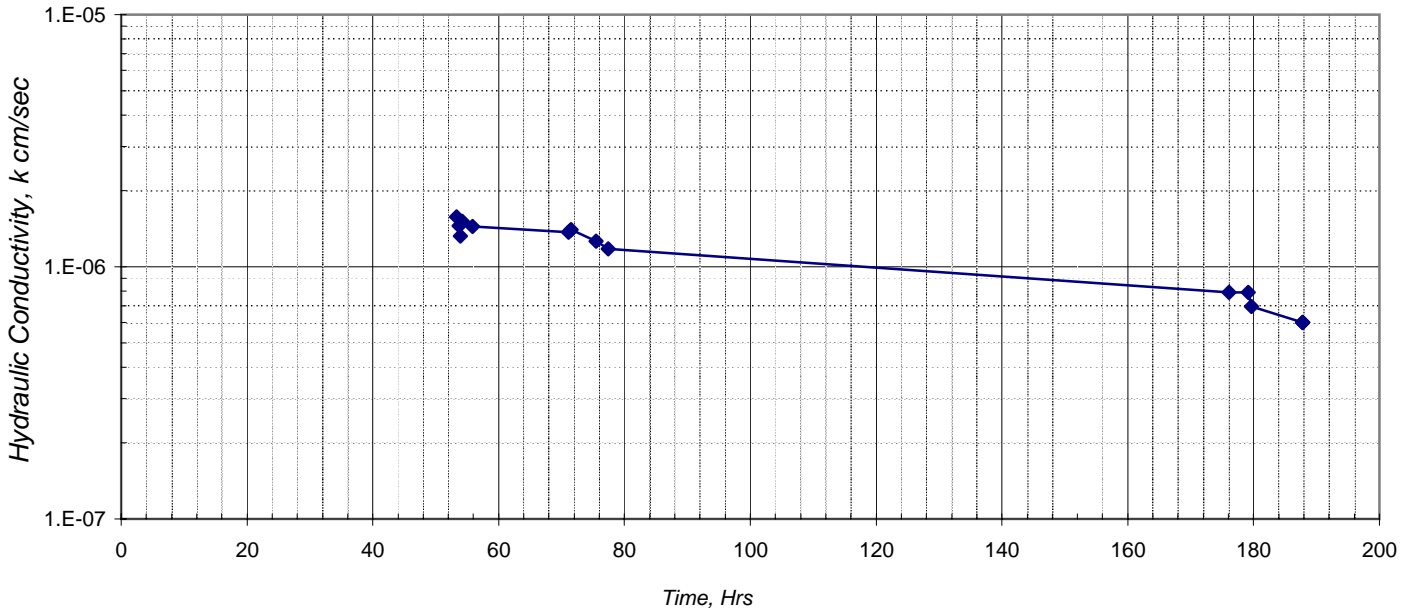
Sample ID:

BWI-LOC 5

Report Date:

September 10, 2010

Hydraulic Conductivity vs Time



SPECIMEN DATA

SAMPLE ID:	BWI-LOC 5	
DESCRIPTION:	Soil Bentonite	
	<u>INITIAL</u>	<u>FINAL</u>
HEIGHT, in.	3.6	3.6
DIAMETER, in.	2.9	2.8
WATER CONTENT, %	23.5	24.5
DRY DENSITY, pcf	98	100
SATURATION, %	88	96
<i>(Specific Gravity assumed as 2.7)</i>		
MAXIMUM DRY DENSITY, pcf		
OPTIMUM WATER CONTENT, %		
SPECIFIED COMPACTION, %		
ACHIEVED COMPACTION, %		

TEST DATA

<u>ASTM D-5084, Method C</u>		
EFFECTIVE STRESS:	10 psi	
GRADIENT RANGE:	4 - 11	
IN / OUT RATIO:	0.98	
"B" PARAMETER:	0.96	
		HYDRAULIC
TRIAL	TIME	CONDUCTIVITY
<u>nos.</u>	<u>hrs.</u>	<u>cm / sec</u>
8	71.5	1.4E-06
9	75.5	1.3E-06
10	77.5	1.2E-06
11	176.1	7.9E-07
12	179.2	7.9E-07
13	179.7	7.0E-07
14	187.8	6.0E-07
AVERAGE LAST 4 :		7.2E-07

COMMENTS:

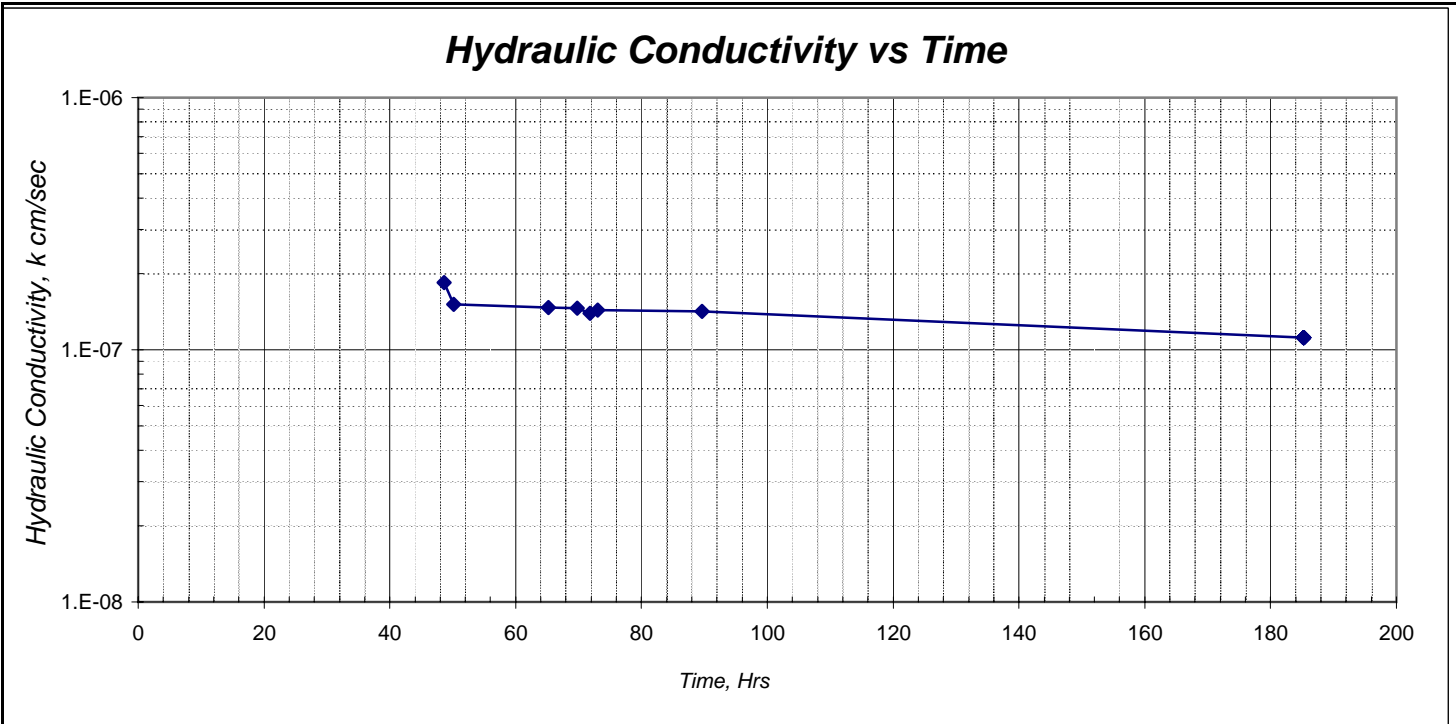
Tap water used as permeant.

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Client / Project Name: **Northgate Environmental Management, Inc. / Tronox Slurry Wall** Project No: **USVC00059** Lab Sample Number: **3068C**

Sample ID: **BWI-LOC 6** Report Date: **September 10, 2010**



SPECIMEN DATA

TEST DATA

SAMPLE ID:	BWI-LOC 6	
DESCRIPTION:	Soil Bentonite	
	<u>INITIAL</u>	<u>FINAL</u>
HEIGHT, in.	3.5	3.5
DIAMETER, in.	2.9	2.9
WATER CONTENT, %	23.2	24.2
DRY DENSITY, pcf	98	100
SATURATION, %	88	95
<i>(Specific Gravity assumed as 2.7)</i>		
MAXIMUM DRY DENSITY, pcf		
OPTIMUM WATER CONTENT, %		
SPECIFIED COMPACTION, %		
ACHIEVED COMPACTION, %		

<u>ASTM D-5084, Method C</u>	
EFFECTIVE STRESS:	10 psi
GRADIENT RANGE:	2 - 11
IN / OUT RATIO:	1.01
"B" PARAMETER:	1

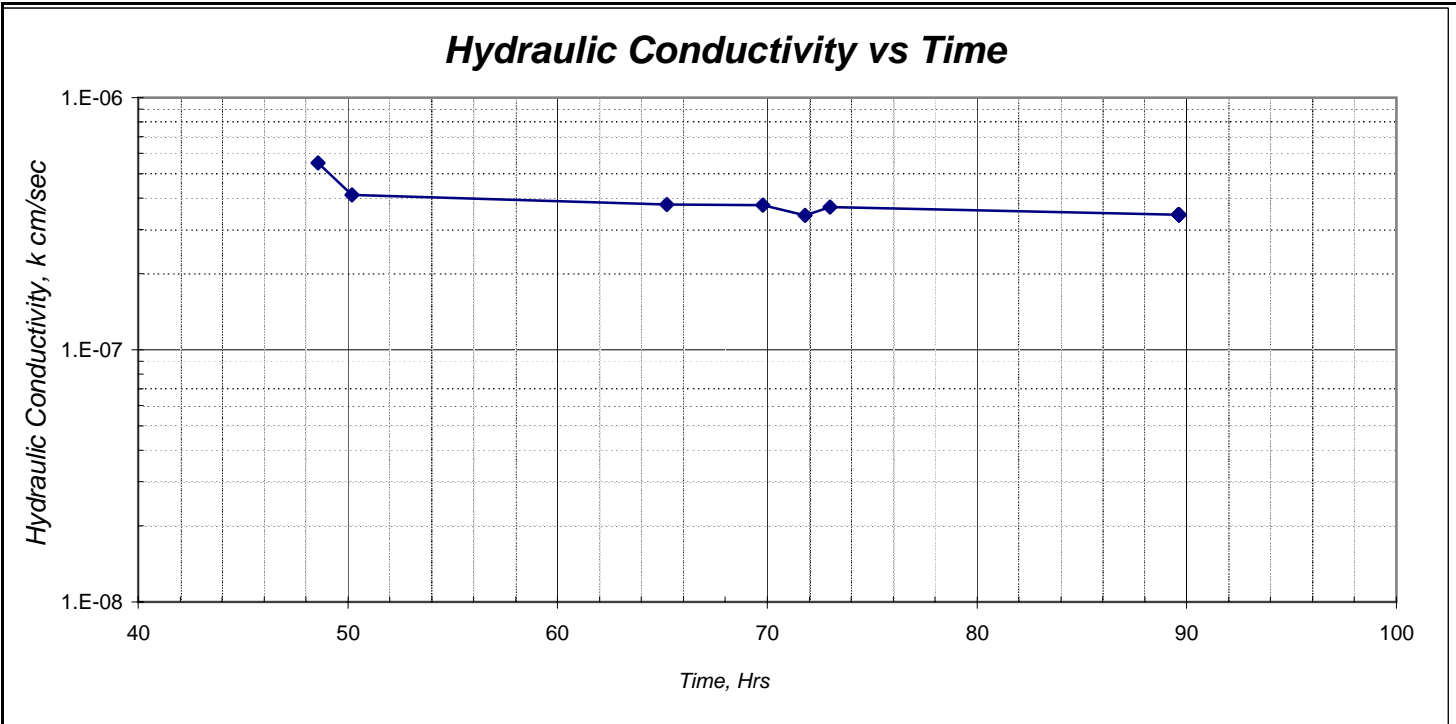
		HYDRAULIC
TRIAL	TIME	CONDUCTIVITY
<u>nos.</u>	<u>hrs.</u>	<u>cm / sec</u>
2	50.2	1.5E-07
3	65.2	1.5E-07
4	69.8	1.5E-07
5	71.8	1.4E-07
6	73.0	1.4E-07
7	89.6	1.4E-07
8	185.3	1.1E-07
AVERAGE LAST 4 :		1.3E-07

COMMENTS:
Tap water used as permeant.

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Client / Project Name: **Northgate Environmental Management, Inc. / Tronox Slurry Wall** Project No: **USVC00059** Lab Sample Number: **3068D**

Sample ID: **BWI-LOC 7** Report Date: **September 10, 2010**



SPECIMEN DATA

TEST DATA

SAMPLE ID:	BWI-LOC 7	
DESCRIPTION:	Soil Bentonite	
	<u>INITIAL</u>	<u>FINAL</u>
HEIGHT, in.	3.9	3.9
DIAMETER, in.	2.9	2.9
WATER CONTENT, %	24.5	26.1
DRY DENSITY, pcf	96	97
SATURATION, %	87	95
<i>(Specific Gravity assumed as 2.7)</i>		
MAXIMUM DRY DENSITY, pcf		
OPTIMUM WATER CONTENT, %		
SPECIFIED COMPACTION, %		
ACHIEVED COMPACTION, %		

<u>ASTM D-5084, Method C</u>	
EFFECTIVE STRESS:	10 psi
GRADIENT RANGE:	3 - 11
IN / OUT RATIO:	1.01
"B" PARAMETER:	0.96

TRIAL nos.	TIME hrs.	HYDRAULIC CONDUCTIVITY cm / sec
1	48.6	5.5E-07
2	50.2	4.1E-07
3	65.2	3.8E-07
4	69.8	3.7E-07
5	71.8	3.4E-07
6	73.0	3.7E-07
7	89.6	3.4E-07
AVERAGE LAST 4 :		3.6E-07

COMMENTS:
Tap water used as permeant.

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