

September 21, 2009

DRAFT

Penny Newbury
Town of Sprague
1 Main Street
Baltic, CT 06330

Re: Baltic Mills Site
Fuel Oil Remediation Evaluation

Dear Penny:

This letter summarizes fuel oil soil contamination associated with the referenced site.

Background

Two 50,000 gallon concrete No. 6 fuel oil underground storage tanks(USTs) previously existed onsite. The tanks were removed by a previous property owner circa January 1989. CTDEP records indicate that some soil remediation was conducted at that time, but that residual contamination may exist.

Previous Investigations

A Targeted Brownfields Assessment was conducted on behalf of the USEPA dated August 2006. A soil boring (SB-6) was conducted in the area of the former fuel oil USTs. A soil sample from a depth of 14- 16 feet was analyzed and contained extractable total petroleum hydrocarbons(ETPH) at 2,800 parts per million(ppm).

A second Targeted Brownfields Assessment is being conducted. The USEPA contractor, Advanced Environmental Solutions(AES) , conducted test pits, installed a groundwater monitoring well, and collected soil samplings for analysis in the area of the former fuel oil USTs. Although the final report is not complete, AES provided the test pit logs and soil sample results to the Town of Sprague for review. The AES information is attached to this letter.

I reviewed the data on behalf of the Town of Sprague to evaluate remediation requirements and alternatives. The test pit locations and soil analytical results are summarized on the attached Figure. The ground water depth is estimated to be 20- 22 feet below grade.

Data Evaluation

The CTDEP soil remediation standards integrate two soil cleanup criteria: (1) Direct Exposure Criteria (DEC) to protect human health and the environment from risks associated with direct exposure to pollutants in contaminated soil; and (2) Pollutant Mobility Criteria (PMC) to protect groundwater quality from pollutants that migrate from the soil to groundwater. The site is classified as a GB groundwater area, therefore, the GB PMC applies (ETPH criteria is 2,500 ppm). Soils to which both criteria apply must be remediated to a level that is equal to the more stringent criteria.

The GB PMC applies to soils above the seasonal high groundwater table. The PMC do not apply to soils above the groundwater table below a building if certain conditions are met and an environmental land use restriction (ELUR) is established preventing removal of the building. The conditions include that the soils are not polluted with volatile organic compounds (VOCs). VOCs were detected in this area, therefore, this compliance option can not be used.

Residential DEC (RDEC) and separate commercial/industrial DEC (IDEC) have been established by CTDEP for most chemicals. The RDEC have been used to evaluate data at this site due to potential future land use. The RDEC for ETPH is 500 ppm. The DEC applies to soil to a depth of 15 feet bgs. However, with the proper ELUR preventing disturbance, contaminated soil can remain 4 feet below grade or below pavement and 2 feet of sub-base material (clean fill).

Based on the presence of ETPH concentration well above 2,500 ppm, soil remediation in the area indicted on Figure 1 is required.

Remediation Options

Two alternatives have been evaluated. Option 1 is the excavation and disposal of the contaminated soil. Option 2 is a chemical treatment approach that involves the injection of a chemical solution into the soil.

Option 1: Contaminated Soil Excavation and Disposal

The estimated quantity of contaminated soil is based on the following calculation:

$$140' \times 60' \times 10' \text{ (thick)} \times 1 \text{ cy} / 27 \text{ cf} \times 1.5 \text{ tons/cy} = 4,660 \text{ tons}$$

The estimated per ton remediation cost is \$90/ton (\$60 transportation and disposal, \$10 excavation, & \$ 20 backfill). Therefore, the estimated cleanup cost for this option is \$90/ton x 4,660 tons or \$ 420,000.

Option 2: Chemical Oxidation

Regenesis was contacted to provide a preliminary design and quote for this process. RegenOx is an advanced chemical oxidation technology that destroys contaminants through chemical reactions. This product maximizes in situ performance while using a solid alkaline oxidant that employs a sodium percarbonate complex with a multi-part catalytic formula. RegenOx directly oxidizes contaminants while its catalytic component generates a range of highly oxidizing free radicals that destroy target contaminants. The email from this company is attached. The estimate for this technology is \$350,000. The negative factors with this approach are the high concentrations of petroleum hydrocarbons in the soils and the potential negative impacts to groundwater. Also, the effectiveness is not guaranteed.

Recommendations

- AES recently installed a groundwater well in the fuel oil contamination area. The groundwater results should be reviewed and factored into the remediation approach for this area.
- Additional investigation of this area should be considered to refine the remediation approach. This should include synthetic precipitation leachability analysis(SPLP) to evaluate PMC compliance.
- Once the additional investigation is complete, I believe Option 1 would be the most direct and reasonable approach to pursue.

Please contact me if you have any questions.

Sincerely,

Paul Burgess, LLC

A handwritten signature in black ink that reads "Paul Burgess". The signature is written in a cursive, slightly slanted style.

Paul Burgess, P.E., LEP