

Missouri Department of Natural Resources
Natural Resource Restoration Project Proposals for the
Southeast Missouri Lead Mining District

Madison County:

*Little St. Francis River
Tributary (Logtown Branch and
Slime Creek), Stream Bank,
Floodplain and Riparian
Corridor Primary Restoration*

St. Francois County:

*“Bonehole” Primary Terrestrial
and Riparian Restoration*

St. Francois County:

*Flat River Creek Stream Bank
and Riparian Corridor Primary
Restoration*

April 2016

Introduction and Background

Missouri Trustees for the ASARCO Settlement

In 2009, the Missouri Department of Natural Resources as Trustee for the State of Missouri and the U.S. Fish and Wildlife Service (FWS), acting as Trustee on behalf of the U.S. Department of the Interior, successfully resolved a claim for natural resource damages against the American Smelting and Refining Company (ASARCO) resulting in the recovery of over \$40 million for the Southeast Missouri Lead Mining District (SEMOLMD).

Pursuant to CERCLA, the Natural Resource Damage Assessment and Restoration Trustee Council for the State of Missouri developed the Southeast Missouri Ozarks Regional Restoration Plan (SEMORRP) which provides a process framework that governs the approach for restoration project identification, evaluation, selection and implementation. As part of the restoration process, an agency member of the Trustee Council may submit proposal(s) for restoration projects to be evaluated by the Trustee Council in accordance with the factors discussed in the SEMORRP.

Preliminary Project Proposals

In its role as a Trustee and in accordance with Section 7 of the SEMORRP, the Missouri Department of Natural Resources (MDNR) submits the following restoration proposals to the FWS as cooperating co-trustee for the ASARCO settlement. The proposed restoration actions contained in the enclosed proposals are for the implementation of primary restoration as a means to directly restore natural resources and their services lost in the Old Lead Belt (OLB) specifically from mining operations at the restoration project locations.

The MDNR requests that the FWS review the available information contained in the proposals and concur that the projects scope, methods and proposed budgets presented align with FWS restoration goals.

Project summary sheets for three project proposals are included below. The summary sheets provide project specific details including restoration actions, requested budget earmarks and proposed funding sources. The project proposals are intended to integrate with and compliment USEPA remedial work in the project areas and are envisioned as an initial step in a phased restoration process. Specific phased proposals will be developed as determined by site conditions and the progress of USEPA remedial actions. Each phase will be developed as a stand-alone formal proposal with specific scopes, task and budgets, in consultation with the USFWS and submitted to the Trustee Council for consideration, public outreach and other steps outlined in the SEMORRP.

Restoration Project Proposal Summary Sheet

General Information

Project Name: Logtown Branch and Slime Creek Stream Bank and Riparian Corridor Restoration

Project Location: Madison County, Missouri

Organization: Missouri Department of Natural Resources

Date Submitted: April 6, 2016

Contact name: Eric Gramlich

Street address: 1730 E. Elm Street, Jefferson City, MO 65101

Phone number: 573-522-1347

Email: eric.gramlich@dnr.mo.gov

Organization website: <http://dnr.mo.gov/env/hwp/sfund/nrda.htm>

Project Information

Project Description:

This project proposes the direct restoration of stream banks, riparian corridors and floodplains in the Logtown Branch and Slime Creek tributaries of the Little St. Francis River in Madison County, Missouri. Project areas include tributary reaches undergoing USEPA remedial actions and those not identified for remedial work, but which exhibit non-native or poor quality vegetation, habitat degradation and stream bank erosion. Please see the attached map identifying the Project location included as Figure 1.

Site conditions and the need for restoration

The proposed restoration project area is located in Madison County Operable Unit 5 (OU5) and includes the Catherine Mines and Skaggs Mine Tailing Subsites, surface impoundment and tributaries to the Little St. Francis River. This portion of the Madison County Mines Superfund Site (MCM) has been identified by USEPA as a significant contributing source of mining waste to the Little St. Francis River and Fredericktown City Lake.

The Record of Decision for OU5 was completed in September 2012 and certain actions have already been completed by EPA related to removal and consolidation of mine waste within OU5. USEPA remedial work associated with the OU5 tributaries, including those identified for restoration in this proposal, is slated to begin in the current calendar year. The proposed remedy includes the excavation of tributary creek sediment, floodplain soils and transition soils to meet the respective cleanup levels. The proposed remedial actions are unlikely to restore natural resources to an acceptable condition and are anticipated

to result in response injury to habitat due to the mechanical removal of contaminated material. Vegetation, soils, sediments and stream bank integrity will be negatively impacted during response activities. Planned USEPA stream bank stabilization and erosion control consists of hard practices such as rock rubble emplacement and erosion mat barrier installation. Remediated riparian and floodplain areas are slated for the establishment of monoculture fescue stands.

In addition to areas which will be impacted by remedial actions, the project seeks to identify areas, in addition to those undergoing remediation, where site conditions warrant restoration work. To increase the positive impacts of restoration completed in remediated areas and restore ecological function in the watershed, restoration of stream banks, riparian zones and floodplains of tributary reaches not scheduled for remedial action is proposed where appropriate.

Restoration and Remedial Coordination

- Restoration coordination efforts will be conducted with USEPA Remedial Project Managers to identify the areas of remedial work where restoration can best address the negative ecological impacts resulting from remedial processes and the releases of hazardous substances.
- Watershed locations where habitat degradation and site conditions warrant restoration outside the planned locations of USEPA contaminant removal efforts will be identified and prioritized for restoration.
- Trustee representatives will canvas landowners in the planned remedial areas and identify those with interest in restoration partnerships.
- Trustee representatives will coordinate with local municipal interests and landowners in the affected areas and public involvement sessions will be held to seek public input on the proposed projects.

Restoration Methods and Goals

The methods used in the proposed project will consist of conservation practices for stream banks stabilization, riparian corridor and floodplain revegetation and will integrate the acquisition of conservation easements to assist in achieving project goals. Restoration methods will be derived and adapted from multiple sources including the Natural Resources Conservation Service and Missouri Department of Natural Resource Soil and Water Conservation Practices, among others. Conservation easements will provide incentives for landowner participation ensure the permanence of restoration actions and help prevent land disturbance with relatively modest investment, while also keeping land in private ownership. These projects will also improve riparian habitat and water quality in the project area by creating permanent riparian corridors with native vegetation.

- Stream bank and intermittent channel project restoration goals are to reintroduce native vegetation, reduce sedimentation and create or maximize fish and wildlife habitat in actively eroding or otherwise degraded stream and drainage channel reaches in the project area. In order to achieve this goal the project, we propose to employ stream restoration design and implementation methods using natural channel design techniques and state-of-the-art bioengineering approaches in accordance with state and federal guidance documents. These methods best maximize both the physical and ecological outcomes versus traditional hard-engineering practices proposed by USEPA such as rip-rap and other hard materials. The process will use bank grading, natural materials, and revegetation for long-term site stabilization thereby providing, ecological benefits to trust resources and increasing sustainability by reducing long term

maintenance costs.

- Riparian corridor and floodplain restoration goals are to stabilize streambanks, regulate water temperatures, supply stream carbon and large woody material, reduce stream sediment and provide fish and wildlife habitat and travel corridors. We propose to revegetate riparian corridors and floodplains following remedial work and in those and other areas plant native trees and shrubs to compliment stream bank restoration efforts. In order to achieve this goal, undesirable vegetation, such a monoculture fescue or non-native species will be eradicated and native grasses seeded, tree and shrub seedlings or potted plants that are suitable for soil and site conditions will be planted to create permanent buffers zones of variable widths. Follow-up spraying of herbicide for non-native control and replanting to address losses will occur as needed.

Connection to the Injured Natural Resources

This proposed project is intended to provide direct restoration of natural resources that the Trustees have identified as injured by releases of heavy metals in the Old Lead Belt. This project takes place within tributaries of the Little St. Francis River (LSFR) watershed. The Trustees received a settlement from ASARCO for natural resources injuries to terrestrial and aquatic resources including soils, sediments and biota within the OLB.

The Proposal requests funding derived from settlement monies for Madison County which were directly related to ASARCO operations at the Catherine Mine and Mill. Those operations contributed contamination which came to rest in the floodplain, riparian corridor and sediments within the tributaries, intermittent drainages as well as the LSFR. The project will address rehabilitating those areas both directly injured and within adjacent locations not receiving remedial actions but which are ecologically connected.

Proposed Budget

The proposal seeks to earmark an amount not to exceed \$500,000 to fund overall restoration actions related to the project. To address uncertainties in the exact scope and timing of remedial actions, the project is envisioned to be implemented in phases. Each phase of the project will be submitted to the Trustee Council under the auspices of the SEMORRP for consideration and will contain detailed budgets and descriptions of all actions to occur under that phase. A phased proposal process integrates restoration with remedial components specific to the sequence of remedial work and allows for earlier restoration of remediated areas. For example, a tributary stream bank stabilization and stream bank revegetation and restoration proposal would follow removal of contaminated tributary bank material or address response injury due to heavy equipment operation in the stream without the need to await future remedial actions downstream.

Timeline

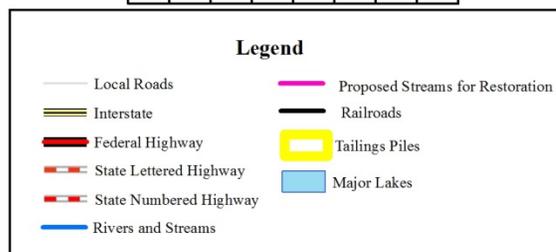
Upon Authorized Official concurrence on the proposal, the MNDR will coordinate with applicable stakeholders and USEPA to develop detailed phased proposals for Trustee consideration. Response actions are anticipated to begin in the current calendar year and the initial phase(s) will be developed to allow for integration with planned remedial actions.

Logtown Branch / Slime Creek Stream Project Area

Figure 1



0 0.125 0.25 0.5 Miles



Created on: April 1, 2016. This map is located at M:\Superfund\NRD\SlimeCreekProject.mxd

Base Map: National Agriculture Imagery Program (NAIP) ortho photography. Flight Date: 2014

Data Sources: Missouri Department of Transportation
 Although data sets used to create this map have been compiled by the Missouri Department of Natural Resources, no warranty, expressed or implied, is made by the department as to the accuracy of the data and related materials. The act of distribution shall not constitute any such warranty, and no responsibility is assumed by the department in the use of these data or related materials.



Restoration Project Proposal Summary Sheet

General Information

Project Name: "Bonehole" County Park

Project Location: St. Francois County, Missouri

Organization: Missouri Department of Natural Resources

Date Submitted: April 6, 2016

Contact name: Eric Gramlich

Street address: 1730 E. Elm Street, Jefferson City, MO 65101

Phone number: 573-522-1347

Email: eric.gramlich@dnr.mo.gov

Organization website: <http://dnr.mo.gov/env/hwp/sfund/nrda.htm>

Project Information

Project Description:

This Project proposes the direct restoration of uplands, riparian corridor and floodplain in the Big River watershed of St. Francois County. The Project area encompasses 40 acres and includes a portion of the Owl Creek tributary to the Big River and abutting upland, riparian and floodplain areas. Project areas include those slated for near-term USEPA remedial actions to address soil contamination and stabilize mine tailings. Please see the attached map identifying the Project location included as Figure 1.

Site conditions and the need for restoration

The proposed restoration project area is located in St. Francois County as part of the Big River Mine Tailings Site and is located adjacent to both the Big River and the Desloge Mine Waste Pile. The site is locally known as the "Bonehole" and is the location of a County public use area. Current USEPA actions at the site are planned under Operable Unit 1 (OU1) which includes residential and public use areas. This portion of the Big River Mine Tailings Site has been identified by USEPA as a source of mine waste contribution to Owl Creek, the Big River floodplain and a source of potential human exposure. The Record of Decision for OU1 was completed in September 2011.

The MDNR Superfund Section, under a cooperative agreement from USEPA is in the design phase of remedial work to address stabilization of the Owl Creek mine waste dam and the adjacent areas which

are part of the Bonehole. The proposed remedy includes the excavation of Owl Creek sediment, stabilization of mine waste by removal and capping, and removal of transition soils to meet the remedial action objectives. The proposed remedial actions are unlikely to restore natural resources to an acceptable condition and are anticipated to result in response injury to habitat due to the mechanical removal of contaminated material. Vegetation, soils, sediments and stream integrity will be negatively impacted during response activities. Proposed restoration actions outlined herein will compliment response actions and restore and rehabilitate injured natural resources.

In addition to areas which will be impacted by current remedial actions, the Project seeks to identify areas not slated for response actions where site conditions warrant restoration work.

Restoration and Remedial Coordination

- Restoration coordination efforts will be conducted with USEPA and/or MDNR Remedial Project Managers to identify the areas of remedial work where restoration can best address the negative ecological impacts resulting from remedial processes and the releases of hazardous substances.
- Terrestrial, floodplain and riparian corridor locations where habitat degradation and site conditions warrant restoration outside the planned locations of USEPA contaminant removal efforts will be identified and prioritized for restoration.
- Trustee representatives will coordinate with St. Francois County and other stakeholders including conducting public involvement sessions to seek public input on the proposed Project.

Restoration Methods and Goals

The methods used in the proposed project will consist of conservation practices for stream banks stabilization, riparian corridor and floodplain revegetation. Restoration methods will be derived and adapted from multiple sources including the Natural Resources Conservation Service and Missouri Department of Natural Resource Soil and Water Conservation Practices, among others. This Project will also improve riparian habitat and water quality in the project area by creating permanent riparian corridors with native vegetation.

- Owl Creek aquatic restoration goals are to reintroduce native vegetation, reduce sedimentation and maximize aquatic and wildlife habitat following response actions. In order to achieve this goal, we propose to employ stream restoration design and implementation methods using natural channel design techniques and state-of-the-art bioengineering approaches in accordance to state and federal guidance documents. These methods best maximize both the physical and ecological outcomes versus traditional hard-engineering practices commonly used in response actions such as rip-rap and other hard materials. The process will use bank grading, natural materials, and revegetation for long-term site stabilization which provides ecological benefits to trust resources and increases sustainability by reducing long term maintenance costs.
- Riparian corridor and floodplain restoration goals are to stabilize streambanks, regulate water temperatures, supply stream carbon and large woody material, reduce stream sediment and provide fish and wildlife habitat and travel corridors. We propose to revegetate riparian corridors and floodplains following remedial work with native trees and shrubs to compliment stream bank

restoration efforts. Follow-up spraying of herbicide for non-native control and replanting to address losses will occur as needed.

- Upland Restoration goals are to address response injuries related to the stabilization and capping of mine waste areas and the removal of transition zone contamination by the establishment of native grasses, shrubs and trees as are appropriate for the area. Due to the likely presence of poor quality soils either emplaced as capping material or remaining following excavations the addition of organic amendments such as compost will be used increase growth and survival of vegetation. Follow-up spraying of herbicide for non-native control and replanting to address losses will occur as needed.

Connection to the Injured Natural Resources

This proposed project is intended to provide direct restoration of natural resources that the Trustees have identified as injured by releases of heavy metals in the Old Lead Belt. This project takes place within the Big River watershed on property abutting the Big River. The Trustees received a settlement from ASARCO for natural resources injuries to terrestrial and aquatic resources including soils, sediments and biota within the OLB.

This Proposal requests funding derived from settlement monies for Big River Mine Tailing/St. Joe Minerals Site which included ASARCO natural resource injuries in St. Francois County. Those operations contributed contamination which injured upland resources and came to rest in the floodplain, riparian corridor and sediments within the Big River. The project will address rehabilitating those areas both directly injured and within adjacent locations not receiving remedial actions but which are ecologically connected.

Proposed Budget

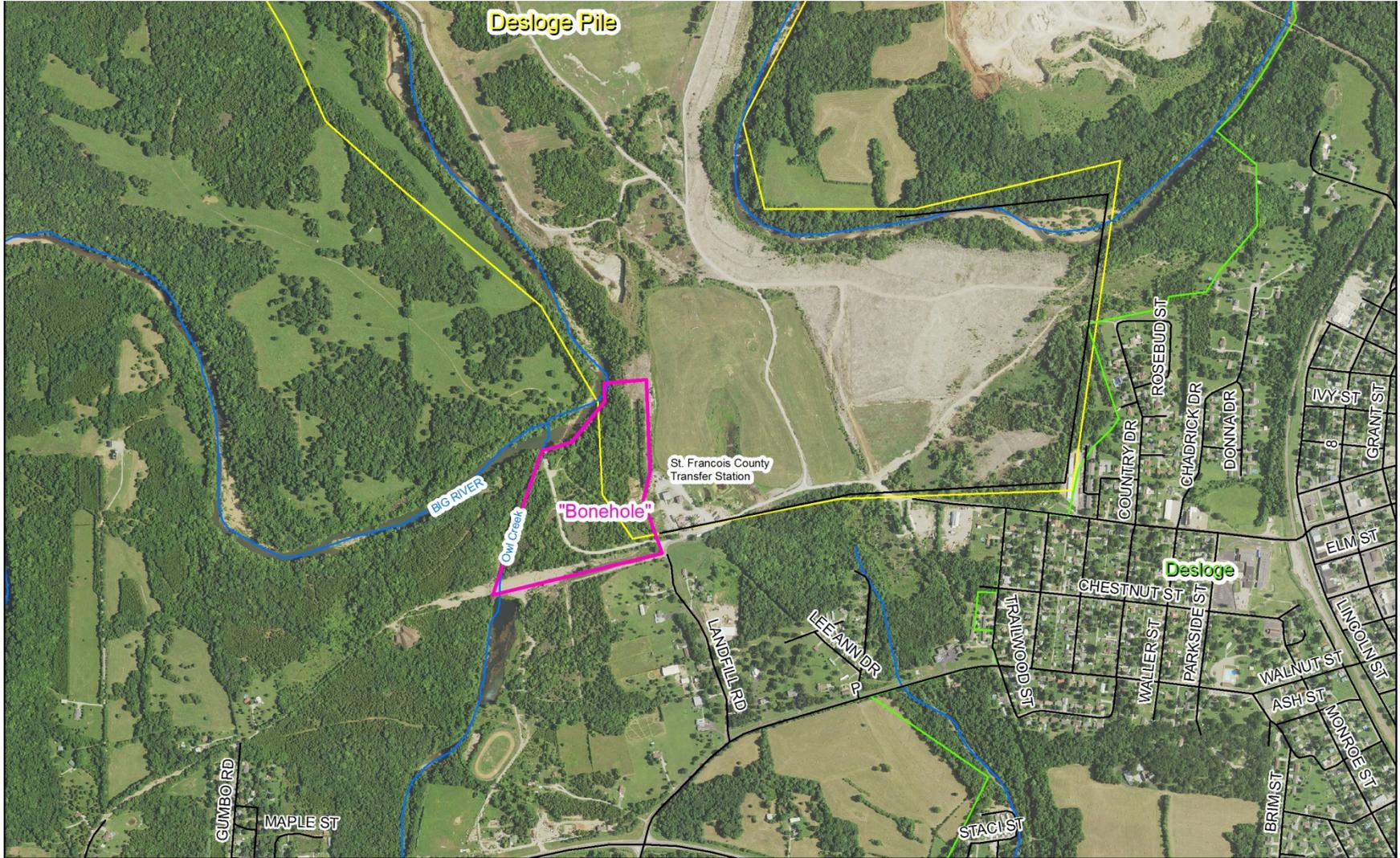
The proposal seeks to earmark an amount not to exceed \$250,000 to fund overall restoration actions related to the project. To address uncertainties in the exact scope and timing of remedial actions, the project is envisioned to be implemented in phases. Each phase of the project will be submitted to the Trustee Council under the auspices of the SEMORRP for consideration and will contain detailed budgets and descriptions of all actions to occur under that phase. Phased restoration at the project location will allow for earlier restoration action such as habitat improvement in areas that are not slated for remedial action. Restoration needs can be adapted to on-the-ground conditions as remedial actions evolve based on site conditions during the actual cleanup.

Timeline

Upon Authorized Official concurrence on the proposal outline, the MNDR will coordinate with applicable stakeholders and USEPA / MDNR Superfund to develop detailed phased proposals for Trustee consideration. Response actions are anticipated to begin in the current calendar year and the initial phase will be development to allow for integration with planned remedial actions.

Bonehole Project Area

Figure 1



Legend	
	NRDSDEP4.AQUATIC.STRM_SEGMENTS
	NRDSDEP4.TRANSPRT.MODOT_ALL_RDS
	MUNICIPAL
	Big River Tailings Piles
	Proposed Area of Restoration

Created on: April 1, 2016. This map is located at M:\Superfund\NRD\ParkHill\Project.mxd
 Base Map: National Agriculture Imagery Program (NAIP) ortho photography.
 Flight Date: 2014

Data Sources: Missouri Department of Transportation
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Restoration Project Proposal Summary Sheet

General Information

Project Name: Flat River Creek Stream Bank and Riparian Corridor Restoration

Project Location: St. Francois County, Missouri

Organization: Missouri Department of Natural Resources

Date Submitted: April 6, 2016

Contact name: Eric Gramlich

Street address: 1730 E. Elm Street, Jefferson City, MO 65101

Phone number: 573-522-1347

Email: eric.gramlich@dnr.mo.gov

Organization website: <http://dnr.mo.gov/env/hwp/sfund/nrda.htm>

Project Information

Project Description:

This Project proposes the direct restoration of stream banks and riparian corridor in the Big River watershed of St. Francois County. The Project area encompasses the riparian corridor and unstable banks of a portion of Flat River Creek in the City of Park Hills. The Project area includes the Haney Park riparian area recently remediated By USEPA. Please see the attached map identifying the Project location included as Figure 1.

Site conditions and the need for restoration

The USEPA recently completed remedial actions at a portion of the Project area under Operable Unit 1 (OU1) which includes residential and high public use areas. The remediated area includes a large section of Flat River Creek riparian corridor within Haney Park. The Record of Decision for OU1 was completed in September 2011. Additional USEPA decisions regarding Flat River Creek are anticipated in 2017 as part of OU2.

The completed remedial action at the Haney Creek park portion of the Project area have not restored the riparian natural resources to an acceptable condition and the final remedy established a monoculture of fescue on the remediated site and did not address pre-existing bank erosion issues as part of the record of decision. Proposed restoration actions outlined herein will compliment response actions and restore

and rehabilitate injured natural resources.

In addition to remediated areas proposed for restoration, the Project seeks to identify areas of riparian corridor and stream segments not slated for response actions where site conditions warrant restoration work.

Restoration and Remedial Coordination

- Restoration coordination efforts will be conducted with USEPA Remedial Project Managers to confirm that ecological restoration of the Haney Park riparian area is compatible with the completed remedy.
- Restoration staff will, in conjunction with USEPA staff evaluate riparian corridor and stream bank locations where response actions are not planned to determine the potential for additional restoration opportunities.
- Trustee representatives will coordinate with the City of Park Hills and other stakeholders including conducting public involvement sessions to seek public input on the proposed Project.

Restoration Methods and Goals

The methods used in the proposed project will consist of conservation practices for stream banks stabilization and riparian corridor revegetation. Restoration methods will be derived and adapted from multiple sources including the Natural Resources Conservation Service and Missouri Department of Natural Resource Soil and Water Conservation Practices, among others.

- The Flat River Creek bank stabilization project goals are to reintroduce native vegetation, reduce sedimentation and maximize aquatic and wildlife habitat following response actions. In order to achieve this goal, we propose to employ bank stabilization design and implementation methods using natural channel design techniques and state-of-the-art bioengineering approaches in accordance to state and federal guidance documents. These methods best maximize both the physical and ecological outcomes versus traditional hard-engineering practices commonly used in response actions such as rip-rap and other hard materials. The process will use bank grading, natural materials, and revegetation for long-term site stabilization which provides ecological benefits to trust resources and increases sustainability by reducing long term maintenance costs.
- Riparian corridor restoration goals are to aid in stabilizing streambanks, benefit aquatic biota by regulating water temperatures, suppling stream carbon and large woody material, reducing stream sediment and providing wildlife habitat and travel corridors. We propose to revegetate the existing remediated riparian corridor with native vegetation to compliment stream bank restoration efforts. In addition, areas identified by USEPA as not subject to future remedial actions will be prioritized and evaluated for restoration. Follow-up spraying of herbicide for non-native control and replanting to address losses will occur as needed.

Connection to the Injured Natural Resources

This proposed project is intended to provide direct restoration of natural resources that the Trustees have identified as injured by releases of heavy metals in the Old Lead Belt. This project takes place within the Big River watershed on property immediately downstream of the Federal Tailings Pile. The Trustees

received a settlement from ASARCO for natural resources injuries to terrestrial and aquatic resources including soils, sediments and biota within the OLB.

This Proposal requests funding derived from settlement monies for Big River Mine Tailing/St. Joe Minerals Site which included ASARCO natural resource injuries in St. Francois County. Those operations contributed contamination which injured upland resources and came to rest in the riparian corridor and sediments and sediments of Flat River Creek. The project will address rehabilitating those areas both directly injured and within adjacent locations not receiving remedial actions but which are ecologically connected.

Proposed Budget

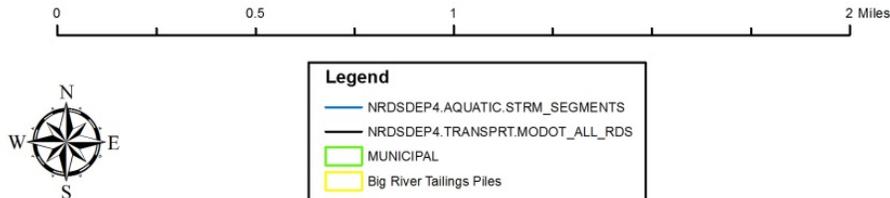
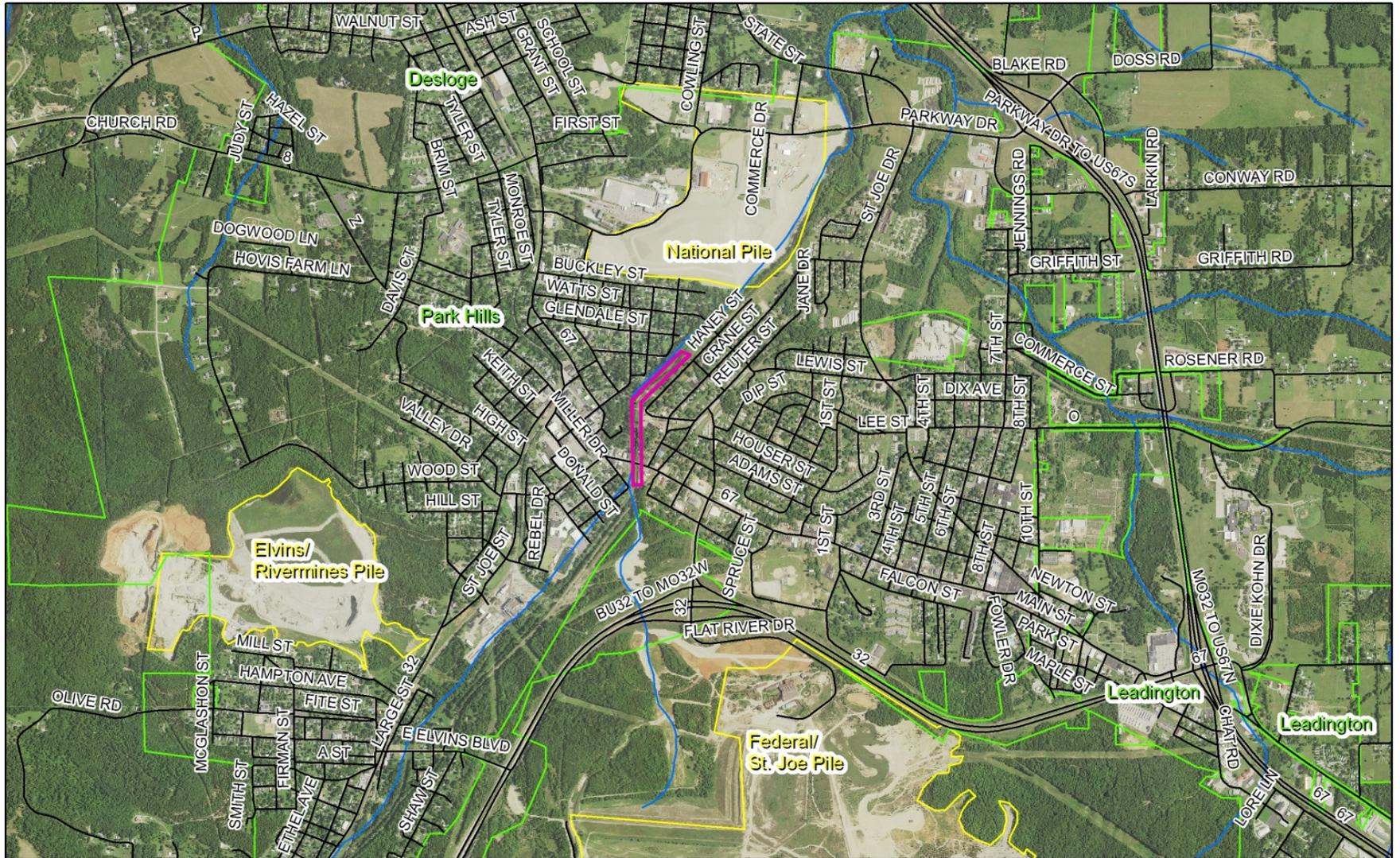
The proposal seeks to earmark an amount not to exceed \$200,000 to fund overall restoration actions related to the project. To address uncertainties in the exact scope and timing of remedial actions, the project is envisioned to be implemented in phases. Each phase of the project will be submitted to the Trustee Council under the auspices of the SEMORRP for consideration and will contain detailed budgets and descriptions of all actions to occur under that phase. Project areas with completed floodplain remediation will be evaluated for the installation of native vegetation and stream bank stabilization in coordination with USEPA for the first phase of the projects. Additional projected phases may be submitted as floodplain and other remedial actions are implemented.

Timeline

Upon Authorized Official concurrence on the proposal outline, the MNDR will coordinate with applicable stakeholders and the USEPA to develop detailed phased proposals for Trustee consideration.

Flat River Creek Project Area

Figure 1



Legend	
	NRDSDEP4.AQUATIC.STRM_SEGMENTS
	NRDSDEP4.TRANSPRT.MDOT.ALL_RDS
	MUNICIPAL
	Big River Tailings Piles
	Proposed Area of Restoration

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