



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

July 17, 2019

Heather Ziegelbauer  
Project Manager  
Jacobs  
135 South 84<sup>th</sup> Street, Suite 400  
Milwaukee, WI 53214

RE: EPA and WDNR Review of Arsenic Migration Pathway Evaluation Work Plan  
Tyco Fire Products LP Facility, Marinette, WI, WID 006 125 215  
EPA RCRA Administrative Order Docket No. RCRA-05-2009-0007

Dear Ms. Ziegelbauer:

The EPA and WDNR have reviewed Tyco's Arsenic Migration Pathways Evaluation Work Plan submitted on June 24, 2019. The Agencies approve of the work plan with the following conditions listed below. Responses are not required for comments 1 through 4, but submission of additional material is needed for comments 5 and 6.

**1. Section 2.5 Post-Dredging Surface-Weighted Average Concentrations**

The Agencies understand that the glacial till was specifically excluded from the remedial approach outlined in the 2009 AOC and accept that it can be excluded from the SWAC calculations. However, it is not appropriate to conclude that the glacial till is not conducive to benthic organisms. The glacial till, particularly where it remains uncovered by sediments, is an exposure pathway to surface water, fish, and anything that may be moving on top of it if arsenic is present, regardless of whether it lives there permanently or not. When Tyco updates its ecological risk assessment in 2022 or 2023, if needed, this exposure pathway should be part of that assessment (see May 13, 2019 meeting notes for discussion on future ecological risk assessment needs).

**2. Section 3.2**

The title of this section says "Glacial Fill," it should say "Till."

**3. Section 3.2 Ongoing Diffusive or Advective Transport of Arsenic from Glacial [Till] and/or Bedrock**

The second paragraph contains statements that require more information for clarity about EPA's concerns with the vertical advective groundwater transport pathway.

Ongoing monitoring data of bedrock groundwater does not exclusively show that concentrations of arsenic are "generally declining," and relying on trends masks the actual concentrations found in bedrock groundwater, which is not contained by the vertical barrier wall (VBW). Table 12 of the 2018 Five Year Technical Review (Mann-Kendall Trend Analysis Summary) shows 7 bedrock wells with decreasing trends, 1 well with an increasing trend, 4 wells with stable trends, and 2 wells with no significant trend; half of the bedrock wells are decreasing while the other half are not. Bedrock groundwater concentrations in the Salt Vault and 8th Street Slip were up to 190,000 ug/L and 480,000 ug/L in 2018, respectively. In the Main Plant, bedrock groundwater concentrations were up to 460 ug/L along the VBW.

Tyco assumes that the glacial till has low permeability, but hydraulic conductivity in the glacial till has not been directly measured yet. Table 2 of the 2012 Monitored Natural Recovery Plan (Summary of Model Input Parameters) calculates a groundwater upwelling velocity of 0.5 to 2 cm/yr in the glacial till. Meanwhile, the MW-117D boring log notes "silty sand, brown, wet, trace gravel and cobbles, subangular" in the 1.7 feet above bedrock, where till would be present according to the Conceptual Site Model. These features may represent preferential pathways for vertical movement of groundwater from bedrock that may be risk factors to the sediment and river.

#### **4. Section 4.1 Project Quality Objectives and Table 2 Step 1**

As stated in Section 2.5, the Turning Basin SWAC is 63.2 mg/kg. The SWAC across the entire dredge footprint is 18.6 mg/kg. The Turning Basin has been identified as a hotspot for arsenic sediment concentrations and the project quality objectives seek to determine the reason for the high concentrations there. The Agencies do not consider the Turning Basin to be meeting the cleanup goal of 20 mg/kg, therefore it cannot "continue" to meet the cleanup goal.

#### **5. Section 5.2.3 Continuous Soil Core Samples for Arsenic Profiles and Discrete Groundwater Samples**

Please provide the drilling contractor's Standard Operating Procedure for boring advancement and sample collection for the subject samples from a barge-mounted drill rig. These SOPs should address quality control steps to insure the correct sample is collected from targeted intervals or sources, including how sampling methods will verify that surface water is not entering the discrete groundwater sample for data quality assurance. Provide the SOP(s) to the Agencies at least 14 days in advance of the scheduled sampling event.

#### **6. Table 2 Step 3 Existing Data**

Please provide the vertical gradient information from historical vibrating wire piezometer and paired monitoring well data and describe how that data was used to inform the development of this Work Plan, including how it may have impacted sample location selection.

Please contact me at 312-886-7193 or [neal.conor@epa.gov](mailto:neal.conor@epa.gov) should you have any questions.

Sincerely,



Conor Neal  
Geologist

Ecc: Angela Carey, WNDR  
Joseph Janeczek, Johnson Controls  
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