



FUSS & O'NEILL
Disciplines to Deliver

October 24, 2011

Ms. Jerry Minor-Gordon
United States Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912

RE: Analysis of Brownfields Cleanup Alternatives
Former Brookfield Mill Site
59-67 Mill Street
Brookfield, Massachusetts
Mass DEP RTNs 2-10354 and 14601

Dear Ms. Minor-Gordon:

Fuss & O'Neill Inc. (Fuss & O'Neill) has conducted an analysis of potential brownfields cleanup alternatives for the environmental remediation planned at the Former Brookfield Mill Site, located at 59-67 Mill Street in Brookfield, Massachusetts (the site). Three remedial alternatives for the mitigation of soil containing regulated levels of hazardous materials and fill material at the site were evaluated on the basis of protectiveness, implementability, and cost. A summary of the documented environmental conditions, the evaluations of remedial alternatives, and the preferred remedial alternative are described herein. Fuss & O'Neill prepared this analysis on behalf of the Town of Brookfield (the Town). This analysis will be finalized following the completion of public notice, presentation of this analysis at a public meeting, and a 30-day public comment period to solicit feedback from the community regarding the proposed strategy.

Site History, Environmental Conditions, and Current Status

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The subject property, the former Brookfield Mill, is located at 59-67 Mill Street and consists of one rectangular-shaped, 0.667-acre parcel on the southern side of Mill Street, identified as Town Tax Assessor's Map 6C, Block 2, Lot 105. A site location map and site plan are attached hereto as *Figures 1 and 2*, respectively.

Between 1893 and 2000, the Brookfield Mill, a four-story wooden building, occupied the subject site. In August 2000, the building burned to the ground and was razed into its foundation.

Connecticut
Massachusetts
New York
Rhode Island
South Carolina

The subject property is bordered to the north by the Town Highway Department Garage, to the south by a railroad operated by CSX and undeveloped wetlands, to the west by the intersection of Mill Street, River Street, and Fiskdale Road, and to the east by another mill

Ms. Jerry Minor-Gordon
October 24, 2011
Page 2

complex. The subject property is currently undeveloped. At surface grade, there is visible evidence of the building foundation of the former Brookfield Mill.

The “disposal site” encompasses the majority of the subject property, excluding the western approximate one-third of the property. The disposal site includes the areas of the subject property where hazardous materials and physical hazards have come to exist as a result of releases at the subject site. The disposal site includes soil that contains hazardous materials as the result of the release documented by Release Tracking Number (RTN) 2-10354.

The Town acquired the subject property in 2003 and is the current property owner. The former Brookfield Mill occupied the site from 1893 until August 2000, when it was destroyed by fire. Businesses that operated in the former mill building included a paper-coating company, a shoe manufacturer, a plastic molding business, and a charcoal filter manufacturer, among other small businesses. Following the August 2000 fire, the building remnants were either razed or collapsed and were used to fill the building basement (Town of Brookfield, 2011). The site has remained vacant following the fire.

The following environmental investigations have been conducted at the site:

- *Phase I Limited Site Investigation* completed by Lycott Environmental Research, Inc. in August 1991
- *Targeted Brownfield Assessment* completed by Metcalf & Eddy, Inc. (M&E) in November 2002
- *Phase I Initial Site Investigation* completed by M&E in January 2004
- *Phase II Comprehensive Site Assessment Report* completed by M&E in November 2007
- *Targeted Brownfield Assessment* and *Phase III Remedial Action Plan* completed by Advanced Environmental Solutions, Inc. (AES) and AECOM Environment (AECOM) in March 2009
- *Release Abatement Measure Plan* (RAM Plan) by Fuss & O'Neill in September 2011

The subject property has been regulated by the Massachusetts Department of Environmental (MassDEP) Bureau of Waste Site Cleanup (BWSC) since March 1995, when RTN 2-10354 was assigned based on conditions identified during the August 1991 *Phase I Limited Site Investigation*. A second RTN (2-14601) was assigned following identification of 120-day Reportable Condition at the subject property during the 2002 *Targeted Brownfield Assessment*. The second RTN was later linked to the original and is currently classified as closed by MassDEP (AES and AECOM, 2009).

Investigations conducted at the site documented the presence of solid waste and hazardous materials in soil at the subject property which warrant remediation under the Massachusetts

Ms. Jerry Minor-Gordon
October 24, 2011
Page 3

Contingency Plan (MCP; 310 CMR 40.0000) to achieve a condition of No Significant Risk to future users of the property, which the Town intends to redevelop as a public park featuring recreational access to the nearby Quaboag River.

The hazardous materials identified in soil at the property consisted of metals, polycyclic aromatic hydrocarbons (PAH), and polychlorinated biphenyls (PCBs), which were generally attributed to the building debris and ash associated with the August 2000 fire. The horizontal extent of the disposal site was documented to be limited to the former building foundation. The vertical extent of the disposal site was estimated to coincide with the depth of fill and associated disturbed soil within the former building foundation hole, which reportedly extended to between 5 and 10 feet below grade. In addition to regulated soil, solid waste, including glass, rusted metal, wood, and wire, and unstable ground slopes were identified as potential safety hazards at the site (AES and AECOM, 2009).

Based on the results of the previous environmental investigations, remedial actions are warranted at the subject property to achieve a permanent solution and bring the site into compliance with the MCP. The primary remedial objectives documented in the March 2009 *Targeted Brownfield Assessment* and *Phase III Remedial Action Plan* were to:

- mitigate the potential for direct exposure to soil containing regulated concentrations of hazardous materials and solid waste at the disposal site
- remove unstable slopes at the disposal site

Fuss & O'Neill, on behalf of the Town, will coordinate, design, and oversee implementation of the selected remedial alternative.

Brownfields Cleanup Alternatives

In April 2010, the Town was selected for a \$200,000 USEPA Brownfields Cleanup Grant for remedial activities at the Site. The Town intends to use the grant money to conduct community involvement activities, the remedial activities recommended herein, and regulatory reporting associated with the site.

Two commingled and related environmental conditions are currently associated with the site. Soil at the site, generally within the footprint of the former building foundation contains regulated levels of compounds of concern, and as a result of the mill fire ash, demolition debris, and other detritus have been deposited in the building footprint. This detritus was considered to pose a physical safety and potential stability risk.

Soil containing regulated compounds of concern and debris at the site has been adequately characterized to consider the remedial alternatives described below. Previous assessments have documented that the groundwater at the site is compliant with the applicable

Ms. Jerry Minor-Gordon
October 24, 2011
Page 4

MassDEP Method 1 Groundwater Standards, and that no further action is warranted with regard to groundwater at the site. Therefore, the cleanup alternatives evaluated pertain solely to the mechanism of direct exposure to regulated soil at the site.

Soil Contamination Alternative #1: No Action

No action may be feasible as an appropriate remedial alternative at certain properties, as existing site conditions may not pose an unacceptable risk.

Protectiveness

A regulated release of hazardous materials to soil was documented at the site. Soil concentrations of the contaminants of concern (COC) at the site exceeded applicable MassDEP risk-based criteria and must be managed accordingly. Remedial action is warranted to minimize exposure to these contaminants and reduce risks to future site users. This cleanup alternative would not be an effective remedial alternative to achieve a permanent solution and a Condition of No Significant Risk at the site as required by MassDEP regulations.

Implementability

Implementation of a “no action” alternative is technically feasible, as no action would be taken. However, the Town has entered an Administrative Consent Order (ACO) with MassDEP, which requires completion of remedial activities to minimize exposure to regulated soil at the site. Deliberate inaction would violate the ACO and potentially result in enforcement actions by MassDEP against the Town.

Additionally, a “no action” alternative would be inconsistent with the Town’s goal of site reuse as a public access point. Site conditions currently pose a potential risk to users and therefore, a public access point cannot be developed until this risk is addressed.

Therefore, while this process may be technically possible, it is not feasible to implement this alternative while still achieving regulatory compliance as well as the Town’s eventual goal of site reuse.

Cost

By not conducting response actions, the Town would not incur an immediate cost for remediation. However, as stated above, deliberate inaction could result in enforcement actions against the Town, which could carry unspecified financial penalties, and undefined opportunity costs based on the inability to redevelop this priority parcel.



Ms. Jerry Minor-Gordon

October 24, 2011

Page 5

Soil Contamination Alternative #2: Excavation and Off-Site Disposal of Soil Containing Metals and Debris

Excavation and off-site disposal of soil containing hazardous materials and debris may be an effective way of reducing risks posed by hazardous materials at the site by physically removing the source material.

Protectiveness

By removing the soil from the site, long-term risks to human health and the environment at the site would be mitigated. During excavation and transportation of soil, there may be short-term high-intensity direct exposure risks to human health and the environment at the site, as well as at the final destination of the excavated materials. However, personnel conducting these activities would be required to have appropriate training and personnel protective equipment to mitigate significant risks to their health during remediation activities. The off-site disposal location would be a licensed receiving facility designed to mitigate off-site migration of hazardous material. Therefore, this alternative would result in the secure long-term disposal of the material, mitigating future risks to both on-site and off-site receptors.

Implementability

Implementation of excavation and off-site disposal of soil as a remedial alternative is technically feasible. The regulated soil is located within the footprint of the former mill building and would be accessible for heavy equipment.

Implementation of excavation and off-site disposal of soil containing hazardous materials as a remedial alternative would comply with the MCP as well as other state and local laws. Any modifications to grade at the site will have to be managed in accordance with municipal by-laws and Orders of Conditions issued by the Conservation Commission.

Cost

The costs of excavation, transportation, and disposal of the volumes of regulated soil at the site may be considered to be excessive. Previous environmental investigations have indicated that approximately 7,700 cubic yards of material exhibit concentrations of leachable lead constituting a hazardous waste under the Federal *Resource Conservation and Recovery Act*. Although the volume could be reduced by segregation of metal debris and similar materials, excavation, transportation and landfill disposal of the volume of hazardous waste present at the site would be financially prohibitive. A previous evaluation of the cost of this alternative estimated that it would be approximately \$1.6 million (AECOM-AES, 2009). Stabilization of the material (via a process typically involving Portland cement to create a material resembling concrete-aggregate) would reduce the cost by making the soil non-hazardous, thereby facilitating disposal off-site in a lined municipal

Ms. Jerry Minor-Gordon
October 24, 2011
Page 6

solid waste landfill. However, the cost of this alternative, including disposal fees, transportation to an appropriately licensed facility, and the unit cost of stabilization, is typically approximately one-third of the cost of disposal of hazardous waste, and would still exceed \$500,000.

Following the excavation and off-site disposal of regulated soil at the site, there would be the follow-up cost of backfilling, restoring grades, and redeveloping the site for future use. The costs for backfilling and restoration is estimated to be between \$150,000 and \$200,000.

Based on the range of costs described herein, this remedial alternative could not be completed by the Town with the funds available in the \$200,000 USEPA Brownfields Cleanup Grant. Therefore, excavation and off-site disposal is considered financially infeasible.

Soil Contamination Alternative #3: Capping in Conjunction with an Activity and Use Limitation (AUL)

A third potential remedial alternative consists of capping the site with clean fill or an engineered barrier to mitigate direct exposure to soil containing hazardous materials at concentrations greater than the applicable soil standards. The cap could consist of ten inches (or more) of clean fill overlying a geotextile fabric, concrete or granite curb stones, and/or bituminous asphalt pavement. An AUL, a type of permanent deed restriction, would also be implemented following the installation of the engineered barrier. The AUL would restrict future usage of the site in order to ensure the integrity of the soil cap and would include inspection, maintenance, and reporting requirements.

Protectiveness

This remedial alternative would involve capping the site for the purpose of reducing the potential for site users to be exposed to soil containing hazardous materials and debris. An AUL would restrict future site usage (generally prohibiting damage to the cap and/or construction in the vicinity of the regulated soil) in order to maintain the engineered barrier, thereby limiting the exposure to soil containing hazardous materials on the site. Therefore, this alternative would result in the reduction of exposure to soil containing hazardous materials, mitigating future risks to site users.

Implementability

Capping of soil containing regulated COC and fill material as a remedial alternative is technically feasible. The work would involve the importation of fill material and require access to the site by earthwork equipment. The Town would be technically capable of executing and/or supporting a construction project of this nature. Any modifications to



Ms. Jerry Minor-Gordon
October 24, 2011
Page 7

grade at the site will have to be managed in accordance with municipal by-laws and Orders of Conditions issued by the Conservation Commission.

Implementation of a cap in conjunction with the filing of an AUL would comply with the MCP as well as other state and local laws, including the MassDEP ACO. Prior to implementation of an AUL, two administrative requirements must be completed in accordance with the MCP:

- 1) This approach may not be consistent with the response action performance standard (RAPS) if a permanent solution may be feasible without an AUL, and therefore a demonstration of the financial and/or technical infeasibility of other alternatives must be completed.
- 2) A *Phase III Identification, Evaluation and Selection of Comprehensive Remedial Action Alternatives* (Phase III) report is required to be submitted to MassDEP. This document was submitted by AECOM Environment (AECOM) and Advanced Environmental Solutions, Inc. (AES) to MassDEP in March 2009.

Additionally, the Town has indicated its intention to maintain the site as a public open space. A cap design can be developed to be consistent with this objective.

Cost

Based on Fuss & O'Neill's experience at sites with similar characteristics, the actual cost of cap construction may vary, but the general costs are in the range of \$100,000 to \$150,000 per acre, and, thus, would be financially feasible for the Town under the existing USEPA Brownfields Cleanup Grant funding. The subject site is approximately 0.67 acres and therefore, capping may be feasible under the existing funding.

Implementation of a cap and AUL as the preferred remedy would additionally incur long-term management expenses related to maintenance of the ground cover. However, these costs are typically limited expenses for mowing and similar activities, and periodic repair costs, and would be financially feasible for the Town to manage. These costs are consistent with similar costs for the Town's Department of Public Works for other public parks and open space.

Summary of Soil Contamination Cleanup Alternatives

The following table is a summary of potential cleanup alternatives evaluated for the surficial soil releases identified at the site, as discussed herein:

Ms. Jerry Minor-Gordon

October 24, 2011

Page 8

Cleanup Alternative	Protectiveness of Human Health and Environment	Implementability	Cost
1. No Action	Not adequate	Technically feasible, not practical given the Town's reuse goal, legally infeasible	Minimal immediate costs, moderate cost due to regulatory enforcement, long term costs due to risk to public safety and loss of revenue/redevelopment opportunity.
2. Excavation and Off-Site Disposal	Adequate	Technically feasible	Significant costs for off-site disposal; additional funds would be required.
3. Capping in Conjunction with an AUL	Adequate	Technically and legally feasible	Could be conducted with existing funding; long-term maintenance costs are manageable for the Town.

Preferred Cleanup Alternative

Based on the evaluation of cleanup alternatives documented above, Fuss & O'Neill considers **Soil Contamination Alternative #3: Capping in Conjunction with an AUL** the most feasible, protective, and cost-effective strategy for reducing risks posed by hazardous materials at this site. This strategy will reduce risks to human health and the environment by mitigating direct exposure to contaminated materials and facilitate redevelopment of the property. Furthermore, these remedial alternatives can potentially be completed by the Town with the existing available funding from the USEPA Brownfields Cleanup Grant and Town matching funds.

Public Comment Regarding the Preferred Cleanup Alternative

This document will be included in the Town's information repository, maintained at the Selectmen's Office at Brookfield Town Hall, and online on Brookfield's website. A public meeting regarding this analysis and the preferred remedy included herein is scheduled to be conducted during a regularly scheduled meeting of the Board of Selectmen on November 8, 2011. Oral and written comments will be received at the meeting and written comments may be submitted within 30 days of October 30, 2011 [date of publication of legal advertisement]. These comments will be incorporated into the final ABCA for the site, to be completed following the completion of the public comment period.



Ms. Jerry Minor-Gordon
October 24, 2011
Page 9

Please feel free to contact us if you have any questions or if you require additional information.

Sincerely,

DRAFT **DRAFT**
PENDING EPA COMMENTS & 30-DAY PUBLIC NOTICE PERIOD

Daniel C. LaFrance
Project Engineer

David JP Foss, CPG, LSP
Senior Project Manager

C: Ms. Donna Neylon, Town of Brookfield

Attachments: Figure 1: Site Location Map
Figure 2: Site Plan

File Path: J:\DWG\2011\0847\A10\Environmental\Plan\20110847A10_LOC01-USGS.dwg, Layout: FIGURE 1, Plotted: Fri, Oct 21, 2011, 11:30 AM, User: dbrance
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MAP REFERENCE

THIS MAP WAS PREPARED FROM USGS TOPOGRAPHIC QUADRANGLE IMAGE © 1995 MASSGIS. ORIGINAL MAP PUBLICATION DATE: 1982-1985

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SCALE:	
HORZ.:	1" = 2000'
VERT.:	
DATUM:	
HORZ.:	
VERT.:	
GRAPHIC SCALE	

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TOWN OF BROOKFIELD
 SITE LOCATION MAP
 59-67 MILL STREET
 BROOKFIELD MASSACHUSETTS

PROJ. No.: 20110847.A10
 DATE: OCTOBER 2011
FIGURE 1



MAP REFERENCE:

THIS MAP WAS PREPARED FROM USGS COLOR ORTHO IMAGERY DATED APRIL 2008/2009.
 SOURCE: OFFICE OF GEOGRAPHIC AND ENVIRONMENTAL INFORMATION (MASSGIS), COMMONWEALTH OF MASSACHUSETTS EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS

LEGEND

- - - - - APPROXIMATE SITE BOUNDARY
- - - - - DISPOSAL SITE BOUNDARY

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
1.			xx/xx	xx

SCALE:
 HORZ.: 1" = 40'
 VERT.:
 DATUM:
 HORZ.:
 VERT.:
 0 20 40
GRAPHIC SCALE

f
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TOWN OF BROOKFIELD
 AERIAL SITE PLAN
 59-67 MILL STREET
 MASSACHUSETTS

PROJ. No.: 20110847 A10
 DATE: OCTOBER 2011
FIGURE 2

File Path: J:\D\W\920110847A10\EnvironmentalPlan\20110847A10_LOC02-AERIAL.dwg, Layout: FIGURE 2, Plotted: Fri, Oct 21, 2011 - 11:35 AM, User: dfrance
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