



Environmental Solutions with Geosynthetics

Government of Nunavut c/o Kudlik Construction Ltd.

80mil HDPE
Qikitarjuaq Water Storage Reservoir

Project Completion Submittal Package

NOV 1 0 2010

Project Divisio

Nunavut Water Board DEC 1 3 2010 **Public Registry** 

www.geomembranes.com

**DESIGN** MANUFACTURE **FABRICATION** 

INSTALLATION

**MAINTENANCE** 

## Layfield Environmental Systems Ltd.

Project Completion QA/QC Package for

# Government of Nunavut

c/o Kudlik Construction Ltd.

#### Qikitarjuaq Water Storage Reservoir

Qikitarjuaq, Nunavut

Supply and Install of HDPE 80mil

Prepared By: Michael Cerilli

Reviewed By: Fred Cross

Date Submitted: August 24, 2009



#### Layfield Environmental Systems Ltd.

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for

### Government of Nunavut c/o Kudlik Construction Ltd.

#### Qikitarjuaq Water Storage Reservoir

Qikitarjuaq, Nunavut

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#### CERTIFICATE OF ACCEPTANCE OF SOIL SUBGRADE SURFACE

PROJECT NAME: Qikitazing 2008 installation
PROJECT NUMBER: OSC-8/90
OWNER: Governont of Nunavat
LOCATION: Cikitarjuag
I, the undersigned, a duly appointed representative of Layfield Environmental Systems Ltd (LESL), have visually observed the soil subgrade described below, and found it to be a acceptable surface on which to install geomembrane.
This certification is based on observations of the surface of the subgrade only. No subterranea inspections or tests have been performed by Layfield Environmental Systems, and LESL make no representations or warranties regarding conditions which may exist below the surface of th subgrade. Layfield Environmental Systems accepts no responsibility for conformance of th subgrade to this project's specifications.
The soil subgrade accepted on this date refers to its present condition. Any changes in the subgrade condition that result from the effects of inclement weather and/or other force beyond the control of Layfield Environmental Systems and remedial work to correct the resulting deficiencies, will be the direct responsibility of the General Contractor.
Area Being Accepted: Water nuserrin
· · · · · · · · · · · · · · · · · · ·
LAYFIELD ENVIRONMENTAL SYSTEMS REPRESENTATIVE:
Date: aug. 13/08
Signature:
Name: It but in Clude!
Title: tech.
OWNERS REPRESENTATIVE:
Date: Aug /13/08
Signature:
Name: John + RMSOR
Title: Top to Rose An.
Company: <u>Hollik</u>

PROJECT NUMBER:	38C-G/9			yalong	Sucre 1
OWNER: 500E	rmont of Vuna	vit	CONTRACTOR:	- Rudlin	Cons
LOCATION: _ () ih	toring				
GEOMEMBRANE	SECONDARY (PRI	MARY C	LOSURE	OTHER	
	URFACE COMPACTION, PROTRUSIONS	, DESICCATION, EXCE	SSIVE MOISTURE):	•	
REMARKS: Panel	19 uns destouded	1 Mist. K	Cudlik 1	DATE: and	Col Su
REMARKS: 10 100	nd it Domana T	UMA M	site and	SHEET NUMBER	R: <b>1</b>
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DESCRIPTION	NUMBER	NUMBER		NUMBER	
	1/9/17559	† <del>  </del>			
PANEL/ROLL NUMBER DEPLOYMENT LENGTH	100111730	<del>                                     </del>			
AMBIENT AIR TEMP.					
VISUAL OBSERVATION	concrete blocks di	ecting on li	nes.	<del>-,</del>	
OBSERVED OVERLAP CHECKED BY		<del>   </del>			
ADJACENT PANEL	N= S=	N=	S=	N=	S=
ADJACENT MILE	E= W=	E=	W=	E=	W⊭
	PANEL LOCATION REFERENCE	PANEL LOCATION	ON REFERENCE	PANEL LOCATIO	N REFEREN
DESCRIPTION	NUMBER	NUMBER		NUMBER	
	NOMBER		•		
PANEL/ROLL NUMBER					<del></del>
DEPLOYMENT LENGTH AMBIENT AIR TEMP.					
VISUAL OBSERVATION					
OBSERVED OVERLAP				<u> </u>	
CHECKED BY ADJACENT PANEL	N= S=	N=	S=	N=	S≃
ADJACENT FANEL	E= W=	E=	W=	E=	W=
	PANEL LOCATION REFERENCE	PANEL LOCATION	ON REFERENCE	PANEL LOCATIO	N REFEREN
DESCRIPTION	NUMBER	NUMBER		NUMBER	<u> </u>
<u></u>					
PANEL/ROLL NUMBER DEPLOYMENT LENGTH		<del>                                     </del>			
AMBIENT AIR TEMP.					
VISUAL OBSERVATION		<u> </u>	·····		
OBSERVED OVERLAP CHECKED BY					
ADJACENT PANEL	N= S=	N=	S=	N=	S=
ADJACENT TANGE	E= W= ·	E=	W=	E=	W=
		-			r
	PANEL LOCATION REFERENCE	PANEL LOCATI	ON REFERENCE	PANEL LOCATIO	N REFEREN
DESCRIPTION	NUMBER	NUMBER		NUMBER	
	TOTAL STATE OF THE	1			
PANEL/ROLL NUMBER DEPLOYMENT LENGTH					<del></del>
AMBIENT AIR TEMP.					
VISUAL OBSERVATION		<del>                                     </del>	<del></del>		
OBSERVED OVERLAP CHECKED BY		<b>│                                    </b>			
ADJACENT PANEL	N= S=	N=	S=	N=	\$=
	l	E=	W=	E=	W≑
the since	I may be a fine	On + tak	· Ham er	JBMITTED BY:	Ci. A.
ma popus	on it and would not to well	المار حر الأعن	ا ۱۳۱۳ می تو ۱۸ می		على دارات
DO THEY WIT	ent me to swell	X CUMI TO	40 mil.	DATE:	

LAYFIELD	GEOMEMBR	ANE DEPLOYME	NT LOG			
PROJECT NUMBER:	190-086	PROJECT TITLE:	Uhter reservoir			
OWNER: Generat of Nunavet CONTRACTOR: Kidlik Const.						
LOCATION: Biz	itaring					
GEOMEMBRANE	SECONDARY PRIM	MARY CLOSURE	OTHER			
SUBGRADE CONDITION (S		DESICCATION, EXCESSIVE MOISTURE):				
REMARKS:		ichor trench,	DATE: aug 14/08			
	na 8'-		SHEET NUMBER:			
DEPLOYMENT EQUIPME	NT: <u>exicanation</u>					
DESCRIPTION	PANEL LOCATION REFERENCE	PANEL LOCATION REFERENCE	PANEL LOCATION REFERENCE			
DESCRIPTION	NUMBER	NUMBER5	NUMBER			
PANEL/ROLL NUMBER	101/19389	10/1/9385				
DEPLOYMENT LENGTH AMBIENT AIR TEMP.	176'	1701				
VISUAL OBSERVATION	OK .	OK				
OBSERVED OVERLAP	mA	m A				
CHECKED BY ADJACENT PANEL	N= S= 2	N= 4 S= 6	N= S=			
ADJACENI IANEE	E= W=	E= W=	E= W=			
DESCRIPTION	PANEL LOCATION REFERENCE	PANEL LOCATION REFERENCE	PANEL LOCATION REFERENCE			
	NUMBER	NUMBER	NUMBER			
PANEL/ROLL NUMBER	101119389	101119385				
DEPLOYMENT LENGTH AMBIENT AIR TEMP	1701	170'				
VISUAL OBSERVATION	CK	OK				
OBSERVED OVERLAP CHECKED BY	mA	mA				
ADJACENT PANEL	N= / S= 3	N= 5 S= 7	N= S=			
	E= W=	E= W=	E= W=			
	DANIEL LOCATION RECEDENCE	PANEL LOCATION REFERENCE	PANEL LOCATION REFERENCE			
DESCRIPTION	PANEL LOCATION REFERENCE NUMBER	NUMBER	NUMBER			
	101/19387	10/1/9392				
PANEL/ROLL NUMBER DEPLOYMENT LENGTH	1011/136/	1701				
AMBIENT AIR TEMP.	15°C	15,'C				
VISUAL OBSERVATION OBSERVED OVERLAP	Ø (,	OK G"				
CHECKED BY	M14	$\underline{\hspace{1cm}}$				
ADJACENT PANEL	N= 2	N= 6 S=	N= S=			
	E= W=	E= W=	E= W=			
	PANEL LOCATION REFERENCE	PANEL LOCATION REFERENCE	PANEL LOCATION REFERENCE			
DESCRIPTION	NUMBER	NUMBER	NUMBER			
PANEL/ROLL NUMBER	10///9387					
DEPLOYMENT LENGTH	170'1					
AMBIENT AIR TEMP. VISUAL OBSERVATION	OK					
OBSERVED OVERLAP	(g 11					
CHECKED BY ADJACENT PANEL	M A S= 5	N= S=	N= S=			
ADJACENT FANEL	E= W=	E= W=	E= W=			
		SU	BMITTED BY: M. Que dot			
			DATE.			

LAYFIELD	<b>GEOMEM</b>	BRANE D	EPLOYME	NT LOG	
PROJECT NUMBER:	386-019		PROJECT TITLE:	uster res	eastois
OWNER: Coco		marrit	CONTRACTOR:	12 - M.M I	const.
	itarius				
GEOMEMBRANE	SECONDARY	PRIMARY	CLOSURE	OTHER	
	URFACE COMPACTION, PROTRU	SIONS, DESICCATION, I	EXCESSIVE MOISTURE):		
REMARKS:				DATE: OLIG	<u> 15/08</u>
				SHEET NUMBER:	\ 3
DEPLOYMENT EQUIPME	NT: excavator				
	PANEL LOCATION REFERENCE	F PANEL LO	CATION REFERENCE	PANEL LOCATION	REFERENCE
DESCRIPTION	NUMBER	NUMBER .	, 7		6
PANEL/ROLL NUMBER	101119392	10	01119395	10111	9380
DEPLOYMENT LENGTH	1701		170'	J 7C	, 1
AMBIENT AIR TEMP. VISUAL OBSERVATION	12°C		OK	/2	
OBSERVED OVERLAP	(61)		617	6	l t
CHECKED BY	MA	N= I	m4	N=15	S=
ADJACENT PANEL	N= <b>7</b>	E=	%= W=	E=	3= W=
					· · · · · · · · · · · · · · · · · · ·
	PANEL LOCATION REFERENCE	E PANEL LO	CATION REFERENCE	PANEL LOCATION	REFERENCE
DESCRIPTION	NUMBER9	NUMBER.	13	NUMBER	
PANEL/ROLL NUMBER	101119391	10	1119361		
DEPLOYMENT LENGTH	170		170;		
AMBIENT AIR TEMP. VISUAL OBSERVATION	OK.	<del> </del>	OK		
OBSERVED OVERLAP	61		G. 4		
CHECKED BY	N= 8 S=	N= 12	S=	N=	S=
ADJACENT PANEL	E= W=	E=	W=	E=	W= .
				*····	
DESCRIPTION	PANEL LOCATION REFERENCE	E PANEL LO	CATION REFERENCE	PANEL LOCATION	REFERENCE
DESCRIPTION	NUMBER/O	_ NUMBER		NUMBER	
PANEL/ROLL NUMBER	1011/9391		101119381		
DEPLOYMENT LENGTH	170'		176'		
AMBIENT AIR TEMP. VISUAL OBSERVATION	12.C		CX		
OBSERVED OVERLAP	mA		m4		
CHECKED BY ADJACENT PANEL	N= 9 S=	N= 13	S=	N=	S=
ADJACENT FANEL	E= W=	E=	W=	E=	W=
DESCRIPTION	PANEL LOCATION REFERENCE	E PANEL LO	CATION REFERENCE	PANEL LOCATION	REFERENCE
DESCRIPTION	NUMBER /	NUMBER		NUMBER	
PANEL/ROLL NUMBER	101119395		1119380		
DEPLOYMENT LENGTH	170'	<del></del>	1701		
AMBIENT AIR TEMP. VISUAL OBSERVATION	614		OL		
OBSERVED OVERLAP CHECKED BY	MA		mA	-	
ADJACENT PANEL	N= /O S=	N= 14	\$=	N=	S=
	E= W=	E=	W=	E=	W=
			SU	BMITTED BY: M	andet
	· ·			DATE:	

LAYFIELD ENVIRONMENTAL SYSTEMS

LS FORM 2

LAYFIELD	GEOMEMBE	RANE D	EPLOYME	NT LOG	
PROJECT NUMBER:			PROJECT TITLE	· unto	cservan
OWNER: Gara	ment of Nume	zit	CONTRACTOR:	Kudlik	const.
LOCATION: (Diki	tarjuas				
GEOMEMBRANE	SECONDÁRY (PŘÍ	MARY	CLOSURE	OTHER	
SUBGRADE CONDITION (S	SURFACE COMPACTION, PROTRUSIONS	, DESICCATION,	EXCESSIVE MOISTURE):		<del></del>
REMARKS:				DATE: A LA	. /8 <i>/0</i> 8_
				SHEET NUME	er: <u>4</u>
DEPLOYMENT EQUIPME	NT: <u>executator</u>				
DESCRIPTION	PANEL LOCATION REFERENCE NUMBER	PANEL LO	CATION REFERENCE	PANEL LOCAT	ION REFERENCE
PANEL/ROLL NUMBER DEPLOYMENT LENGTH	1011/9393	10	11/9393		
AMBIENT AIR TEMP.	12.7	┨	12.6		
VISUAL OBSERVATION OBSERVED OVERLAP	61!	1	<u>CK</u>		
CHECKED BY	mA		mA		
ADJACENT PANEL	N= 14 S=	N= 14	S=	N=	S=
	E= /9 W=	E=		E=	W=
DESCRIPTION	PANEL LOCATION REFERENCE NUMBER	PANEL LOO	CATION REFERENCE	PANEL LOCATI	ON REFERENCE
PANEL/ROLL NUMBER		1			
DEPLOYMENT LENGTH					
AMBIENT AIR TEMP. VISUAL OBSERVATION		<b>∤</b>			<del></del>
OBSERVED OVERLAP					
CHECKED BY		<u> </u>			
ADJACENT PANEL	N= S=	· N=	· S=	N=	S=
	E= W=	E=	W≒	E=	W=
	PANEL LOCATION REFERENCE	1 PANELLO	CATION DESERVE	PANEL LOCATI	ON REFERENCE
DESCRIPTION	NUMBER	<b>I</b> [		NUMBER	
PANEL/ROLL NUMBER DEPLOYMENT LENGTH					
AMBIENT AIR TEMP.					
VISUAL OBSERVATION OBSERVED OVERLAP		ł <b> </b>			
CHECKED BY					

ADJACENT PANEL E= W=

S= E= W=

S= E= W=

DESCRIPTION PANEL/ROLL NUMBER DEPLOYMENT LENGTH AMBIENT AIR TEMP. VISUAL OBSERVATION OBSERVED OVERLAP CHECKED BY ADJACENT PANEL

PANEL LOCATION REFERENCE NUMBER \_ N= S= Ē=

PANEL LOCATI	ON REFERENCE
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E=	W=

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SUBMITTED BY: M. Q. A.

DATE: \_\_\_\_\_

LAYFIELD	GEOMEMBI	RANE DEP		A	
PROJECT NUMBER:	38C-019		PROJECT TITLE:		serzin
OWNER: Cores	ment of Numar	T. I	CONTRACTOR:	Kudlik	conso.
LOCATION:	tarrugg	<del></del>			
GEOMEMBRANE			OSURE	OTHER	·
SUBGRADE CONDITION (S	SURFACE COMPACTION, PROTRUSIONS	S, DESICCATION, EXCESS	SIVE MOISTURE):		10 0
REMARKS:		<del> </del>		DATE: _	
				SHEET NUMB	ext: <u>5</u>
DEPLOYMENT EQUIPME	NT:				
DESCRIPTION	PANEL LOCATION REFERENCE NUMBER 20	PANEL LOCATION		PANEL LOCATI	ON REFERENCE
PANEL/ROLL NUMBER DEPLOYMENT LENGTH AMBIENT AIR TEMP. VISUAL OBSERVATION OBSERVED OVERLAP CHECKED BY	101119393 150' 850' 9K				
ADJACENT PANEL	N= /6 S=	N=	S=	N=	S=
	E= W=	E=	W=	E=	W≂
PANEL/ROLL NUMBER DEPLOYMENT LENGTH AMBIENT AIR TEMP. VISUAL OBSERVATION OBSERVED OVERLAP CHECKED BY	PANEL LOCATION REFERENCE  NUMBER 21  1011/9393  150' 8'C C'K G'' MA  N= 20 S=	PANEL LOCATION NUMBER		PANEL LOCATI	ON REFERENCE
ADJACENT PANEL	N= <b>20</b>	E=	3= W=	E=	%= ₩=
DESCRIPTION	PANEL LOCATION REFERENCE NUMBER 22	PANEL LOCATION		PANEL LOCATI	ON REFERENCE
PANEL/ROLL NUMBER DEPLOYMENT LENGTH AMBIENT AIR TEMP. VISUAL OBSERVATION OBSERVED OVERLAP CHECKED BY	101119 399 150' OK MA				
ADJACENT PANEL	N= Z1	N=	S=	N= E=	S= '
	E= W=	E=	W=		W=
DESCRIPTION	PANEL LOCATION REFERENCE NUMBER	PANEL LOCATION	N REFERENCE	PANEL LOCATI	ON REFERENCE
PANEL/ROLL NUMBER DEPLOYMENT LENGTH AMBIENT AIR TEMP.					
VISUAL OBSERVATION OBSERVED OVERLAP		<del>                                     </del>			

SUBMITTED BY: \_\_\_\_\_\_

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W=\_

CHECKED BY

LS FORM 2

ADJACENT PANEL

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LAYFIELD		ANE DEPLOYME	NT LOG
PROJECT NUMBER:	D8C-019	PROJECT TITLE:	unter resorrore
OWNER: GOVERN	.1. 27 4 1	contractor:	Kudlis const.
LOCATION: Ack	toring		
GEOMEMBRANE	SECONDARY PRIM	MARY CLOSURE	OTHER
SUBGRADE CONDITION (SI	URFACE COMPACTION, PROTRUSIONS,	DESICCATION, EXCESSIVE MOISTURE):	-1/00
REMARKS:			DATE: 0119 21/08
			SHEET NUMBER:6
DEPLOYMENT EQUIPMENT	VT: excavator		
DESCRIPTION	PANEL LOCATION REFERENCE	PANEL LOCATION REFERENCE	PANEL LOCATION REFERENCE
DESCRIPTION	NUMBER	NUMBER	NUMBER
PANEL/ROLL NUMBER	101119399	101119388	
DEPLOYMENT LENGTH	150.	7.50	
AMBIENT AIR TEMP. VISUAL OBSERVATION	OK C	OK .	
OBSERVED OVERLAP	Ca	6 "	
CHECKED BY	N=27 S=	N= 26 S=	N= S=
ADJACENT PANEL	N=2/2 S= E= W=	E= W=	E= W=
	PANEL LOCATION REFERENCE	PANEL LOCATION REFERENCE	PANEL LOCATION REFERENCE
DESCRIPTION	NUMBER 24	NUMBER Z8	NUMBER
DINES (DOLL NUMBER	10/1/9393	1011/9388	
PANEL/ROLL NUMBER DEPLOYMENT LENGTH	1501	150'	
AMBIENT AIR TEMP.	66	62	
VISUAL OBSERVATION OBSERVED OVERLAP	OK.	6 1	
CHECKED BY	mA	<u>m</u> A	
ADJACENT PANEL	N= 2 3 S=	N= 27 S=	N=' S=
	E= W=	E= W=	E= W=
	PANEL LOCATION REFERENCE	PANEL LOCATION REFERENCE	PANEL LOCATION REFERENCE
DESCRIPTION	NUMBER 25	NUMBER 29	NUMBER
	101119397	1011/9396	
PANEL/ROLL NUMBER DEPLOYMENT LENGTH	10/1/9/547	150'	
AMBIENT AIR TEMP.	6.7	6.0	
VISUAL OBSERVATION OBSERVED OVERLAP	<u> </u>		
CHECKED BY	m A	MA	
ADJACENT PANEL	N=2 4 S=	N= <b>28</b> S=	N= S=
	E= W=	E= W=	E= W=
			DULIE LOGISTICN DEPENDENCE
DESCRIPTION	PANEL LOCATION REFERENCE	PANEL LOCATION REFERENCE NUMBER	PANEL LOCATION REFERENCE NUMBER
	NOMBER		NUMBER
PANEL/ROLL NUMBER	101119397	10/1/9/396	
DEPLOYMENT LENGTH AMBIENT AIR TEMP.	67	6.0	
VISUAL OBSERVATION	CK MA G"	C.K.	
OBSERVED OVERLAP CHECKED BY	mA C"	MA	
ADJACENT PANEL	N= 25 S=	N= 29 S=	N= S=
	E= W=	E= W=	E= W=
		su	BMITTED BY: M. Quelot
			DATE: