Technical Assistance Services *for* Communities

TASC Review of the Screening Risk Evaluation for Individuals Observed Swimming in the Tar Creek

Introduction

The LEAD Agency requested assistance from EPA's Technical Assistance Services for Communities (TASC) program to help the community review the June 30, 2023, Screening Risk Evaluation for Individuals Observed Swimming in the Tar Creek (2023 SRE) for the Tar Creek Superfund site (the Site). This exposure scenario had been evaluated previously in the February 2021 Remedial Investigation/Baseline Human Health Risk Assessment report, documenting high risk from exposure to several hazardous chemicals in surface water and sediment during recreational and swimming activities in the Tar Creek watershed. Based on these 2021 results, EPA recommended against recreational swimming activities at the Tar Creek watershed.

EPA revisited the recreational swimming exposure pathway in the 2023 SRE to specifically focus on the Swimming Hole Area and to expand the risk evaluation to also include surface soils collected from the banks of the Swimming Hole Area since picnicking activities were observed at that location.

EPA's TASC program funded this document. Its contents do not necessarily reflect the policies, actions or positions of EPA.

TASC's review provides a summary of the 2023 SRE and technical comments for community members' consideration. The review is divided into the following sections.

- Sampling Effort
- 2023 SRE Methodology
- 2023 SRE Conclusions
- TASC Review Comments

Sampling Effort

EPA completed a focused sampling effort within the Swimming Hole Area in October 2022. The Swimming Hole Area is located southeast of the Miami Nursing Home and includes waters surrounding the Low Water Bridge and BNSF Bridge (Figure 1). EPA collected 12 surface water samples and 20 collocated sediment (fine fraction and unsieved) samples and 24 surface soil samples from banks where picnicking activities have been observed.

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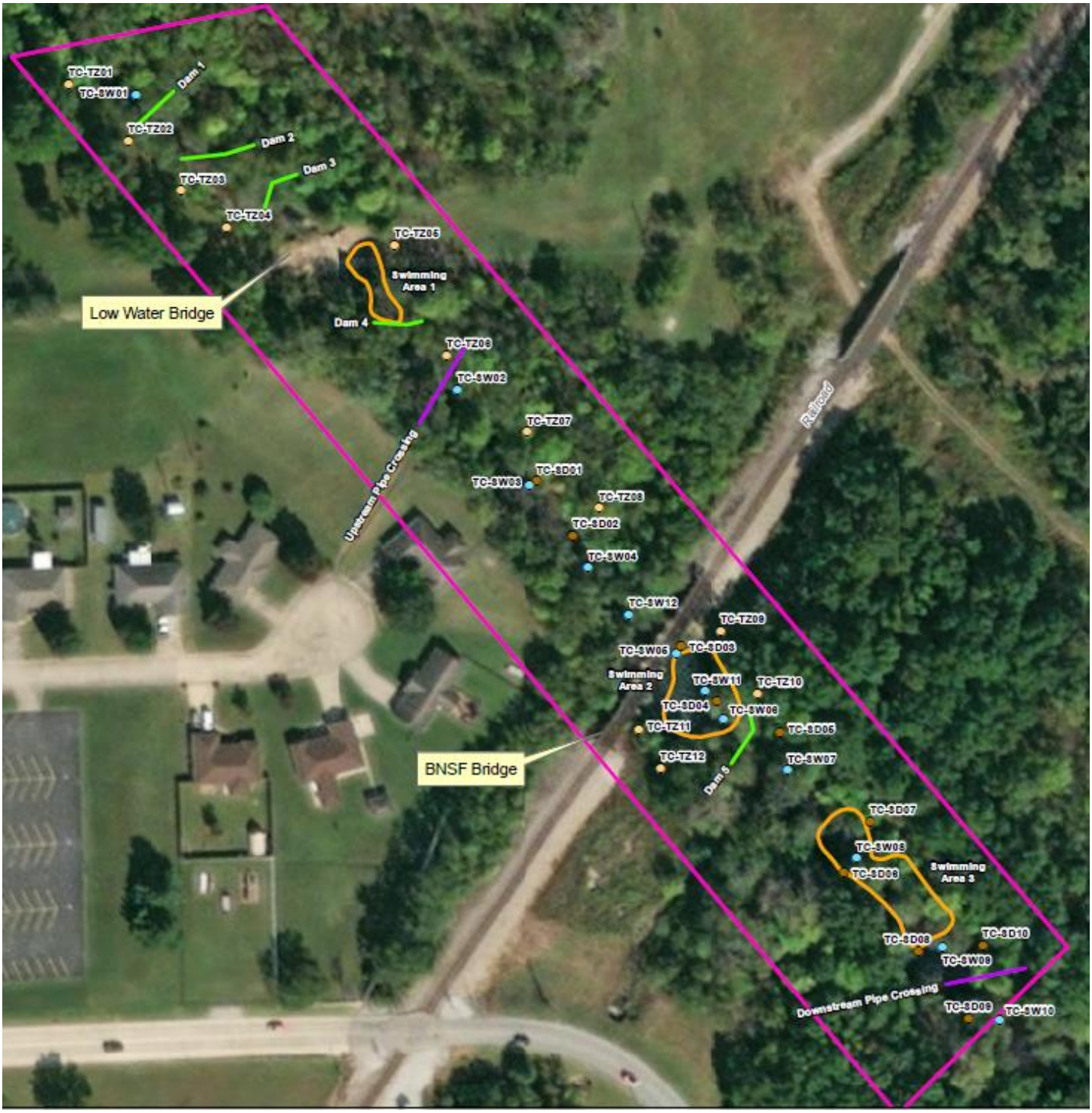

Figure 1: Surface Water, Sediment and Soil Sampling Locations

Methodology

The 2023 SRE focused on the same contaminants of concern (COCs) as the 2021 baseline risk assessment. The 2023 SRE added evaluation of soil, which had not been evaluated in 2021 (Table 1).

The 2023 SRE investigated potential exposures and risks to two general age groups – child (ages 0 to 6) and adult – under both Tribal Lifeway and General Public exposure scenarios (Table 2).

The Tribal Lifeway is based on a much higher frequency of exposure than the General Public, higher soil ingestion rates for an adult and a child, and longer exposure duration. Also, the adult body weight is less than the General Public adult. These differences in exposure assumptions show that the Tribal Lifeway exposure results in greater potential exposure than to the General Public.

The exposure routes evaluated in the 2023 SRE include:

- Incidental ingestion
- Skin contact
- Inhalation (soil/dry sediment)

EPA calculated cancer risks and noncancer hazards associated with exposure to site COCs except lead. EPA evaluates lead exposure using blood lead modeling. Cancer risks below a cancer risk of 1 x 10^{-4} generally do not trigger the need for any cleanup action or action to stop exposure from happening. Similarly, noncancer hazards below a hazard index of 1 generally do not require any cleanup action or action to stop exposure. Health effects associated with lead exposures is a concern when blood lead concentrations in more than 5% of a typical child or group of similarly exposed children exceed a blood lead level of 5 micrograms per deciliter (µg/dL).[1]

COC	Surface Water	Sediment	Bank Soil
Arsenic	X		
Cadmium	X	X	X
Cobalt	X		
Iron	X		
Lead	X	X	X
Manganese	X		
Nickel	X		
Zinc	X	X	X

Table 1: Summary of COCs by Media

Exposure Assumption	Tribal Lifeway	General Public
Exposure frequency (days/year) Child Adult	 234 312	 90 90
Swimming/wading (Hours/day)	6	3
Soil/sediment ingestion rate (milligrams/day) Child Adult	 200/400 200/400	 200 100
Exposure Duration (years) Child Adult	 6 64	 6 20

Table 2: Summary of Exposure Assumptions – Tribal Lifeway and the General Public

Conclusions

EPA completed a health evaluation of Tribal Lifeway separate from the General Public exposures to surface water, sediment and bank soils. The results are consistent with the 2021 baseline risk assessment findings that swimming/wading and picnicking activities at the Tar Creek Swimming Hole Area pose noncancer hazards and unacceptable lead exposures. As such, it is recommended to refrain from such activities until the site is remediated.

[1] The SRE used a more conservative blood lead level of 5 µg/dL rather than 10 µg/dL in anticipation of a new EPA lead policy that will lower the acceptable blood lead level in the near future.

A summary of the key conclusions of the 2023 SRE are as follows:

- The October 2022 sediment contaminant levels were within the same range of the 2021 sediment results for the watershed.
- The surface water contaminant levels were lower than observed in the 2021 watershed results.
- The cancer risks for both the Tribal Lifeway and the General Public were below 1 x 10^{-4} for surface water, sediment and bank soil exposures.
- The noncancer hazard index was equal to or exceeded the threshold of 1 for the Tribal Lifeway and General Public child. The Tribal Lifeway exceedances were about three times higher than the noncancer hazard exceedances for the General Public child.
- The noncancer hazard index was exceeded for the Tribal Lifeway adult exposure pathways but not for the General Public adult exposure pathways.
- All noncancer hazard exceedances were due primarily to exposure to contamination through ingestion with a secondary contribution from skin contact.
- The probabilities of exceeding a blood lead level of 5 µg/dL under different scenarios for Tribal Lifeway and General Public young children were estimated to exceed the acceptable probability of no more than 5% exceeding a blood lead level of 5 µg/dl.
    - Tribal Lifeway child had probability exceedance ranging from 64.5% to 99.7% based on bank soil and sediment ingestion, respectively.
    - General Public child had a probability exceedance ranging from 12.5% to 25.9% based on bank soil and sediment ingestion, respectively.
    - The average blood lead levels for the Tribal Lifeway child were about twice as high as the General Public child.

TASC Review Comments

TASC Comment: Community members understand that many of the exposure assumptions were obtained from the 2021 baseline risk assessment, but according to Table 5 of the 2023 SRE, some assumptions were modified. However, it is unclear which exposure assumptions were modified and why. Community members may want to ask EPA for clarification on which exposure assumptions were modified and the reasons for modifying them.

TASC Comment: The conclusions indicated that swimming/wading and picnicking activities at the Tar Creek Swimming Hole Area pose a risk exceeding EPA's accepted risk levels and as such it is recommended to refrain from such activities until the site is remediated. The community may want to ask EPA for clarification on how ongoing and known exposures to the Swimming Hole Areas will be discouraged or prevented given site remediation will take time and has not been completed.

TASC Comment: While the 2023 SRE results in similar conclusions as determined in the 2021 baseline human health risk assessment, the actions that have taken place to discourage swimming and recreational activities in these areas have not been entirely successful. For example, EPA with the help of the state of Oklahoma (ODEQ) placed several "Swimming Discouraged" signs in and around the swimming areas. The signs have since been stolen or damaged. Community members may want to ask EPA if increased monitoring of these areas can be conducted to ensure signage remains posted and that artificial dams can be removed.