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Memorandum

To: Merritt Clapp-Smith *for submission to MPCA as comments from the City of St Paul*

From: Ken Haberman

Subject: Comments Regarding Area C Investigation Report
Ford Motor Twin Cities Assembly Plant Site

Date: July 20, 2017

Landmark Environmental, LLC (Landmark) has reviewed the report entitled *Area C – Comprehensive Site History and Investigation Report II* (Investigation Report) prepared by Arcadis U.S., Inc. (Arcadis) on behalf of Ford Motor Company (Ford) dated May 2017. Landmark reviewed the Investigation Report, regarding the above-referenced Twin Cities Assembly Plant (TCAP) Site, on behalf of the City of St. Paul, Department of Planning & Economic Development (PED). Excerpts from the Investigation Report, including figures showing the location of Area C in relationship to the rest of the TCAP Site, are attached. Landmark also attended a meeting held at the Minnesota Pollution Control Agency (MPCA) on June 21, 2017.

Background

According to the Investigation Report, between 1945 and 1966, Area C was a former disposal area for industrial waste such as construction rubble, paint products and wastes, and noncombustible plant waste. In addition, in 1962 and 1966, excavated materials from other parts of the TCAP Site were deposited in Area C. Ford ceased disposal of industrial waste at Area C in 1966. Between 1978 and 1983, the United States Army Corps of Engineers placed construction debris and soil from the rehabilitation activities at Lock and Dam No. 1 on Area C. Additional soil and construction debris (i.e., broken concrete and road excavation rubble) from a Mississippi River Boulevard construction project were also disposed of at Area C around 1988 and 1990. The exact quantities and composition of the materials disposed over time in Area C are unknown.

In response to a complaint received by the Minnesota Pollution Control Agency (MPCA), Ford conducted an investigation that included groundwater sampling from five (5) newly installed monitoring wells as well as surface water sampling from the Mississippi River. In 1984, the

TCAP Site was included on the original state Superfund list, also known as the Permanent List of Priorities (PLP). In 1987, a supplemental soil, groundwater, and surface water investigation was completed at Area C. Groundwater samples were collected from the 5 monitoring wells previously installed and surface water samples were collected from two (2) locations along the Mississippi River. Groundwater and surface water samples were collected sporadically through June 1990, and based on the groundwater and surface water sampling results, the TCAP Site, including Area C, was delisted from the Minnesota State PLP on July 8, 1993.

Two (2) additional monitoring wells were installed within Area C in 2011. Although the Investigation Report indicates that additional investigations have been conducted in anticipation of plant closure and future sale and redevelopment of the TCAP Site, the Investigation Report does not provide the rationale for the well installation in 2011. In 2014, Arcadis prepared and submitted a report to the MPCA entitled *Area C – Comprehensive Site History and Investigation Report*. As stated in the Investigation Report:

“Following flooding of the Mississippi River in June and early July of 2014, and at the request of the MPCA, the five existing permanent monitoring wells surrounding Area C were gauged on a weekly basis and sampled monthly, if accessible, for a period of three months following the peak flooding period. In October 2014, the MPCA requested Ford to conduct additional investigation work in Area C to improve delineation and characterization of the industrial waste and to evaluate potential exposure pathways. Between 2015 and 2016, Arcadis conducted these additional investigation activities, which included the completion of soil borings and vertical sampling through Area C, surficial soil sampling along the northern, western, and southern slopes of Area C, test trenching along the south slope of Area C, monitoring well installation within and along the perimeter of Area C, and groundwater sampling of both existing and newly installed wells.”

Summary of Conclusion in the Investigation Report

As also stated in the Executive Summary of the Investigation Report:

“Historical and current groundwater, surface water and soil analytical data was used to delineate the extent of and to characterize the industrial waste as well as evaluate potential exposure pathways. The ten soil borings completed vertically through the top of the paved portion of Area C and the five test trenches completed near the toe of the southern slope are sufficient to delineate the approximate extent of the industrial waste fill in each accessible direction. The 40 soil samples collected from the soil borings and the 20 samples collected from the test trenches are sufficient to characterize the variability of impacts present within the industrial waste fill, the overlying construction debris and the underlying floodplain sands. Investigation of the distribution and characteristics of the industrial waste fill present at Area C is considered complete.

The evaluation of the potential exposure pathways to impacts associated with Area C can be summarized as follows:

- *Direct contact with industrial waste: Debris at or near the surface has been identified within the zero to four foot below ground surface (bgs) accessible zone and paint sludge was identified in Trenches 1, 2 and 3 at depths as shallow as 2.5 feet bgs. The presence of paint sludge and impacted soil within the accessible zone at concentrations exceeding industrial SRVs [soil reference values] represents a potential exposure pathway with an unacceptable level of long-term risk.*
- *Direct contact with surficial soil fill: Current land use does not allow exposure to surficial soil via direct contact, however, this exposure pathway could be complete in the case of trespassers. Results of surficial soil sampling completed on the slopes of Area C detected concentrations of Benzo(a)pyrene (BaP) equivalents and diesel range organics (DRO) that exceeded their respective screening values. The presence of surficial soil with contaminant concentrations exceeding industrial SRVs represents a potential exposure pathway with an unacceptable level of long-term risk. Additionally, there is construction debris including concrete and chunks of metal at the surface of Area C that present a potential physical hazard to trespassers in the area.*
- *Ingestion of groundwater: This exposure pathway is not considered complete because Site groundwater is not currently used as a drinking water source, and it is highly unlikely to be used as a source in the future. Also, as documented in the 2007 Phase I Environmental Site Assessment by Arcadis, no public water supply wells were observed within a one-mile radius of the Site.*
- *Discharge of groundwater to surface water: An evaluation of the discharge of groundwater to surface water was completed in accordance with the MPCA Surface Water Pathway Evaluation User's Guide. Results of that evaluation did not identify any unacceptable risk to surface water based on the groundwater data collected at Area C to date.*
- *Inhalation of Soil Vapor: There are no permanent buildings designed for occupancy within 100 feet of Area C, therefore vapor intrusion is not a completed exposure pathway.*

A Feasibility Study will be completed for Area C to evaluate remedial options for the potential exposure pathways identified above as having unacceptable long-term risk.”

As described above, the Executive Summary listed 5 exposure pathways. Section 10 of the Investigation Report listed the following sixth exposure pathway:

“Erosion of surficial soil to surface water: One of the surface soil samples collected from below

the 100-year flood level detected two compounds (DRO and BaP equivalents) at concentrations greater than what was typical of all surface soil samples. There are not surface water standards for DRO or BaP equivalents so this is considered a potentially complete exposure pathway with no unacceptable level of long-term risk.”

Comments

The comments in this section focus on Landmark’s responses to each of the conclusions reached in the Investigation Report with respect to the six (6) exposure pathways. The comments in this section also take into account information discussed during the June 21, 2017 meeting. As mentioned in previous memos prepared by Landmark, our comments are primarily intended to inform PED staff of how the results of the investigations and could impact future discussions and decisions related to the future use of the Property. Based on Landmark’s review of the Investigation Report and the discussions during the June 21, 2017 meeting, we offer the following comments and recommendations:

- 1. Direct contact with industrial waste:* Landmark agrees that the presence of paint sludge and impacted soil in the top four (4) feet at concentrations exceeding industrial SRVs represent a potential exposure pathway with an unacceptable level of long-term risk. As a result, Landmark believes that response actions are necessary to address the contaminated soil. As mentioned at the June 21, 2017 meeting, even though Area C is no longer listed as a Superfund site, as part of the next step, the MPCA is requiring Ford to follow a process typical of a Superfund site by conducting a Feasibility Study (FS) instead of preparing Response Action Plan (RAP). It is Landmark’s opinion that a FS is not necessary with respect to addressing the direct contact with the paint sludge and impacted soil in the top 4 feet because the number of acceptable response action alternatives is limited. Landmark recommends that for this exposure pathway the next step in the process be for Ford to prepare an Interim Response Action Plan, which is a common element of the Superfund process, to be submitted to the MPCA for review and approval. In addition, it is Landmark’s opinion that the next step in the process also includes the preparation a draft Environmental Covenant by Ford for review and approval by the MPCA. Landmark also recommends that the proposed soil cleanup goals for the top four feet be based on applicable unrestricted risk-based criteria and based on applicable soil leaching values to protect groundwater.
- 2. Direct contact with surficial soil fill:* Landmark agrees that the contaminated surficial soil documented to be present on the slopes of Area C represents a potential exposure pathway with an unacceptable level of long-term risk. In addition, Landmark agrees that the construction debris present on the surface of Area C presents a potential physical hazard. As a result, Landmark believes that response actions are necessary to address the contaminated soil and remove all exposed buried debris. As stated above, instead of

preparing a FS as recommended in the Investigation Report, it is Landmark's opinion that this exposure pathway should be addressed as part of the Interim Response Action Plan that would be submitted to the MPCA for review and approval. Landmark also recommends that the proposed cleanup goals for the surficial soil be based on applicable unrestricted risk-based criteria, including removal of buried debris, and based on applicable soil leaching values to protect groundwater.

3. *Ingestion of groundwater:* Landmark agrees that based on the groundwater data and most importantly because of the lack of drinking water receptors on or in the vicinity of Area C, this exposure pathway is not considered complete and does not present an unacceptable long-term risk. However, based on concerns raised at the June 21, 2017, meeting, Landmark suggests that a receptor survey be conducted that assesses potential public and private groundwater receptors beyond the one mile radius that was completed as part of the Phase I Environmental Site Assessment.
4. *Discharge of groundwater to surface water:* It is Landmark's opinion, based on the information presented in the Investigation Report and additional information provided in the June 21, 2017, meeting, that there is insufficient information to conclude that this exposure pathway does not present any unacceptable long-term risk.
 - Section 3.2 of the Investigation Report describes groundwater elevations around Area C with reference to Figure 4 and describes the flow direction of groundwater at Area C based on this figure. Figure 4 (attached to this memo) does not show groundwater elevations in Area C; the flow is depicted east of Area C and it depicts the St. Peter component but not the overburden component. Figure 1 (attached to this memo) indicates there are multiple monitoring well points in and around Area C to use for this purpose and the cross sections in Figure 3 series (attached to this memo) indicate these wells were mapped, including AMW-19, AMW-22 and MW-6. However, these wells were not depicted in the cross sections. Based on this, it is unclear what data was used to validate the elevation of the St. Peter. The calculation of flow velocity in this section of the Investigation Report is not valid without the data being plotted. This also invalidates the modeling discussed in Section 9.5.
 - Section 3.2 of the Investigation Report also discusses river elevation and flood conditions. Figure 4 (attached to this memo) shows the river elevation below the dam but does not show the elevation above the dam, which could influence the groundwater flow direction in the northern part of Area C. The Investigation Report indicates that the typical river elevation is cited as being 689 feet amsl, which is similar to the elevation of the water table below Area C. However,

Figure 4 shows a groundwater elevation in the St. Peter as 695 feet amsl. This information could have a significant impact on the conclusions provided in Section 6.3.1 and in Section 9 of the Investigation Report.

- Section 3.3 discusses flooding of the buried industrial waste and concludes that the set back from the Mississippi River and the slow response in the groundwater fluctuations are factors that would limit the industrial waste from being impacted. There is no data presented in the Investigation Report that support this conclusion. Landmark recommends that a supplemental report be prepared that provides hydrographs from all of the wells in Area C (inside and outside the waste) along with the staff gauge data during flooding and non-flooding events. In addition, the intervals for samples collected with the industrial waste are listed in Section 8 as “feet bgs” and not elevations. This information could have a significant impact on the conclusions provided in Section 6.3.1 and in Section 9 of the Investigation Report.
- Although Section 7 references surface water quality criteria, it does not include an assessment of all ecological receptors. As has been completed at other contaminated sites located along the Mississippi River, Landmark recommends that a supplemental report be prepared that includes a review and evaluation of specific benthic organisms and critical habitat using data bases such as the Natural Heritage Information System and resources provided by the Minnesota Department of Natural Resources. Landmark recommends this review and evaluation focus on the list of SVOCs and dissolved metals, in particular thallium, that were reported in multiple wells at concentrations above the applicable surface water criteria.
- Section 8 of the Investigation Report states that AMW-07 is representative of groundwater flow in the St. Peter in Area C. Figure 4 shows that this well is upgradient of Area C. Because of this, this well would not be representative of loading from Area C. According to the well construction logs included in Appendix I, monitoring wells AMW-19, AMW-20, AMW-21 and AMW-22 located between the buried industrial waste and the Mississippi River are screened in unconsolidated sediments above the St. Peter Sandstone.
- As discussed in Section 9.3, there is the potential for higher groundwater concentrations based on leaching impacts from the industrial waste during flooding events. However, as stated in Section 9.5.1 “*those higher concentrations have not been observed in downgradient monitoring wells even during high frequency sampling that was completed after the most recent flood event...*” It is unclear as to what downgradient wells this section of the Investigation Report is referring to. As listed in Table 7 of the Investigation

Report, wells AMW-19 and AMW-20 were sampled on August 7, 2014, and September 16, 2014, and were the only wells located between the buried industrial waste and the Mississippi River that were sampled during this period of time.

It is Landmark's opinion that additional groundwater sampling should be conducted and that a long-term groundwater monitoring plan be prepared and submitted to the MPCA for review and approval. As discussed during the June 21, 2017, meeting, selected monitoring wells should be equipped with continuous monitoring devices to measure groundwater elevations. It is also Landmark's opinion that there is insufficient groundwater data and understanding of the long-term potential impacts of this exposure pathway to be able to conduct an adequate FS at this time. .

5. Inhalation of Soil Vapor: Landmark agrees that because there are no buildings designed for occupancy within 100 feet of Area C, this exposure pathway is not considered complete and, as a result, does not present an unacceptable risk. However, this conclusion assumes that no buildings will be constructed in the future on or in the vicinity of Area C. The Environmental Covenant could be a mechanism by which the future use of Area C could be restricted. Unlike the ingestion of groundwater exposure pathway listed above where data was collected to help come to the conclusion that particular exposure pathway does not present any unacceptable long-term risk, no soil vapor samples have been collected on or in the vicinity of Area C. It is Landmark's opinion that as an alternative to restricting the future use of Area C, soil vapor sampling should be conducted so that the laboratory results could provide further evidence that this exposure pathway will not present an unacceptable long-term risk.
6. Erosion of surficial soil to surface water: It is Landmark's opinion that, based on the information presented in the Investigation Report, there is insufficient information to conclude that this exposure pathway does not present any unacceptable risk. As discussed in Section 9.3 of the Investigation Report, the results from only three (3) soil samples (HA-22, HA-26 and HA-31) collected below the 100 year flood level were used as the basis for the conclusion reached by Arcadis. It is Landmark's opinion that additional soil sampling be conducted in the area below the 100 year flood level to adequately address this exposure pathway. Landmark recommends that this additional sampling be conducted prior to including this exposure pathway in the FS.

Thank you for the opportunity to provide environmental assistance on this project. Please contact me with any questions at khaberman@landmarkenv.com or at 952-666-2424.