



**Conservation and Water Stewardship**

Environmental Stewardship Division  
Environmental Approvals Branch  
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T 204 945-8321 F 204 945-5229  
[www.gov.mb.ca/conservation/eal](http://www.gov.mb.ca/conservation/eal)

**File: 190.40**

September 23, 2014

Ms. Florence May  
Chief Administrative Officer  
Rural Municipality of Ritchot  
352 Main Street  
St. Adolphe MB R5A 1B9

Dear Ms. May:

**Re: Rural Municipality of Ritchot – Ile Des Chenes Wastewater Treatment Lagoon  
Environment Act Licence No. 2577 RR**

This is further to liner test results for the above facility provided by Jason Bunn of WSP on September 22, 2014. The liner's hydraulic conductivity meets the requirements of Clause 23 of the above licence, and so approval to operate the new cell of the facility is provided pursuant to Clause 26 of the Licence.

As required by Clause 21 of the Licence, record drawings of the facility must be provided within six months of the completion of construction.

If you have any questions regarding this matter, please contact me at (204) 945-7021 or at [Bruce.Webb@gov.mb.ca](mailto:Bruce.Webb@gov.mb.ca).

Yours truly,

*“original signed by”*

Bruce Webb, P. Eng.  
Water Development and Control  
Assessment Officer

c: Jason Bunn, WSP  
Don Labossiere/Donna Smiley, Environmental Compliance and Enforcement Branch



6 - 854 Marion Street, Winnipeg, Manitoba, R2J 0K4  
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September 18, 2014

File No. 14-035-01

WSP Canada Inc.  
1600 Buffalo Place,  
Winnipeg, MB  
R3T 6B8

**ATTENTION:** Mr. Jason Bunn

**RE:** WWSP Expansion, Town of Ile des Chenes, Manitoba

ENG-TECH Consulting Limited (ENG-TECH) received two Shelby tubes labelled ST1 and ST2 for hydraulic conductivity testing from the above site. ENG-TECH prepared the sample for hydraulic conductivity in accordance with ASTM D5084-03, *Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials using a Flexible Wall Permeameter*.

The final hydraulic conductivity values ( $k_{20}$ ) of  $9.9 \times 10^{-9}$  cm/sec and  $2.3 \times 10^{-8}$  cm/sec were obtained for the samples identified as ST1 and ST2, respectively. The hydraulic conductivity test data is outlined in Table 1, while the graphical representation of the hydraulic conductivity versus elapsed time is shown in Figures 1 and 2 for ST1 and ST2, respectively.

ENG-TECH trusts the above is all the information you require. If you have any questions, please contact the undersigned.

Sincerely,  
ENG-TECH Consulting Limited

A handwritten signature in black ink, appearing to read "Clark Hryhoruk".

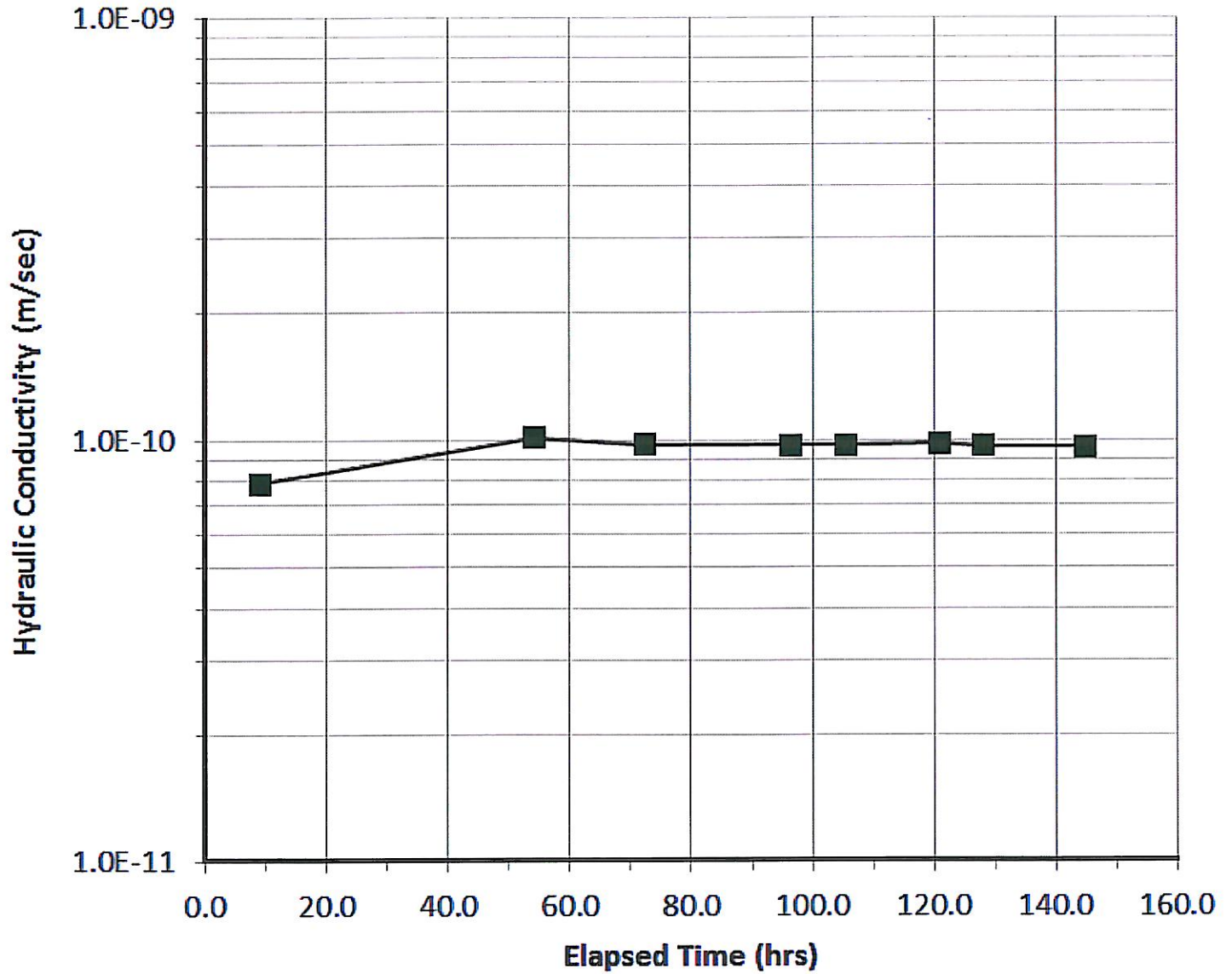
Clark Hryhoruk, M.Sc., P.Eng.  
President, Geotechnical Engineer

CDH/erm

Attachments: Table 1 – Hydraulic Conductivity Test Data  
Figure 1 – Hydraulic Conductivity Versus Elapsed Time (ST1)  
Figure 2 – Hydraulic Conductivity Versus Elapsed Time (ST2)

**TABLE 1  
HYDRAULIC CONDUCTIVITY TEST DATA  
WWSP EXPANSION, TOWN OF ILE DES CHENES, MANITOBA**

SAMPLE IDENTIFICATION	ST1	ST2
<b>INITIAL VALUES</b>		
ENG-TECH Reference No.	14-35-1-4	14-35-1-5
Length of Sample in Tube (cm)	61.0	20.3
Length (cm)	5.75	5.28
Diameter (cm)	7.15	7.06
Area (cm <sup>2</sup> )	40.1	39.1
Volume (cm <sup>3</sup> )	230.7	206.4
Water Content (%)	55.6	23.6
Bulk Dry Density (kg/m <sup>3</sup> )	1065	1611
Specific Gravity (G <sub>s</sub> ) (assumed)	2.70	2.70
Void Ratio	1.534	0.676
Degree of Saturation (%)	97.9	94.3
<b>FINAL VALUES</b>		
Length (cm)	5.83	5.46
Diameter (cm)	7.19	7.50
Area (cm <sup>2</sup> )	40.6	44.1
Volume (cm <sup>3</sup> )	236.6	241.0
Water Content (%)	58.2	34.1
Bulk Dry Density (kg/m <sup>3</sup> )	1046	1394
Specific Gravity (G <sub>s</sub> ) (assumed)	2.70	2.70
Void Ratio	1.581	0.937
Degree of Saturation (%)	99.4	98.3
<b>CONSOLIDATION PHASE</b>		
Confining Pressure (kPa)	103.4	103.4
Pore Water Pressure (kPa)	82.7	82.7
Effective Stress (kPa)	20.7	20.7
<b>PERMEATION PHASE</b>		
Confining Pressure (kPa)	103.4	103.4
Pore Water Pressure (kPa)	82.7	82.7
Effective Stress (kPa)	20.7	20.7
Hydraulic Gradient	19.3	20.6
Permeant Fluid	Distilled Water	Distilled Water
<b>HYDRAULIC CONDUCTIVITY at TEST TEMPERATURE OF 19 °C (cm/sec)</b>	$9.7 \times 10^{-9}$	$2.2 \times 10^{-8}$
<b>HYDRAULIC CONDUCTIVITY at TEMPERATURE OF 20 °C (K<sub>20</sub>) (cm/sec)</b>	$9.9 \times 10^{-9}$	$2.3 \times 10^{-8}$



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ENG. STAMP:



CLIENT:

WSP CANADA INC.

DATE:

SEPTEMBER 2014

DRAWN BY:

ERM

FIGURE No.:

1

REV.:

PROJECT:

WWSP EXPANSION, TOWN OF  
 ILE DES CHENES, MANITOBA

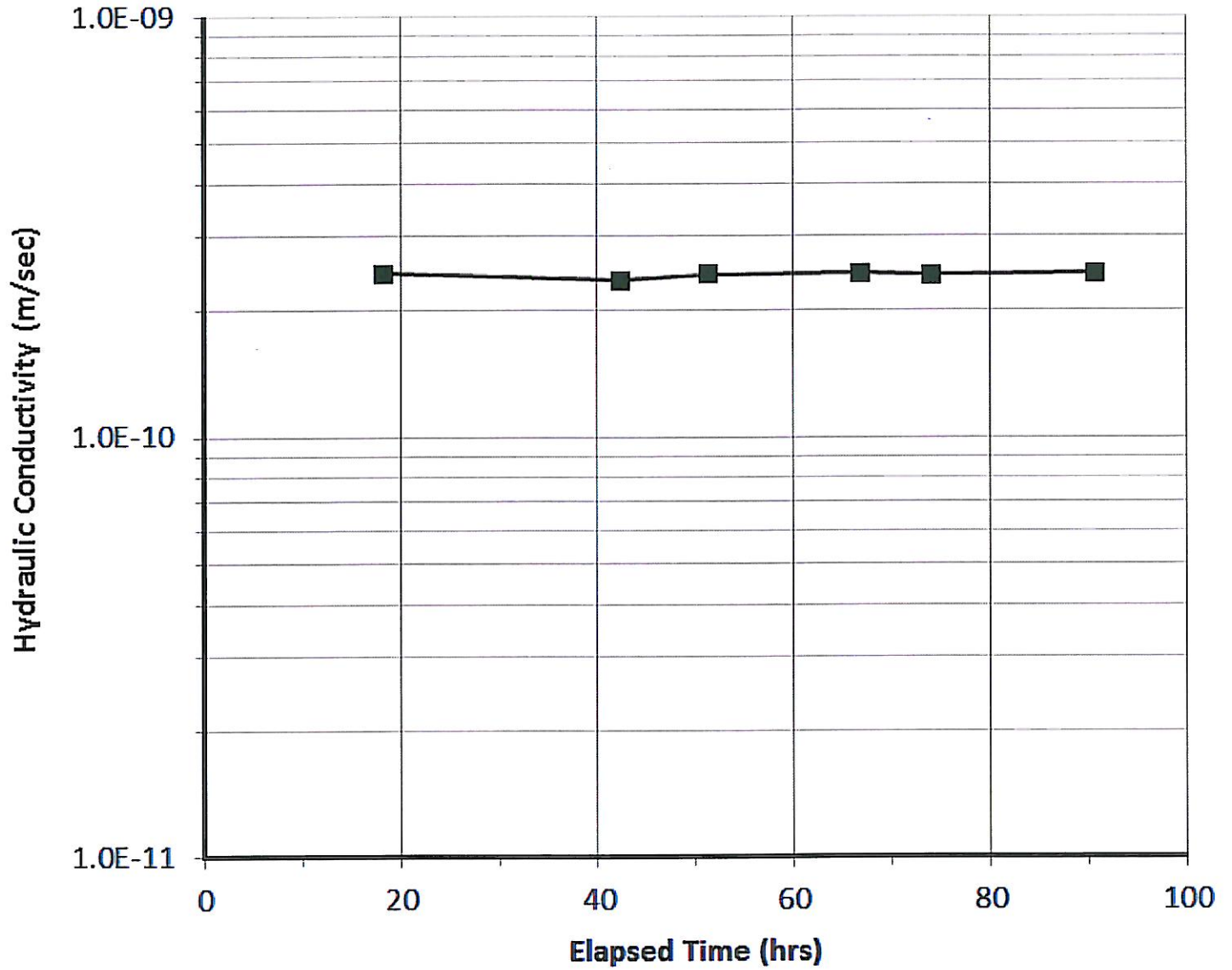
FILE No.:

14-035-01

SCALE:

N/A

HYDRAULIC CONDUCTIVITY  
 VERSUS ELAPSED TIME  
 (ST1)



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ENG. STAMP:



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WSP CANADA INC.

DATE:

SEPTEMBER 2014

DRAWN BY:

ERM

FIGURE No.:

2

REV.:

PROJECT:

WWSP EXPANSION, TOWN OF  
 ILE DES CHENES, MANITOBA

FILE No.:

14-035-01

SCALE:

N/A

HYDRAULIC CONDUCTIVITY  
 VERSUS ELAPSED TIME  
 (ST2)