



Lafarge Canada Inc.  
ATTN: [REDACTED]  
87 Cement Plant Road  
PO Box 5  
Brookfield NS B0N1C0

Date Received: 27-SEP-19  
Report Date: 24-OCT-19 10:54 (MT)  
Version: FINAL

Client Phone: 613-[REDACTED]

## Certificate of Analysis

Lab Work Order #: L2355647  
Project P.O. #: 4501312231  
Job Reference: NDMA TESTING FOR TDF PERMIT  
C of C Numbers:  
Legal Site Desc:

[REDACTED] \_\_\_\_\_  
Account Manager

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ALS CANADA LTD Part of the ALS Group An ALS Limited Company

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2355647-1 PERMIT2019-07-24 Sampled By: Field Operator on 24-JUL-19 @ 09:30 Matrix: Solid							
<b>Miscellaneous Parameters</b>							
% Moisture	<0.10		0.10	%	16-OCT-19	17-OCT-19	R4873383
<b>NDMA ALS Method</b>							
N-Nitrosodimethylamine	0.27	M	0.26	ng/g	16-OCT-19	18-OCT-19	R4876171
Surrogate: N-Nitrosodimethylamine (Surr.)	31.0		13-109	%	16-OCT-19	18-OCT-19	R4876171
Moisture %					16-OCT-19	18-OCT-19	R4876171
Sample Size					16-OCT-19	18-OCT-19	R4876171
L2355647-2 PERMIT2019-08-21 Sampled By: Field Operator on 21-AUG-19 @ 10:35 Matrix: Solid							
<b>Miscellaneous Parameters</b>							
% Moisture	<0.10		0.10	%	16-OCT-19	17-OCT-19	R4873383
<b>NDMA ALS Method</b>							
N-Nitrosodimethylamine	0.147		0.041	ng/g	16-OCT-19	18-OCT-19	R4876171
Surrogate: N-Nitrosodimethylamine (Surr.)	87.0		13-109	%	16-OCT-19	18-OCT-19	R4876171
Moisture %					16-OCT-19	18-OCT-19	R4876171
Sample Size					16-OCT-19	18-OCT-19	R4876171
L2355647-3 PERMIT2019-09-05 Sampled By: Field Operator on 05-SEP-19 @ 15:05 Matrix: Solid							
<b>Miscellaneous Parameters</b>							
% Moisture	<0.10		0.10	%	16-OCT-19	17-OCT-19	R4873383
<b>NDMA ALS Method</b>							
N-Nitrosodimethylamine	0.091	M	0.027	ng/g	16-OCT-19	18-OCT-19	R4876171
Surrogate: N-Nitrosodimethylamine (Surr.)	99.0		13-109	%	16-OCT-19	18-OCT-19	R4876171
Moisture %					16-OCT-19	18-OCT-19	R4876171
Sample Size					16-OCT-19	18-OCT-19	R4876171
L2355647-4 PERMIT2019-09-12 Sampled By: Field Operator on 12-SEP-19 @ 11:30 Matrix: Solid							
<b>Miscellaneous Parameters</b>							
% Moisture	0.31		0.10	%	16-OCT-19	17-OCT-19	R4873383
<b>NDMA ALS Method</b>							
N-Nitrosodimethylamine	0.091		0.051	ng/g	16-OCT-19	18-OCT-19	R4876171
Surrogate: N-Nitrosodimethylamine (Surr.)	77.0		13-109	%	16-OCT-19	18-OCT-19	R4876171
Moisture %					16-OCT-19	18-OCT-19	R4876171
Sample Size					16-OCT-19	18-OCT-19	R4876171
L2355647-5 PERMIT2019-09-20 Sampled By: Field Operator on 20-SEP-19 @ 15:00 Matrix: Solid							
<b>Miscellaneous Parameters</b>							
% Moisture	<0.10		0.10	%	16-OCT-19	17-OCT-19	R4873383
<b>NDMA ALS Method</b>							
N-Nitrosodimethylamine	0.097		0.041	ng/g	16-OCT-19	18-OCT-19	R4876171
Surrogate: N-Nitrosodimethylamine (Surr.)	101.0		13-109	%	16-OCT-19	18-OCT-19	R4876171
Moisture %					16-OCT-19	18-OCT-19	R4876171
Sample Size					16-OCT-19	18-OCT-19	R4876171
L2355647-6 PERMIT2019-09-24 Sampled By: Field Operator on 24-SEP-19 @ 09:30 Matrix: Solid							

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2355647-6 PERMIT2019-09-24 Sampled By: Field Operator on 24-SEP-19 @ 09:30 Matrix: Solid							
<b>Miscellaneous Parameters</b>							
% Moisture	<0.10		0.10	%	16-OCT-19	17-OCT-19	R4873383
<b>NDMA ALS Method</b>							
N-Nitrosodimethylamine	0.084	M	0.033	ng/g	16-OCT-19	18-OCT-19	R4876171
Surrogate: N-Nitrosodimethylamine (Surr.)	88.0		13-109	%	16-OCT-19	18-OCT-19	R4876171
Moisture %					16-OCT-19	18-OCT-19	R4876171
Sample Size					16-OCT-19	18-OCT-19	R4876171

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## Reference Information

**Sample Parameter Qualifier Key:**

Qualifier	Description
J,G	QC result did not meet ALS DQO. Refer to narrative comments for further information. Duplicate expressed in terms of absolute difference.
M	A peak has been manually integrated.
M,U	A peak has been manually integrated, and the analyte was not detected above the EDL.

**Test Method References:**

ALS Test Code	Matrix	Test Description	Method Reference**
MOISTURE-BU	Soil	% Moisture	CCME PHC in Soil - Tier 1 (mod)
This method is used to determine the percent moisture in a sample. Samples are homogenized, moisture is removed by heating at 105°C until constant mass is achieved. The residues are measured gravimetrically and the difference in weight between the wet sample and the dried sample is used to determine the moisture content. This percent moisture can be used, in conjunction with analytical results, to report data on a dry weight basis.			
NDMA-IHM-HRMS-BU	Soil	NDMA ALS Method	IN HOUSE METHOD
Samples are Soxhlet extracted and analyzed by GC-HRMS			

\*\* ALS test methods may incorporate modifications from specified reference methods to improve performance.

*The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:*

Laboratory Definition Code	Laboratory Location
BU	ALS ENVIRONMENTAL - BURLINGTON, ONTARIO, CANADA

**Chain of Custody Numbers:**
**GLOSSARY OF REPORT TERMS**

*Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.*

*mg/kg - milligrams per kilogram based on dry weight of sample  
mg/kg wwt - milligrams per kilogram based on wet weight of sample  
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight  
mg/L - unit of concentration based on volume, parts per million.*

*< - Less than.*

*D.L. - The reporting limit.*

*N/A - Result not available. Refer to qualifier code and definition for explanation.*

*Test results reported relate only to the samples as received by the laboratory.*

*UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.*

*Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.*



## Quality Control Report

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Client: Lafarge Canada Inc.  
 87 Cement Plant Road PO Box 5  
 Brookfield NS B0N1C0

Contact: [REDACTED]

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MOISTURE-BU</b>		<b>Soil</b>						
Batch	R4873383							
<b>WG3176537-3</b>	<b>DUP</b>	<b>L2355647-1</b>						
% Moisture		<0.10	<0.10	RPD-NA	%	N/A	20	17-OCT-19
<b>WG3176537-2</b>	<b>LCS</b>							
% Moisture			98.5		%		90-110	17-OCT-19
<b>WG3176537-1</b>	<b>MB</b>							
% Moisture			<0.10		%		0.3	17-OCT-19
<b>NDMA-IHM-HRMS-BU</b>		<b>Soil</b>						
Batch	R4876171							
<b>WG3176533-4</b>	<b>DUP</b>	<b>L2355647-1</b>						
N-Nitrosodimethylamine		0.27	1.41	J,G	ng/g	1.14	0.52	18-OCT-19
COMMENTS: Sample and dup don't meet criteria. Sample is solid- may be a homogeneity issue.								
<b>WG3176533-2</b>	<b>LCS</b>							
N-Nitrosodimethylamine			111.0		%		60-135	18-OCT-19
<b>WG3176533-1</b>	<b>MB</b>							
N-Nitrosodimethylamine			<1.1	M,U	ng/g		0.1	18-OCT-19
Surrogate: N-Nitrosodimethylamine (Surr.)			93.0		%		13-109	18-OCT-19

# Quality Control Report

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## Legend:

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Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

## Sample Parameter Qualifier Definitions:

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Qualifier	Description
J,G	QC result did not meet ALS DQO. Refer to narrative comments for further information. Duplicate expressed in terms of absolute difference.
M,U	A peak has been manually integrated, and the analyte was not detected above the EDL.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

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# Quality Control Report

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## Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
<b>Semi-Volatile Organics</b>							
NDMA ALS Method							
	1	24-JUL-19 09:30	16-OCT-19	14	84	days	EHTR
	2	21-AUG-19 10:35	16-OCT-19	14	56	days	EHTR
	3	05-SEP-19 15:05	16-OCT-19	14	40	days	EHTR
	4	12-SEP-19 11:30	16-OCT-19	14	34	days	EHTR
	5	20-SEP-19 15:00	16-OCT-19	14	25	days	EHT
	6	24-SEP-19 09:30	16-OCT-19	14	22	days	EHT

## Legend & Qualifier Definitions:

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.  
EHTR: Exceeded ALS recommended hold time prior to sample receipt.  
EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.  
EHT: Exceeded ALS recommended hold time prior to analysis.  
Rec. HT: ALS recommended hold time (see units).

### Notes\*:

Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.

Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2355647 were received on 27-SEP-19 08:40.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

