Site-Specific Quality Assurance Project Plan Addendum
Brownfields Cleanup Confirmation Testing
Long Falls Paperboard
161 Wellington Road
Brattleboro, Vermont 05301

EPA RFA 19093
Vermont DEC Site #2018-4828

February 2, 2021
Updated June 2, 2021

Prepared for:

Brattleboro Development Credit Corporation
76 Cotton Mill Hill
Brattleboro VT 05301

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LEE #18-122

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Section A: Title and Approval Page / Introduction

Long Falls Paperboard, Brattleboro, Vermont
Brownfields Site Specific Quality Assurance Project Plan Addendum
EPA RFA 19093
Vermont DEC Site #2018-4828

June 2, 2021

LEE Brownfields Project Manager: Alan Liptak

Signature

LEE Brownfields QA Officer: Angela Emerson

Signature

U.S. EPA Project Manager: Christine Lombard

Signature

U.S. EPA /QA Officer: Jessica Iverson

Signature

Vermont DEC Brownfields Project Manager: Shawn Donovan

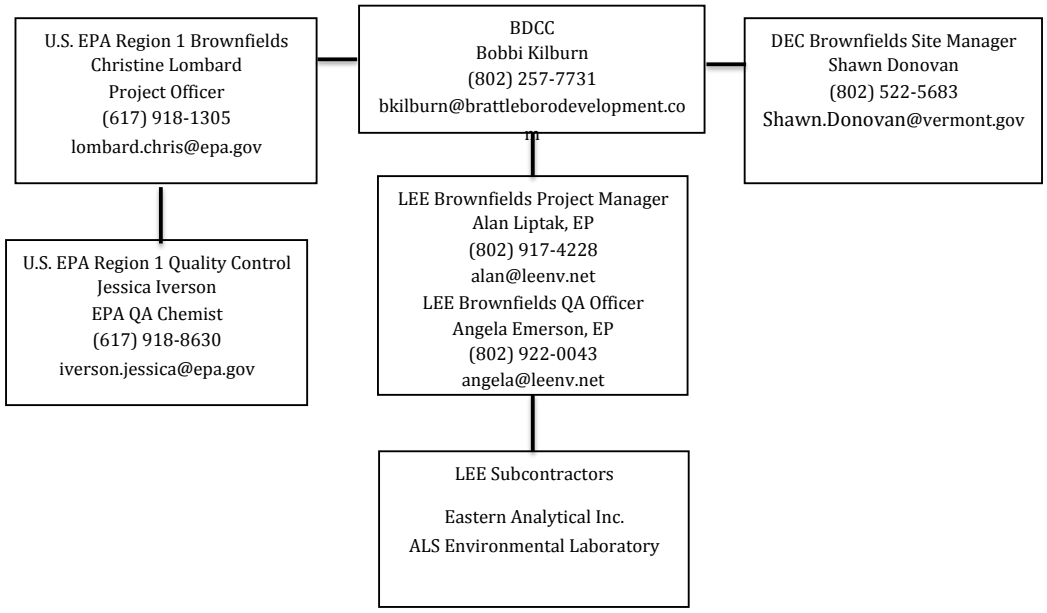
Signature

Introduction

LE Environmental LLC (LEE) of Waterbury, Vermont prepared this Brownfields site-specific quality assurance project plan addendum (SSQAPP addendum) for Brownfields Cleanup Confirmation Testing at Long Falls Paperboard, 161 Wellington Road, Brattleboro, Vermont (Site). This SSQAPP was prepared for the Brattleboro Development Credit Corporation (BDCC). BDCC is funding this work via EPA Brownfields Cleanup Grant # BF-BF00A00502. A Site location map is included in Appendix 1. This SSQAPP addendum was prepared using rules and guidance provided by USEPA and the Vermont Department of Environmental Conservation (DEC) Investigation and Remediation of Contaminated Properties Rule (I-Rule), July 2019, the DEC's Hazardous Waste Management Regulations, December 2016, and regulations governing the management of PCB remediation wastes at 40 CFP Part 761.61(a). EPA Region 1 originally approved this SSQAPP Addendum on April 12, 2021. EPA Region 1 approved the Self Implementing Cleanup Plan on June 1, 2021, which resulted in modifications to the PCB sampling specified in the April document.

Section B: Project Organization

Communications during the planning and implementation of the Brownfields Cleanup Confirmation Testing will be performed according to the following organization flow chart.



Section C: Problem Definition / Site Information

Following is the problem definition and relevant Site information as noted in § 35-304 of the Investigation and Remediation of Contaminated Properties Rule (I-Rule).

(1) Table of names

Stakeholder	Mailing Address	Name and Email Address	Phone Number
Brattleboro Development Credit Corporation	76 Cotton Mill Hill Brattleboro, Vermont 05301	Bobbi Kilburn bkilburn@brattleborodevelopment.com	(802) 257-7731
Long Falls Paperboard	161 Wellington Road Brattleboro, Vermont 05301	Gabriela Constantin gabriela.constantin@longfallspaperboard.com	(802) 257-0365
Town of Brattleboro	230 Main Street Suite 202 Brattleboro, VT 05301	Sue Fillion sfillion@brattleboro.org	(802) 251-8112

(2) Current land uses and activities of the Site

The property consists of a 39.52-acre parcel with a paperboard manufacturing facility at the north end of Wellington Road in Brattleboro, Vermont (see Appendix 1).

(3) Adjacent Site Uses

Current uses of the adjoining properties were observed as follows:

- North: undeveloped woodland.
- East: Connecticut River.
- South: Green Mountain Power substation, Wellington Road.
- West: (south to north): Suburban Propane; BDCC Business Park (multi-tenant, former Book Press), C&S Wholesale Grocers, Closed Windham Solid Waste Management District (WSWMD) Landfill.

(4) Site Description

The property is at the eastern edge of the Brattleboro Industrial Zone, which encompasses most of the area east of Putney Road and north of I-91 Exit 3 (Appendix 1). Development in this zone includes industrial manufacturing, warehouses, retail, and wholesale distribution. A Phase I ESA[1] and a Phase II ESA[2] were recently performed. Twelve Recognized Environmental Conditions (RECs) were identified during the Phase I ESA. These were evaluated during the Phase II ESA. The outcome of the Phase II ESA was that many of the

[1] LEE, 2018.
[2] Stone Environmental, 2019.

RECs identified in the Phase I ESA did not have significant subsurface contamination associated with them.

The Corrective Action Investigation followed up on recommendations of the Phase II ESA, and the following conclusions were made.

1. Soil testing indicates no contamination above residential screening levels in the sandy soils surrounding the holding basin lagoon. This suggests that overtopping in the past was not a frequent or significant occurrence.
2. Holding basin sludge testing indicates the presence of dioxin, PCBs, metals and poly and perfluoroalkyl substances (PFAs). The reported PFAs concentrations in the sludge are 1-2 orders of magnitude less than the DEC's residential soil standard; however, their presence at any concentration in waste sludge will influence the available disposal options. Metals are present at concentrations above I-Rule residential soil standards. Samples showing elevated concentrations of metals, including lead, cadmium and mercury, were evaluated using Toxicity Characteristic Leaching Procedure (TCLP) methods, and the results indicate the sludge is non-hazardous for metals concentrations. PCBs above 1 ppm were detected. Dioxin was detected in the sludge at concentrations above I-Rule residential soil standards.
3. Groundwater PFAs concentrations are uniformly below state standards.
4. Results of the background vanadium soil review indicate that vanadium concentrations in Site soils are not abnormally elevated with respect to other locations, and are toward the low end of reported concentration ranges at other Vermont locations.[3]

The area of proposed active remediation will be the holding basin lagoon. Confirmation testing will focus on compounds and analytes in the sludge that either exceeded DEC's non-residential soil standards, or had elevated levels relative to the "Rule of 20" during the Corrective Action Investigation and Phase II ESA. These included: metals (lead, cadmium and mercury) and dioxin. PCBs are also included due to some concentrations above 1 part per million, which classifies the sludge as PCB remediation waste and necessitating a Self Implementing Cleanup Plan.

A map showing the lagoon excavation area is included in Appendix 2. Compliance point testing will be performed, consisting of sampling and testing of soil samples from beneath the holding basin lagoon. The compliance sampling will be performed on two sampling schedules:

- For dioxin and metals, four confirmation soil samples and one duplicate will be collected at approximately 25' intervals across the bottom of the excavated area. The proposed cleanup levels are the I-Rule non-residential soil standards.
- For PCBs, because two of six sludge samples were reported to have PCB concentrations above 1 ppm, the sludge is considered to be PCB remediation waste

[3] See Corrective Action Investigation Report, Long Falls Paperboard, Section 13, August 14, 2020.

and a cleanup plan is required under 40 CFR Part 761.61. Due to the relatively low PCB concentrations and the nature of the cleanup (one source), a Self Implementing Cleanup Plan (SICP) has been developed in accord with 40 CFR Part 761.61(a). The SICP designates 35 composite soil samples and two duplicates collected from 105 soil sampling locations and 10-foot grid spacing. The approved SICP also includes collecting 13 wipe samples and a duplicate from removed piping and up to 4 aqueous washwater samples and a duplicate for PCB analysis.

The goal of the work is to remove contaminated media to the extent necessary to leave this portion of the Site in usable condition for future use with a minimum of restrictions on future use.

(5) Cleanup Testing Objectives and Strategy

The strategy of the cleanup testing is to verify that the cleanup work (sludge and liner removal) adequately removed contaminants such that no, or minimal, site restrictions are required post-remediation. The objective will be to collect shallow soil samples from beneath the removed sludge and liner and submit them for laboratory testing of contaminants of concern.

The investigation objectives are further defined in Section D of this SSQAPP.

(6) Identification of Analytical Methods

Analytical methods to be used in this Brownfields Corrective Action Investigation are described in Section F.

(7) List of Standard Operating Procedures

A list of standard operating procedures to be used in this Brownfields Corrective Action Investigation is presented in Section G.

(8) Conceptual Site Model

The following conceptual Site Model is based on DEC I-Rule Section 35-303(c).

Source of the Releases and Contaminants

The source of the contaminants is spills and process reagents from the historic paper making process, which made their way into the wastewater stream and into the wastewater sludge inside the unused holding basin.

Structural Information

The property hosts an approximately 200,000 square foot paperboard manufacturing plant. The plant obtains pulp and recycled paper from outside sources and produces 7-ply hard stock finished product. The property also includes the following other structures:

- A wastewater treatment plant for process water: The wastewater treatment plant includes four aerated treatment lagoons and a clarifier. The lagoons are approximately 160 feet wide each and are oriented parallel to the Connecticut River. The holding basin lagoon is at the south end of the aerated treatment lagoons, and is unused.
- A water filtration plant for process water: The sand filter house is a single-story cement block building approximately 20 feet wide and 40 feet long. It was built in 1996 to treat process water from the river. It houses a disinfection unit (sodium hypochlorite) stored in a vertical AST, and six large steel tanks containing sand for filtration.
- An agricultural field that has been leased to area farmers in the past.
- The property is on the DEC's Underground Storage Tank (UST) registry and has two active 25,000-gallon #6 fuel oil USTs. The plant's primary heating source is compressed natural gas and fuel oil is a backup source of heat for the plant. Five USTs were also documented as being removed in 1988 and 1990.

Historical Land Uses

The first building (main plant) was constructed in 1960-61. Additions to the building were made in 1967, 1973, 1974, 1978, 1982, 1988, and 1996. The 1893, 1935 and 1954 USGS maps show no development on the property. The only adjoining development was the railway line. A 1951 air photo shows the property was cleared and undeveloped at that time, except for indications of excavation activity along the north end of the property. Adjoining properties appear to be in agricultural use. Excavation appears at the WSWMD landfill site. The 1958 property survey shows the property undeveloped except for an overhead electric line. Historically, the town land records indicate that the property was owned by a succession of individuals through 1958, and then BDCC acquired the property for development as a paper mill. The property was sold by BDCC in 1960, and was owned by a number of corporate entities until late 2018 when BDCC re-acquired the property.

Geology

The property is situated on a flat alluvial terrace overlooking the Connecticut River, and approximately 70 feet higher than the river.[4] The soils beneath the property consist predominantly of sand and gravel according to the subsurface investigations.[5] No natural bodies of water were observed on the property. No exposed bedrock was noted.

[4] USGS, 2018.
[5] Griffin, 1990; Stone Environmental, 2019.

The following geological information is from the 2019 Phase II ESA report.[6] According to the Agency of Natural Resource (ANR) Atlas, the Site is underlain by schist (primary) and metawacke (secondary) bedrock. The bedrock is described as dark gray to coaly-black, fine-grained plagioclase-muscovite-quartz schist and metawacke, shown southeast of Springfield, in part correlative with staurolite-grade rocks mapped as Littleton Formation. Bedrock was reported at depths of 137 and 142 feet below ground surface in two bedrock wells drilled to the west and southwest of the Site where ground surface elevations are relatively similar to that of the Site. Overburden groundwater production wells at the Site were drilled to approximately 100 feet below ground surface. Therefore, it is anticipated that bedrock would be encountered between 100 and 150 feet below ground surface at the Site. Depth to water is approximately was measured between 66 and 69 feet below ground surface in the parking area of the site, and 75 feet below ground surface in the area immediately southeast of the lagoons.

During the 2019 Phase II ESA, strata observed were indicative of a meandering river system bisecting through previously deposited lacustrine deltaic sediments. Coarser sediments with angular to sub-angular grains, like those that are prominent between 0 and 20 feet below ground surface Site-wide, suggest that these sediments are close to their source and that the paleo-Connecticut River flowed at a high velocity along the Site. Groundwater at the northeastern portion of the site, northeast of the wastewater treatment system lagoons, has been reclassified as Class IV groundwater due to contaminants from the Windham SWMD landfill located immediately to the northwest of the site.[7]

Hydrogeology

Depth to groundwater was approximately 70-75 feet below grade during previous Site investigations. The groundwater flow direction beneath the property was estimated to be northwesterly in 1990 and easterly in 1994 and 2019. The groundwater flow direction may be influenced by the Connecticut River elevation and may be subject to inversion at times.[8]

Contaminant Fate and Transport

The wastewater holding basin is a clay-lined containment vessel that was formerly used to store overflow process water until treatment could take place. During the 2019 Phase II ESA, a shallow sample and its duplicate were collected from the center of the holding basin (IP-06-0.5 and IP-06-0.5-FD).

On May 8, 2020, LEE oversaw advancement of four shallow soil borings (LF-1 through LF-4). T&K Drilling of Troy, NH advanced borings LF-1 through LF-4 using a hand auger. Sludge samples were screened for VOCs using a calibrated photoionization detector (PID) and bag headspace screening protocol. Sludge samples were submitted to Con-Test

[6] Stone Environmental, 2019.
[7] Ibid.
[8] Griffin, 1990 and 1994.

Analytical Laboratory of East Longmeadow, Massachusetts for analysis. Samples for analysis of dioxin/furan congeners were submitted to ALS Laboratory of Houston, Texas. Results of sludge sampling were tabulated in comparison to the current Vermont Hazardous Waste Management Regulations (December 2016, VHWMR). The following observations were made:

- The wastewater sludge is loose dark grey granular material with no odor and low density relative to soil and no free liquids.
- A silty clay liner was encountered at 1-2' depth at each of the wastewater sludge locations. The liner appeared to be 4-6" thick.
- No elevated PID field screening readings were obtained. The PID readings ranged from 0.0-0.1 ppm.
- None of the potentially hazardous constituents included in the VHWMR with numerical thresholds were reported at concentrations exceeding those thresholds. This included VOCs, SVOCs, PCBs and metals. Results of TCLP metals testing were non-detectable and below all thresholds.
- Reported elevated total chromium and total lead concentrations from the 2019 Phase II ESA were not replicated in this testing.
- Laboratory-measured pH was acidic and ranged from 4.3-5.1 standard units.
- The sum of five Vermont-regulated PFAs concentration was present in the sludge at concentrations ranging from 0.096-0.152 milligrams per kilogram (mg/kg). This is comparable to the results of the 2019 Phase II ESA testing.
- Reactivity via cyanide and sulfide was non-detectable and the sludge was not ignitable.
- Dioxin/furan congeners were present at detectable concentrations. Reported toxicity equivalency as 2,3,7,8-TCDD ranged from 1.15-2.38 x 10^{-5} mg/kg. These results were roughly an order of magnitude higher than those from the 2019 Phase II ESA.

The tabulated sludge testing results and laboratory report are in Appendix 3.

LEE tabulated the sludge testing results versus current criteria for hazardous waste in the State of Vermont.[9] A spreadsheet summary of the results compared to current hazardous waste criteria is included in Appendix 3. These results suggest the following regarding the holding basin sludge

- Chromium and lead concentrations generated during the 2019 Phase II ESA exceeded the "Rule of 20" for the toxicity characteristic leaching procedure; however, total metals and TCLP metals data generated during the Corrective Action Investigation showed lower total metals concentrations not in excess of the "Rule of 20" concentrations, and non-detectable TCLP metals concentrations. The elevated total chromium and total lead concentrations could not be replicated during the Corrective Action Investigation.

[9] Vermont Hazardous Waste Management Regulations, December 2016.

- PCBs were present at concentrations well below 50 parts per million, which is EPA's threshold for "Bulk Product Waste" and Vermont's Hazardous Waste listing threshold. PCB concentrations below 1 ppm were generated during the Corrective Action Investigation and PCB concentrations greater than 1 ppm generated during the Phase II ESA were not replicated. These data indicate that the sludge is classified as remediation waste due to PCBs above 1 ppm.
- The Corrective Action Investigation confirmed the 2019 Phase II finding that PFAs are present in the sludge at measurable concentrations. At present, there is no Vermont threshold for designation of solid matrices containing PFAs as hazardous waste. PFAs are not listed as hazardous waste under RCRA at the present time. Legislation in the US Congress in January 2020 proposes to regulate PFOA and PFOS in waste at the national level, but it has not passed and become law as of February 2021. This uncertain regulatory status has led to the disposal contractors handling PFA containing waste as hazardous and recommending incineration in most instances.
- The Corrective Action Investigation confirmed the 2019 Phase II finding that Dioxin Toxicity Equivalency (TEQ) as 2,3,7,8-TCDD was present in the lagoon sludge samples.

Receptor Study and Evaluation

1. Site Users: Site users include primarily paper company workers, who are indoors for most of the time. Outdoor activities including parking, grounds maintenance, and operation of the water and wastewater plants. Most of the Site used by employees is paved or covered by the building.
2. Adjoining Properties: Adjoining properties would not be affected by reported contamination in the treatment lagoon, which is a closed structure.
3. Wetlands and Surface Water Bodies: No surface water bodies or wetlands are present on Site. The 2019 Phase II ESA report indicates that impact to the Connecticut River from identified contaminant sources is not taking place.
4. Public and Private Water Supplies: The Site and surrounding area are served by a municipal water supply system. There are two on-Site water wells for paper production that have low levels of MTBE in them. The water is not for potable purposes and does not impact Site users.
5. Public Utility Corridors in the vicinity of the Site include buried water, sewer, and storm drain lines. The 2019 Phase II ESA report findings do not suggest that public utility corridors are at risk from the contamination.

(9) Investigation Derived Waste:

Shallow soil samples will be collected from beneath the removed sludge and liner. Any surplus soil left after filling the sample collection jars will be placed back into the borehole.

(10) Quality Assurance and Quality Control Plan

This document comprises the required Quality Assurance and Quality Control Plan.

(11) Maps

Site maps showing the intended sampling locations are included in Appendix 2.

(12) Latitude/longitude of the Site

The center of property coordinates are 42° 53' 22.34'' north latitude and 72° 32' 34.28'' west longitude.

(13) Estimated Costs

Estimated costs have been presented to BDCC.

(14) Implementation Schedule

The work is forecast to take place according to the following implementation schedule.

- QAPP Review: February 1-June 30, 2021.
- Fieldwork: Subject to contractor's schedule, estimated to be July-August 2021
- Laboratory analysis: Will be requested on 5 day turnaround from sampling date.
- Reporting: One month following receipt of results.

(15) Signature

Signed in Section A.

Section D: Project Objectives

The project objectives are to verify that contaminated sludge and liner materials have been removed to the extent necessary to result in no, or minimal, restrictions on future land use. The sampling design set forth in Section E provides sufficient work scope to provide the necessary data to proceed with cleanup planning.

Section E: Sampling Design

The following sampling design will provide necessary data regarding identified REC and other environmental conditions identified in the Phase I and Phase II ESAs and according to the project objectives as outlined in Section D.

LEE will conduct soil confirmation/verification sampling and testing after the sludge and liner are removed.

Verification sampling and testing (to meet USEPA TSCA requirements): 35 composite soil samples and 2 duplicate samples will be collected using disposable EasyDraw Syringes. The samples will be collected from 105 discrete sampling locations from 0-3" depth. The sampling grid will be marked out in advance of the sampling. Each composite sample will be drawn from three adjacent discrete sampling locations as shown on the composite soil sampling plan in Appendix 2. Additionally, 13 wipe samples and 1 duplicate sample will be collected from piping associated with the lagoon closure, and up to 4 aqueous washwater samples and 1 duplicate sample will be collected and tested for PCBs.

Confirmation sampling and testing (to meet Vermont DEC requirements): A hand auger will be used to advance four borings 6" deep inside the overflow lagoon. Soil borings will be advanced at the locations as shown on the Confirmation Sampling Plan in Appendix 2. Four grab samples and one duplicate sample will be collected from four soil borings shown on the Confirmation Sampling Plan for analysis of:

- PCBs via EPA Method 8082 with Soxhlet extraction via EPA Method 3540C
- Dioxin/Furan Congeners via EPA Method 8290
- RCRA 8 Metals via EPA Method 6010

Samples will be submitted Eastern Analytical Inc. of Concord, NH for analysis, except for Dioxin/Furan Congeners, which will be submitted to ALS Environmental of Simi Valley, CA.

Data Validation and Reporting

Following receipt of analytical data, LEE's quality assurance officer will validate the data according to the site-specific QAPP and LEE's generic QAPP procedures. A Brownfields Corrective Action Construction Completion Report will be prepared for review and approval. A description of the methodologies and results will be included. Comparison with appropriate environmental and materials quality standards will be made. The report will also contain: a site map, sampling locations map, laboratory analytical data, conclusions, and other recommendations, as applicable.

Section F: Sampling and Analytical Method Requirements

Parameter & Matrix	Number of Samples # + QA	Analytical Method (Section G)	Sampling SOP Form F-1	Containers per Sample (number, size and type)	Preservation	Extraction Hold Time (days)	Post Extraction Hold Time (days)
PCBs Soil	35 + 2 duplicate composite 4+1 duplicate grab	EPA M8082 Soxhlet Extraction EPA M3540c	A, E	1-4 oz ag	Cool 4°C	14	40
Wipe	13 + 1 duplicate		Footnote 10, SOP E[10]	Laboratory supplied solvent wipe	Cool 4°C	14	40
Aqueous (washwater)	4 + 1 duplicate		Footnote 11, SOP E[11]	1-liter amber jar	Cool 4°C	7	40
RCRA 8 Metals Soil	4 + 1 duplicate	EPA M6020 and 245.1	A, E	1-4oz cg	Cool 4°C	90	90
Dioxin Soil	4 + 1 duplicate	EPA M8290	A, E	1-8 oz ag	Room Temperature	45	45
Key to Containers: cg= clear glass; ag=amber glass; p=plastic; ss=stainless steel							

Section G: Methods and SOP Reference Table

Following is a description of LEE and laboratory methods and standard operating procedures to be employed during this work. LEE SOPS are included in LEE's generic QAPP document, Exhibit A.

- LEE SOP A: Soil Sampling (January 24, 2019)
- LEE SOP E: Sample Handling (January 24, 2019)

[10] The Standard Wipe Test will be performed as specified in 40 CFR § 761.123. The wipes will be supplied by and analyzed by Eastern Analytical.
[11] Washwater samples will be collected directly from the collection containers into the sampling containers by dipping the sampling container into the collection container, or by using a disposable bailer if the collection container access is too small.

Summary of Laboratory Analytical Procedures to be used during this work:

Matrix and Analytes	Laboratory Analytical Procedures
Metals in Soil and Groundwater	Standard Operating Procedure Inductively Coupled Plasma – Mass Spectrometry, Method EPA 6020A; June 10, 2015, revision #6, Eastern Analytical, Inc.
PCBs in Soil	Standard Operating Procedure PCB and Pesticide Analysis EPA Method 8081B, 8082A and 608.3; August 2018, Revision #0, Eastern Analytical, Inc.
Soxhlet Extraction	Standard Operating Procedure Methods 8081A and 8082 Solid Sample Extraction by Soxhlet, Method 3540C; January 29, 2015, Revision #7, Eastern Analytical, Inc.
Dioxin in Soil	Standard Operating Procedure, Analysis of Polychlorinated Dibenzo-P-Dioxins and Polychlorinated Dibenzofurans by High Resolution Gas Chromatography/High Resolution Mass Spectrometry, February 28, 2018, ALS Environmental

Section H: Field Equipment Calibration and Corrective Action

Data contained in LEE Generic QAPP V1 (RFA 19093), Section H.

Section I: Lab Equipment Calibration and Corrective Action

Data contained in LEE Generic QAPP V1 (RFA 19093), Section I.

Section J: Sample Handling and Custody Requirements

Data contained in LEE Generic QAPP V1 (RFA 19093) Section J.

Section K: Analytical Sensitivity and Project Criteria

The form K tables (Appendix 3) were compiled based on the project's sampling design, analytical requirements, and relevant regulatory criteria. The criteria have been checked to verify that the numbers presented herein are current. The shaded compounds / media / regulatory criteria have one or more applicable regulatory criteria below the laboratory reporting limit. Based on review of these criteria and the project's scope and context, LEE does not believe that the highlighted entries will impede analysis of the data because these compounds are not likely to occur in isolation and are more likely to be associated with other similar compounds.

Section L: Field Quality Control Requirements

Field quality control measures are included in Section F per guidance presented in LEE's Generic QAPP document (RFA 19093), Section L.

Section M: Laboratory Quality Control Requirements

Laboratory quality control requirements are included in laboratory SOPs presented in LEE's Generic QAPP document (RFA 19093), Exhibit 2.

Section N: Data Management and Documentation

Data management and documentation requirements are presented in LEE's Generic QAPP document (RFA 19093), Section N.

Section O: Assessment and Response Actions

Assessment and Response Actions are presented in LEE's Generic QAPP document (RFA 19093), Section O.

Section P: Project Reports

Upon receipt of the laboratory data, a report will be prepared to address data usability and any sampling problems or modifications and will provide a quality assurance and quality control of the field and laboratory data collected and received. The report will include the specific sample locations, field observations, laboratory data summary tables, contaminant distribution maps, and conclusions relating to soil and groundwater. Reports will be submitted to the DEC and the EPA Project Officer for review.

Section Q: Field Data Evaluation

The project manager and QA reviewer will evaluate field data collected during cleanup planning activities. The field data will be reviewed for accuracy, completeness, precision and compliance with LEE SOP requirements and site-specific QAPP addendum work scope requirements. The evaluation will be documented in the project quality assurance report, which will be an appendix or attachment to the project report.

Section R: Laboratory Data Evaluation

The laboratory analytical results will be verified by the QA reviewer per LEE Generic QAPP (RFA 19093) Section R.

Section S: Data Usability and Project Evaluation

Assessment of data usability will be performed per LEE Generic QAPP (RFA 19093) Section S.

APPENDIX 1

SITE LOCATION MAP

Long Falls Paperboard

161 Wellington Road, Brattleboro, Vermont

LE·Environmental

2018 USGS Map

LE #: 18-122
Date: March 16, 2020
Source: USGS Store

APPENDIX 2

BROWNFIELDS CORRECTIVE ACTION SITE MAPS

WASTEWATER TREATMENT LAGOON

PROCESS WASTE PIPE

(ROWS)

(COLUMNS)

GATE

INDEX CONTOUR	
MINOR CONTOUR	
RAILROAD TRACKS	
PAVED ROAD/DRIVE	
GRAVEL ROAD/DRIVE	
WATER	
DRAIN	
UNDERGROUND ELECTRIC	
GAS	
HYDRANT	
MONITOR WELL	

GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)

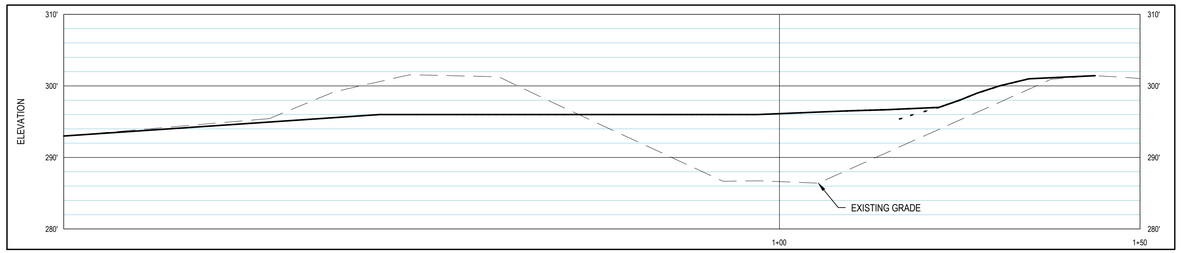
Grab Sample Locations

AREA OF ACCUMULATED SLUDGE

COMPOSITE SAMPLE LOCATIONS

COMPOSITE SAMPLE

(COLUMN, ROW) S.S.



SITE SECTION A-A'

H: 1"=10'

V: 1"=10'

REV.	DATE	DESCRIPTION	BY

1438 SOUTH BROWNELL ROAD
WILLISTON, VERMONT 05495
PHONE: (802)862-3500
FAX: (802)862-1568

GREEN MOUNTAIN ENGINEERING

CIVIL
WATER
WASTEWATER

DRAWING TITLE: LONG FALLS PAPERBOARD CONFIRMATION SAMPLING PLAN - HOLDING BASIN LAGOON

PROJECT: LONG FALLS PAPERBOARD LAGOON REMEDIATION

CLIENT: BRATTLEBORO DEVELOPMENT CREDIT CORPORATION

DESIGNED: AH	PLOT DATE: 04/22/21
DRAWN: JJB	SCALE: 1" = 10'
CHECKED: AH	DATE: FEB. 2021

PROJECT NO.
25-005.18

DRAWING NO.
3

SHEET 3 OF 3

FILE: S:\ME PROJECT FILES\25-005\25-005.18 LE ENVIRONMENTAL\25-005.18 BDS\LONG FALLS PAPER MILL\DRAWINGS\FINAL DRAWINGS 4-16-21 EPA CHANGES.DWG

LEE
LE·Environmental
21 North Main Street Unit #1
Waterbury, Vermont
Phone: 802-917-2001
www.leenv.net

Holding Basin Sampling Map
Long Falls Paperboard
161 Wellington Road
Brattleboro, Vermont

Legend
- Soil Boring/Soil Sample
- Sludge Sample
- Paper Sludge Piles

Drawing Date: 8/13/20
LEE Project #: 18-122

APPENDIX 3

SLUDGE DATA TABLE AND FORM K TABLES

Brownfields Cleanup Confirmation Sampling
Analytical Sensitivity and Project Criteria (Form K) Tables
Long Falls Paperboard
161 Wellington Road, Brattleboro, Vermont

Soil Analyte Category/Compound	*Reporting Limit*	*EPA Industrial RSL*	*VSS Non-Residential*
POLYCHLORINATED DIOXIN (ng/kg, as TEQ)(ALS Laboratory)			
Tetrachlorodibenzo-p-dioxin, 2,3,7,8-TCDD)	0.5	-	13.7
TOTAL METALS, EPA Method 6020 (mg/kg, dry) (Eastern Analytical)			
Total Arsenic	0.2	-	16
Total Barium	0.5	-	127,382
Total Cadmium	0.5	-	87
Total Chromium	0.5	-	360,223
Total Lead	0.5	-	800
Total Mercury	0.1	-	3.1
Total Selenium	0.5	5,800	-
Total Silver	0.5	-	2,483
PCBS, EPA Method 8082 (mg/kg, dry)(Eastern Analytical)			
Aroclor-1016	0.02	27	-
Aroclor-1221	0.02	0.83	-
Aroclor-1232	0.02	0.72	-
Aroclor-1242	0.02	0.95	-
Aroclor-1248	0.02	0.95	-
Aroclor-1254	0.02	0.97	-
Aroclor-1260	0.02	0.99	-
Aroclor-1262	0.02	-	-
Aroclor-1268	0.02	-	-
Total PCBs		1 (TSCA)	0.68

NOTES:
Vermont Soil Standards (VSS) and Statewide Background Concentrations from July 2019 DEC I-Rule
EPA Regional Screening Levels (RSLs) from April 2019 RSL Summary Table. RSLs not included when a VSS exists.
Dashed Cell=no published value (VSS) or published value not applicable (RSL)

Brownfields Cleanup Confirmation Sampling
Analytical Sensitivity and Project Criteria (Form K) Tables
Long Falls Paperboard
161 Wellington Road, Brattleboro, Vermont

Aqueous Compound	*Reporting Limit*	*EPA TSCA Threshold*
PCBS, EPA Method 8082 (ug/l)(Eastern Analytical)		
Aroclor-1016	0.2	-
Aroclor-1221	0.2	-
Aroclor-1232	0.2	-
Aroclor-1242	0.2	-
Aroclor-1248	0.2	-
Aroclor-1254	0.2	-
Aroclor-1260	0.2	-
Aroclor-1262	0.2	-
Aroclor-1268	0.2	-
Total PCBs		0.50

NOTES:
EPA TSCA Threshold from 40 CFR § 761.79
Dashed Cell=no published value

Wipe Sample Compound	*Reporting Limit*	*EPA TSCA Threshold*
PCBS, EPA Method 8082 (ug/wipe)(Eastern Analytical)		
Aroclor-1016	0.3	-
Aroclor-1221	0.3	-
Aroclor-1232	0.3	-
Aroclor-1242	0.3	-
Aroclor-1248	0.3	-
Aroclor-1254	0.3	-
Aroclor-1260	0.3	-
Aroclor-1262	0.3	-
Aroclor-1268	0.3	-
Total PCBs		10

NOTES:
EPA TSCA Threshold from 40 CFR § 761.61(a)(4)(ii)
Dashed Cell=no published value

Brownfields Cleanup Site Investigation
Holding Basin Sludge Sample Results
Long Falls Paperboard
161 Wellington Road, Brattleboro, Vermont

Sample ID	*IP-6A (mg/kg)*	*IP-06FD (mg/kg)*	*LF-1*	*LF-2*	*LF-3*	*LF-4*	*Duplicate LF-2*	*TCLP "Rule of 20"*	EPA/DEC TCLP Threshold (mg/l) (2)
Sample Date	*8/15/19*		*5/8/20*						
Collected by/Laboratory	*Stone/Alpha (1)*		*LEE/Con-Test Analytical*						
PID (ppm)	*NT*	*NT*	*0.0*	*0.1*	*0.1*	*0.0*	*0.1*		
Arsenic (Total, mg/kg, dry)	**16**	**6.8**	ND <5.1	ND<4.9	ND<5.4	ND<6.0	ND<5.0	100	---
Arsenic (TCLP, mg/l)	NT	NT	ND<0.050	ND<0.050	ND<0.050	ND<0.050	ND<0.050	---	5.0
Barium (Total, mg/kg, dry)	**156**	**143**	**130**	**93**	**110**	**93**	**85**	2000	---
Barium (TCLP)	NT	NT	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	---	100.0
Benzene	ND	ND	ND<0.11	ND<0.12	ND<0.12	ND<0.13	ND<0.10	10	0.5
Cadmium (Total, mg/kg, dry)	**8.55**	**3.66**	ND<0.51	ND<0.49	ND<.0.54	ND<0.60	ND<0.5	20	---
Cadmium (TCLP)	NT	NT	ND<0.010	ND<0.010	ND<0.010	ND<0.010	ND<0.010	---	1.0
Carbon tetrachloride	ND	ND	ND<0.11	ND<0.12	ND<0.12	ND<0.13	ND<0.10	10	0.5
Chlordane	NT	NT	NT	NT	NT	NT	NT	1	0.03
Chlorobenzene	ND	ND	ND<0.11	ND<0.12	ND<0.12	ND<0.13	ND<0.10	2000	100.0
Chloroform	**0.0013**	**0.004**	ND<0.22	ND<0.23	ND<0.24	ND<0.26	ND<0.20	120	6.0
Chromium (Total, mg/kg, dry)	**311**	**140**	**45**	**42**	**44**	**29**	**47**	100	---
Chromium (TCLP)	NT	NT	ND<0.050	ND<0.050	ND<0.050	ND<0.050	ND<0.050	---	5.0
o-Cresol (2-methylphenol)	ND	ND	ND<1.0	ND<1.0	ND<2.2	ND<1.2	ND<1.0	4000	200.0
m-Cresol (3-methylphenol)	ND	ND	ND<1.0	ND<1.0	ND<2.2	ND<1.2	ND<1.0	4000	200.0
p-Cresol (4-methylphenol)	ND	ND	ND<1.0	ND<1.0	ND<2.2	ND<1.2	ND<1.0	4000	200.0
Cresol (total)	NT	NT	NT	NT	NT	NT	NT	4000	200.0
2,4-D	NT	NT	NT	NT	NT	NT	NT	200	10.0
1,4-Dichlorobenzene	ND	ND	ND<0.11	ND<0.12	ND<0.12	ND<0.13	ND<0.10	150	7.5
1,2-Dichloroethane	ND	ND	ND<0.11	ND<0.12	ND<0.12	ND<0.13	ND<0.10	10	0.5
1 ,1-Dichloroethene	ND	ND	ND<0.11	ND<0.12	ND<0.12	ND<0.13	ND<0.10	14	0.7
2,4-Dinitrotoluene	NT	NT	ND<1.0	ND<1.0	ND<2.2	ND<1.2	ND<1.0	3	0.13
Endrin	NT	NT	NT	NT	NT	NT	NT	0.4	0.02
Heptachlor/Heptachlor Epoxide	NT	NT	NT	NT	NT	NT	NT	0	0.008
Hexachlorobenzene	ND	ND	ND<1.0	ND<1.0	ND<2.2	ND<1.2	ND<1.0	3	0.13
Hexachlorobutadiene	ND	ND	ND<0.11	ND<0.12	ND<0.12	ND<0.13	ND<0.10	10	0.5
Hexachloroethane	ND	ND	ND<1.0	ND<1.0	ND<2.2	ND<1.2	ND<1.0	60	3.0
Lead (Total, mg/kg, dry)	**633**	**555**	**65**	**60**	**43**	**32**	**56**	100	---
Lead (TCLP)	NT	NT	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	---	5.0
Lindane	NT	NT	NT	NT	NT	NT	NT	8	0.4
Mercury (Total, mg/kg, dry)	**3.45**	**3.04**	**0.22**	**0.47**	**0.18**	**0.12**	**0.45**	4	---
Mercury (TCLP)	NT	NT	ND<0.00010	ND<0.00010	ND<0.00010	ND<0.00010	ND<0.00010	---	0.2
Methoxychlor	NT	NT	NT	NT	NT	NT	NT	200	10.0
2-Butanone(MEK)	ND	ND	ND<2.2	ND<2.3	ND<2.4	ND<2.6	ND<2.0	4000	200.0
Nitrobenzene	ND	ND	ND<1.0	ND<1.0	ND<2.2	ND<1.2	ND<1.0	40	2.0
Pentachlorophenol	ND	ND	ND<1.0	ND<1.0	ND<2.2	ND<1.2	ND<1.0	2000	100.0

NOTES:
(1) Stone/Alpha Data from Phase II Environmental Site Assessment Report, Long Falls Paperboard, October 2019
(2) TCLP Thresholds from EPA Hazardous Waste Characteristics, October 2009 and Vermont DEC Hazardous Waste Management Regulations, December 31, 2016
(3) PFAs values per DEC I-Rule, sum of PFOS, PFOA, PFHxS, PFHpA, PFNA (ug/kg)

Brownfields Cleanup Site Investigation
Holding Basin Sludge Sample Results
Long Falls Paperboard
161 Wellington Road, Brattleboro, Vermont
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Sample ID	*IP-6A (mg/kg)*	*IP-06FD (mg/kg)*	*LF-1*	*LF-2*	*LF-3*	*LF-4*	*Duplicate LF-2*	*TCLP "Rule of 20"*	EPA/DEC TCLP Threshold (mg/l) (2)
Sample Date	*8/15/19*		*5/8/20*						
Collected by/Laboratory	*Stone/Alpha (1)*		*LEE/Con-Test Analytical*						
PID (ppm)	*NT*	*NT*	*0.0*	*0.1*	*0.1*	*0.0*	*0.1*		
Pyridine	ND	ND	ND<1.0	ND<1.0	ND<2.2	ND<1.2	ND<1.0	100	5.0
Selenium (Total, mg/kg, dry)	**1.08**	**0.62**	ND<5.1	ND<4.9	ND<5.4	ND<6.0	ND<5.0	20	---
Selenium (TCLP)	NT	NT	ND<0.050	ND<0.050	ND<0.050	ND<0.050	ND<0.050	---	1.0
Silver (Total, mg/kg, dry)	**0.811**	**0.71**	**0.68**	ND<0.49	**0.54**	**0.80**	ND<0.5	100	---
Silver (TCLP)	NT	NT	ND<0.050	ND<0.050	ND<0.050	ND<0.050	ND<0.050	---	5.0
Tetrachloroethene (PCE)	ND	ND	ND<0.11	ND<0.12	ND<0.12	ND<0.13	ND<0.10	14	0.7
Toxaphene	NT	NT	NT	NT	NT	NT	NT	10	0.5
Trichloroethene (TCE)	ND	ND	ND<0.11	ND<0.12	ND<0.12	ND<0.13	ND<0.10	10	0.5
2,4,5-Trichlorophenol	NT	NT	ND<1.0	ND<1.0	ND<2.2	ND<1.2	ND<1.0	8000	400.0
2,4,6-Trichlorophenol	NT	NT	ND<1.0	ND<1.0	ND<2.2	ND<1.2	ND<1.0	40	2.0
2,4,5-TP Silvex	NT	NT	NT	NT	NT	NT	NT	20	1.0
Vinyl Chloride	ND	ND	ND<0.22	ND<0.23	ND<0.24	ND<0.26	ND<0.20	4	0.2

Sample ID	*IP-6A (mg/kg)*	*IP-06FD (mg/kg)*	*LF-1*	*LF-2*	*LF-3*	*LF-4*	*Duplicate LF-2*	EPA/DEC HW Threshold (mg/kg) (2)
Sample Date	*8/15/19*		*5/8/20*					
Collected by/Laboratory	*Stone/Alpha (1)*		*LEE/Con-Test Analytical*					
PID (ppm)	*NT*	*NT*	*0.0*	*0.1*	*0.1*	*0.0*	*0.1*	
Aroclor - 1016	ND	ND	ND<0.12	ND<0.12	ND<0.12	ND<0.14	ND<0.12	
Aroclor - 1221	ND	ND	ND<0.12	ND<0.12	ND<0.12	ND<0.14	ND<0.12	
Aroclor - 1232	ND	ND	ND<0.12	ND<0.12	ND<0.12	ND<0.14	ND<0.12	
Aroclor - 1242	ND	ND	ND<0.12	ND<0.12	ND<0.12	ND<0.14	ND<0.12	
Aroclor - 1248	ND	ND	ND<0.12	ND<0.12	ND<0.12	ND<0.14	ND<0.12	
Aroclor - 1254	**2.66**	**1.68**	**0.38**	**0.47**	**0.38**	**0.38**	**0.67**	50 (total)
Aroclor - 1260	**0.865**	**1.04**	ND<0.12	**0.20**	**0.18**	**0.19**	**0.56**	
Aroclor - 1262	ND	ND	ND<0.12	ND<0.12	ND<0.12	ND<0.14	ND<0.12	
Aroclor - 1268	ND	ND	ND<0.12	ND<0.12	ND<0.12	ND<0.14	ND<0.12	
pH	NT	NT	5.1	4.6	4.6	4.3	4.7	≤2 or ≥10
Percent Solids	58	62	65.5	65.2	59.8	55.5	65.3	None
Reactivity (CN/S)	NT	NT	ND	ND	ND	ND	ND	250 / 500
Per- and polyfluoroalkyl substances (PFAS)(mg/kg)	**0.165**	**0.142**	**0.097**	**0.110**	**0.096**	**0.152**	**0.096**	None
2,3,7,8-TCDD Toxicity Equivalency	**1.14E-06**	**1.14E-06**	**1.24E-05**	**2.38E-05**	**1.60E-05**	**1.15E-05**	**1.64E-05**	None
TPH	NT	NT	2,900	3,100	4,300	5,200	3,300	50,000
Ignitibility/Flashpoint	NT	NT	Absent	Absent	Absent	Absent	Absent	Present/Absent

NOTES:
(1) Stone/Alpha Data from Phase II Environmental Site Assessment Report, Long Falls Paperboard, October 2019
(2) TCLP Thresholds from EPA Hazardous Waste Characteristics, October 2009 and Vermont DEC Hazardous Waste Management Regulations, December 31, 2016