

June 25, 2008

Ms. Brenda Boyce
Wisconsin Department of Natural Resources
141 NW Barstow Street, Room 180
Waukesha, Wisconsin 53188



RE: Estimated Costs
Interim Action – Soil Remediation
Klinke Cleaners
Fox Run, Waukesha

No Record Found
7.18.08 JS

Dear Ms. Boyce:

Pursuant to your recent communications, RSV Engineering, Inc. (RSV) has prepared this comparative cost estimate for the remediation of tetrachloroethene (PCE) impacted soil at the Klinke Cleaners facility in the Fox Run shopping center, Waukesha (site). RSV has obtained quotes for two approaches: Excavation with off-site disposal and reagent injection. For purposes of this cost estimation, it is assumed that the area in which PCE concentrations are above 1 mg/kg will require remediation (see Figure 1).

Description:

Excavation & disposal:

The area shown on Figure 1 will be excavated to a depth of approximately 10 feet. Because this area is the primary utility corridor for Fox Run, some areas will likely be left unexcavated, while others may require some hand-digging. Based on a discussion of the options with Veolia Environmental Services, RSV recommends that excavated soils be stockpiled on site, with a composite sample collected for waste characterization. Veolia indicated that the use of the existing data would likely cause them to assume that the soil would be characterized as a listed waste, whereas a composite sample may result in a more cost-competitive classification.

At the completion of the investigation, confirmation samples will be collected along the walls and on the base of the excavation. Pursuant to Wisconsin Department of Natural Resources (WDNR) guidelines, sidewall samples will be collected at 25-foot intervals, and one base sample will be collected for every 100 square feet of excavation. This will result in an estimated 38 samples, to be analyzed for volatile organic compounds (VOCs).

After the completion of excavation and sampling, the excavation will be backfilled with clean material, and compacted as appropriate for its use as a paved delivery area. Upon receipt of the laboratory results from the composite sample, arrangements will be made for appropriate disposal.

Reagent injection:

The following discussion is based on the Cool-Ox technology (DeepEarth Technologies, Inc.) In this process, a chemical reagent is injected into the impacted soil. The process typically involves that advancement of a direct-push probe (e.g., Geoprobe), through which the chemical is injected (a hand-applied method is available for indoor injection). Based on the stratigraphy at the site, we estimate that injection points would be spaced at 5-foot intervals, and the chemical would be injected to a depth of 10 feet.

This technology combines chemical oxidation with accelerated biodegradation (subsequent to the oxidation phase), using hydrogen peroxide to generate the oxidizer. However, as opposed to other oxidation processes, the injection of metal catalysts is not used, and the heat that is typically generated by injection is therefore eliminated.

Because this is an injection process, the underground utilities are not a barrier to complete area coverage. Additionally, no soil is stockpiled on site, awaiting the results of chemical analyses.

Like the excavation option, confirmatory soil samples will be collected subsequent to injection. RSV's practice in the past has been to collect samples from the approximate locations and depths of the samples from the site investigation that yielded the highest concentrations.

Schedule:

It is estimated that the two approaches described above would both be completed in a period of 2 to 3 days. However, the excavation option would result in the presence of a large stockpile of impacted soil for a period of 2 to 4 weeks.

Costs:

Table 1 summarizes the estimated costs for excavation and disposal; costs for injection are provided in Table 2. Three sets of costs are presented in Table 1, based on the potential for the waste to be characterized as characteristic soils (i.e., direct landfill disposal), listed soils at less than 500 ppm of PCE, or listed soil at greater than 500 ppm of PCE. As the two tables indicate, the cost for injection is estimated to be less than half that of excavation.

It is important to note that uncertainty exists in both methods. With excavation, there is a risk that confirmation sampling will indicate that all contaminants have not been removed to acceptable levels, and that additional excavation will be required. In the case of injection, it is possible that other, not defined chemical conditions in the soil will result in less than adequate oxidation of the contaminants of concern (e.g., other chemicals competing for the oxidizer).

Recommendation:

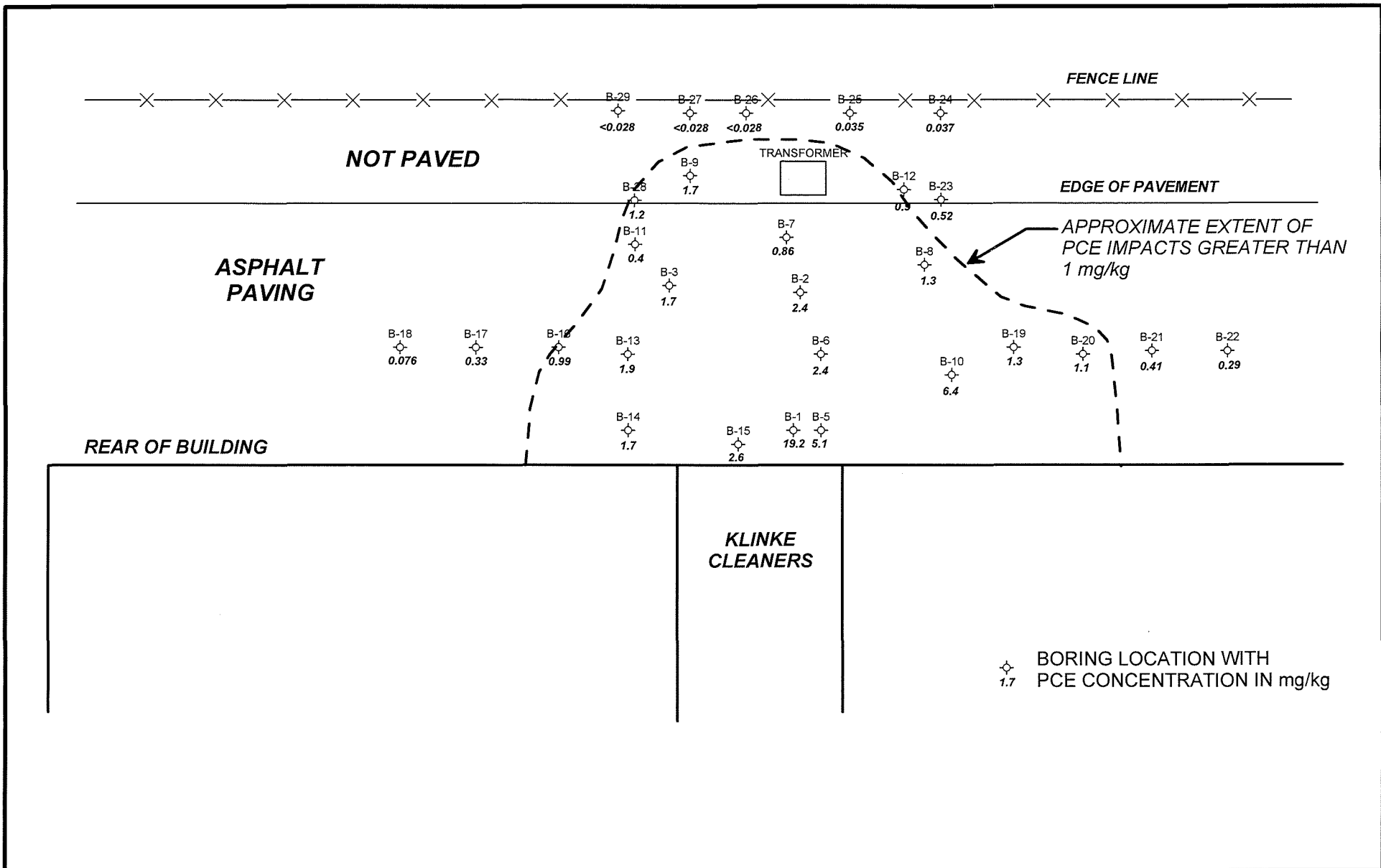
The uncertainties cited above are comparable for the two methods. However, the costs, area coverage and minimal site disturbance provided by reagent injection appear to be

significantly better than for excavation and disposal. Based on this, RSV recommends that reagent injection be utilized as an interim action for soil remediation at this site.

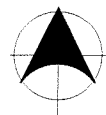
Sincerely,
RSV ENGINEERING, INC.



Robert J. Nauta, P.G.
Vice President



SCALE IN FEET
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NORTH

RSV
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KLINKE CLEANERS
 FOX RUN - WAUKESHA, WISCONSIN
 SOIL REMEDIATION AREA

FIGURE
1

DRAWN BY	PROJ. No.	DATE	FILE NAME
RN	05-529	12 MAY 08	REM AREA