

Addendum to the Final Draft Assessment Plan for the Natural Resource Damage Assessment of the Sauget Industrial Corridor Sites: Inclusion of the 2018 Sediment and Benthic Macroinvertebrate Study and 2018 Baseline Bat Acoustics Surveys

May 2018

Sediment and Benthic Macroinvertebrate Study

Introduction

Acting under their authority as natural resource trustees pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the United States Department of Interior Fish and Wildlife Service (FWS), Illinois Environmental Protection Agency (IEPA), Illinois Department of Natural Resources (IDNR), and Missouri Department of Natural Resource (MDNR) (collectively, the “Trustees”) are conducting a natural resource damage assessment (NRDA) within the Sauget Industrial Corridor (SIC), in Sauget, Cahokia, and East St. Louis, St. Clair County, Illinois. The NRDA assessment area (Assessment Area) for this addendum is a relatively flat area of land in the municipalities of Sauget, Cahokia, and East St. Louis directly adjacent to and located within the floodplain of the East Bank of the Mississippi River, known as the American Bottoms. The SIC provides important habitat for a variety of fish and wildlife species and is situated within the Mississippi River Flyway. The American Bottoms is home to numerous species of endangered and threatened aquatic birds. The aquatic areas of the SIC that are the focus of this report provide important ecological services to both local and migratory animals.

This Assessment Area contains numerous hazardous waste disposal sites, back-filled former wastewater impoundments and adjacent affected areas, including natural wetlands and waterways contaminated through releases of hazardous substances. As part of remedial investigation and response activities under CERCLA, the U.S. Environmental Protection Agency (USEPA) grouped these features into two areas (“Area 1” and “Area 2”), each comprised of multiple sub-units delineated on the basis of geographic features, historical aerial photographs, magnetometer surveys, soil gas surveys, and test trenches.

Given the long history of industrial development, unpermitted releases and dumping of hazardous substances within the Assessment Area, natural resources have been exposed to and injured by hazardous substances throughout much of the last century, and injury is expected to continue into the future.

The Trustee’s Preassessment Screen (PAS) and Assessment Plan (AP) for the SIC Sites assembled readily available pertinent information and noted releases of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), dioxins and furans, and metals from the SIC Sites at concentrations that “constituted an imminent and substantial threat to public health and the environment”(Assessment Plan for the NRDA of the Sauget Industrial Corridor Sites <https://www.fws.gov/midwest/es/ec/nrda/Sauget/index.html>). The Draft Surface Injury Determination report drafted by the Trustees for the SIC sites identified injuries to natural resources, while exposing gaps in the data required by the Trustees to fully quantify the extent of contamination and to evaluate potentially on-going releases of contaminants that may not be addressed by the remedial process.

Through a phased approach, the Trustees seek an understanding of pathway, exposure, injury and damages associated with the release of hazardous substances to the environment in locations where sampling has either not occurred or sampling was sparse. The first step and the purpose of the 2018 sediment and benthic macroinvertebrate sampling study is to address uncertainties and data gaps associated with the spatial characterization of the concentrations of PCBs and other contaminants in sediments and benthic invertebrates in the vicinity of the SIC Site (i.e., the study area; Figure 1).

Objectives

- Determine the concentrations of PCBs and other contaminants in sediments in un-sampled and under-sampled areas within the study area:
- Determine the concentrations of PCBs and other contaminants in macroinvertebrate benthic tissue in areas within the study area:
- Determine whether additional sampling is required to evaluate the nature and extent of contamination of sediments, and benthic macroinvertebrates within the SIC:

General Design

Based on the review of existing data and other information, a number of candidate sampling areas for sediment sampling were identified in the study area. Most of the selected sampling areas for sediments represent un-sampled or under-sampled areas within Dead Creek and nearby contiguous or off-channel wetland habitats. For benthic macroinvertebrates, most of the selected sampling areas are wetland habitats located adjacent to Borrow Pit Lake and agricultural lands.

The 2018 sediment sampling study will target the collection and analysis of approximately 25 sediment and approximately 10 benthic macroinvertebrate samples. A number of alternate sampling locations were also identified in the event that the field sampling team cannot safely or effectively obtain a sample from the target coordinates, or, if the station is deemed to be inappropriate. Up to 5 QA/QC samples also will be prepared and submitted for analysis as part of the study (i.e., about 20% of the overall sampling program analytical resources will be allotted to QA/QC). The general approach used to design the sampling study is described in the following.

A total of 25 sediment samples will be collected during the field sampling study from locations selected through a desktop review of areas with data gaps (Figure 2.) . In the field, each sampling location will be located using maps and a GPS unit. Upon arrival at each sampling station, a cursory reconnaissance will be conducted to determine if it is feasible and safe to collect a sample. If the location is deemed unacceptable for sample collection, an alternate sampling location will be selected. If conditions are appropriate for sample collection, a total of three to five grab sediment samples will be collected and composited., except those samples intended for VOC analysis which will not be composited. The aliquots for each composited sample will be collected within a 25-meter radius of the designated sampling coordinates, focusing on those areas that appear to be the most depositional or the lowest in elevation (i.e., areas that are more likely to be inundated during flooding events).

Sediment samples will be collected at each station by deploying and retrieving a handheld core sampler (i.e., the modified Besser sampler) or Ekman sampler, targeting the top 15 cm of surficial material. In some cases, it may not be possible to penetrate the sediment matrix to the desired depth (i.e., due to the presence of coarse substrate, root masses, debris, etc.). In such cases, the field sampling team may choose to accept the sample as collected (recording depth of penetration), or to sample from an alternate sampling location. All samples will be sieved in the field to a diameter of 2 mm. Material that exceeds this size will be discarded. Samples will be collected in 1.25-gallon high-density polyethylene (HDPE) buckets. Each container will be filled with at least 2.5 liters (L) of sieved material to facilitate analysis. These samples will be carefully sealed and labeled following collection and stored in coolers on ice prior to being transported to the laboratory. All samples will be accompanied by a Field Chain-of-Custody (COC) Form.

A total of 12 benthic macroinvertebrate samples will be collected at designated locations using ponar/Ekman dredge samplers. Macroinvertebrates will be identified, sorted, preserved, and analyzed for PCBs, heavy metals, organochlorines, and aromatics. Information on amount of optimal habitat, number of species, density, and water quality parameters will be recorded. All macroinvertebrate specimens collected, regardless of species, from each sediment sampling location will be consolidated for contaminant analysis. Up to five QA/QC samples will be taken at control locations for analysis as part of the program.

Species Identification - Multiple sediment grab samples will be composited and placed in a 10-12 Liter capacity bucket. Water will be added to the sample and gently hand-mixed or agitated to break up lumps of sediment. The sample slurry will be poured from the bucket through an elutriator or sieve bucket which is placed over a second bucket to catch the rinse water. It may be necessary to sieve the slurry in small portions to prevent clogging of the mesh and several rinses may be necessary to remove all the sediment, leaving behind sediment-dwelling invertebrates. The number of grabs collected and rinses performed will be recorded. Invertebrate samples will be transferred to sample container(s) (500 to 1,000 ml capacity) and preserved in enough 95% ethanol to cover the sample. Samples will be carefully sealed and labeled following collection and stored in coolers for transportation to the field laboratory. At the field laboratory, all samples will be logged, clearly labeled, and packaged for transport. All samples will be accompanied by a Field Chain-of-Custody (COC) Form.

Contaminants – a parallel sample using the same collection techniques will be collected for contaminant analysis. Invertebrates will be composited to obtain a single homogeneous sample. Organisms will be collected until the mass requirements for the analytical analyses are met. Benthic macroinvertebrate samples that will be analyzed for contaminants should be kept on frozen carbon dioxide..

Data Quality Objectives:

Generation of high quality, reliable sediment data is a primary objective of the sampling study. All reasonable efforts will be made to minimize the potential for sample contamination and/or degradation during sample collection, handling, and processing. Some of the steps that will be taken to avoid sample contamination include:

- Approaching the sampling locations from the downstream direction (to the extent possible), and in a manner that will not disturb the samples (i.e., do not step or place equipment on the sampling location as the area is approached);
- Ensuring that sediment samples do not come in contact with any item that has not undergone the approved decontamination process;
- Designating a clean-hands person to label sample containers, take notes, and seal sample containers;
- Ensuring that any utensils that are used in the sediment sampling process do not come in contact with any item that has not undergone the approved decontamination process;
- Placing decontaminated samplers and other sampling equipment in clean plastic bags during transit between sampling stations;
- Covering the sample collection container after each grab sample has been taken, and covering the sieved sample container when material is not being transferred in or out of the container;

- Fully decontaminating all sampling equipment after sampling has been completed at a sampling location; and,
- Prohibiting any activity during sampling that could result in sample contamination (e.g., smoking, applying sunscreen, and consuming food or drinks during the sampling process;)

Summary

The 2018 study is the initial phase of sampling to evaluate areas of the SIC sites where inadequate or no sampling has occurred to date. The study will provide information to determine if contaminants are present at concentrations that may injure natural resources in areas in close proximity and hydrologically connected to known contaminated areas. This initial phase will evaluate sediment and benthic invertebrates in conjunction with bat acoustics surveys. Depending on the information from these studies, additional foodweb studies may be conducted.

Timeline for Tasks to be Completed:

Sample collection: June-July 2018

Data compilation and analysis: July – October 2018

Report generation and review: November 2018 – January 2019

2018 Baseline Bat Acoustics Surveys

Introduction

The NRDA assessment area for the Sauget Industrial Corridor (SIC) is a relatively flat area of land in the municipalities of Sauget, Cahokia, and East St. Louis directly adjacent to, and located within, the floodplain of the East Bank of the Mississippi River. This area is known as the American Bottoms Ecoregion, which is an ecologically significant area due to its location along the Mississippi River migratory bird flyway and the presence of multiple floodplain wetlands. The American Bottoms are also home to numerous species of bats including the federally endangered and state endangered Indiana bat, federally endangered and state endangered gray bat and the federally threatened and state threatened northern long-eared bat. Documented occurrences of threatened and endangered (TE) bat species have been documented within less than 10 miles of the SIC sites. Results of sediment and water samples within the SIC show elevated levels of contaminants including PCBs, heavy metals, pesticides, SVOCs, and VOCs. A Trustee site visit in June 2017 determined that there was habitat present within the SIC sites that would be conducive to support migrating and maternity roosting bats. The primary objective of this study is to determine if bats, specifically TE bats, are present at the SIC. Results from this study will determine whether future studies are required to evaluate potential effects of contaminants on bats.

Objectives and Methods

Advances in acoustic technology have made it possible to decipher bat echolocations by species. This study will use bat acoustic monitors at several locations throughout the SIC sites to determine bat species presence, specifically TE bats. The areas chosen represent surface waters known to be contaminated as a result of releases from the SIC. The objectives of the acoustic surveys are to document: the presence or probable absence of the Indiana bat, gray bat and/or northern long-eared bat along wetlands and creeks within the SIC, the presence or probable absence of these bats during the maternity season, and bat activity throughout the seasons.

Based on a site review, six locations within the SIC conducive to bat activity were chosen. The acoustic surveys will be conducted between May 21 and November 15 to detect spring migrating bats, summer roosting bats, and fall migrating bats. Surveys will be conducted using full-spectrum acoustic bat detectors and data loggers. Six acoustic monitors will be deployed in selected areas during the week of May 21. Exact locations of deployment will be determined after a field habitat examination by a qualified biologist and may be adjusted depending on factors such as activity levels, weather, etc. Acoustic monitoring will begin 30 minutes prior to sunset and continue until a half hour after sunrise. For each acoustic survey night, the date, start and end time, site description, site coordinates, and detector specifics will be recorded. Batteries and memory cards will be swapped out every two weeks. Information on the memory cards will be processed upon collection and entered into a database.

Subsequent bat call analysis will follow the most recent USFWS survey guidelines, which include both a quantitative and qualitative review of acoustic data to determine if TE species were present or likely absent. Certified bat call software will be used to perform automated quantitative species identification. In order to assure QA/QC, all calls identified by the software as Indiana bat, gray bat, or northern long-eared bat will be sent for manual viewing and verification by a third-party, contracted, qualified biologist with extensive acoustic identification experience. As well, if a night's worth of acoustic data exceeds the maximum likelihood threshold ($p\text{-value} < 0.05$) for the presence of northern long-eared bats, Indiana bats, and/or gray bats, all Myotis files from that night will receive qualitative review. If call sequences were not characteristic of Indiana bat, gray bat, or northern long-eared bat, contained distinct calls produced by species other than these species, or were of insufficient quality, they will be reclassified as another species or as unknown. The acoustic monitors will be removed from the sites the week of November 15th. Upon

completion of the survey and manual vetting of the potential TE calls, call abundance by TE species by night by site will be graphed to compare species specific bat activity through time and among habitats.

Concurrent with this study, the sediment and benthic macroinvertebrate sampling analysis will be occurring. The bat survey will be coordinated with the sediment/macroinvertebrate sample collection sites. Results from the sediment/macroinvertebrate sampling study will be compared to bat presence to determine if there is potential concern for effects to bats feeding on insects within the SIC and/or effects to resident roosting/lactating bats.

Timeline

May – November 2018 – Acoustic surveys with data collection and processing every 2 weeks and contractor manual vetting of potential TE calls

November –December 2018 – Final Report

Study Area

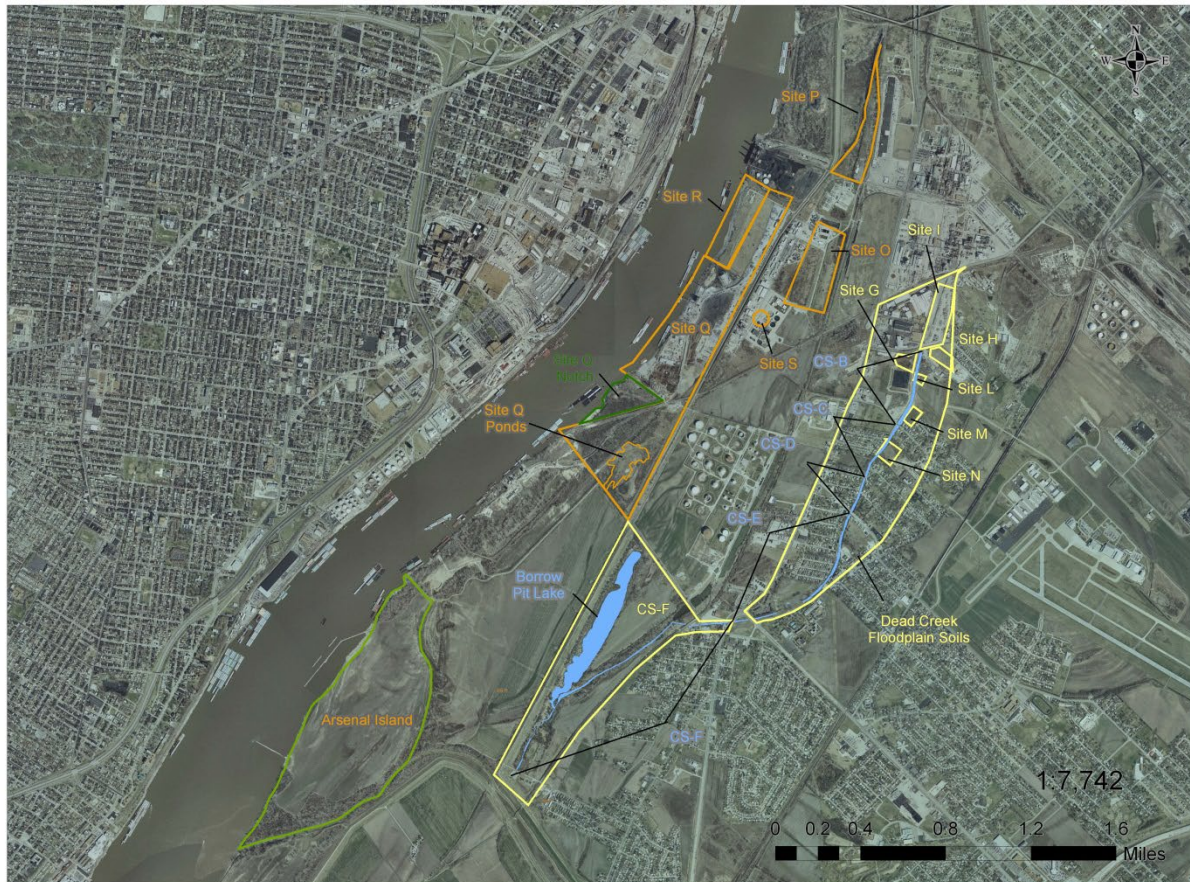


Figure 2

Proposed Field Sampling Locations

