

**LEAD-BASED PAINT
INVESTIGATION REPORT**

**CSX RAILROAD BRIDGE
OVER INTERSTATE 85
MILE MARKER 80.7
SPARTANBURG COUNTY, SOUTH
CAROLINA**

SCDOT BRIDGE #421008500191

PREPARED FOR:



PREPARED BY:

F&ME Consultants
3112 Devine Street
Columbia, South Carolina 29205
(803) 254-4540

January 25, 2016

Yes, lead-based paint was found.

No, lead-based paint was not found.

G5439.000

TABLE OF CONTENTS

I.	Executive Summary.....	1
II.	LBP Background Information	2
III.	Introduction	2
IV.	Investigation Results.....	3
V.	Recommendations	3

APPENDIX A

- Site Vicinity Map (Figure 1)
- XRF Data (Table I)
- Photographs of Bridge and Lead-Based Painted Items

APPENDIX B

- Personnel Certification

I. EXECUTIVE SUMMARY

As requested, F&ME Consultants has completed a Lead-Based Paint (LBP) investigation of the CSX Railroad Bridge over Interstate 85 in Spartanburg County, South Carolina. This investigation was performed on February 1, 2016, as a component of a proposed bridge replacement project.

It is our understanding that the proposed project will include the complete demolition/removal of the existing bridge structure and replacement with a new bridge as part of the rehabilitation of Interstate 85 from MM 77 to MM 84. Therefore, the scope of this investigation was to identify, analyze, and assess the condition of lead-based painted or coated components that are associated with the existing bridge. This scope includes both a visual evaluation of the physical condition of painted materials as well as quantitative testing of random surfaces using a Thermo Scientific Niton X-Ray Fluorescence (XRF) Portable Analyzer. The XRF documents the concentration of lead, if any, in the overall paint or coating. Bridge components were scanned with a Niton XRF analyzer (Model #XLp 300A, Serial #18185) with a limit of detection (LOD) of 0.01 mg/cm^2 .

LBP is governed by multiple regulatory agencies, and each requires different response actions when the concentration of lead exceeds specified thresholds. The Occupational Safety and Health Administration (OSHA) regulates worker exposure to lead dust, and as a result considers materials with **any** lead content to be a potential hazard. Furthermore, the SC Department of Health and Environmental Control (SCDHEC) requires some materials found to contain $\geq 0.7 \text{ mg/cm}^2$ lead to be disposed of at specialized waste facilities. In an effort to present the data in a user-friendly format, we have highlighted the XRF results depending upon which threshold is exceeded. Items in red text exceed the SCDHEC threshold, while items in blue text contain lead in concentrations between 0.01 to $<0.7 \text{ mg/cm}^2$ and would therefore be a concern under OSHA's regulations.

The suspected painted bridge components that were identified during this investigation are the following: silver painted metal bridge beams, H-piles, diaphragms, and cross-bracing; silver painted hand rail post; black and yellow caution striping on the bridge concrete shaft piers. The results from the XRF quantitative testing indicate that the yellow painted caution striping on the concrete shaft piers and all of the silver painted bridge components except for the handrails tested positive for lead in concentrations $\geq 0.7 \text{ mg/cm}^2$. The XRF test results are organized in Table I, which includes the location, description and type of bridge component from which the readings were taken.

We sincerely appreciate the opportunity to assist you with this project. If you have any questions or require any additional information, please do not hesitate to contact our office at (803) 254-4540.

Sincerely,

F&ME CONSULTANTS

Jeffrey S. Leary
S.C. Lead-Based Paint Inspector
EPA Certification No. SC-I-18721-3 (Exp. 07/29/18)

Glynn M. Ellen
Environmental Department Manager

II. LBP BACKGROUND INFORMATION

Housing and Urban Development (HUD) defines “lead-based paint” as any coating that has a lead concentration of 1.0 milligrams of lead per square centimeter (1.0 mg/cm^2) or greater, or if the lead concentration is greater than 0.5% by weight. The Consumer Product Safety Commission (CPSC) currently considers paint to be lead-containing if the concentration of lead exceeds 90 ppm (0.009% by weight). In 1978, the CPSC banned the sale of lead-based paint to consumers, and banned its application in areas where consumers have direct access to painted surfaces. Both the CPSC and HUD definitions of lead-containing paint are aimed at protecting the general population from exposure to lead in the residential setting.

In contrast, the mission of the Occupational Safety and Health Administration (OSHA) with respect to lead-containing paint is to protect workers during construction activities that may generate elevated airborne lead concentrations. OSHA states that construction work (including renovation, maintenance, and demolition) carried-out on structures coated with paint having lead concentrations lower than the HUD or CPSC can still result in airborne lead concentrations in excess of regulatory limits. For this reason, OSHA has not defined lead-containing paint, but states that paint having any measurable level of lead may pose a substantial exposure hazard during construction work, depending upon the work performed. Therefore, in these situations, OSHA regulations, guidelines, and safety procedures should be followed.

Additionally, the South Carolina Department of Health and Environmental Control (SCDHEC) require the use of specialized waste disposal sites if materials contain lead concentrations at or exceeding 0.7 mg/cm^2 as determined by testing with an XRF analyzer or $>0.06\%$ ($>600\text{ppm}$) as determined by lab testing. It is imperative that these regulations be considered if any demolition activities will impact LBP-containing bridge components.

III. INTRODUCTION

As requested, F&ME Consultants has completed a Lead-Based Paint (LBP) investigation of the CSX Railroad Bridge over Interstate 85 in Spartanburg County, South Carolina. This investigation was performed on February 1, 2016, as a component of a proposed bridge replacement project.

It is our understanding that the proposed project will include the complete demolition/removal of the existing bridge structure and replacement with a new bridge as part of the rehabilitation of Interstate 85 from MM 77 to MM 84. Therefore, the scope of this investigation was to identify, analyze, and assess the condition of lead-based painted or coated components that are associated with the existing bridge.

The results, conclusions and recommendations from this investigation are representative of the conditions observed at the site on the date of the field inspection. F&ME does not assume responsibility for any changes in conditions or circumstances that occur after the inspection. Use of this document for bidding purposes is not recommended without prior consultation with F&ME. No other environmental issues were addressed in this report.

IV. INVESTIGATION RESULTS

The existing bridge structure (SCDOT Bridge #421008500191) is a one track railroad bridge used by CSX railroad. The bridge crosses over Interstate 85 at mile marker 80.7. The railroad tracks and timbers are supported by steel beams with steel cross-bracing and diaphragms. The bridge has seven (7) interior bents and two (2) end bents. The four center interior bents consist of a solid concrete pier with a concrete cap. On the north end of the bridge the outer interior bent consists of two separate concrete footings with six (6) battered H-piles per footing with one solid concrete trestle bent cap. On the south end of the bridge, the two outer interior bents are constructed the same way. The supports for the two end bents are covered with soil and rock, and the only component that is visible is the concrete bent cap.



Photo 1 – CSX Railroad Bridge over I-85

The LBP sampling protocol for this investigation consisted of randomly selecting bridge components associated with the existing bridge structure and scanning them with our Thermo Scientific Niton X-Ray Fluorescence (XRF) Portable Analyzer (Model XLp300A, Serial #18185, Isotope 1: Cd109, 40mCi, source date 11/15/2011). The limit of detection (LOD) for the XRF analyzer is 0.01 mg/cm².

The suspect bridge components that were tested with the XRF included the following: silver painted metal bridge beams, H-piles, diaphragms, and cross-bracing; silver painted hand rail post; black and yellow caution striping on the bridge concrete shaft piers. The results from the XRF quantitative testing indicate that the yellow painted caution striping on the concrete piers and all of the silver painted bridge components except for the handrails tested positive for lead in concentrations ≥ 0.7 mg/cm². For more information regarding the specific descriptions and locations of the items that were tested, refer to the XRF Data (Table I) located in Appendix A. The appendices include a Site Vicinity Map (Figure 1), the XRF Data (Table I), photographs of bridge and lead-based painted bridge components, and Personnel Certification.

V. RECOMMENDATIONS

As reported herein, lead-based paint was identified in concentrations above both the SCDHEC and OSHA limits on the silver painted bridge components and the yellow caution striping on the concrete shaft piers. It is important to ensure that the debris generated from the demolition activities are disposed of appropriately. The proper handling and disposal procedures depend on the type of substrate (i.e., metal, wood, masonry block, etc.). Intact removal is recommended in order to reduce/eliminate the generation of lead-containing dust and *residue*. Metal components painted with and/or containing lead, such as the silver painted bridge components, may be recycled if they are taken to a recycling facility that accepts lead painted and/or lead-containing material.

Components found to contain lead should be handled appropriately. It is recommended that work tasks which require grinding, sanding, torch cutting or other disturbance of the lead-based painted surfaces identified herein be performed in accordance with federal regulations pertaining to worker protection from exposure to LBP. When lead containing items are disturbed or begin to decay they become a concern with regard to human and environmental health. The typical routes of exposure to

lead are through the inhalation or ingestion of lead-contaminated materials. In cases where the lead-containing paint/ coating is intact (i.e. has not been aerosolized and free of chipping or flaking), there is minimal risk to people.

As stated previously, OSHA regulates **any** measurable level of worker exposure to lead, as it may pose a substantial exposure hazard during construction work. Therefore, in these situations, OSHA regulations and safety procedures should be followed. These regulations also list the proper personal protective equipment to be used by the workers disturbing the lead-based paint items and the requirements for personal air monitoring. OSHA's exposure action level (AL) for lead, regardless of respirator use, is an airborne concentration of $30\mu\text{g}/\text{cm}^3$, averaged over an eight-hour period. The action level (AL) is the level at which an employer must begin specific compliance activities as outlined in OSHA's lead standards. By OSHA standards and regulations, the employer shall ensure that no employee is exposed to lead at concentrations greater than fifty micrograms per cubic meter of air ($50\ \mu\text{g}/\text{m}^3$) averaged over an 8-hour period which is the permissible exposure level (PEL).

As previously mentioned the SCDHEC is primarily concerned with the proper disposal of LBP and associated debris. The following is a synopsis of the concerns associated with the disposal of these materials:

The SCDHEC defines two types of lead-based paint debris. The first is lead-based paint *waste*, which is defined as material such as wood, brick and metal that is painted with lead-based paint. The other is lead-based paint *residue* which is defined as residue that is generated from the removal (e.g., scraped, chipped, sandblasted or chemical) of lead-based paint from a structure. Lead-based paint *waste* that comes from a commercial or residential facility may be disposed of in either a class 2 or 3 landfill, while lead-based paint *residue* from a commercial facility must have a toxicity characteristic leaching procedure (TCLP) analysis to determine the lead content.

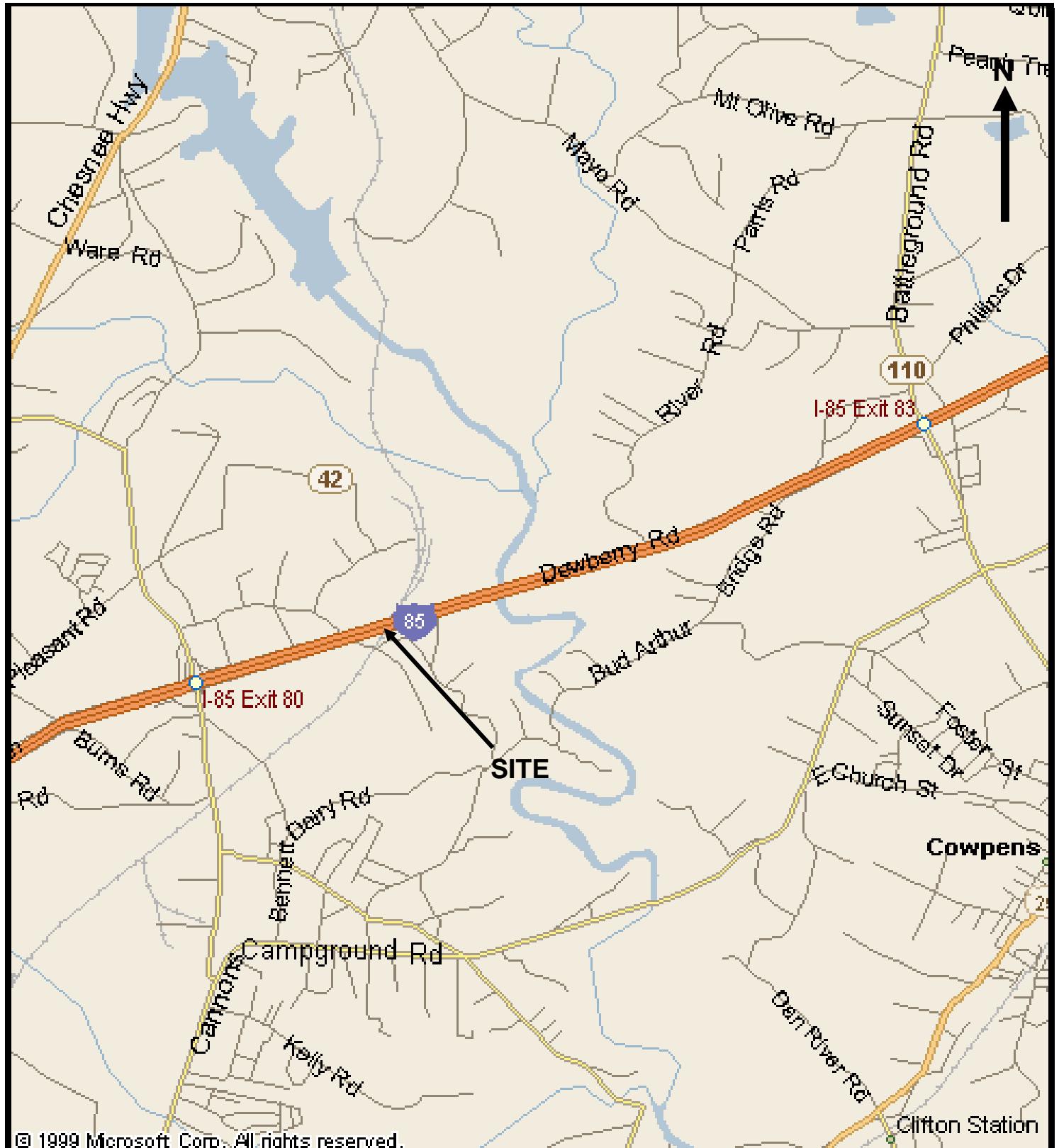
TCLP analysis is used to determine whether or not a waste is a characteristic hazardous waste due to leach ability and is expressed in mg/l; $\geq 5.0\ \text{mg/l}$ is considered hazardous waste under the SC Hazardous Waste Management Regulation. Lead-based paint *residue* from a commercial facility with a TCLP analysis result less than $5\ \text{mg/l}$ lead must be disposed of in a class 3 landfill. Lead-based paint *residue* with a TCLP analysis result greater than or equal to $5\ \text{mg/l}$ lead must be disposed of in a Subtitle C landfill (Hazardous Waste).

Should any hidden and/or inaccessible components suspected to have LBP be encountered during demolition activities, the Contractor performing the work is advised to stop work, follow proper procedures and precautions relating to LBP, and contact F&ME Consultants at (803) 254-4540 for an immediate response action.

This report has been prepared exclusively for TranSystems and F&ME Consultants and shall not be disseminated in whole or part to other parties without prior consent from TranSystems or F&ME Consultants, Inc. Use of this document for bidding purposes is not recommended without prior consultation with F&ME.

APPENDIX A

Site Vicinity Map (Figure 1)
XRF Data (Table I)
Photographs of Bridge and Lead-Based Painted Items



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**F&ME
CONSULTANTS**

SITE VICINITY MAP

CSX Railroad Bridge over I-85, Mile Marker 80.7 Spartanburg County, South Carolina

TRANSYSTEMS

Prepared By:	JSL	Scale:	N.T.S.
Checked By:	GME	Project:	G5439.000
Approved By:	GME	Figure:	1

Table I. XRF Data
Lead-Based Paint Investigation
CSX Railroad Bridge over I-85, Mile Marker 80.7
Spartanburg County, SC
F&ME Project No. - G5439.000
Date Analyzed: 02/01/2016

READING NO.	COMPONENT	SUBSTRATE	SIDE	CONDITION	COLOR	PbC (mg/cm ²)
1			Shutter Calibrate			NA
2			Calibrate			1.1
3			Calibrate			0.7
4			Calibrate			1
5			Calibrate			0.7
6	Interior Bent H-Pile	Metal	A	INTACT	Silver	11.4
7	Interior Bent H-Pile	Metal	A	INTACT	Silver	11.8
8	Beam	Metal	A	INTACT	Silver	9.7
9	Beam	Metal	A	INTACT	Silver	8.3
10	Diaphragm	Metal	A	INTACT	Silver	10.8
11	Angle Iron Cross-bracing	Metal	A	INTACT	Silver	13
12	Handrail Post	Metal	A	POOR	Silver	0.5
13	Handrail Post	Metal	A	POOR	Silver	0.14
14	Handrail Post	Metal	A	POOR	Silver	0.16
15	Bridge Pier Caution Striping	Concrete	D	PEELING	Black	< LOD
16	Bridge Pier Caution Striping	Concrete	D	PEELING	Yellow	1.8
17	Bridge Pier Caution Striping	Concrete	D	PEELING	Yellow	1.1
18	Beam	Metal	C	INTACT	Silver	9
19	Diaphragm	Metal	C	INTACT	Silver	9.6
20			Shutter Calibrate			NA
21			Calibrate			1
22			Calibrate			0.7
23			Calibrate			1.2
24			Calibrate			0.7

Side A = North, then go clockwise

LOD = Limit of Detection (0.01 mg/cm²)

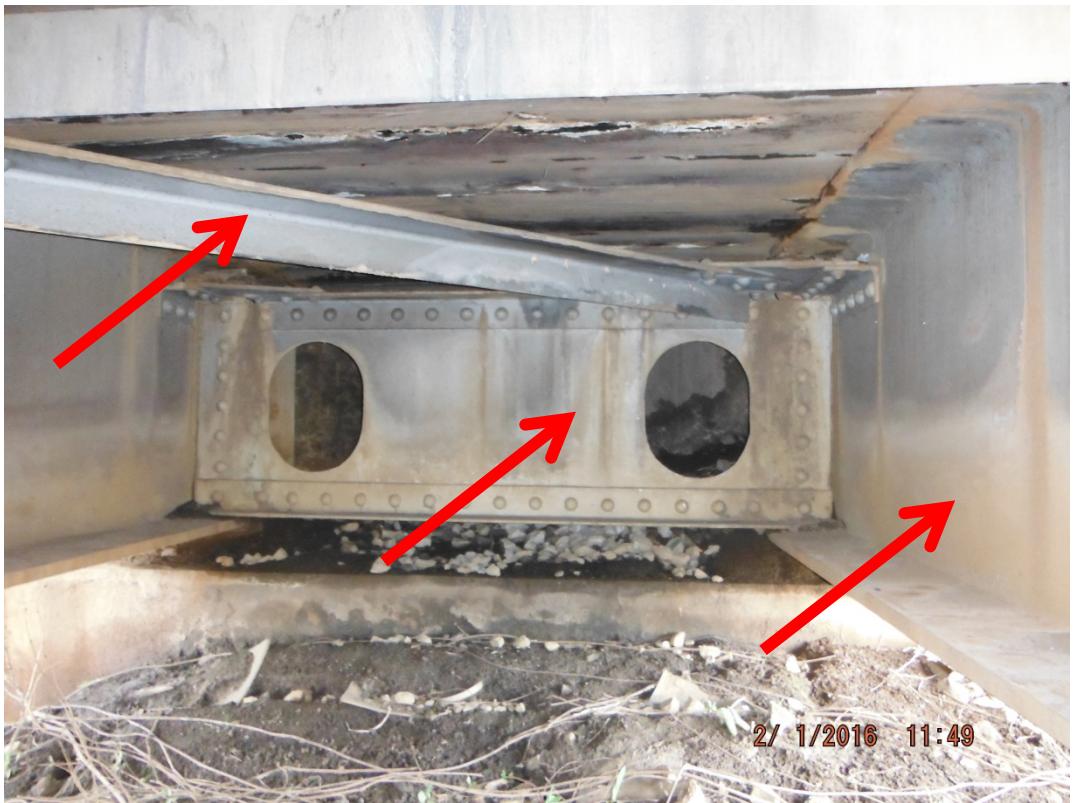


Side view and top view of railroad bridge





Lead-based paint on silver painted bridge beams, diaphragms, and cross-bracing





Lead-based paint on silver painted H-piles



Lead-based paint on yellow caution striping on concrete shaft pier

APPENDIX B

Personnel Certification

United States Environmental Protection Agency

This is to certify that



Jeffrey Steve Leary

has fulfilled the requirements of the Toxic Substances Control Act (TSCA) Section 402, and has received certification to conduct lead-based paint activities pursuant to 40 CFR Part 745.226 as:

Inspector

In the Jurisdiction of:

South Carolina

This certification is valid from the date of issuance and expires July 29, 2018

SC-I-18721-3

Certification #

April 24, 2015

Issued On



Adrienne Priselac, Manager, Toxics Office
Land Division