State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
101 S. Webster Street
Box 7921
Madison WI 53707-7921

Tony Evers, Governor
Preston D. Cole, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

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AMY WERLEIN
STELLA-JONES CORP
W1038 CTH U STE 101
BANGOR WI 54614

Subject: Vapor Intrusion – Short Term Risks for Trichloroethylene Vapors, Vapor Intrusion Pathway Assessment, and Immediate and Interim Actions

STELLA-JONES (FKA: WEBSTER WOOD PRESERVING)
W1038 CTH U STE 101, BANGOR, WI
BRRTS# 02-32-000253 FID# 632029640

Dear Sir or Madam:

This letter is being sent to all Responsible Parties (RPs) that currently have an active contamination response site on the Department of Natural Resources (DNR's) Bureau for Remediation and Redevelopment Tracking System (BRRTS). It reiterates and enhances information about vapor intrusion risk that has been previously provided to you by DNR, either in a letter sent by DNR in 2011 regarding assessment of the vapor pathway or in your responsible party letter if your case was opened after 2011. Recent studies indicate that vaporized trichloroethylene (TCE) in indoor air is more toxic than previously understood and the risk posed by TCE vapors requires an immediate response when women of child-bearing years are present.

The purpose of this letter is to communicate three points related to vapor intrusion:

1. **TCE poses short-term risks to human health that justify accelerated assessment, investigation and mitigation of the vapor intrusion pathway.**
2. Assessment of the vapor intrusion pathway is part of the investigation process and should be assessed as early as possible and routinely re-assessed throughout the life of a project.
3. Immediate and interim actions may be necessary early in the site investigation process to protect human health from contaminated vapors.

We encourage you to discuss this information with your environmental consultant. The DNR believes the health risks of TCE vapors are serious enough that it should be one of *the first things* evaluated as part of a site investigation, especially at sites where contamination may impact sensitive populations. RPs should be diligent about screening for TCE in vapors as early in the site investigation process as possible, to determine if immediate actions are warranted to reduce harmful exposure.

Unfortunately, many RPs and consultants wait until late in the site investigation process, or even at case closure, before taking steps to assess the presence of vapors and any needed mitigation efforts. We are encouraging you to do this as one of the first steps in your site investigation.

Health Risk

All volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), some metals (e.g., mercury) and methane have the potential to create harmful vapors with varying degrees of toxicity. Some compounds produce an odor, such as gasoline, but many do not, making expedited assessment critical to identifying exposure. Preferential pathways such as sewers allow vapors to travel long distances from the source in multiple directions, increasing the possibility of exposure to humans. Additional information on the human health hazards from vapor intrusion can be found by going to dnr.wi.gov, search "Vapor" and go to the "Health" tab.

The VOC, trichloroethylene (TCE), poses a short-term (i.e., acute) health risk in indoor air at certain concentrations that justifies expedited assessment, investigation and mitigation as immediate or interim actions (USEPA, 2014; Makris et al., 2016). As discussed in DNR vapor intrusion guidance (see below), quickly identifying demographics is a key component of the risk assessment. This is supported by the Department of Health Services. TCE also poses a long-term (i.e., chronic) health risk.

TCE is a chlorinated solvent commonly used as a parts washer and degreaser of metal equipment. It is also used for spot cleaning and found in household items such as aerosols. TCE is also a breakdown product of tetrachloroethylene (PCE or "perc"). PCE is a chlorinated solvent used in commercial and industrial businesses such as dry cleaners, metal plating, paper mills, etc. When released to the environment, PCE, TCE (either as a source or a breakdown product) and other contaminants readily migrate through soil, groundwater and subsurface air.

Authority – Assessments and Interim and Immediate Actions

Assessment of the vapor intrusion pathway is a critical part of an environmental investigation. Wisconsin Administrative Code (Wis. Admin. Code) Chapter NR 716 outlines the requirements for investigation of contamination in the environment. Specifically, Wis. Admin. Code § NR 716.11(3)(a) requires the field investigation "determine the nature, degree and extent, both areal and vertical, of the hazardous substances or environmental pollution in **all** affected media," which includes sub-surface and indoor air. In addition, Wis. Admin. Code § NR 716.11(5) specifies that the field investigation include an evaluation of the "potential pathways for migration of the contamination, including drainage improvements, utility corridors, bedrock and permeable material or soil along which **vapors**, free product or contaminated water may flow."

A vapor intrusion pathway assessment may demonstrate that an immediate or interim action is required under Wis. Admin. Code ch. NR 708. Wis. Admin. Code § NR 708.05(2) states "for hazardous substance discharges that pose an **imminent threat to public health**, safety or welfare or the environment, responsible parties shall conduct all necessary emergency immediate actions." Under Wis. Admin. Code § NR 708.11(1), appropriate interim actions must be taken when "necessary to… **minimize any threat to public health, safety or welfare** or the environment" and could include "constructing a temporary engineering control, such as low permeability cover, or **installing and operating a vapor mitigation system**" per Wis. Admin. Code § NR 708.11(2)(d).

Immediate and interim actions, such as installation of a vapor mitigation system, can be taken to interrupt human exposure. **However, interim actions are not acceptable long-term remedies.** Wis. Admin. Code chs. NR 722, 724 and 726 address required cleanup actions to address the sources of contamination. More specifically, Wis. Admin. Code § NR 726.05(8)(b)1, states a site is not eligible for closure until "**a remedial action has been conducted and reduced the mass and concentration of volatile compounds to the extent practicable**."

Guidance and Evolution of Vapor Intrusion Science

The DNR publishes guidance to help RPs and their consultants comply with the requirements in Code. *Addressing Vapor Intrusion at Remediation & Redevelopment Sites in Wisconsin*, RR-800 (v. January 2018) can be found at https://dnr.wi.gov/files/PDF/pubs/rr/RR800.pdf. **As noted above, the presence of TCE may present specific concerns related to demographics. Section 3.4.1 of DNR's guidance discusses the need to quickly identify demographics and prioritize action when TCE is the contaminant of concern. Section 7.1 discusses potentially appropriate immediate actions necessary to limit exposure.**

The science of vapor intrusion continues to rapidly evolve. The mechanics of vapor intrusion and risks to human health are being continually researched and discussed on a national and international level. This constant increase in knowledge requires the vapor intrusion pathway to be routinely reassessed throughout the life of a project until case closure. Therefore, in addition to RR-800, the DNR provides videos, fact sheets and additional guidance on vapor intrusion on its website. Go to dnr.wi.gov and search "Vapor." Technical resources developed by other government and private sources are included.

The DNR will continue to update its resources to incorporate advances in science on assessment, investigation and mitigation options, to partner with local and state health departments on the risks to human health, and to routinely communicate with environmental consultants on these advances.

If you have questions regarding this letter, please contact the assigned DNR Project Manager or DNR Site contact:

TIM ZEICHERT
608-219-2240
timothy.zeichert@wisconsin.gov

Sincerely,

Christine Haag
Program Director
Remediation & Redevelopment Program

Copy to Consultant(s) on Record