



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

August 24, 2010

Comments Regarding Off-Site Soil Gas Sampling Results
Tecumseh Products Company
100 E. Patterson Street
Tecumseh, MI 49286

On July 15, 2010, RMT, Inc. (RMT) submitted a Quarterly Report to the U.S. Environmental Protection Agency (EPA) for review on behalf of Tecumseh Products Company (TPC). Appendix A of this report is a Technical Memorandum (Memorandum) regarding off-site soil gas investigation activities conducted between April 2010 and May 2010 in the vicinity of the former TPC manufacturing site located at 100 East Patterson, Lenawee County, Michigan. The Memorandum includes a description of field activities, a summary of off-site soil gas sampling data, an evaluation of the data in the context of the investigation objectives, and proposed future activities.

On August 23, 2010, representatives from RMT, TPC and EPA convened a conference call to discuss the Memorandum and future steps regarding off-site soil gas.

In response to the Memorandum and conference call, EPA provides the following written comments.

- 1) EPA has reviewed the Generic Groundwater Screening Levels calculated in Attachment A of Appendix A of the July, 2010 Quarterly Report and found them to be adequate.
- 2) TPC proposed implementing a quarterly soil gas sampling schedule, beginning in September. EPA agrees with this decision and approves on-going sampling.
- 3) EPA requests that TPC increase the number of soil gas sample locations to the quarterly sampling plan, in the region of the current samples located at SG-12, SG-13 and SG-14. The volatilization potential is not understood in this area due to unproductive soil gas probes at SG-12 and SG-14. The VOC concentrations in groundwater exceed GWSL, thus requiring soil gas sampling. Though SG-13 yielded sample results less than applicable screening criteria, one sample location is not sufficient to characterize the soil gas potential for all the homes located at the intersection of South Maumee Street and Kilbuck Street. The complex geology at SG-12 and SG-14 has made installation of soil gas probes above the groundwater table difficult. EPA suggests installing at least one additional soil gas

probe on South Maumee Street, halfway between Kilbuck Street and Cummins Street. TPC should also attempt to obtain samples from near or around SG-12 and SG-14.

As discussed on the call, the presence of clay lenses could promote lateral rather than vertical migration of any volatilized gases. To assess the lateral migration potential of volatilized groundwater constituents, it is imperative to first establish whether the groundwater is volatilizing. MDNRE Op. Memo No. 4 states that to investigate the influence of contaminated groundwater on soil vapor, “samples should be collected from clusters of soil vapor probes at varying depths in the vadose zone.” For this reason EPA recommends that an additional deep sample location be located in conjunction with SG-12 and SG-14, if a clay lens is found at these locations. Both shallow and deep sample locations should be analyzed in the upcoming September, 2010 sample collection event.

- 4) At the time this soil gas sampling event was conducted, soil gas screening criteria calculated by TPC were under review by EPA. TPC submitted DEEP soil gas criteria calculated using an attenuation factor (α) of 0.003 based on generic site conditions in their July 15, 2010 Quarterly Report. EPA has determined that the attenuation factor proposed by TPC is not acceptable for the purpose of ruling out an exposure pathway. Therefore, the soil gas screening criteria calculated by TPC are not approved. The 2008 US EPA Vapor Intrusion Database paper finds that the 95th percentile soil gas attenuation factor is about 0.3. However, the variability among soil gas attenuation factors was found to be large and potentially influenced by a number of factors. The 95th percentile sub-slab attenuation factor is 0.1, therefore an acceptable and conservative approach is to set $\alpha = 0.1$ to calculate the soil gas screening criteria. For reference, the attenuation factor calculated by TPC was near the 25th percentile for soil gas. EPA makes no distinction between Deep Soil Gas and Shallow Soil Gas. Acceptable Soil Gas screening criteria are found by dividing the Indoor Air Criteria (IAC) calculated by TPC by an attenuation factor of 0.1. Approved screening criteria are presented in the tables below.

Analyte	Residential Indoor Air Criteria (IAC)	
	(ug/m ³)	(ppbv)
1,1-Dichloroethane	15	3.8
1,2-Dichloroethane	0.94	0.24
1,1-Dichloroethene	210	52
Cis-1,2-Dichloroethene	37	9.3
Trans-1,2-dichloroethene	63	16
Tetrachloroethene	4.1	0.62
1,1,1-Trichloroethane	5,200	940
Trichloroethene	12	2.3
Vinyl Chloride	2.8	1.1

Analyte	Residential Soil Gas Criteria	
	(ug/m ³)	(ppbv)
1,1-Dichloroethane	150	38
1,2-Dichloroethane	9.4	2.4
1,1-Dichloroethene	2,100	525
Cis-1,2-Dichloroethene	370	93
Trans-1,2-dichloroethene	630	158
Tetrachloroethene	41	6.2
1,1,1-Trichloroethane	52,000	9360
Trichloroethene	120	23
Vinyl Chloride	28	11

- 5) Applying the EPA calculated Residential Soil Gas Criteria to the data from the May, 2010 soil gas sampling event, SG-01, SG-05, SG-06, SG-07, SG-09 and SG-10 exceed screening criteria for one or more VOCs. SG-06, SG-07, SG-09 and SG-10 are all in or near residential areas. To establish whether or not an exposure pathway exists into these homes, further lines of evidence are necessary. EPA requires sub-slab and indoor air sampling at the two residential properties around SG-09 on Mohawk Street (parcels 325-0323-00 and 325-0330-00) as well as the two residential properties north of SG-07 and SG-06 (parcels 325-0190-00 and 325-0129-00). A work plan for sub-slab and indoor air sampling at these properties should be submitted no later than October 15, 2010. Based on the July 15, 2010 Quarterly Report, it is also recommended that TPC collect sub-slab and indoor air data at seven homes north of SG-10 (parcels 305-2091-00, 305-2110-00, 305-2120-00, 305-2131-00, 305-2140-00, 305-2151-00, and 305-2170-00).
- 6) MDNRE Op. Memo 4 section 2.6 provides: “To evaluate the preferential migration pathways in areas with low permeability soils, samples should be collected along preferential soil vapor flow paths, such as sewer lines, utility corridors, trenches, pipelines, and other subsurface structures that are likely to be bedded with higher permeability materials; and at depths corresponding to these subsurface features.” This recommendation is particularly relevant given the detection of TCE above soil

gas screening criteria at SG-05, which is in close proximity to a known sewer line, and the previous detection of Vinyl Chloride in the sewer system. EPA understands that TPC has been sampling the air space within some of the sewer lines. EPA requests a sampling plan for the sewer and any other known utilities be submitted in the October, 2010 quarterly report, and that sampling of these corridors continue with the quarterly soil gas sampling events.

Sincerely,

A handwritten signature in cursive script that reads "Michelle Mullin". The signature is written in black ink on a white background.

Michelle Mullin,
Project Manager