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February 13, 2020

Mr. Kenneth Diediker, Environmental Specialist
Bureau of Environmental Remediation
Kansas Department of Health and Environment
1000 SW Jackson St., Suite 410
Topeka, KS 66612-1367

Subject: *Addendum to the report titled Corrective Action Study for the Former USDA/CCC Facility in Powhattan, Kansas,* ANL/EVS/AGEM/TR-18-01

Dear Mr. Diediker:

Enclosed, at the request of Caroline Roe of the Commodity Credit Corporation, U.S. Department of Agriculture (CCC/USDA), is an addendum to the report titled *Corrective Action Study for the former USDA/CCC Facility in Powhattan, Kansas*, originally sent to you on February 8, 2018.

The addendum focuses on the issue of risk related to the vapor intrusion pathway at the Powhattan site and was prepared to address concerns raised in the conference call meeting between the CCC/USDA and the Kansas Department of Health and Environment on December 6, 2019.

Please direct questions to Ms. Roe. Let me know if I can do anything to facilitate your review.

Sincerely,

Lorraine M. LaFreniere

LML:tp

Enclosures: Addendum to the *Corrective Action Study for the Former USDA/CCC Facility in Powhattan, Kansas*

cc: C. Roe (CCC/USDA)
CHRON-2255

Corrective Action Study for the Former CCC/USDA Facility in Powhattan, Kansas

Addendum (Regarding Vapor Intrusion Risk)

The Commodity Credit Corporation of the U.S. Department of Agriculture (CCC/USDA) submitted its Corrective Action Study (CAS) for the former CCC/USDA facility in Powhattan, Kansas, to the Kansas Department of Health and Environment (KDHE) on February 8, 2018 (Argonne 2018). As part of the review process, in a teleconference held on December 6, 2019, the KDHE requested additional information regarding vapor intrusion risks at the former CCC/USDA facility. As noted in the Executive Summary of the original report (page ix), one of the defined site-specific goals for corrective action at the site was to "reevaluate potential vapor intrusion risks associated with any changes in site conditions since the original investigation." As described below, the weight of evidence indicates that there are currently no risks to receptors from upward vapor intrusion.

The CAS refers to the 2007 Kansas vapor intrusion guidance (KDHE 2007) which has since been superseded by new guidance published in 2016 (KDHE 2016). Nevertheless, the 40 ft vertical and 100 ft lateral separation distances which define "buildings of concern," cited in Section 4.2.4 of the CAS (page 4-5), remain applicable in the 2016 Kansas guidance.

As noted in Section 2.2.1 of the CAS (page 2-2), the predominant lithology at the former CCC/USDA facility site consists of fine-grained soils: a gray-brown to light brown, non-calcareous, silty clay. This silty clay layer ranged from approximately 42 ft to 64 ft in thickness. The silty clay layer is underlain by thin zones of silty sandy clay, sandy clay, and trace silty sand, ranging 2 to 4 ft in thickness. These thin zones, encountered at depths of 42-74 ft below ground level, were the first instance where groundwater was identified during cone penetrometer direct push soil sampling. They produced limited quantities of water during sampling, under semi-confined conditions. As noted in the CAS (page 2-3), historic well records indicate that multiple private wells were installed to a depth of 35 ft or less, suggesting that saturated conditions exist within the silty clay portion of the till sequence. Furthermore, groundwater levels measured in the network of monitoring wells completed in the lower silty-sand interval routinely occur at 5-15 ft below ground level across much of the investigation site.

The soil sampling performed as part of the site investigation shows that at most of the locations tested on the former CCC/USDA facility, no carbon tetrachloride contamination was

detected in these fine-grained (mostly saturated) silty clay soils even where these soils overlie carbon tetrachloride contamination in the deeper groundwater toward the base of the sequence. Two distinct contamination sources were identified: (1) a CCC/USDA site related source and (2) a co-op related source. As noted in Section 4.2.4 of the CAS (page 4-5), there are no receptors within 100 ft laterally of the confirmed CCC/USDA site related soil contamination source that is the subject of the corrective action outlined in the CAS.

Groundwater sampling has demonstrated that carbon tetrachloride contamination has migrated laterally from both the confirmed CCC/USDA site related soil contamination source and the co-op related soil contamination source. Although groundwater levels routinely occur at depths of 5 to 15 ft below ground level, contaminant migration is interpreted to have occurred primarily in the lowermost, more permeable silty sandy clay and silty sand interval of the unconsolidated section located at depths greater than 40 ft. The thick section of less permeable and uncontaminated silty clay (as indicated by the saturated soil sampling) materials overlying the more permeable interval in most portions of the site suggests that the bulk of the identified carbon tetrachloride contamination in groundwater is unlikely to pose a threat of vapor intrusion. As noted in the 2016 Kansas guidance (KDHE 2016), the default attenuation factor (AF) for groundwater in fine-grained soils is 0.0005 (page 16), an AF particularly relevant given the thickness of silty clay overriding contaminated groundwater at the site.

As part of the CCC/USDA's corrective action activities, a vapor intrusion assessment following the 2016 Kansas guidance (KDHE 2016) will be performed for those areas potentially affected by groundwater contamination from the site. Vapor intrusion testing will be performed for habitable structures within 100 ft of the carbon tetrachloride contamination in groundwater that has been linked to the former CCC/USDA facility, particularly in the vicinity of wells KDHEP-2, MW-4, and MW10. If warranted, a mitigation plan will be developed.

References

Argonne, 2018, *Corrective Action Study for the Former USDA/CCC Facility in Powhattan, Kansas*, ANL/EVS/AGEM/TR-18-01, prepared for the Commodity Credit Corporation, U.S. Department of Agriculture, Washington, D.C., by Argonne National Laboratory, Argonne, Illinois, February.

KDHE, 2007, *Kansas Vapor Intrusion Guidance: Chemical Vapor Intrusion and Residential Indoor Air*, Bureau of Environmental Remediation, Kansas Department of Health and Environment, Topeka, Kansas, June.

KDHE, 2016, *Kansas Vapor Intrusion Guidance,* Bureau of Environmental Remediation, Kansas Department of Health and Environment, Topeka, Kansas, August.